

ISSN 1913-9004 (Print)  
ISSN 1913-9012 (Online)

# **INTERNATIONAL BUSINESS RESEARCH**

**Vol. 2, No. 4  
October 2009**



**Canadian Center of Science and Education**

# Editorial Board

Ali Mansouri	Zanjan University, Iran
Amran Awang	Head of Entrepreneurship Center, Malaysia
Ananda Jeeva	Central Queensland University, Australia
Azian Madun	University of Malaya, Malaysia
Benjamin J. Inyang	University of Calabar, Nigeria
Bhagaban Das	Fakir Mohan University, India
Cindy Xu	Canadian Center of Science and Education, Canada
Dennis Yao Dzansi	Central University of Technology, South Africa
Guneratne Wickremasinghe	Victoria University, Australia
Hanoku Bathula	AIS St Helens, New Zealand
K. G. Viswanadhan	NSS College of Engineering, India
Kevin James Daly	University of Western Sydney, Australia
Law Kian Aun	University College Sedaya International, Malaysia
Maznah Wan Omar	Universiti Teknologi MARA Kedah, Malaysia
Michaela Schaffhauser-Linzatti	University of Vienna, Austria
Mohd Nasir bin Mohd Yatim	Universiti Tenaga Nasional, Malaysia
Nik Maheran Nik Muhammad	Universiti Teknologi, Malaysia
Rafiuddin Ahmed	James Cook University, Australia
Samuel Allen Broyles	California State University, USA
Sana El Harbi	University of Sousse, Tunisia
Shaiful Annuar Khalid	Universiti Teknologi MARA Perlis, Malaysia
Tajul Ariffin Masron	Universiti Sains Malaysia, Malaysia
Thanos Verousis	Swansea University, UK
Vasileios Bill Kallinterakis	University of Durham, UK
Vlasios D. Sarantinos	University of Strathclyde, UK



## Contents

Employee Change Agents: The Foundation for Effective Organizational Change	3
<i>Allen Barclay</i>	
The Dissimilar Significance of Functional and Experiential Beliefs when Marketing Brands in Cross-Cultural Settings	8
<i>S. Allen Broyles, Sunil Thomas, Howard Forman &amp; Thaweephan Leingpibul</i>	
Study on the Application of CRS in China Hotel Chain: the Analysis based on System Functional Factors	20
<i>Junliang Lu &amp; Zhaojun Zhu</i>	
The Inventory Problem with A Non-Symmetric Loss Function	31
<i>Amaresh Das &amp; Adnan Omar</i>	
The Effect of Globalization, Labor Flexibilization and National Industrial Relations Systems on Human Resource Management	36
<i>Mohammad Ziaul Hoq, Muslim Amin, Iftekhar Amin Chowdhury &amp; Sulaiman Ali</i>	
Game Analysis of Strategic Partner Selection of Chinese and Foreign Technology Alliance	46
<i>Xiaohua Sun &amp; Lin Hu</i>	
Consumer Credit as Lifestyle Interests Facilitators for Consumers of Bangladesh	50
<i>Ataur Rahman</i>	
Disclosure Quality on Governance Issues in Annual Reports of Malaysian PLCs	61
<i>Rusnah Muhamad, Suhaily Shahimi, Yazkhiruni Yahya &amp; Nurmazilah Mahzan</i>	
Analysis on Financial Risks of Derivation and Preventive Measures	73
<i>Yu Pan &amp; Fan Wu</i>	
The Explanation of Anti-Citizenship Behaviors in the Workplaces	76
<i>Aryan Gholipour, Majid Saeidinejad &amp; Mona Zehtabi</i>	
Performance and Volatility of Oil and Gas Stocks: A Comparative Study on Selected O&G Companies	87
<i>Shaharudin, Roselee S, Samad, Fazilah &amp; Bhat, Sonal</i>	
On effects of Foreign Direct Investment on Economic Growth	100
<i>Xinglong Xie &amp; Hongqi Wang</i>	
Communication Skill of the Business Executives: An Empirical Study on Some Local Private Business Concerns in Bangladesh	109
<i>Nargis Akhter, Sardana Islam Khan &amp; Md. Kamrul Hassan</i>	
Developing Competitive Advantage through Ethical and SR Practices: The Case of SME in Australia and Malaysia	116
<i>Noor Hazlina Ahmad &amp; Pi-Shen Seet</i>	
Study on the Influence of Foreign Direct Investment on Chinese Foreign Trade	125
<i>Mengchun Ding &amp; Hongxin Li</i>	
Decomposition of Malaysian Production Structure Input-Output Approach	129
<i>HUSSAIN ALI BEKHET</i>	



## Contents

On the Channels of Foreign Direct Investment to Exchange Rate Pass-Through Strategies: An Analysis from Spatial Panel Data <i>Piriya Pholphirul</i>	140
The Prospect of Catastrophe Securitization in China <i>Jong-Hag Jang</i>	159
Job Satisfaction of Faculty Members in Private Universities -In Context of Bangladesh <i>Taskina Ali &amp; Ireen Akhter</i>	167
Applying Multiple Linear Regression and Neural Network to Predict Bank Performance <i>Nor Mazlina Abu Bakar &amp; Izah Mohd Tahir</i>	176
Analysis of the Implementation of Fair Value in China <i>Xiaoyan Liu &amp; Lin Wang</i>	184
A Study of Hong Kong Tax Compliance Ethics <i>Daniel Ho &amp; Brossa Wong</i>	188
Research on the Sino-us Trade Conflict and Countermeasures <i>Qige Wu</i>	194
Causal Relationship between Foreign Direct Investment and Growth: Evidence from BRICS Countries <i>Sridharan. P, Vijayakumar. N &amp; Chandra Sekhara Rao. K</i>	198
The Enterprise Organizational Structure Change Strategy in Internet Times <i>Zitian Xu</i>	204



## Employee Change Agents: The Foundation for Effective Organizational Change

Allen Barclay

Academic Services Coordinator

College of Natural Sciences, Colorado State University

Instructor of Management

College of Management, Metropolitan State University

1801 Campus Delivery, 11 Weber

Fort Collins, CO 80523-1801

Tel: (970) 491-5365 E-mail: allen.barclay@colostate.edu

*Employee Change Agents: The Foundation for Effective Organizational Change*

### Abstract

This paper specifically looks at the process of organizational change and how employees can influence the outcomes. Organizations tend to underutilize their employees during times of change. An organization is basically a collection of people with the same objectives. Ultimately, I seek to understand how an employee change agent framework can function as an essential tool for controlling and analyzing organizational change.

As a manager and an instructor of management, I believe that is the employee that essentially controls the success of any change in an organization. Employees should be charged with the ability to foster positive change by management, but more so, by themselves. It is the employees responsibility to make the change work in the organization, along with making changes in themselves to help improve not only the organization, but to improve their own working behaviors. All employers should be creating a learning organization by asking their employees to become responsible members of the organization. Allow your staff to be present at the table. Also empower your staff to become more aligned with the core mission of the organization. The more your staff believes they are making a difference for the organization, the more vested, accountable, and responsible they will become.

**Keywords:** Employee Change Agents, Organizational Change, Management

### 1. Introduction

There are many change procedures that focus on either the organization as a whole or how management should work with their employees to make change. This means that there are normally two perspectives for focusing change. The first one is to focus on how to change an organization from an organizational level. To do this, attention must be placed on the whole process involved in the organization. The second one is to focus the change on the people within the organization. The second is usually more effective due to the fact that an organization is not an entity itself, but a collection of people. Most research has proved that for a change to be effective, change efforts should be focused on the people because organizations after all are just a collection of people working towards a common goal.

Organizations who do focus on people, usually interpret that to mean the change effort needs to be centered on upper or executive management, as change from the top is more likely to take place. This is the premise of many change initiatives, to have leadership spearhead the change and allow the change to flow down the hierarchy. I intend to concentrate this paper on another option, focusing the change on the actual employees. This includes not just explaining the change, but empowering the employees to make the change. Employee involvement in change management is the specific focus I intend to discuss. Empowering employees to strive to be more efficient and effective is a must. And while many managers are afraid to turn over the reins to their staff, author, David Childs (2009) states "occasional glitches, created by empowered over-exuberance, do not create nearly as many problems or obstructions to performance as those that would be created by an office full of bureaucratic robots." (Childs, p.53) From my experience, and from historical research on change management, this focus is lacking and needs attention.

### 2. Change from the Inside

From a change perspective, most initiatives are communicated from the top down. Consultants and change agents will work with the decision makers in an organization to help facilitate whatever change needs to take place. Upper

management then works the change down the hierarchy of the organization. Through this and all other change techniques, the employees are given marching orders to transform. For employees to be successful, they must follow the change and implement the new 'ways' of the organization. What normally will distinguish a good change from a bad change is if the management can get buy-in from the employees.

Buy-in and following orders are necessary from staff to make any change work; however I believe more can be done. Organizations spend a great deal of time and money investing in change, only to hand this change over to the employees to be responsible for implementing the transformation. Since it is often up to the employees to make the change work, it should be the employees that are the focused upon by the organization.

As stated in several pieces of literature, employees are the most important aspect of an organization, just use the Hawthorne study as an example. Kinicki and Williams (2008) believe this to be true because, "...the people actually involved with the product or service are in the best position to detect opportunities for improvements" (p.46). This being said, they should also be the most important aspect of any change to the organization.

Within change, we are not normally changing the organization; we are changing the people in the organization. This reinforces the need to shift focus from the organization and management and instead target employees. If employees are the ones that are impacted by the change, they should be the ones that implement the change. For this to occur, employees need to realize their own potential in this change effort and take control of the situation.

Employees should be charged with the ability to foster positive change by management, but more so, by themselves. To do this I have developed a couple of questions that employees must ask themselves to become effective change agents. The first one relates to the employee taking control and implementing the change: *Is there something I can do to make the organization a better place?* The second question is more introspective and relates to employees taking the responsibility to change: *Is there something I personally need to change to make myself a better employee?* The answers to these questions provide the foundation for if an employee is ready to be a strategic partner within the organization.

- If the answer to the first question is yes, then it is the employee's responsibility to do what needs to be done to make the improvement.
- If the answer to the second question is yes, it is the employee's responsibility to do what needs to be done to make the improvement.
- If the answer to the first question is no, then the employee is at a place where he or she needs to decide if the job is a correct fit.
- If the answer to second question is no, then the employee also needs to decide if they have surpassed the growth potential in the job.

When an employee answers these questions, the focus should be related to either improving him or herself or the organization; if not, employees are hindering progress towards productive change.

### 2.1 Employees as Change Agents

The first question focuses on an employee's ability to step up and control the organization. Leadership is not something granted by position; it is something that all people can learn to do. According to Burke (2008); "[Leadership] is usually associated with the behavior of senior executives" (p. 192). Whereas individual needs are focused on "the extent to which one's needs are met on the job" (p. 194). Not many change interventions focus on the actual employee adding input into the organization and/or the change taking place. As he also (2008) states, "...leaders do make a difference, especially in terms of organizational change" but they are only part of the process (p. 227). Change affects everyone, so everyone has to affect change. It is the individual employee that will have the most impact on if change will be effective.

As I stated earlier, employees are one of the most important pieces of an organization. Because they are so important, all change models discuss how to deal with employees during the change process. This is normally limited to telling employees how to change or what to do during the change. What the models do not discuss is how to have employees empower themselves to make the change. Professor Jerry Gilley at Colorado State University (2009) states, "that you cannot empower anyone, they must empower themselves." I agree and believe that this statement gets to the root of all change. The main questions an organization needs to consider are: what is change in an organization? Does the organization change or do the people change? If an organization is really just a group of likeminded people working towards a common goal, then it is easy to answer that question with; it is people that change. That is a pretty generic statement, but when there is change, it is the people in the organization that will have to either make the change, change their process for how they complete the task, and/or both. This means that what really needs to happen for a change to be successful is the people who make up the organization have to take control and make the initiative work.

This being true, how do we change people? Change is a foreign and strange phenomenon that does not come easy to most employees and most organizations have the people they presumably want because they hired them in the first

place. So really, we are not changing the people, but usually a process that they are doing to complete the work being done in the organization. During many change processes, organizations will and do change people. This is done through lay-offs, attrition, people frustrated and quitting, and new people hired on. Change does affect people, but the change must come from already hired employees that are performing at an optimal level. Sometimes they will not change, and that will lead back to negative consequences.

In order to keep the employees management will want and to make sure they are where the change starts, I propose that they reflect on the questions in this paper.

## *2.2 Employee Responsibility to the Organization*

*Is there something you can do as an employee to make the organization a better place?* As an employee it is critical that they should always be asking this question. I already stated that an organization is a collection of likeminded people who have shared goals. If each employee were to ask this question every day, then change would not be so daunting. Change would merely be part of a daily routine. As part of Deming's (1960) philosophy, this is a big part of Total Quality Management (TQM). Deming (1960) states; managers must "get every employee involved. To build teamwork and trust, TQM companies see that every employee is involved in the continuous improvement process. This requires that workers must be trained and empowered to find and solve problems. The goal is to build teamwork, trust, and mutual respect." (p. 59) How better to do this than to teach all employees to continuously reflect on this question.

For this to be successful, management must encourage employees to ask this question, and allow them to act on the answers. This does not mean to give them free rein to make changes, but if the question is considered by the people who do the work, then the answer should help the process. If a true team member is continuously asking how they can improve, and they are the ones tied to the actual work, then this should lead to supportive buy-in, performance, and overall more effective and efficient change.

Employee buy-in is very important for change to be successful. Employees that feel that they are contributing to the organization will be happier about the change, and will work harder to be successful. What I am targeting is the personal aspects of an employee's own processes that all leaders should know. David Neeleman, founder and CEO of JetBlue Airways Corporation says when he worked at former employer Morris Air, "We had 250 people in their homes doing reservations at Morris Air... They were 30 percent more productive – they take 30 percent more bookings, by just being happier" (Friedman, 2005, p. 37). Empowered employees typically leads to productive benefits such as long term employment, increased job satisfaction, pride in the organization, and overall better communication, all of which contribute to lower operating expenses. Leaders must learn enough about their employees to create an environment that fosters long term loyalty that will allow employees to take the risk of asking how they can do what they do better. Other additional benefits of empowered and satisfied employees include the fact that long term employment saves the company in the long run due to lower turnover costs. Turnover costs can include advertisements for posting jobs, the hiring process which may include hidden costs such as salaries if a search committee is required, training new employees, as well as the stress on co-workers who have to help during the training process.

Leaders must have the ability to understand what is important to their employees. "Managers spend most of their time relating to other people – in conversations and meetings, in groups and committees, over coffee or lunch, on the phone, or on the Internet." (Bolman & Deal, 2002, p. 345) Henri Fayol, a French CEO was the first leader to start discussing what he called "employee equity" (Simms, 2002). Fayol believed that employees should be treated with respect and as equals with management. Thinking like this was pretty radical in the early 20<sup>th</sup> century, but now times have changed. Today, I believe employees will be more productive if they are treated with respect. This leads us to our next question:

## *2.3 Employee Responsibility to become more Effective and Efficient*

The second question focuses on an employee's ability to step up and control their own behavior. *Is there something you personally need to change to make yourself a better employee?* This question is a little different and the more important piece of this paper. Not only should good employees continuously ask about making the organization better, but they must also reflect on their own production behavior. Empowering employees to take the reins and make the change happen is great, but I also discussed earlier that there are times when the employee must change too. Management must be ready to help empower employees to also make changes in themselves. As an employee, and as a valued member of the organization, employees must also be critical of what they are doing to better themselves along with making the organization better.

Most changes in organizations are made at the individual level, and it is great when organizations have people that will continuously ask the first question. But how many people are willing to ask themselves the second question. If an organization must evolve to grow and be more productive, should not the people in the organization also do the same? I believe that the second question gets to the center of all change, what can each employee do to be better? If people thought like organizations, they would continue to make themselves strategic partners with the organization.

Is there something I can do personally to make myself a better employee? That question is very difficult for most people to answer. Organizations spend millions of dollars continuously trying to answer that question about the company. If this logic can be brought down to the employee level, then each person in the company should be asking if they can do anything to make themselves better.

The Myers-Briggs and DISC are both used by organizations to assess how employees' personalities impact how they work with each other. But how often do they use these tests to explore how an employee works alone. It would make sense that if you could make each individual better then as a result it would make the whole organization better since an organization is a collection of individuals. As organizations work towards improving processes, they also need to work towards improving individual performance. This individual change for performance improvement refocuses from an employer making the individual more effective and efficient to the employee improving their own performance.

This concept explores motivation and how to motivate employees to become better at what they do on a daily basis. Motivation is a lot like empowerment, management cannot make an employee feel empowered, nor can they make an employee feel motivated. This is something that comes from within a person. Employees must motivate themselves. The old saying that you can lead a dog to water, but you cannot make them drink holds true for employees, you can hold out incentives, praise, and many other rewards, but you cannot make them work if they are not motivated.

So how do we as change agents make employees want to critically reflect and improve upon their own work behavior? By looking at these models, there are many areas that focus on individual performance, but they do not focus individual behavior. This is where this paper is intending to add to the existing literature and add a section about self motivation and individual work behavior. Management must realize that individual behaviors are based on what the individual wants to do at work. This idea is not new. In their book, *Management, a Practical Introduction*, Angelo Kinicki and Brian Williams (2008, p.46) discuss how Hugo Munsterberg stated back in 1892 that managers need to:

- 1) Study jobs and determine which people are best suited to specific jobs.
- 2) Identify the psychological conditions under which employees do their best work.
- 3) Devise management strategies to influence employees to management's interests.

Two out of three points by Munsterberg state that the employee must be engaged in their own work experience. Managers need to create a work environment that allows employees to internally motivate themselves for improvement. And the only way for managers to achieve this is to create a work environment that allows employees to want to answer the second question and want to improve their own behavior towards work.

It is time to add a new box to change models that discusses the individual employee work perspective. And it is time for management to take the perspective that employees cannot be forced to behave in a certain way, they must create a work environment that makes employees want to behave in a way that creates a more productive organization.

### **3. Managerial Responsibility**

Although the most important aspect of this paper is focused on employees changing their own behavior, it is also just as important for managers to understand this about their staff. Managers set the tone for the organization. They uphold and support the organizational culture. They must create an environment that fosters employees to want to succeed. As I stated earlier change does involve employees. And they usually are the component that has to drive the change to become effective. But to create organizational change that will last, managers and leaders must empower their subordinates to want to change.

Suggestions for managers would be to take a proactive approach to the questions asked in this article. Create an environment where these questions are part of the culture. These could also be implemented into annual reviews. All employers should be creating a learning organization by asking their employees to become responsible members of the organization. Allow your staff to be present at the table. Also empower your staff to become more aligned with the core mission of the organization. The more your staff believes they are making a difference for the organization, the more vested they become.

### **4. Further Research**

Because most of the organizational change research in the past focuses on management, not much is written about focusing on employees. The limitations of this paper are contained to what has been previously written and my own past experience as a manager and leader. Further research, both quantitative and qualitative, is needed in this area. Beyond further research, it is important to understand the most employees think that they are already doing what is being suggested in this paper. The issue then lies in the gap between what is, and what should be. And this is the area that should be focused upon my managers.



## 5. Conclusion

This paper focused on a critical piece that is missing in management, the piece that includes change in the individuals in the organization. I believe that it is the employees responsibility to make the change work in the organization, along with making changes in themselves to help improve not only the organization, but to improve their own working behaviors. Empowerment comes from within, and employees must take the ownership of making themselves better.

## References

- Bolman, L. & Deal, T. (2002). *Reframing organizations, artistry, choice, and leadership*. San Francisco, CA: Jossey-Bass
- Burke, W. W. (2008). *Organizational change: Theory and practice 2<sup>nd</sup> edition*. Thousand Oaks, CA: Sage Publications.
- Burke, W.W. & Litwin, G.H. (1992). A causal model of organizational performance and change. *Journal of Management*, 18(3), 532-545.
- Burke, W.W. (2002). *Organizational change: Theory and practice*. Thousand Oaks, CA: Sage Publications.
- Child, D. (2009). *Improving Employee Productivity and Efficiency*. Government Finance Review. April 2009
- Deming, W.E. (2000). *Out of the Crisis*. Boston, MA: The MIT Press
- Friedman, T. (2005). *The world is flat, a brief history of the twenty-first century*, New York, NY: Farrar, Straus, and Giroux.
- Gilly, J.W. & Maycunich, A. (2000). *Organizational learning, performance, and change: An introduction to strategic HRD*. Cambridge, MA: Perseus Publishing.
- Kinicki, A. & Williams, B. (2008). *Management, a practical introduction*, Third Edition, New York, NY: McGraw-Hill.
- Simms, G. (2002). *Compassionate management: Insights and applications from biblical tradition*: [www.natagent.org](http://www.natagent.org).



## The Dissimilar Significance of Functional and Experiential Beliefs when Marketing Brands in Cross-Cultural Settings

S. Allen Broyles (corresponding author)

California State University, Fullerton

Mihaylo College of Business and Economics

Fullerton, CA 92834-6848

Tel: (657) 278-3180 Fax: (657) 278-7117 E-mail: [sbroyles@fullerton.edu](mailto:sbroyles@fullerton.edu)

Sunil Thomas

California State University, Fullerton

Mihaylo College of Business and Economics

Fullerton, CA 92834-6848

Tel: (657) 278-3646 Fax: (657) 278-7117 E-mail: [sunilthomas@fullerton.edu](mailto:sunilthomas@fullerton.edu)

Howard Forman

California State University, Fullerton

Mihaylo College of Business and Economics

Fullerton, CA 92834-6848

Tel: (657) 278-3799 Fax: (657) 278-7117 E-mail: [hforman@fullerton.edu](mailto:hforman@fullerton.edu)

Thaweephan Leingpibul

Western Michigan University

Haworth College of Business

Kalamazoo, MI 49008-5411

Tel: (269) 387-4249 Fax: (269) 387-6225 E-mail: [duke.leingpibul@wmich.edu](mailto:duke.leingpibul@wmich.edu)

### Abstract

Drawing from social science literatures, this paper proffers and examines a theory that firms should adapt their marketing strategies in cross-cultural settings in order to reflect the dissimilar significance of their brand's *functional* and *experiential* elements in disparate cultures. Employing American and Chinese respondents, the paper tests hypotheses that empirically examine whether there is support for the discussed theory. It presents the findings, some which were unexpected, and offers new insight into the ongoing standardized vs. localized marketing strategy debate, with respect to marketing brand(s) in cross-cultural settings. The paper also provides a future research program to further our understanding of which marketing strategies are more apposite in cross-cultural settings.

**Keywords:** Cross-cultural, Marketing strategy, Functional elements, Experiential elements

### 1. Introduction

As domestic markets mature and competitive pressures increase, firms frequently turn to foreign markets in quest of growth opportunities for their brands. Unfortunately, the increased marketing costs and greater risks that are associated with international expansion frequently lead to firms failing to achieve their performance goals in these markets (Liu and McClure, 2001; Ma and Elango, 2008). Merrill Lynch's initial entry into the Japanese market in the 1980's is an exemplar of such failure because of the firm's inadequate adaptation of its marketing strategy to the customer disparities that are found in this cross-cultural setting (Ekeledo and Sivakumar, 2004).

While practitioners often assume that brands which do well in their home market will do well abroad, if customers perceive brands to be dissimilar in cross-cultural settings similar success cannot be assumed, because foreign customers'

purchase behavior might differ (Sinha and DeSarbo, 1998; Keller, 2000; Barnes, 2003). Thus, given the importance of international markets to many firms and the challenges that confront their brands in these markets, it becomes critical to understand the differences in consumers' brand beliefs and perceptions across cultures, and the impact (if any) of these differences on individuals' purchase behavior.

Interestingly the literature suggests that two aspects of a brand which are important contributors to consumers' beliefs regarding a brand are its functional elements and its experiential elements (Zaltman, 2003; Barnes, 2003; deChernatony, Harris and Riley, 2000). Specifically, consumers' beliefs about a brand reflect their perception of its *functional* (utilitarian) elements (a brand's quality and performance), and its *experiential* (subjective) elements (the resonance and imagery associated with a brand) (Broyles, Schumann, and Leinpibul, 2009).

In drawing from social science literatures, we theorize that the dissimilar cognitive processes, values, evaluative criteria, and purchase decision processes that exist in disparate cultures (e.g. Nisbett, Peng, Choi and Norenzayan, 2001; Briley and Wyer, 2001) likely lead to a brand's *functional* and *experiential* elements having dissimilar influence on consumers' purchase behavior. If supported, this difference would suggest that firms will most likely need to adapt their marketing strategies to place disparate weights on the *functional* versus the *experiential* elements of their brands in cross-cultural transactions.

From a strategic perspective, this is an important issue that is related to the ongoing standardized versus localized marketing strategy debate. For example, some (e.g. Katsikea and Skarmeas, 2003) suggest that firms tend to struggle in international markets when they do not adapt their marketing strategies to reflect dissimilarities that exist between customers in their domestic and foreign markets. Conversely, others (e.g. Ozsomer and Prussia, 2000) question whether firms should adapt their marketing strategies in foreign markets, suggesting that standardized strategies may be quite apposite in cross-cultural settings.

In order to expand our understanding of whether standardized or localized marketing strategies are more appropriate in cross-cultural transactions, this paper discusses an empirical study that examines whether consumers' perceptions of a brand's *functional* and *experiential* elements suggest that firms' marketing strategies should have (dis)similar focus on the *functional* and *experiential* elements of their brands across cultures.

Using individuals in a Western culture, such as exists in the U.S., and in a traditional Eastern culture, such as exists in mainland China, the present study was conducted to test the proposed theory. These cultures were chosen for a comparative study based on social science literatures suggesting that the cognitive processes, values, and evaluative and decision processes of individuals typically found in these two cultures are so dissimilar that they are essentially opposite (Nisbett et al., 2001). Because of these differences, some (e.g. Nisbett et al., 2001; Briley and Wyer, 2001) suggest that the focus of a firm's marketing strategy on its brand's *functional* and *experiential* elements should differ in these cultures. This would suggest that a firm would need to have a more localized marketing strategy for these markets. This makes a stronger case for the use of U.S. and Chinese subjects in this study for evaluating the (dis)similar importance of a brand's *functional* and *experiential* aspects in these cultures.

This paper begins by discussing the *functional* and *experiential* elements of a brand that are frequently employed in a firm's marketing strategies. The paper next examines the dissimilar significance of these elements in Western and traditional Eastern cultures, and puts forth testable hypotheses to examine this study's theory. It then discusses the study and its findings, some of which were quite unexpected. It closes by discussing implications of the study's findings, after which it puts forth a future research agenda to provide further insight into the standardized vs. localized marketing strategy debate, followed by a discussion of this study's limitations.

## 2. Conceptual Development

### 2.1 Functional and Experiential Beliefs

Fundamentally, consumers' beliefs regarding a brand are linked to their perceptions of its *functional* and *experiential* facets (Zaltman, 2003; Barnes, 2003; deChernatony, Harris and Riley, 2000). The *functional* aspect represents a brand's more intrinsic, objective, utilitarian, and tangible facets (Holbrook and Hirschman, 1982; Keller, 2003), including consumers' perception of its quality and performance (Rajagopal, 2007; Hall and Jones, 2007). Perceived quality refers to consumers' judgments of the overall excellence of a brand, relative to substitutes (Zeithaml, 1988). Perceived performance refers to one's judgment of a brand's ability to fulfill its intended functions, relative to substitutes (Keller, 2001).

The *experiential* aspect refers to a brand's extrinsic, subjective, emotive, and intangible facets (Holbrook and Hirschman, 1982; Keller, 2003), including its resonance and imagery (Keller, 2001). Whereas resonance refers to the relationship that consumers have with a brand, such as an individual having an emotive bond with the brand (Rajagopal, 2007), imagery deals with how well a brand fulfills consumers' psychological/social needs (Hall and Jones, 2007).

It is important for a firm to determine whether its marketing strategies should have disparate focus on the *functional* or *experiential* elements of its brand(s) in cross-cultural settings (Herstein and Tifferet, 2007). For example, Wheelwright (1984) addresses our need to better understand the significance of the *functional* elements with regards to their influence on consumers' purchase intent by noting that a firm has greater potential to achieve its performance goals by incorporating guiding principles such as a commitment to the *functional* elements of its brand(s). With respect to the *experiential* elements, Taylor and Prideaux (2008) discuss that firms have greater potential for success if their marketing strategies incorporate these elements. These views clearly suggest that we need to better understand whether the *functional* and *experiential* elements have dissimilar influence on consumers' purchase behavior.

It should be noted that consumers' purchase behavior toward a brand could be influenced by factors beyond the four employed here (i.e. quality, performance, resonance and imagery). For example, the literature discusses that other facets of a brand which might impact purchase behavior include: i) one's awareness of a brand (i.e. ability to recognize and recall a brand name) (Keller, 2003); ii) one's attitude toward a brand (favor/disfavor) (Armstrong and Kotler, 2003); iii) one's loyalty toward a brand (repeat purchases) (Keller, 2003); and, iv) a brand's economic life (Aaker, 1991). Demographic variables such as age could also play a role in influencing purchase behavior. However, as the purpose of this paper is to build a foundation of new knowledge about the comparative influence of brands' *functional* and *experiential* facets on purchase behavior in cross-cultural settings, we elected to limit the study to those antecedent variables which literature discusses as being crucial in the development of consumers' purchase behavior toward a brand. Thus, we did not incorporate other factors as dummy variables in this study (Hair, Black, Basin, Anderson and Tatham, 2006).

## 2.2 Implications for Marketing in Cross-Cultural Settings

Social science literatures suggest that the significance of one's *functional* and *experiential* beliefs may differ across cultures due to the disparate cognitions, perceptions, emotional experiences and expressions, and evaluative and consumptive behaviors that exist in such settings (Paladino, 2007). If empirical evidence supports the existence of such differences, might the inadequacies of existing cross-cultural research (Ferraro, 2002) be restricting our ability to develop and disseminate knowledge about such differences to practitioners which would help firms achieve their desired performance in international markets (Contractor, 2007)?

Support for examination of this question is found in Abbott's (1976) discussion that we need to develop and test theories and models that help overcome our 'foreignness', which refers to our unfamiliarity with, and inadequate understanding of customers' differences that exist across international markets (Zaheer and Mosakowski, 1997). Further support regarding the need to understand potential disparities among consumers in foreign markets is found in Ferraro's (2002) statement: "Since there are so many good brands on the market today, the crucial factor in determining who makes the sale is not so much the intrinsic superiority of the brand but rather the skill of the seller in understanding the...cultural differences and similarities operating in the global marketplace" (p. 14).

## 3. The U.S. and China as Exemplars for Cross-Cultural Study

Drawing from social science literatures, we posit that U.S. and Chinese samples are apposite for a comparative cross-cultural study, as the literature indicates that there are no two cultures with greater differences than the Western culture, such as found in the U.S. and the traditional Eastern culture, such as found in mainland China. Hofstede (2001), for example, shows that the Chinese and U.S. cultures differ most significantly on the Individualism and Long-term Orientation cultural dimensions. It is essential to strengthen our understanding of the impact of these differences on customer purchase behavior given that China is a strategic target market for many firms because of its large population and relatively strong economic growth (Liu and McClure, 2001). Further, studies are needed that will help stop domestic firms' declining market share in China, which stems from practitioners' uncertainty of how to develop marketing strategies that accommodate the differences between these two cultures (Zhou and Hui, 2003).

### 3.1 Differences between Chinese and U.S. Cultures

Before discussing dissimilarities between the U.S. and China, an assumption needs to be discussed. Specifically, any reference to China means mainland China, and does not include Taiwan, Hong Kong, or other parts of China. This is to avoid entangled discussions about the cultural, cognitive, and behavioral dissimilarities that exist between mainland China and these other areas (Tai and Tam, 1997; Inglehart and Baker, 2000).

With respect to individuals typically found in China, the literature suggests that their values, cognitive and evaluative processes, and behaviors can be traced back to the ancient philosophies, beliefs, and teachings of Confucius, Buddha, and Tao (Hofstede, 1984; Markus and Kitayama, 1991; Watkins and Liu, 1996). In comparison, these aspects of individuals in Western cultures can be traced back to the ancient teachings of Socrates, Aristotle and Plato (Nakamura, 1960). The beliefs, teachings and philosophies of these great thinkers have been passed down over generations through each culture's arts and sciences (Huntington, 1993), through their educational, religious (Huntington, 1993) and legal systems

(Nakamura, 1960; Nisbett et al., 2001), and have been influenced by the level of each culture's economic development (Nakamura, 1960).

The result of these influences is that a typical Westerner (as compared to a typical Chinese) has an *experiential* orientation, and wants to fulfill his/her subjective, emotional and psychological needs through purchase behaviors (Costa and Bamossy, 1995; Inglehart and Baker, 2000). Understanding these orientations is important for helping firms determine whether standardized or localized marketing strategies are best suited for cross-cultural settings (Eerie, Edwards and Lee, 2008). Thus with respect to *experiential* facets, we expect that:

H1: Resonance has stronger influence on future purchase intent with Americans than with Chinese.

H2: Imagery has stronger influence on future purchase intent with Americans than with Chinese.

With respect to Chinese, the literature suggests that the typical individual in an Eastern culture, and in particular, China has more of a utilitarian and objective orientation (Inglehart, 2001; Inglehart and Baker, 2000). This suggests that the *functional* facets of a firm's brands should be given greater focus in a firm's marketing strategies within the Chinese culture (as compared to the U.S. culture) (Inglehart, 2001; Holbrook and Hirschman, 1982). To examine whether these thoughts are empirically supported, the following hypotheses are put forth:

H3: Perceived quality has stronger influence on future purchase intent with Chinese than with Americans.

H4: Perceived performance has stronger influence on future purchase intent with Chinese than with Americans.

## 4. Study

### 4.1 Study Perspective

Future purchase behavior was employed in this study's hypotheses as the consequence of brand's *functional* and *experiential* elements, because increasing consumers' purchase behavior is a desired performance outcome for a firm (Calderon, Cervera and Molla, 1997). Further, various scholars (e.g. Holbrook and Hirschman, 1982; Sinha and DeSarbo, 1998; Zeithaml, 1988; Keller, 2001, 2003; McAlexander, Schouten, and Koenig, 2002) indicate that a consequence of strong brands is that consumers' purchase behavior toward those brands is strengthened.

As found in the noted hypotheses, future purchase intent was used in this study as a surrogate for future purchase behavior (Newberry, Klemz and Boshoff, 2003) because current research reveals that intent is "most likely to be predictive of actual purchase" (Keller, 2003, p. 462). Further, Chandon, Morwitz and Reinartz (2004) found support for this view in their study which found a degree of evidence that one's purchase intentions has some level of association with their actual purchase behavior.

### 4.2 Participant and Brand Selection

To test this study's hypotheses it was important to secure comparable U.S. and Chinese respondents to minimize within-group heterogeneity, reduce measurement and random error, strengthen the study's validity, and lead to more valid comparisons of the two groups (Ter Hofstede, Wedel and Steenkamp, 2002; Steenkamp and Baumgartner, 2000). To this regard, we conducted qualitative interviews with 24 students at a major southeastern U.S. university, with half of the samples having been born and raised in mainland China, and only recently having come to the U.S. to pursue their undergraduate degree. The other half of the sample is American born and bred university students. The qualitative data secured from these interviews indicate that the test could be conducted with U.S. and Chinese university students, in that the samples from each culture noted this would lead to a strong probability that the study should be conducted with respondents that have comparably similar needs, attitudes and beliefs, lifestyles, and behaviors (especially as compared to older age groups).

Because a cross-cultural comparative study requires using a brand(s) for which respondents in each group have similar familiarity and usage, qualitative interviews were conducted with various U.S. and Chinese respondents to identify suitable brands. Interview data indicated that KFC would be an appropriate brand based on it meeting our criteria. Support of using KFC is found in discussion of the samples that it is a brand with a strong market presence and strong recognition by individuals in the U.S. and China (Businessline, 2006).

### 4.3 Survey Development

An in-depth review of literature did not reveal extant measures that adequately capture the contextualities of KFC (e.g. smell, taste, and tenderness of its chicken; the choice of side items; and, the cleanliness of its restaurants). Thus, Churchill's (1979) guidelines were used to develop new measurement items, with focus on ensuring the measures and survey instrument are easy for U.S. and Chinese samples to comprehend (Dillman, 1978).

Interviews were conducted with employees of KFC and volunteer university student respondents to develop insights into perceptions of the brand's *functional* and *experiential* elements. Interview data were used to develop initial measures that were then reviewed by four subject matter experts (SME's) to confirm the face validity of the measures, and to determine how well they represent the constructs. SME feedback was also used to identify any measures that should be

dropped from the survey or be altered; and, to determine whether any new measures needed to be developed (Maurer and Tross, 2000). The resultant survey instrument employed a Strongly Disagree – Strongly Agree, 5-point Likert scale throughout, and was examined by various respondents to confirm its clarity and understandability (Dillman, 2000).

Next, the survey instrument was translated into Chinese, after which it was back-translated into English by a bi-lingual person, with all discrepancies corrected. The Chinese version was then examined by a Chinese university professor and two of his student assistants, each who are proficient in English, in order to ensure similarity of the two versions of the survey (Mullen, 1995).

#### 4.4 Pre-Test and Methodology

A pre-test was conducted with 272 American and Chinese volunteer student respondents at the noted U.S. university. Of these completed surveys, twenty-two were discarded due to outliers (using the multivariate data screening function in NCSS 2001), missing data, incomplete surveys, and indifferent answer patterns. Using the pre-test data, descriptive statistics procedures in SPSS 15.0 were utilized for identifying whether any of the measures were problematic (e.g. were poorly worded or had high kurtosis). Any measures identified as being problematic were either corrected or removed if judged to be uncorrectable. Then, confirmatory factor analysis (CFA), utilizing SPSS 15.0 was used to identify the degree of construct validity (e.g. no cross-loading or weak loading). The results of the measurement model were then run in Structural Equation Modeling (SEM), employing Amos 7.0 in order to cross-check the retained items for evaluating their potential behavior in the actual study. The modification indices and normality test in SEM were also satisfied.

SEM was employed because it is a good methodology for a study that entails constructs which must be evaluated through observable measures and indicators (Steenkamp and Baumgartner, 2000). It also enables cross-cultural comparison (Steenkamp and Baumgartner, 2000) and produces series of goodness-of-fit statistics to help evaluate proposed models (Mullen, 1995). Lastly, SEM helps ensure equivalence of constructs, measurement items, and samples, which are important for avoiding weakening the validity of substantive inferences in a cross-cultural study (Mullen, 1995).

#### 4.5 Conducting of the Actual Study and Revealed Findings

The final survey was administered to 280 volunteer students at a southeastern U.S. university, and to 298 volunteer students at a university in Beijing. Of the U.S. samples, 60% were male and 40 % female; and, of the Chinese samples, 45% were male and 55% female. The average age of the samples was 19-25 for each group.

Of the completed surveys, 65 that were completed by U.S. students and 68 that were completed by Chinese students were discarded due to outlier test, illegibility, missing data, or answers that were overly similar. CFA, employing SPSS 15.0 was utilized to examine the study's data in order to ensure proper factor loading patterns. Next, SEM in Amos 7.0 was used to examine the data to evaluate how well it performs with the proposed model.

Measures identified as loading weakly on constructs, or having atypically strong modification indices were removed. Descriptive statistics such as kurtosis and skewness were also examined for identifying any problematic items, which were then removed from the data. Next, the measurement model was re-run to confirm that the purified data performs well with the structural model.

Since this cross cultural study entails comparison between two cultures, the measurement invariance (equivalence) was evaluated (Steenkamp and Baumgartner, 1998; Myers, Calantone, Page and Taylor, 2000; He, Merz and Alden, 2008). Although back translation was conducted during scale development to ensure some degree of face validity, the EFA and multi-group analysis were also conducted to ensure the degree of measurement invariance (Deshpande, Farley, and Webster, 2000; He et al., 2008).

The result of EFA showed a similar loading pattern for both cultures, indicating the existence of the same simple structure in both cultures. Finally, the multi-group analysis in SEM was conducted to define the level of measurement invariance by comparing the fit of a baseline model (unconstrained) with other four constrained models, including: i) equal covariance, ii) equal lambdas, iii) equal covariance and lambdas; and, iv) equal covariance, lambdas, and error variances (Mullen, 1995; Steenkamp and Baumgartner, 1998; Myers et al., 2000). The results of Chi-square and degree-of-freedom and other fit indices (e.g. CFI, RMSEA, etc.) from the three constrained models revealed that the configural and metric invariance are satisfied, but the last constrained model showed some degree of instrument bias in Chinese samples. Two items which indicate bias error variances in Chinese samples were removed in order to avoid the common method variance (Myers et al., 2000). In sum, the level of measurement invariance is matched with the purpose of this research (Steenkamp and Baumgartner, 1998) and the measurement should work for comparison study.

As shown in Table 1, the targeted overall fit statistics for the structural model were achieved (Chi-Square:  $DF \leq 3:1$ ;  $CFI \geq .9$ ;  $RMSEA \leq .07$ ) (Hair et al., 2006). Table 1 also depicts that the statistical results for the Structural Model reveal that at a confidence level of 95% the parameter weights for the retained measurement items met, or were very close to the targeted parameter weight ( $\geq .4$ ) (Hair et al., 2006). However, Table 1 shows that some of the constructs have Cronbach's Alpha values below the oft cited value of .70 (Hair et al., 2006). For example, the value for quality is .54 for

Chinese samples; performance is .65 with Americans; Imagery is .59 with Chinese; and, future purchase intent is .68 for U.S. and .56 for Chinese samples. While the targeted Cronbach's Alpha value of .70 was not met by some of the constructs, the scores were significantly higher than the .40 recommendation by Hinkin (1998).

Similar to the perspective held by Churchill (1979), Anderson, Plotnikoff, Raine and Barrett (2005), and Hair et al. (2006), we believe that with a study such as this, which examines new hypotheses and uses new measures, and was conducted with respondents in two dissimilar cultures, that statistical flexibility is essential. Based on these various points, we warrant that the model and statistical findings are sufficiently strong to accept in this study.

While Figure 1 presents a conceptual model that guided the study, Figure 2 depicts the final structural equation model that was employed for testing this study's hypotheses. As indicated in Figure 2, this study revealed expected and unexpected findings. All findings related to paths that were retained between constructs shown in Figure 2 were significant at a 95% confidence level. As depicted in this model, the paths between resonance and future purchase intent and between imagery and future purchase intent did not hold up. Thus, **H1 and H2 are not supported**.

While Figure 2 depicts that perceived quality was found to have statistically significant influence on future purchase behavior for Americans (standardized path weight of .46), it also depicts that perceived quality does not have significant influence for the Chinese respondents. Thus, **H3 is not supported**. With respect to perceived performance, it was found to have greater influence on future purchase intent for Chinese than for Americans (standardized path weights of .91 and .26, respectively). Thus, **H4 is supported**.

## 5. Discussion and Conclusion

### 5.1 Need for International Marketing Studies

Notable international marketing studies have been completed on topics such as market selection (Brouthers and Nakos, 2005); patterns and speed of multinational corporations' penetration of international markets (Buckley and Casson, 2007); the relationship between international diversification and performance (Hennart, 2007); and, international market channel partner selection (Wang and Kess, 2006). However, there has been inadequate investigation of potential cross-cultural disparities regarding consumers' preference for brands' *functional* and *experiential* elements.

Some (e.g. Ferraro, 2002; Gilmore and Dumont, 2003) indicate this restricted study may be a result of the limited focus on international studies in the Western educational system. Unfortunately, this limits scholars' knowledge of consumers' likely dissimilar purchase behavior in cross-cultural settings. The probable consequence of this situation is that academicians cannot disseminate adequate knowledge to practitioners that enables firms to develop marketing strategies which yield their desired international performance goals (Homburg, Harley, Cannon and Kiedaisch, 2002). To this regard, we believe that studies such as the present one discussed here are needed for strengthening our understanding of consumer disparities in international markets.

### 5.2 Revealed Cross-Cultural Differences

An unexpected finding of this study is that consumers' perception of a brand's quality was found to have greater influence on future purchase intent for the U.S. respondents (standardized path weight of .46 for Americans vs. no statistically significant path for Chinese, as shown in Figure 2), than with the Chinese. This implies that in order to fortify consumers' purchase behavior towards their brand(s) in a Western culture, a firm's marketing strategies need to emphasize the excellence of its brand(s), while such emphasis may be questionable in an Eastern culture. Another difference revealed in this study is that the performance of a firm's brand(s) has greater significance with Chinese samples than with U.S. respondents (standardized path weights of .91 and .26, respectively). This finding suggests that a firm should place greater emphasis of a brand's performance in an Eastern culture than in a Western culture.

Regarding a brand's *experiential* elements (resonance and imagery), this study found that these elements have no significant impact on consumers' purchase behavior in either a Western or Eastern cultural setting. This suggests that it is unlikely beneficial for firms to promote the *experiential* facets of their brand(s) in either Western or Eastern cultures.

In attempting to ascertain what might have led to this study's findings, it may be that respondents' familiarity with, and periodic usage of KFC was a contributing factor. This usage experience may result in respondents in each culture simply assuming that their social and psychological needs will be met by KFC, leading to it being unnecessary for respondents to consider whether the brand will meet their experiential expectations. This situation may not exist (or be as strong) with brand(s) that respondents have less familiarity or usage experience.

### 5.3 Implications

Some suggest that any revealed differences between Americans and Chinese that were uncovered in this study are likely to dissolve due to globalization leading to cultures around the world converging and becoming homogeneous (Tse, Lee, Vertinsky and Wehrung, 1988; Costa and Bamossy, 1995). Sewell (1999) suggests that such convergence will occur because cultures are changeable, and the ever greater transnational flows of capital, technology, people, brands, ideas and information between these cultures are evolving in the same direction.

However, some (Hofstede, 1984; Sewell, 1999) make a case for the argument that the fundamental values and identities that underlie cultures are durable and resistant to change, and will endure over many generations. Tse et al. (1988) and Abbott (1976) argue that the Chinese culture will be especially resistant to change because its values have long and strong historical roots that are deeply entrenched. This suggests that the extant differences between the U.S. and Chinese cultures are likely to remain into the foreseeable future (Costa and Bamossy, 1995). In fact, the ongoing cultural homogenization vs. heterogenization debate (Venkatesh, 1995) is likely to provide additional insight on whether a firm's marketing strategy should be localized or standardized in cross-cultural settings. Thus, a study such as this which helps strengthen our understanding of cross-cultural differences is likely to correlate with, and impact our understanding of the issues involved in homogenization vs. localization, and vice versa.

#### 5.4 Future Research

Knowledge gained from cross-cultural studies such as discussed in this paper offers insights that can help guide future studies. Specifically, this study offers insights that the impact of brand beliefs on purchase behavior can vary in cross-cultural settings. This is important, based on the calls for cross-cultural studies that strengthen our understanding of (dis)similarities that exist between individuals in disparate cultures (Nisbett et al., 2001; Ferraro, 2002) and the fact that these differences can impact firms' performance.

As previously noted in this paper, we acknowledge that the functional and experiential facets of brands which influence consumers' purchase behavior may include more than the 4 variables studied here (quality, performance, resonance, and imagery). Thus, we posit that future studies need to identify and empirically examine the influence of other variables, such as consumers' attitude and loyalty toward a brand, and the economic life of a brand. Undoubtedly, other variables such as price also influence purchase behavior.

It is important to acknowledge that in addition to brand communication, there are other elements of a firm's overall marketing approach that are critical. A firm's brand pricing and distribution channel strategies are two prominent examples. For these two elements, what is the most effective way to proceed when addressing the needs of multiple cultures? Might a standardized approach work, or should adaptation be implemented in disparate cultures?

With respect to future research, this paper suggests several avenues for additional study. For example, because this study employed a well known brand that the majority of respondents had periodically consumed, future research should be conducted with brands/services with which consumers are less familiar, and have had less usage experience. Future research should also include studies that entail a wider array of respondents within cultures because it might provide insight into potential regional dissimilarities. Also, future studies need to entail a wide age range of respondents to help determine whether this study's findings offer any degree of generalizability, with this also offering potential to evaluate whether other demographics such as income would impact the findings.

#### 5.5 Limitations

The present study only involved one brand that is neither exclusive nor conspicuous. It is also a brand that is relatively affordable and available to individuals within each culture. Thus, this study's findings may not be reflective of other brand classes.

Another limitation is that the study used only U.S. and Chinese undergraduate student volunteers. As indicated by Ter Hofstede et al. (2002) and Steenkamp and Baumgartner (2000), this minimizes within-group heterogeneity, reduces measurement and random errors, strengthens the validity of the study, and contributes to a more valid set of comparisons for the two groups. However, use of a very narrow range of samples likely results in the respondents not being representative of other age or socioeconomic groups. Thus, future studies need to explore a wider range of sample groups in order to strengthen our understanding of how *functional* and *experiential* facets of brand(s) impact purchase behavior for dissimilar respondents.

Finally, while steps were taken to ensure that the English and Chinese versions of the survey were conceptually similar and equally understandable, one cannot discount the possibility that the dissimilarities and nuances of each culture's language may have led to some unfound differential understanding of some of the questions.

#### References

- Aaker, D. A. (1991). *Managing Brand Equity*, The Free Press, New York, NY.
- Abbott, K. A. (1976). Culture change and the persistence of the Chinese personality. In G. A. DeVos (ed). *Responses to change; society, culture, and personality*, New York: Van Nostrand, 74-104.
- Anderson, D., Plotnikoff, R. C., Raine, K. & Barrett, L. (2005). Development of Measures of Individual Leadership for Health Promotion. *International Journal of Health Care Quality Assurance*, 18, 2/3, R1-R12.
- Armstrong, G. & Kotler, P. (2003). *Makreting: An Introduction*, sixth edition. Upper Saddle River, NJ: Prentice Hall.



- Barnes, J. G. (2003). Establishing meaningful customer relationships: Why some companies and brands mean more to their customers. *Managing Service Quality*, 13, 1, 178-186.
- Briley, D. & Wyer, R. S. (2001). Transitory determinants of value and decisions: the utility (or nonutility) of individualism and collectivism in understanding cultural differences. *Social Cognition*, 19, 3, 197-227.
- Brouthers, L. E. & Nakos, G. (2005). The role of systematic international market selection on small firms' export performance. *Journal of Small Business Management*, 43, 4, 363-381.
- Broyles, S. A., Schumann, D. W. & Leungpibul, T. (2009). Examining brand equity antecedent/consequence relationships. *Journal of Marketing Theory and Practice*, 17, 2, 145-161
- Buckley, P. J. & Casson, M. (2007). Edith Penrose's theory of the growth of the firm and the strategic management of multinational enterprises. *Management International Review*, 47, 2, 151-173.
- Businessline (2006). KFC: The fast food king of China. *Chennai*, (October 24), 1.
- Calderon, H., Cerva, A. & Molla, A. (1997). Brand assessment: a key element of marketing strategy. *The Journal of Product and Brand Management*, 6, 5, 293-306.
- Chandon, P., Morwitz, V. G. & Reinartz, W. J. (2004). The Short-and-Long-Term Effects of Measuring Intent to Repurchase. *Journal of Consumer Research*, 31, 3, 566-572.
- Churchill, G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research*, 16, 1, 64-73.
- Contractor, F. J. (2007). Is international business good for companies? the evolutionary or multi-stage theory of internationalization vs. the transaction cost perspective. *Management International Review*, 47, 3, 453-475.
- Costa, J. A. & Bamossy, G. J. (1995). Perspectives on ethnicity, nationalism, and cultural identity. In A. Costa & G. J. Bamossy (eds.) *Marketing in a multicultural world*, Thousand Oaks: Sage Publications, 3-25.
- de Chernatony, L., Harris, F. & Riley, F. (2000). Added value: its nature, roles and sustainability. *European Journal of Marketing*, 34, 1/2, 39-56.
- Deshpande, R. J., Farley, U. & Webster, F. E., Jr. (2000). Triad lessons; generalizing results on high performance firms in five business-to-business markets. *International Journal of Research in Marketing*, 17, 4, 353-362.
- Dillman, D. A. (1978). *Mail and telephone surveys*. New York, NY: John Wiley & Sons.
- \_\_\_\_\_. (2000). *Mail and Internet surveys: the total design method*. New York: John Wiley & Sons, (Chapter 4).
- Eerie, C. S., Edwards, M. & Lee, W. (2008). Culture, attitudes, and media patterns in China, Taiwan, and the U.S.: Balancing standardization and localization decisions. *Journal of Global Marketing*, 21, 3, 191-208.
- Ekeledo, I. & Sivakumar, K. (2004). International market entry mode strategies of manufacturing firms and service firms: a resource-based perspective. *International Marketing Review*, 21, 1, 68-101.
- Ferraro, G. P. (2002). *The cultural dimension of international business* (4<sup>th</sup> ed.). Upper Saddle River: Prentice Hall.
- Gilmore, F. & Dumont, S. (2003). *Brand warriors china: creating sustainable brand capital*. London: Profile Books.
- Hair, J. F., Black, W. C., Basin, B. J., Anderson, R. E. & Tatham, R. L. (2006). *Multivariate data analysis*, 6<sup>th</sup> ed. Upper Saddle River, New Jersey: Prentice Hall.
- Hall, D. V. & Jones S. C. (2007). Branding of prescription medicines to Australian customers. *Australasian Marketing Journal*, 15, 2, 97-107.
- He Y., Merz, M. A. & Alden, D. L. (2008). Diffusion of measurement invariance assessment in cross-national empirical marketing research: perspectives from the literature and a survey of researchers. *Journal of International Marketing*, 16, 2, 64-83.
- Hennart, J. (2007). The theoretical rationale for a multinationality-performance relationship. *Management International Review*, 47, 3, 423-452.
- Herstein, R. & Tifferet, S. (2007). An investigation of the new generic customer. *The Journal of Customer Marketing*, 24, 3, 133-141.
- Hinkin, T. R. (1998). A brief tutorial on the development of measures for use in survey questionnaires. *Organizational Research Methods*, 1, 1, 104-121.
- Hofstede, G. (1984). *Culture's consequences: international differences in work-related values*. Newbury Park: Sage Publications.

- \_\_\_\_\_. (2001). *Cultural Consequences: International Differences in Work-Related Values, Behaviors, Institutions, and Organizations Across Nations*. (2<sup>nd</sup> ed.). Thousand Oaks, CA: Sage Publications.
- Holbrook, M. B. & Hirschman, E. C. (1982). The experiential aspects of consumption: customer fantasies, feelings, and fun. *Journal of Customer Research*, 9, September, 132-140.
- Homburg, C., Harley, K., Cannon, J. P. & Kiedaisch, I. (2002). Customer satisfaction in transnational buyer-seller relationships. *Journal of International Marketing*, 10, 4, 1-29.
- Huntington, S. P. (1993). The clash of civilizations? *International Affairs*, 72, 3, 22-49.
- Inglehart, R. (2001). Modernization's challenge to traditional values: who's afraid of Ronald McDonald? *The Futurist*, 35, 2, 16-21.
- \_\_\_\_\_, & Baker, W. E. (2000). Modernization, cultural change, and the persistence of traditional values. *American Sociological Review*, 65, February, 19-51.
- Katsikea, E. S. & Skarmeas, D. A. (2003). Organizational and managerial drivers of effective export sales organizations: An empirical investigation. *European Journal of Marketing*, 37, 11/12, 1723-1747.
- Keller, K. L. (2000). The brand report card. *Harvard Business Review*, 78, 1, 147-157.
- \_\_\_\_\_. (2001). Building customer-based brand equity. *Marketing Management*, 10, July/August, 15-19.
- \_\_\_\_\_. (2003). *Strategic brand management: building, measuring, and managing brand equity*. Upper Saddle River: Prentice Hall.
- Liu, R. R. & McClure, P. (2001). Recognizing cross-cultural differences in customer complaint behavior and intentions: An empirical examination. *The Journal of Customer Marketing*, 18, 1, 54-75.
- McAlexander, J. H., Schouten, J. W., & Koenig, H. F. (2002). Building Brand Community. *Journal of Marketing*, 66, 1, 38-54.
- Ma, Y. & Elango, B. (2008). When do international operations lead to improved performance? An analysis of property-liability insurers. *Risk Management and Insurance Review*, 11, 1, 141-155.
- Markus, H. R. & Kitayama, S. (1991). Culture and the self: implications for cognition, emotion and motivation. *Psychological Review*, 98, 2, 224-253.
- Maurer, T. J. & Tross, S. A. (2000). SME committee vs. field job analysis ratings: convergence, cautions, and a call. *Journal of Business and Psychology*, 14, 3, 489-500.
- Mullen, M. R. (1995). Diagnosing measurement equivalence in cross-national research. *Journal of International Business Studies*, 26, 3, 573-596.
- Myers, M. B., Calatone, R. J., Page, T. J. & Taylor, C. R. (2000). An application of multiple-group causal models in assessing cross-cultural measurement equivalence. *Journal of International Marketing*, 8, 4, 108-121.
- Nakamura, H. (1960). *The ways of thinking of eastern peoples*, Compiled by Japanese National Commission for UNESCO, New York: Greenwood Press.
- Newberry, C. R., Klemz, B. R. & Boshoff C. (2003). Managerial implications of predicting purchase behavior from purchase intentions: a retail patronage case study. *The Journal of Services Marketing*, 17, 6/7, 609-618.
- Nisbett, R. E., Peng, K., Choi, I. & Norenzayan, A. (2001). Culture and systems of thought: holistic versus analytic cognition. *Psychological Review*, 108, 2, 291-310.
- Ozsomer, A. & Prussia, G. (2000). Competing perspectives in international marketing strategy: contingency and process models. *Journal of International Marketing*, 8, 1, 27-50.
- Paladino, B. (2007). 5 key principles of corporate performance management. *Strategic Finance*, 89, 1, 33-41.
- Rajagopal. (2007). Stimulating retail sales and upholding customer value. *Journal of Retail and Leisure Property*. 6, 2, 117-135.
- Sewell, W. H. (1999). The Concept(s) of Culture. In V. E. Bonnell & L. Hunt (Eds.). *Beyond the cultural turn: new directions in the study of society and culture*, Berkeley and Los Angeles: University of California Press, 36-61.
- Sinha, I., & DeSarbo, W. S. (1998). An integrated approach toward the spatial modeling of perceived customer value. *Journal of Marketing Research*, 35, May, 236-249.
- Steenkamp, J. E. M. & Baumgartner, H. (1998). Assessing measurement invariance in cross-national customer research. *Journal of Customer Research*, 25, 1, 78-90.

- \_\_\_\_\_. (2000). On the use of structural equation models for marketing modeling. *International Journal of Research in Marketing*, 17, 2/3, 195-202.
- Tai, S.H.C. & Tam, J. L. M. (1997). A lifestyle analysis of female customers in greater china. *Psychology and Marketing*, 14, 3, 287-307.
- Taylor, A. & Prideaux, B. (2008). Profiling four wheel drive tourism markets for desert Australia. *Journal of Vacation Marketing*, 14, 1, 71-86.
- Ter Hofstede, F., Wedel, M. & Steenkamp, J. E. M. (2002). Identifying Spatial Segments in International Markets. *Marketing Science*, 21, 2, 160-177.
- Tse, D. K., Lee, K., Vertinsky, I. & Wehrung, D. A. (1988). Does culture matter? A cross-cultural study of executives' choice, decisiveness, and risk adjustment in international marketing. *Journal of Marketing*, 52, 4, 81-95.
- Venkatesh, A. (1995). Ethnocustomerism: A new paradigm to study cultural and cross-cultural customer behavior. In J. A. Costa & G. J. Bamossy (eds.), *Marketing in a Multicultural World*, Thousand Oaks: Sage Publications, 26-67.
- Wang, L., & Kess, P. (2006). Partnering motives and partner selection; Case studies of Finnish distributor relationships in China. *International Journal of Physical Distribution and Logistics Management*, 36, 6, 466-478.
- Watkins, H. S. & Liu, R. (1996). Collectivism, individualism and in-group membership: implications for customer complaining behaviors in multicultural contexts. *Journal of International Customer Marketing*, 8, 3/4, 69-85.
- Wheelwright, S. C. (1984). Manufacturing strategy: defining the missing link. *Strategic Management Journal*, 5, 1, 77-91.
- Zaheer, S. & Mosakowski, E. (1997). The dynamics of the liability of internationalness: A global study of survival in financial services. *Strategic Management Journal*, 18, 6, 439-464.
- Zaltman, G. (2003). *How customers think: essential insights into the mind of the market*. Boston, MA: Harvard Business School Press.
- Zeithaml, V. A. (1988). Customer perceptions of price, quality, and value: A means-end model and synthesis of evidence. *Journal of Marketing*, 52, July, 2-22.
- Zhou, L., & Hui, M. K. (2003). Symbolic value of international products in the people's republic of China. *Journal of International Marketing*, 11, 2, 36-58.

## Notes

1. The sequence of standardized path weights is Americans followed by (Chinese) at significance level of 0.05
2. “\*” reflects that the directional path is statistically insignificant at a significance level of 0.05

Table 1. Statistical Results for the Structural Model (Sequence is U.S. followed by Chinese)

Constructs and Items	Mean	Standard Deviation	Parameter Estimate	Cronbach's Alpha
Quality: Compared to other products of fast food, KFC:				
Is made with high quality ingredients	3.524 (3.357)	0.846 (0.840)	0.538 (0.412)	0.790 (0.540)
Has the best taste	3.660 (3.556)	0.831 (0.842)	0.860 (0.878)	
Is the best fast food	3.520 (3.132)	0.941 (0.904)	0.844 (0.817)	
Performance: Eating KFC food:				
Provides me with the menu options that I want	3.204 (1.936)	1.019 (0.796)	0.585 (0.416)	0.650 (0.750)
Sells food that fills my hunger the way I hope it will	2.248 (2.316)	1.077 (0.951)	0.844 (0.436)	
Sells food that tastes the way I hope it will	2.164 (1.962)	1.134 (0.786)	0.828 (0.757)	
Resonance: Compared to other products of fast food, KFC:				
Reminds me of doing things with my family and friends	1.640 (2.526)	0.681 (0.895)	0.677 (0.808)	0.940 (0.820)
Is part of the American(Chinese) culture	1.768 (2.744)	0.735 (0.933)	0.724 (0.719)	
Is like eating a meal that my mom cooked	1.688 (2.560)	0.722 (0.832)	0.459 (0.613)	
Imagery: Eating at KFC:				
Makes me feel popular	4.016 (3.707)	0.717 (0.849)	0.961 (0.910)	0.810 (0.590)
Makes me feel like part of the group	3.916 (3.756)	0.784 (0.714)	0.911 (0.763)	
Makes me feel like a person with high social status	3.784 (3.793)	0.756 (0.751)	0.864 (0.675)	
Future Purchase Intent: In the future:				
The next time I want fast food I am likely to eat at KFC	1.972 (3.741)	0.866 (0.714)	0.827 (0.647)	0.680 (0.560)
I will eat at KFC within the next month	2.400 (3.312)	1.199 (0.946)	0.794 (0.694)	
I am likely to purchase another product of fast food	1.988 (2.883)	1.058 (0.785)	0.361 (0.380)	
Overall Structural Model's Fit Statistics				
	Chi-Square: DF	CFI	RMSEA	
Targeted (Hair et al. 2006)	≤ 3: 1	≥ 0.9	≤ 0.05	
Results	1.69: 1	0.0964	0.037	

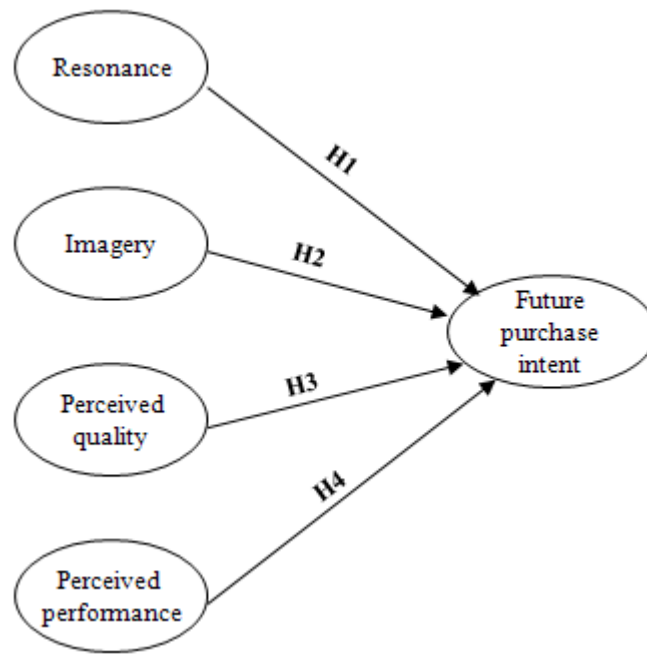


Figure 1. Proposed Conceptual Model

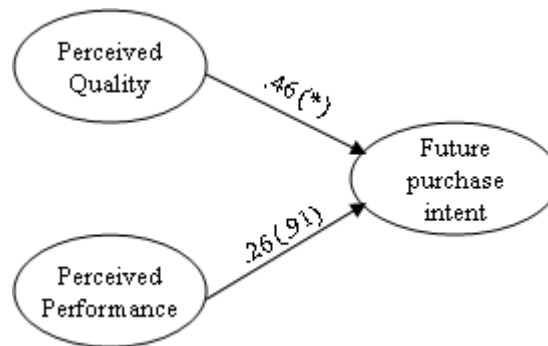


Figure 2. Final Structural Model



## Study on the Application of CRS in China Hotel Chain: the Analysis based on System Functional Factors

Junliang Lu & Zhaojun Zhu

School of Management, Zhejiang University, Hangzhou 310012, China

Tel: 86-571-8820-6872 E-mail: [ljhz@mail.hz.zj.cn](mailto:ljhz@mail.hz.zj.cn)

### Abstract

Based on relative research literature reviews about the development and functions of foreign hotel CRS, combining with the basic situation of China hotel industry and according to the clients' functional requirements to CRS, the functional factor model of CRS in the application of China hotel group is explored in the article. The research methods mainly include literature review, interviews, questionnaires and other empirical analysis methods. Through the empirical analysis, the hypothesis model is analyzed and modified, and the key functional factors of CRS are obtained. The CRS functional model of hotel group is established in the article, and this model has been proved to be effective in the CRS construction of Nanjing Jinling Group.

**Keywords:** Hotel group, Hotel chain, Central reservation system (CRS), Model, Functional factors

### 1. Introduction

At the beginning of 1960s, to simplify the ticket reservation procedure, the airline company successfully developed the electronic reservation system which could directly manage the stock, associate with the agent, and implement scheduled flight inquiry and reservation operation by the agent's reservation system terminal (Gill, 1998). In 1965, Kemmons Wison first introduced the reservation system into the holiday hotel and called it the central reservation system (CRS), and the hotel accommodation industry had first used the CRS to implement the distribution and reservation. Up to the late of 1980s, the occurrence of the seamless connection technology promoted the mutual development of the hotel reservation system and the air reservation system, and realized the real-time confirmation for the reservation demands between the air reservation system and the hotel CRS and between the hotel group and the member hotels, and it could offer up-to-date room price and room supply status real time, and realize the mutual reservation operation among systems (Vallen, 2002). By the interface of the CRS, the chain hotel can centrally control its room list the room price list, give more individualized promote services, realize one-to-one relationship promotion, and better serve for clients and agents by inquiring clients' historical records (Dimitrios Buhalis, 2003). Up to the 1990s, the occurrence of internet accelerated the development of the hotel CRS, and clients could avoid all middle procedures and directly reserve the room. The travel agency and clients can directly interview the CRS of the group to acquire detailed materials of the hotel including the rentable situation and reserve and confirm the room immediately. At present, some famous national hotel groups all have successfully applied CRS, such as the HOLIDEX reservation system of the Bass Hotels, the GLOBAL II reservation system of the Inter Continental Hotels Group, the ACCOR reservation system of the ACCOR Group, the HILTRON CRS and the HILSTAR reservation system in April of 1999 of the Hilton (Dimitrios Buhalis, 2003). This kind of CRS generally can connect with the global distribution system (GDS) to fully utilize the strong function of GDS and the high popularization rate of the travel agent terminal.

With the popularization of internet and the development of E-business, the functional research of CRS has extended to the client management and the income management (Sigala, 2001). In the environment of internet, to acquire the maximization of client value, the hotel CRS must integrate the income database, the client database and the product database (Sigala, 2001). Especially, the occurrence of website added the function of on-line distribution for the hotel CRS, and as the service window of CRS, the website has been adopted by most hotels. Starkov (2005) had made a survey in his research, and the result showed that 53%~54% of the on-line distribution belonged to direct electronic distribution, and half of the on-line distribution at least came from the reservation system (including website) established by the hotel itself. After the E-business based on internet occurred, the application of the hotel CRS was further developed, and in Nyheim (2003)'s research, he thought that the hotel CRS must adapt the development of the E-business, integrate CRS with the income management, the reception system, the banquet and distribution system to make them implement real-time data exchange, seamless stock management and single-page stock (all systems could see same data at the same time), and fulfill the demands of hotel E-business data exchange and business processing. Except for that, the CRS based on networking possesses the functions such as individualized service and sales promotion, and especially as the window of CRS, the website needs to pay attention to the character of client-oriented website service, not the benefit-oriented service, because the client-oriented website can acquire abundant content

supports such as effective reservation, dummy room, interactive route map and figured interface (Lanz & Shapiro, 2004).

At present, many international hotel groups have completely integrated CRS with the internet world, because the tourism or the reservation about the tourism is one of largest commercial applications of internet (Leong, 2003). Only in US, the income of tourism reservation had increased from 46 billion dollars in 2003 to 54 billion dollars in 2004, and this number is predicted to be 91 billion dollars or one third of the total tourism consumption in 2009, and the reservation of the hotel group CRS system occupied quite big proportion (McGann, 2005). In China, up to the late of 2007, there were 13583 state grade hotels, and the collectivized rate of hotel had exceeded 17%, and in recent years, the hotel collectivization is increasing, but only a few Chinese hotel groups have CRM. Though the management staffs of the hotels have realized the function of CRS in the management, but there is no one mature CRS in China up to now. The China hotel industry in the collectivized development is competing with the internal hotel groups with mature CRS for the client source market, and the market extension is seriously threatened. Therefore, the scale extension of Chinese hotel group needs the enhancement of technology, and the establishment of CRS has been the current urgent task, which will impact the development of the whole Chinese tourism industry.

## 2. Literature interview and model hypothesis

CRS belongs to the category of the information system, and it is based on the network environment. From 1965 to now, the range and processing function of CRS are continually being perfected. According to the Anthony Model, the information system should include three layers such as the strategic planning, the tactical decision and the business decision, and consider the function of the interior information flow of the enterprise (Chen, Shuqin, 2006). Same with general enterprise information system, CRS needs to consider the administrative levels and ensure the maneuverability of various management layers to hotel CRS when the system is constructed. Connor (2003) pointed out that CRS had changed the balance among hotel, clients and agent with the continual development of the technology. At present, the functions of hotel CRS are continually perfected, especially in the interactive function with the individual travelers. In fact, the balance of hotel and agent is embodied in various system functions, and those developing on-line agents make the hotels to face very complex distribution channel and the threat of the sales price control (sales management), but CRS can make the hotel to control the room stock and the sales price of the room (Peterson & Merino, 2003). Middleton & Clarke (2001) also pointed out that because there was no a distribution channel to dominate the future market at present, the hotel groups needed to design their own CRS and distribution channels to combine the applications and enter into the bigger market and form the hotel group reservation ability. Lexhagen & Nysveen (2001) surveyed the tourism reservation and increment service, and found that the tourism industry had only offered part reservation services and limited on-line market increment services, and the traditional tourism agents could offer more increment services than the air industry and the hotel industry in the on-line market. That is mainly because that both clients and hotels lack in trust each other, and the inefficient reservations often happen, which indicates that the hotel should pay attention to the client management in the on-line reservation system and cultivate mutual business trusts. Park & Kim (2003) pointed out that the hotel CRS needed to collect, analyze and use three kinds of client information, i.e. the basic information of clients (such as individual and trading data), the information needed by clients (such as product information, service information and organizational information), and the information offered by clients (such as clients' opinions, clients' complaints and clients' advices), which also showed the importance of CRS to the client management.

Chinese scholars' study about CRS just started, and the content mainly includes the functions of CRS. Huang Xiagui (2005) thought that the CRS of domestic hotel group needed to study the client-oriented marketing mode of foreign chain hotels, and give emphasis to utilize the client creation rule of "client impression occupation rate- client market occupation rate- client heart occupation rate", and use the CRS to establish the interactive marketing network to accumulate large numbers of loyal client group. CRS is a large integrated system, and the hotel needs certain supports of investments and technologies to establish the CRS. Therefore, following difficulties are faced by Chinese hotel groups to develop CRS. The first one is the obstacle of a huge sum of money; the second one is the unbalance of the degree to recognize and accept CRS; the third one is the limitation of the market consumption behaviors; the fourth one is the limitations of the technical support and the management level; the fifth one is the tangle of the networking sales benefit and the sixth one is the harmony and communication between network and hotels (Chen Xiaowen, 2005). Yang Mingkui (2006) thought that the main functions of CRS were mainly embodied in following aspects, (1) the room reservation in the interior of the group, and all reservations could be acquired by the interaction between the engine and the interfaces of various member hotels, (2) the system interface with GDS, and it could implement data exchange on the layer of system engine and ensure closer connection between CRS and GDS, (3) Web self-help reservation terminal, and guests of the hotel could reserve the room, inquire the information, modify the order form and inquire the accumulated points by the website of the group. Gu Huimin (2001) pointed out that the hotel group could control the composing, flux and flow of the client source by CRS to adjust various price combinations, implement the income management, and realize the maximization of the group benefit. Wang Haomin (2005) divided CRS functions into the

client management module, the client history management module, the room and room price management module, the reservation management module, the report management module and the data synchronic module when he studied the frame structure of CRS.

The literature review shows that for the research of CRS function, many scholars had studied the sales management, the client management, the group reservation and the self-help reservation surrounding CRS. In the introduction of foreign research articles about CRS, because the application of CRS was universal and the functions of CRS are perfect, these articles mainly emphasized the method of reservation, the new technology application of online website, and the features and management researches of online clients, and paid more attention to the quantitative analysis and research to CRS. In China, most researches about CRS belonged to exploring researches such as the applicable research of the reservation system, the research of the influencing factors to establish CRS, and the research of the construction of the CRS framework, and most of them are qualitative analysis, and few of them studied the construction of the CRS functional structure construction. As viewed from the hotel manager, the hotel group should treat the CRS strategy as the distribution center, and regard the CRS as the distribution system or an operation entity (Gale, 2006).

Though the review and summarization of these articles, the hypothesis model to describe the CRS functional factors can be established, and the final CRS functional factors model can be confirmed through certain empirical and quantitative analysis. The CRS of domestic hotel group is a comprehensive system project and an integrated system, and the domestic CRS has not been confirmed in the functional structure, and the functional factors and structured model of CRS should be systematically studied to explore the CRS functional model fitting for the application in Chinese hotel enterprises. So the following hypothesis of the CRS functional model (seen in Figure 1) is proposed in the article.

### 3. Research method

There are few research articles about the theoretical construction of CRS in China, and most of them belong to the qualitatively exploring study of framework, and there is not one article to adopt the survey data to empirically analyze the CRS functional model. To explore the functional model of hotel CRS, the empirical method design is adopted in the article. Based on the CRS hypothesis model in literature review, put out questionnaires to the hotel groups and their member hotels for acquiring data, and adopt the social science statistical software bag of SPSS to implement data factor analysis and the variance analysis for the effective collected questionnaires, and validate and perfect the hypothesis model, and quantitatively demonstrate the model from the qualitative research.

#### 3.1 Variable definition and structure dimensions

Aiming at the hypothesis model, the interviews and surveys are implemented, and the interview objects mainly are domestic hotel groups and suppliers of hotel software such as Shanghai Jinjiang Corporation, Nanjing Jinling Group, New Century Tourism Group, Shanghai Thayer Interactive Corporation and Hangzhou West Lake Software Corporation. By the interviews, the first-hand materials needed to establish the CRS functional demands were formed, and aiming at 5 dimensions of the hypothesis model, the initial variables of each dimension were defined as seen in Table 1.

#### 3.2 Samples and questionnaires

Because the analysis objects in the article are the CRS functional factors of hotel groups which are direct and main users of CRS, so the questionnaires is designed for the whole hotel groups. The survey range of the questionnaire mainly includes Zhejiang, Shanghai, Nanjing, Beijing and Guangzhou, and the amount of questionnaire was 180, and 132 of them were returned, and 120 of them were effective. The returned questionnaires from groups mainly came from Jinjiang Group, Motel Hotel Group, Jinling Group, Huangshan Tourism Group, and there were 67 group questionnaires, and other 53 questionnaires came from the member hotels in the groups.

There are 40 questions designed in the questionnaire, and the 7-scale system is adopted to count the points by the positive direction. "7" denotes "very important/ agree very much", and "1" denotes "very unimportant/ disagree very much". Then the statistical analysis method is used to process the data and obtain the analysis result.

### 4. Analysis of empirical result

#### 4.1 Empirical factor analysis

The principal component analysis method and the maximum variance rotation method were adopted to confirm the variable structure of the CRS functional factors, and the former 40 variables in 5 dimensions were inducted as 34 variables in 8 dimensions. And the factor loads of the items including "V13 Privacy guarantee, V32 Member reservation, V2 Reservation modification, V36 Message platform, V38 Client sharing and V11 Self-help confirmation" in each principal component had not exceeded 0.5, so these indexes were eliminated, and the factor analysis was performed again. The loads of 34 variables in the second analysis all exceeded 0.5, which indicated that the CRS functional factor possessed certain layer feature in the structure. For the credibility, the coefficient of  $\alpha$  was adopted to measure the coherence degree, and except for the coefficient of the system management factor (0.676), the coefficients of other factors all exceeded 0.7 (about 0.8). Because the study in the article belonged to the exploring study, so the credibility



of these factors could be accepted, which indicated that the structure of CRS functional variables organized in the article was good. The result of the factor analysis is seen in Table 2.

The naming of CRS functional factors after factor analysis is seen in Table 3.

To test the rationality of the factor analysis, the variances of various factors were further analyzed. The character roots of 8 selected dimensional factors could explain 71.312% of the total variance, so the factor structure of the CRS functional factors could be obtained. To further prove the validity of the factor structure and whether the factor structure has the statistical meanings or whether it happens occasionally, the relative variance analysis such as the variance analysis of various factors with investigated persons' ages, learning levels and duties and the variance analysis of various factors with the star grade and the development of CRS of the hotel where the investigated persons lived in was performed. By the analysis, there were not significant differences between these factors and these investigated persons, so the hypothesis model and the factor structure proposed in the article have certain rationality.

#### *4.2 Explanation of CRS functional factor model*

The main difference between the result of the empirical analysis and the hypothesis model established in the article lies in three new factors, i.e. the channel management factor, the member management factor and the system integration factor. The generation of the channel management factor just validated the management demand of the domestic hotel group to the distribution channels. In the interviews, also all objects mentioned the management of the distribution channels. With the occurrence of more new distribution channels, the hotel chain specially set up a department to contact with these channels, so the hotel chain would be a whole (Wang Yonghua, 2004, P15). The generation of the member management factor also has its practical background. The development of the membership card has been popularized in domestic hotel groups, and many hotels which were interviewed thought that the membership management was the main measure for the difference service. The member clients' any consumption in the hotel group could be accumulated by the form of point, and these points could be exchanged with air mileages, so the membership management has been the effective approach to cultivate loyal clients for the hotel group. The system integration factor is the technical measure for the group to really actualize the "network marketing" and eliminate the "information island". At present, various information systems of the hotel group still in the state that each does things in its own way, and large numbers of information can not be shared, and the headquarters can not effectively acquire the management situation of various member hotels, and the information feedbacks are always in the lagged state. The solution of these problems needs the functional factor of system integration. In addition, if the system lacks in the feature of integration, not only the business flow will be blocked, the client data will be repetitive, inconsistent and false (Sigala, 2003). Therefore, the generation of the channel management factor, the member management factor and the system integration factor can be explained reasonably. For the group reservation in the hypothesis model, some variables are divided into the system integration factor by the factor analysis, and the residual various are renamed as the reservation tracing factor after analyzing, and the content of the reservation tracing is the content of the reservation management of hotel group in fact. Finally, perform further regression analysis to 8 confirmed factors, and various factors can gradually enter into the regression equation, so these 8 factors are the functional factors composing the CRS. If the exterior factors of the system establishment, the functional model of CRS (seen in Figure 2) can be obtained.

According to these 8 functional factors analyzed in the article, the hotel group CRS is established, and the hotel group can acquire following service functions in the management of reservation business to enhance the market competitive ability of the hotel.

(1) Offering real-time reservation and fulfilling clients' requirements for smart services. By CRS, the hotel can offer the products which the clients need in the shortest time, and acquire clients' feedbacks for the products and services in time to improve the products and services of the hotel.

(2) Offering self-help services and on-line communication to clients and enhancing clients' satisfaction degree. Clients can inquire information, collect relation information about the hotel in the short time and implement safe and real-time self-help reservation by the reservation website of the hotel group.

(3) Realizing real seamless connection in the interior of the group and exerting the function of the group resources. CRS will realize the networking and computerization of the hotel group, and really connect various departments and various member hotels which are in the "information island" at present.

(4) Quickly connecting international and domestic channels and realizing the function of channel management. The current electric distribution channel still needs off-line telephone or fax to confirm, but the group can establish more close and opening cooperation with the exterior network reservation centers (such as the global distribution system, C-trip, E-long and other tourism webs) by CRS, and realize the supervision and management to the distribution channels.

(5) Realizing effective client evaluation and digging clients' potential values. By the records and analysis of the client materials, CRS could offer interactive client relationship management in the whole process, strengthen the association

between hotels and clients, attract clients' attention to the products and services of the hotel, dig clients' demands, and provide the "possibility" to the "individualized" service and the "one-to-one" marketing for the hotel.

## 5. Model test and advices

### 5.1 The CRS functional model of the Nanjing Jinling Group

Nanjing Jinling Group is the hotel management group based on the Nanjing Jinling Restaurant. In the age of economic globalization, facing the powerful competition of international hotel groups, Jinling Group not only saw the forming and continually development of the new market, but confirmed the road of the collectivized development in 2003. And the group had realized that the collectivized development should depend on the modern science and technology, especially the information communication technology to large extent. At present, the group corporation takes the hotel chain management as the core business.

Depending on the self-management and the management output, Nanjing Jinling Group had realized the extension and growth, and developed to be the large-sized hotel chain enterprise with Chinese representative character and international level. In the top 300 world hotel groups of 2006 in "Hotels", Jinling Group ranked the 154th, and it had ranked the 5th of "the top 20 national brands in the Chinese hotel industry" for three years (Statistics Report of China Hotel Group Corporations of 2006). At present, Jinling Hotel Group has two brands including the "Jinling" Chain Hotel and the "JinYiCun" Chain Hotel, and up to June of 2009, it had managed over 50 hotels, and it is one of Chinese largest 30 hotels in 2009, and its hotels are distributed in Jiangsu, Anhui, Zhejiang, Sichuan and He'nan.

As the group grows continually and the management radius is longer and longer, and group begins to face following problems.

- (1) The communication cost is higher and higher and the client management is more and more difficult. The group can not supervise and manage the subordinate hotels in time, and the management of the products lacks in strict supervision in advance.
- (2) The management information of the group is more and more complex and dispersive, and the client information is hard to be collected and utilized. The headquarters of the group lacks in the data (especially the room management) which can exactly reflect the management status of the group and can not depend on statistical data to make strategic decisions in time.
- (3) The subordinate hotels are in the state that each does things in its own way. The products of the hotels can not be reserved each other, and various hotels only push the sale promotion for their own products and services, and the uniform marketing strategy of the group is deficient, which will influence the extension of the brand.

To solve these problems, in Feb of 2004, Nanjing Jinling Group consigned a 5-year-planning with high jumping-off point, i.e. the "Total Strategic Planning of the Informationization Construction" to IBM. In the planning report, IBM put forward using the informationization measures to solve the management problems of Jinling. By comparing with foreign hotels, the management layer of Jinling Group found that there was large difference between Jinling and foreign hotels in informationization. So the Jinling Hotel Group begun to walk on the road of informationization. In the March of the same year, Jinling Group established the strategic cooperative partner relationship with the Huangzhou West Lake Software Corporation to develop the CRS of hotel group together, and in the March of 2005, the first CRS in Chinese hotel group was formally delivered, and in 2008, the second edition of the Jinling Group CRS was normally delivered. The CRS of Jinling Group mainly includes central reservation, regular program, group marketing and on-line self-help, and the functional model is seen in Figure 3.

- (1) The function of central reservation. It includes the reservation of reservation center, the network reservation, the member reservation, the commission management and the client history management. CRS directly connects with all member hotels and can check various kinds of information of member hotels, such as the client file, the room resource, the restaurant resource and the meeting room resource. And it corresponds with the managements such as the system integration and reservation tracing of the CRS functional factor model.
- (2) The function of regular program. It includes the client management and distribution, and it can help the hotel group to establish various client data systems and sales plans, and enhance the service quality and fulfill clients' individualized demands. It corresponds with the member management and sales management of the CRS functional factor model, and it also includes many functions such as point encouragement, point consumption, and storage consumption.
- (3) The function of group marketing. It could analyze the management data by grasping the real-time resource, offer the marketing content for managers, realize the total marketing of the corporation networking, achieve client value and dig management and sales analysis. It corresponds with the client management and channel management (marketing) of the CRS functional factor model.
- (4) The function of on-line self-help. It can realize the self-help reservation by the website and the window, and it mainly includes the room reservation, the order form inquiry, the room state inquiry, the client consumption, the

accumulated point inquiry, the modification of client material information, and the client communication and complaint. These functions are similar with the factor of self-help reservation of the CRS functional factor model.

(5) The exterior interface mainly realizes the connections of CRS with the exterior parts such as GDS, IDS, self website, distributor and technology.

The CRS functional model of Jinling Group mainly considers three factors, i.e. the group itself, the distribution channel, and the client management, which are basically consistent with the establishment idea of the functional factor model. So the CRS functional factor model in the article could be basically validated in the CRS model of Jinling Group. At present, the third edition of Jinling Group CRS is being planned, and it is hoped to bring competitive advantage for Jinling Group, which is the main reason that Jinling Group can say “no” to the middleman of networking reservation.

### *5.2 Advices for the establishment of CRS*

The CRS functional factor model in the article is just an ideal framework, and in the practice of the hotel management, the establishment and implementation of CRS will be a long-term project which needs the continual investments and supports of manpower, materials and capitals. Because the capitals that many hotel groups invest to the construction of CRS are limited in certain time and the factors such as the sales management and the client management are gradually deepening in the system implementation, so the establishment of the system is a gradually perfecting process. When the CRS is established, the restrictions of current information system should be considered, so the hotel group should make the analysis of investment benefit, reasonably distribute limited capitals, plan the construction as a whole, implement various functional factors step by step, and gradually perfect the system.

#### *5.2.1 Planning as a whole and giving priority to important aspects*

In the interviews, some hotels had not implemented planning and prediction well when using CRS, and they only strived for the direction with more and better functions and technologies. However, in the actual development, because of the limitations of capital, time, technology, manpower and materials, the hotel group can not actualize all functional factors once, so the development time of CRS will be delayed, the charge will exceed the budget and some functions will not be practical. Therefore, when the hotel group establishes CRS, it needs a whole planning, and selects part important functional factors to come true first according to its practical situation. Nanjing Jinling Group is the best example, and it first made the planning with large costs, and gradually implemented the planning.

#### *5.2.2 Considering users and optimizing the combinations*

The development of CRS should first considers the combinations of various functional variables in the functional factors, and the hotel group needs to optimize and combine these factors and functional variables, and establish the CRS which can fulfill the actual demand of the hotel group. Because of the differences in the division of the organizational structure of various groups and the concrete responsibilities, the division of CRS functional model of various hotel groups should be made according to the actual functions and task objects of the organization. The strategies of various groups to the clients and agents should be different, and the combinations and selections of the functions should be implemented according to the actual situation.

#### *5.2.3 Perfecting CRS continually and step by step*

The construction of CRS should not pursue large and complete scale, because the clients' demands are changing continually. The client relationship management should be a long-term strategy for the hotel group, and it needs abundant and complete client materials and should deeply dig customers' demands. The implementation of the client management function needs the supports of all employees. Therefore, the hotel group should fully dig the exterior demands of the group to decide which functions these functional factors should possess and continually perfect CRS based on original demands. With the continual development of CRS, the hotel group should more clearly cognize the demands of CRS functions. According to the principle of “step by step”, the CRS functions should be continually perfected. The continual updating of foreign hotel group CRS also indicated the importance of this point. In the case of the article, the second development of Jinling Group to CRS just showed the necessity that the CRS functions should be developed step by step.

From foreign examples, the contribution of CRS to the sustainable develop of hotel group is very obvious. At present, Chinese hotel industry is in the stage of large development, and though the research in the article mainly emphasizes the study of functional factors of CRS, but the continuous study can consider the development mechanism of hotel group CRS to seek the universal rules of CRS development, and offer constructive advices for the development of the hotel group CRS in China.

### **References**

Chen, Shuqin. (2006). The Theoretical Bases of the Enterprise Management Information System Based on the “Anthony Model”. [Online] Available: [http://www.zzmie.com/Article\\_Show.asp?ArticleID=3477](http://www.zzmie.com/Article_Show.asp?ArticleID=3477). Mar 11, 2006.

- Connor, P.O. & Piccoli, G. (2003). Marketing Hotels Using Global Distribution Systems: Revisited. *Cornell Hotel and Restaurant Administration Quarterly*. No.44(5/6). P.105-115.
- Dimitrios Buhalis. (2003). *E-Tourism: Information Technology for Strategic Tourism Management*. First Edition is published by arrangement with Pearson Education Limited. 2003.
- Gale, C. (2006). What's next for the CRS? *Hotels*. No.7. P.67-68.
- Gao, Yafeng & Lu, Zi. (2006). The Relationship between the Tourism Website Information Function with the Tourism Reservation Behavior. *Journal of Shijiazhuang University of Economics*. No.8. P.964-974.
- Gary K. Vallen & Jerome J. Vallen. (2002). *Check-in, check-out: managing hotel operations*. Upper Saddle River, N.J.: Prentice Hall. 2002.
- Gu, Huimin. (1998). CRS and China Hotel Industry Marketing. *Tourism Tribune*. No.5. P.23-26.
- Huang, Xiangui. (2005). The Inspiration on Ways for International Hotel Groups to Make Success. *Journal of Beijing International Studies University*. No.3. P.55-58.
- Hu, Xiaotao. (2005). Strategic Thinking of China Hotel Development. *Market Modernization*. No.11. P.63-64.
- Lanz, L. & Shapiro, E. (2004). The newest spokes in the wheel of hotel marketing: electronic tools-Web sites, E-marketing, and third-party distribution system. [Online] Available: <http://www.hospitalitynet.org/news/4017890.html>. March 18, 2004.
- Law, R. & Wong, J. (2003). Successful factors for a travel website: perception s of online purchasers in Hong Kong. *Journal of Hospitality and Tourism Research*. No.27(1). P.118-124.
- Leong, C.C. (2003). Effectiveness of the hotel websites in Singapore: a perspective from business to-business (B2B) organizations. *Asia Pacific Journal of Tourism Research*. No.8(2). P.38-47.
- Lexhagen, M. & Nysveen, H. (2001). An Update on Swedish and Norwegian Tourism Websites- The Importance of Reservation Services and Value-added Services. *Scandinavian Journal of Hospitality and Tourism*. No.1(2).
- Lu, Junliang & Lin, Feng. (2005). Discussion and Research of the Real-time Networking Reservation Implementation Mode for Middle and Small-sized Service Enterprises. *Economic Tribune* No.22. P.58-60.
- Ma, J.X., Buhalis, D & Song, H. (2003). ICTs and Internet adoption in China's tourism industry. *International Journal of Information Management*. No.23. P.451-467.
- McGann, R. (2005). US Online Travel Market to Soar. [Online] Available: [www.clickz.com/stats/sectors/travel/article.php/3433881](http://www.clickz.com/stats/sectors/travel/article.php/3433881). Jan 11, 2005.
- Middleton, V. & Clarke, J. (2001). *Marketing in Travel and Tourism*. Butterworth Heinemann, London Crichton, 2001.
- Nyheim, P.D. (2003). *Technology strategies for the hospitality industry*. Pearson Prentice Hall. P.155-160.
- Park, C. & Kim, Y. (2003). A framework of dynamic CRM: linking marketing with information strategy. *Business Process Management Journal*. No.9(5).
- Pedersen, P. E., & Methlie, L. B. (2000). *Integration of Services in E-Commerce*. Bergen: SNF-Report 2000(21).
- Sigala, M. (2003). Competing in the virtual market space: a strategic model for developing e-commerce in the hotel industry. *International Journal of Hospitality Information Technology*. No.3(1). P.43-60.
- Sigala, M., Lockwood, A. & Jones, P. (2001). Gaining advantage from yield management: strategic implementation in the rapidly developing world of IT. *International Journal of Contemporary Hospitality Management*. No.17(3). P.364-377.
- Starkov, M. (2005). Price & J Hotelier's 2005 Top Ten Internet Strategy Resolutions. [Online] Available: <http://www.hotelnewsresource.com/index.php>.
- Tourist Hotels Association of China (CTHA). (2006). Statistics of China Hotel Groups (Management Companies). [Online] Available: <http://www.cztour.com/lyxh/27/fazhanluntan.htm>. May 31, 2006.
- Wang, Haomin & Zhang, Zhongneng. (2005). A Framework of Central Reservation System. *Microcomputer Applications*. No.5. P.24-26.
- Wang, Yonghua. (2004). Analysis of the Development Tendency of the Hotel Tourism Distribution Reservation. *Hotel Modernization*. No.2. P.33-36.
- Yang, Mingkui. (2006). How to Select Proper Hotel Management System. [Online] Available: [http://developer.ccidnet.com/art/480/20060227/438723\\_1.html](http://developer.ccidnet.com/art/480/20060227/438723_1.html). Feb 27, 2006.

Table 1. Definitions of CRS functional variables

Function dimension	Items in the function dimension	Item for short	Item code
Group reservation	Reserve the room real time according to client's requirements and confirm it right now	Real-time reservation	V1
	Modify the reservation according to actual situation	Reservation modification	V2
	Inquire why the reservation has not been completed	Reservation tracing	V3
	All room resources in the group can be reserved	Centralized reservation	V4
	Display all reserved room prices and room quantity in the group	Centralized stock	V5
	Seamless connection between PMS and CRS	PMS direct connection	V6
	Members can reserve the room each other	Members reservation	V7
Self-help reservation	Simple and convenient information search	information search	V8
	Clients can inquire real-time room price and useable room on line	Self-help inquiry	V9
	Clients can reserve the room on line	Self-help reservation	V10
	Self-help reservation can be confirmed	Self-help confirmation	V11
	Function of safe on-line payment	On-line payment	V12
	Function of privacy guarantee	Privacy guarantee	V13
	Obtain reservation help on line	On-line communication	V14
	Self-help manage basic information (such as order inquiry, modification and cancel)	Self-help management	V15
Sales management	Self-help historical status	Self-help history	V16
	Diversiform room price settings (classification according to room type and reservation object)	Room price management	V17
	Flexibly set up usable room reservation	Stock management	V18
	Various reservation statistical reports	Statistical reports	V19
	Reservation data analysis and prediction	Analysis and prediction	V20
	Sales promotion plan of reservation	Reservation promotion	V21
	Sales management of various reservation sources	Reservation sources	V22
	The group headquarters controls various distribution channels	Channel centralization	V23
	Agent reservation system and CRS seamless connection	Agent connection	V24
	Agents can follow their clients' reservations	Channel tracing	V25
	Diversity of commission management	Commission management	V26
	Analysis and prediction of channel reservation data	Channel analysis	V27
System management	Seamless connection between GDS and hotel CRS	GDS connection	V28
	System settings (such as personnel permission setting, system parameter setting)	System settings	V29
Client management	System maintenance (to ensuring the normal running of the system)	System maintenance	V30
	Client record management (such as new, inquiry and modifying)	Client record	V31
	Member reservation management (such as new, inquiry and modifying)	Member reservation	V32
	Member point accumulation management (such as point accumulation calculation and change)	Member point accumulation	V33
	Membership card management (such as issuance and loss reporting)	Membership card	V34
	Clients' opinions management (complaint and advices)	Clients' opinions	V35
	Client message platform (directly send messages to appointed clients at the same time)	Message platform	V36
	Analysis and prediction of client historical reservation	Client management	V37
	Client resource sharing in the group	Client sharing	V38
	Unit agreement file management (such as new, inquiry and modifying)	Agreement file	V39
	Analysis and prediction of unit agreement reservation data	Agreement analysis	V40

Table 2. Analysis result of hotel chain CRS key functional factors

Functional variable	Factor load							
	1	2	3	4	5	6	7	8
V8 Information search	0.739	0.044	0.172	0.150	-0.127	0.071	0.087	0.033
V9 Self-help inquiry	0.831	0.127	0.170	0.182	0.128	0.031	-0.031	0.040
V10 Self-help reservation	0.739	0.127	0.262	0.177	0.171	0.108	0.059	0.034
V12 On-line payment	0.604	-0.079	-0.023	-0.168	-0.057	-0.065	0.370	0.253
V14 On-line communication	0.732	0.127	0.108	0.223	0.091	-0.039	-0.029	0.002
V15 Self-help management	0.716	0.296	0.083	0.093	0.069	-0.048	0.058	0.162
V16 Self-help history	0.876	0.135	0.134	0.095	0.094	-0.020	0.157	0.075
V4 Centralized reservation	0.249	0.770	0.159	0.108	0.118	0.080	-0.117	0.003
V5 Centralized stock	0.281	0.682	0.210	0.125	0.097	0.059	0.038	0.107
V6 PMS Direct connection	0.076	0.588	0.162	0.218	0.094	0.201	-0.082	0.010
V23 Channel centralization	0.079	0.606	0.154	-0.050	0.228	-0.122	0.414	0.082
V24 Agent connection	0.150	0.725	0.133	0.348	0.196	-0.054	0.131	0.191
V28 GDS connection	0.001	0.651	0.141	0.283	0.027	-0.031	0.312	-0.080
V17 Room price management	0.010	0.342	0.719	0.182	0.026	0.051	0.117	0.115
V18 Stock management	0.326	0.066	0.795	0.091	0.148	0.011	0.039	0.173
V19 Statistical reports	0.243	0.234	0.715	0.126	0.182	-0.027	0.122	0.025
V20 Analysis and prediction	0.213	-0.041	0.783	0.184	0.099	0.018	0.035	-0.019
V21 Reservation promotion	0.281	0.253	0.524	0.160	0.285	-0.138	0.308	0.054
V22 Reservation sources	0.034	0.382	0.681	0.168	0.034	0.030	0.083	0.003
V31 Client record	0.229	0.406	0.144	0.639	0.121	-0.229	0.105	0.092
V35 Clients' opinions	0.153	0.062	0.099	0.796	0.089	0.105	0.090	0.048
V37 Client management	0.305	0.291	0.171	0.726	0.076	-0.049	0.098	0.156
V39 Agreement file	0.165	0.208	0.258	0.681	0.096	0.068	0.176	0.182
V40 Agreement analysis	0.084	0.315	0.304	0.726	0.171	0.103	0.102	0.232
V25 Channel tracing	0.053	0.148	0.093	0.236	0.788	0.125	-0.114	0.036
V26 Commission management	0.048	0.226	0.258	-0.003	0.818	-0.074	0.052	0.091
V27 Channel analysis	0.129	0.093	0.092	0.120	0.787	-0.096	0.207	-0.071
V1 Real-time reservation	0.167	-0.173	0.001	0.241	0.077	0.711	0.248	-0.117
V3 Reservation tracing	-0.002	0.104	-0.048	-0.195	0.024	0.832	0.016	0.098
V7 Members reservation	-0.101	0.180	0.088	0.122	-0.175	0.722	-0.280	0.043
V33 Member point accumulation	0.187	0.179	0.248	0.429	0.063	0.046	0.705	0.137
V34 Membership card	0.230	0.148	0.307	0.409	0.093	0.008	0.714	0.022
V29 System settings	0.205	-0.055	0.151	0.298	0.021	-0.008	-0.013	0.732
V30 System maintenance	0.119	0.202	0.047	0.142	0.021	0.058	0.113	0.832

Table 3. Naming of CRS functional factors after factor analysis

Factor		Coefficient of a	Variable combination		
F1	Self-help reservation	0.887	V8 Information search V12 On-line payment management V16 Self-help history	V9 Self-help inquiry V14 On-line communication	V10 Self-help reservation V15 Self-help
F2	System integration	0.850	V4 Centralized reservation connection V23 Channel centralization	V5 Centralized stock V24 Agent connection	V6 PMS direct V28 GDS connection
F3	Sales management	0.877	V17 Room price management V20 Analysis and prediction sources	V18 Stock management V21 Reservation promotion	V19 Statistical reports V22 Reservation
F4	Client management	0.896	V31 Client record V39 Agreement file	V35 Clients' opinions V40 Agreement analysis	V37 Client management
F5	Channel management	0.751	V25 Channel tracing	V26 Commission management	V27 Channel analysis
F6	Reservation tracing	0.855	V1 Real-time reservation reservation	V3 Reservation tracing	V7 Member
F7	Member management	0.926	V33 Member point accumulation	V34 Membership card	
F8	System management	0.676	V29 System settings	V30 System maintenance	

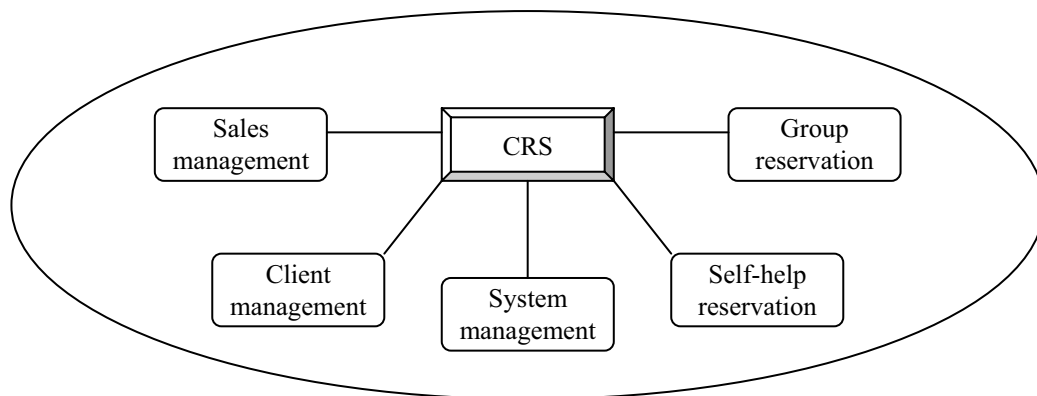


Figure 1. CRS Functional Factor Hypothesis Model

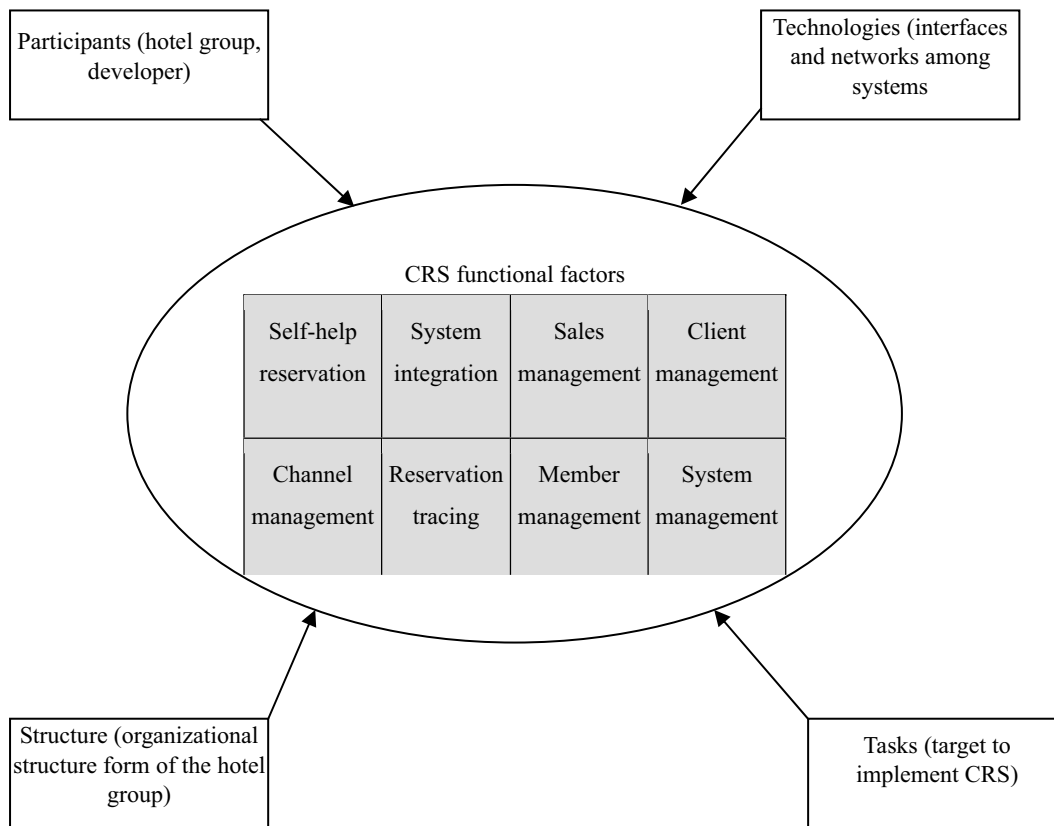


Figure 2. Hotel CRS Functional Factor Model

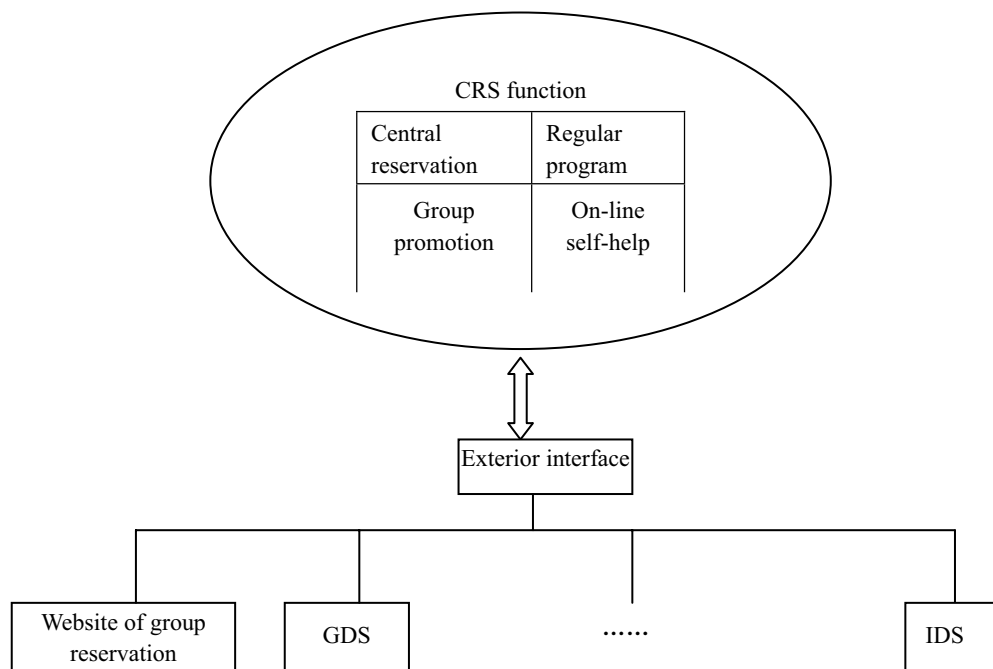


Figure 3. CRS Functional Model of Nanjing Jinling Group



# The Inventory Problem with A Non-Symmetric Loss Function

Amaresh Das & Adnan Omar

College of Business

Southern University at New Orleans &

New Orleans, LA 70056, USA

Tel: 504 286 5331 E-mail: adas2@cox.net

## Abstract

The paper deals with the inventory problem with uncertain demand and a non-symmetric loss function using normal quantile estimation theory. The future demand is predicted via Bayesian theory by using data on previous demands. The paper minimizes an inter temporal loss function by choosing 'new' orders. The micro approach of this paper begins by specifying why and how can an inter temporal loss function be minimized and thus explains a richer variation of inventory behavior than an production smoothing model.

**Keywords:** Uncertainty, Quantile estimation, Loss function

## 1. Introduction

The univariate normal quantile estimation theory is applied in many operations research problems. Long ago, Edgeworth applied this technique to determine the amount of cash to be kept on hand in a bank. Suppose that there is a large number of depositors, for each of whom the amount to be withdrawn, during a single given period, is a random variable independent of the withdrawals of the other depositors. Then the total amount withdrawn is a normal random variable  $x$ , with mean  $\mu$  and variance  $\sigma^2$ , both unknown. The bank may regard as tolerable a certain probability of not being able to meet all withdrawals. The amount of cash  $C$  kept on hand is then  $C = \mu + \delta\sigma$  where  $\delta$  is a standard normal deviate corresponding to an upper tail of  $\theta$ . The purpose of the paper is to build inventory model in conformity with the basic arguments of Edgeworth model. (Note 1). Here the random demand follows a normal distribution. The future demand for the  $N$ th period is related to the previous demand via the parameters. Thus, the future demand is predicted via Bayesian theory by using the data on previous demands. An inter temporal loss function is minimized in the process.

The motivation for the paper comes from the tension that was developing between the emerging macroeconomic and microeconomic views of investors.. Macroeconomics routinely thought of inventories as a *destabilizing* factor: in theory, the inventory accelerator created cycles that otherwise might not exist; in practice, GNP was more volatile than final sales (GNP less inventory investment). Yet, the prevailing micro theory viewed inventories as a *stabilizing* factor, something cost minimizing or loss minimizing firm could use instead of aiming at smoothing production.

The production smoothing model which has been the basic paradigm within which empirical research on inventories is being conducted, embeds a host of strong restrictions regarding the nature of demand and market structure. Despite the alleged revolution in inventory practices brought about by computerization, the economy- wide ratio of real inventories to real sales has been trendless for the last 50 years. A more promising avenue, therefore, for improving the performance of models should be to choose an inter temporal loss function and then minimize it by choosing 'new' orders. With that end in view, we will follow Edgeworth's banking model, where future demand will be predicted via Bayesian theory using data on previous demands. (Note 2). The plan of the paper will be as follows: Section I will introduce the problem. Section II will formulate the model. Section II will be followed by section III that will contain an analysis of the determination of the optimum. The paper will conclude with a few remarks in section IV.

## 2. The Model

We will assume that the demand at the beginning of the  $i$  th period is :  $d_i = h_i'\beta + \varepsilon_i$ , where  $h_i$  is a known  $q$  component vector,  $\beta$  is an unknown  $q$  component regression parameter vector, and  $\varepsilon_i$  is normal with parameters zero and  $\sigma$ . Further we assume that  $U_i$  is the quantity to be ordered at the beginning of the  $i$  th period and  $x_i$  is on-hand inventory at the end of the period  $i$ . Then input to the system is the demand  $d_i$  and the output is  $x_i$  which are related by

$$x_i = x_{i-1} + U_i - d_i = \sum_{j=1}^i U_j - \sum_{j=1}^i d_j + x_0 \quad (1)$$

where  $x_0$  is a given constant and denoted the stock at the beginning of the first period. The random variables  $x_i$  and  $U_i$  have certain normal distribution. The regression parameter vector  $\beta$  is assumed to have a certain prior normal distributions, assuming whether  $\sigma$  is known or unknown.

Let  $C_1$  be the inventory carrying cost per item per period and  $C_2$  be the storage cost per unit per period. Then the specific cost  $W_i$  for the  $i$ th period is

$$W_i = C_1 x_i, \quad x_i \geq 0, \quad W_i = -C_2 x_i, \quad x_i < 0 \quad (2)$$

Now we define the quantities

$$R_i = E[W_i | x_{i-1}, \bar{U}_{i-1}, \bar{d}_{i-1}] \quad (3)$$

where

$$\bar{x}_{i-1} = (x_0, x_1, \dots, x_{i-1}), \quad \bar{U}_{i-1} = (U_1, \dots, U_{i-1}), \quad \bar{d}_{i-1} = (d_1, \dots, d_{i-1}), \text{ and}$$

$$M_i = E(R_i) = \int R_i g(\bar{x}_{i-1}, \bar{d}_{i-1}, \bar{U}_{i-1}) d\bar{x}_{i-1} d\bar{d}_{i-1} d\bar{U}_{i-1} \quad (4)$$

## 2.1 Solution

How to derive the optimum, a question that is ultimately related to minimizing the inter temporal loss function we want to obtain? Now the optimum  $U_i$  will be determined by minimizing the controller

$$M_i + \sum_{j=i+1}^N M_j$$

where  $N$  is the last period.

We will proceed to show that optimum  $U_N$  will be determined by minimizing the expected value  $W_N$  by using the posterior density of  $W_N$ . After determining the optimum  $U_N$ , we use this optimum value to find optimum  $U_{N-1}$  and so on.

We proceed to show a la Gleser and Olkin (1970) that optimum  $U_N$  will be determined by minimizing the expected values  $W_N$  by using the posterior density of  $W_N$ . After determining optimum  $U_N$  we use this optimum value to find optimum  $U_{N-1}$  and so on.

Optimum  $U_N$  will be obtained by minimizing  $M_N$ , where

$$\begin{aligned} M_N &= \langle E(W_i | \bar{x}_{N-1}, \bar{U}_{N-1}, \bar{d}_{N-1}) \rangle \\ &+ \int W_N g(x_N | \bar{x}_{N-1}, \bar{U}_{N-1}, \bar{d}_{N-1}) g(\bar{x}_{N-1}, \bar{U}_{N-1}, \bar{d}_{N-1}) \\ &\quad \times dx_N d\bar{x}_{N-1} d\bar{U}_{N-1} d\bar{d}_{N-1} \end{aligned} \quad (5)$$

To simplify the analysis, we assume that  $x_N$  depends only on  $x_{N-1}$  and  $U_N$  and not on the past values of  $\bar{x}_{N-1}, \bar{U}_{N-1}$ . Thus, we may write

$$\begin{aligned} &g(\bar{x}_N | \bar{x}_{N-1}, \bar{U}_{N-1}, \bar{d}_{N-1}) \\ &= \int \langle g(x_N | x_{N-1}, \bar{U}_N, \bar{d}_{N-1}) \rangle g(U_N | x_{N-1}, \bar{U}_{N-1}, \bar{d}_{N-1}) dU_N \\ &= \int g(x_N | x_{N-1}, U_N, \bar{d}_{N-1}) g(U_N | x_{N-1}, \bar{U}_{N-1}, \bar{d}_{N-1}) dU_N \\ &= \int g(x_N | x_{N-1}, U_N, \beta) g(\beta | \bar{d}_{N-1}) \langle g(U_N | \bar{x}_{N-1}, \bar{U}_{N-1}, \bar{d}_{N-1}) \rangle dU_N d\beta \end{aligned} \quad (6)$$

Where  $g(\beta | \bar{d}_{N-1})$  is posterior density of  $\beta$ . This, we have

$$\begin{aligned} M_N &= \int W_N g(x_N | x_{N-1}, U_N, \beta) g(\beta | \bar{d}_{N-1}) \langle g(U_N | \bar{x}_{N-1}, \bar{U}_{N-1}, \bar{d}_{N-1}) \rangle \\ &\quad \times g(\bar{x}_{N-1}, \bar{U}_{N-1}, \bar{d}_{N-1}) dU_N d\beta d\bar{x}_{N-1} d\bar{U}_{N-1} d\bar{d}_{N-1} dx_N \end{aligned} \quad (7)$$

However, we must have

$$M_N = \int R_N g(\bar{x}_{N-1}, \bar{U}_{N-1}, \bar{d}_{N-1}) d\bar{x}_{N-1} d\bar{U}_{N-1} d\bar{d}_{N-1} \quad (8)$$

It follows from (7) and (8) that

$$R_N = \int W_N g\{x_N | x_{N-1}, U_N, \beta\} g\{\beta | \bar{d}_{N-1}\} g\{U_N | \bar{x}_{N-1}, \bar{U}_{N-1}, \bar{d}_{N-1}\} \\ \times dU_N d\beta dx_N \quad (9)$$

Obviously  $M_N$  is a minimum when  $R_N$  is a minimum. Now let  $\bar{d}_{N-1} = H\beta + \varepsilon$  where  $\varepsilon$  is normal with mean vector zero and covariance matrix  $\sigma^2 I$ , and let  $\beta$  be normal with mean vector  $\beta_0$  and covariance matrix  $\sigma_0^2 I$ . Then,

$$g\{\beta | \bar{d}_{N-1}\} = k \exp \left\{ -\frac{1}{2} (\beta - \beta_1)' \Sigma (\beta - \beta_1) \right\} \quad (10)$$

Where

$$\beta_1 = \Sigma^{-1} \left( \frac{H' \bar{d}_{N-1}}{\sigma^2} + \frac{\beta_0}{\sigma_0^2} \right) \quad (11)$$

Where  $\sigma^2$  and  $\sigma_0^2$  are known. Again, by noting that

$$x_N = x_{N-1} + U_N - d_N = x_{N-1} + U_N - h'_N \beta - \varepsilon_N \quad (12)$$

We find that

$$g\{x_N | x_{N-1}, U_N, \beta\} = k \exp \left\{ -\frac{1}{2\sigma^2} (x_{N-1} + U_N - h'_N \beta - x_N)^2 \right\} \quad (13)$$

Now we define the quantities

$$T = x_{N-1} + U_N - h'_N \beta_1 \quad A = (h'_N \Sigma^{-1} h_N + \sigma^2)^{-1} \quad (14)$$

Using (9), (10), and (13), find that

$$R_N = k \int_0^\infty C_1 x_N \exp \left\{ -\frac{1}{2} (x_N - T)^2 A \right\} dx_N - k \int_0^\infty C_2 x_N \exp \left\{ -\frac{1}{2} (x_N - T)^2 A \right\} dx_N \\ = (C_1 + C_2) f(T \sqrt{A}) + (C_1 + C_2) TF(T \sqrt{A}) - C_2 T \quad (15)$$

Where  $F$  and  $f$  are the distribution and density functions at the standard normal variate. Minimizing  $R_N$  with respect to  $U_N$  yields the optimum  $U_N^*$  as

$$U_N^* = Z_p A^{1/2} - x_{N-1} + h'_N \beta_1$$

Where  $Z_p$ ,  $p = C_2 / (C_1 + C_2)$  is the  $p$ -th quantile of the standard normal density. Note that (15) relates future  $x_N$  with respect to  $T$  via the parameters.

To find  $U_{N-1}^*$ , we minimize  $M_{N-1} + M_N^*$  with respect to  $U_{N-1}$  where  $M_N^*$  is the value of  $M_N$  obtained by substituting  $U_N^*$  for  $U_N$ . Now  $M_N^*$  does not contain  $x_{N-1}$  and  $U_{N-1}$  so that minimum of  $M_{N-1} + M_N^*$  is obtained by minimizing  $M_{N-1}$  with respect to  $U_{N-1}$ . This applies to any intermediate stage and we get a regular strategy for finding the optimum controller (Note 3, Note 4). This analysis for the normal error structure model is given by Sarker (1975).

### 3. Conclusion

We connected a single future variable or observation to the past data. This is just a Bayesian theory and we have obtained this Bayesian statistical inventory model over  $N$  discrete periods of equal length within the framework of normal distribution theory. An expression for optimal order quantity at the beginning of the  $N$ -th period is obtained. And the expected value of a certain function of this predicted demand is minimized to obtain the required order quantity. However, we may also relate more than a single independent variable to past data and form a more general model and the methodology remains the same. The merit of our work is that during 2000s economists once again know something they had known in the 1950s: that inventory investment is of the first order importance in business cycles. But, they will be beginning to realize that the standard production smoothing model or the buffer stock model of inventories can be supplanted by a new micro approach.

## References

- Blinder, Alan S. (1986) "Can the Production Smoothing Model of Inventories be saved?" *Quarterly Journal of Economics*, 101, 431-454
- Bray, M. (1981) "Future Trading, rational expectations and the Efficient Market hypothesis," *Econometrica*, 49, 575-596
- Eichenbaum, Martin. (1984). "Rational Expectations and the Smoothing Properties of Inventories of Finished Goods. *Journal of Monetary Economics*, 14, 71-76.
- Gleaser, L. J., and Olkin, I. (1970). "Linear Models in Multivariate Analysis" in *Essays in Probability in Statistics*, John Wiley & Sons, Inc,
- Grossman, S. J. and Stiglitz, J. S. (1976). "Information and Competitive Price System" *American Economic Review*, 66, , 246-253.
- Gutman, I. (1970). *Statistical Tolerance regions*, Charles Griffith Statistical Monograph, No 26, Charles Griffin, London
- Jeffry. M. and Zeldas, S. P. (1987). "Seasonality, Cost Shocks and the Production Smoothing Model of Inventories" Unpublished Manuscript, Department of Economics, University of Pennsylvania.
- Markland Johan. (2006). "Controlling Inventories in Divergent Supply Chains with Advance-Order Information", *Operations Research*, 54, September, 985-1010.
- Narragon, E. A., Dessouky, N. I. and Devor. S. E. (1974). "A probabilistic Model for Analyzing Campus Parking Problem" *Operations Research*, 22, 1025-1039.
- Sarker, B. (1975). "A Feedback Inventory Control Systems with Linear Cost" *Sankhya*, Series B, 37, 241- 247.
- West. K. D. (1987). "The Sources of Fluctuations in aggregate GNP and Inventories", Unpublished Manuscript, Department of Economics, Princeton University.
- Yongwon Sew, Sungwan Jung and Juho Hahm. (2002). "Optimal Research Decision Utilizing Centralized Stock Information in a Two-Echelon Distribution System", 271, Feb. 2002, 171- 193.

## Notes

Note 1. It is obvious that the problem of inference of normal quantiles of the type of are interesting problems in several situations. The inference problems of the normal quantiles theory associated with classical regression models have been tackled in the literature by various procedures: classical, Bayesian, structural, minimax, etc. For some of the readily available or easily derivable results, see, e.g., Guttman (1970). Narragon et al (1974) applied Edgeworth theory to a campus parking problem where different class of users exhibited varying demand practices.

Note 2. This model differs from the other uncertainty models in the sense that demand is the main source of uncertainty here unlike in the other works, for example, Grossman and Stiglitz (1976) and Bray (1981), where uncertainty is introduced in the form of random supply that prevents price from acting as a price statistic. The major thrust of this model is not to establish conditions under which prices reveal information which can be equivalent to perfect information but to improve the estimate of the parameters determining demand. See on related views

Blinder (1986), Eichenbaum (1984) West (1987), and Jeffry and Zeldes (1987). There are other types of inventory problems specifically related to inventory control where one makes a numerical study using advance order information in supply-chain inventory control, see, for example, see Marklund (2006) and Youngwon, Sungwon and Juho (2002)

Note 3. When  $\beta$  and  $\sigma$  are both unknown, we have

$$R_N = k \int W_N g(\beta, \sigma | \bar{d}_{N-1}) \exp\left(-\frac{1}{2\sigma^2} (x_{N-1} + U_N - h'_N \beta - x'_N)^2\right) dx_N d\beta d\sigma \quad (17)$$

we assume

$$g(\beta, \sigma | \bar{d}_{N-1}) = k \exp\left\{-\frac{1}{2} (\beta - \beta_1)' (H'H + I)^{-1} (\beta - \beta_1) / \sigma^2\right\} \quad \text{where} \quad (18)$$

$$\beta_1 = (H'H + I)^{-1} (H' \bar{d}_{N-1} + \beta_0) \quad (19)$$

On integrating (17) with respect to  $\beta$  first and then with respect to  $\sigma^{-2}$  we have

$$R_N = k \int C_1 x_N [I + (x_N - T)^2 / \sigma]^{-(m+1)/2} dx_N - k \int C_2 x_N [I + (x_N - T)^2 / \sigma]^{-(m+1)/2} dx_N \quad (20)$$

where  $\theta = I + h'_N (H' H + I)^{-1}$ . However (20) and (15) have the same form and hence, in this case, we find that

$$U_N^* = Z_p \theta^{\frac{1}{2}} - x_{N-1} + h'_N \beta_1 \quad (21)$$

Where  $Z_p$  now is the p-th quantile of the density

$$f(x) = k (1 + x^2)^{-(m+1)/2}$$

If  $\beta_1$  of (19) is assumed to be known, then (21) is known. Otherwise, we have to use the Bayesian theory for making probability statement about  $U_N^*$ , after substituting Bayes' estimate for  $\theta_1$  in (21)

Note 4. Another approach where the parameters are unknown is to use Blackwell- Lehman-Scheffe theorem and obtain  $U_N^*$  as the quantile of a certain conditional distribution function.



# The Effect of Globalization, Labor Flexibilization and National Industrial Relations Systems on Human Resource Management

Mohammad Ziaul Hoq (Corresponding Author)

Faculty of Business and Accountancy

University of Malaya

50603 Kuala Lumpur, Malaysia

Tel: 60-17-269-5947 E-mail: [hoq.ziaul@gmail.com](mailto:hoq.ziaul@gmail.com)

Muslim Amin

Faculty of Science and Technology, University Kebangsaan Malaysia

Bangi, Selangor, Malaysia

Iftekhar Amin Chowdhury

Faculty of Business Administration, Daffodil International University

Dhaka, Bangladesh

Sulaiman Ali

Faculty of Economic, University of Syiah Kuala

Banda Aceh, Indonesia

## Abstract

This paper analyzes how changes to the global organization of capitalism have accompanied and intensified globalization as well as have affected the regulation of labor and employment relationship. One of the most significant of these changes has been the dramatic increase in the rate of cross-border merger and acquisition activity. Of equal significance, especially for the regulation of labor and the employment relationship, has been the pronounced tendency of global enterprises to transform themselves into coordinators and organizers of activities performed for them by contractors, sub-contractors and suppliers. Outsourcing and subcontracting have allowed global enterprises to reduce and externalize the costs incurred from the direct employment of labor. This reorganization of the operations of global corporations has been greatly facilitated by the removal of barriers to trade and the global movement of capital, and labor market deregulation. Labor market deregulation has largely been brought about by the emasculating of national Industrial Relations Systems (IRSs) in developed and developing nations alike. As national IRSs have been emasculated, so has the regulation of labor and the employment relationship increasingly been internalized in the firm by the use of Human Resource Management (HRM).

**Keywords:** Globalization, Global capitalism, Labor Flexibilization, National Industrial Relations System, HRM

## 1. Introduction

With increasing globalization there have been enormous and far-reaching changes in the global organization of capitalism. These changes are the result of the fierce international competitive pressures faced by enterprises operating in the global marketplace. One of the most significant changes has been the dramatic increase in the rate of global merger and acquisition (M&A) activity. Another has been the pronounced tendency of global enterprises to reorganize their operations so that they are transformed into coordinators of activities performed on their behalf by others. The sub-contracting and outsourcing of operations, particularly the more labor intensive ones, enable firms to reduce their overheads by externalizing the capital and other costs associated with the direct employment of labor. Naturally, outsourcing and subcontracting have resulted in the lengthening, indeed the globalization, of supply chains which have accordingly also grown in complexity. Globalization, and the development of global capitalism, has been greatly facilitated by, amongst other things, the reduction or removal of trade barriers, and the drastic weakening of barriers to the global movement of capital. Labor market deregulation, reflected in the emasculating of national Industrial Relations Systems (IRSs), has also contributed to increasing and accelerating globalization.

Corresponding to the tendency national IRSs has been the trend to internalize labor regulation within the enterprise. Human Resource Management (HRM) is increasingly used by global enterprises as a regime of labor regulation tailored

to the requirements of the individual firm. The growing dominance of HRM in the regulation of labor and the employment relationship has occurred in tandem with the increasing flexibilization of labor. The workforce of the global enterprise is increasingly divided into core workers and peripheral or flexible workers. The core workers are generally highly skilled professionals directly employed by the enterprise in its global headquarters, usually located in the one of the advanced industrial countries. These workers are usually, fulltime, permanent employees who are relatively well paid and receive other attractive rewards and entitlements. In contrast, the peripheral workers are not employed by the enterprise itself, but by its sub-contractors and suppliers. They are generally part-time or intermittent workers on low casual rates of pay. They are also generally women. Employment growth in the less developing countries over the past several decades, as well as in the advanced industrial countries over the same period, has seen a spectacular increase in the size of the flexible, female labor force rather than in the ranks of fulltime employees.

If we consider the case of Bangladesh, we can find that the part time or temporary workers are increasingly dominant in the business environment. For example, many of the banks and insurance companies employ part time or temporary executives for selling or promoting their services (i.e. telephone banking, credit cards and insurance policies etc.). Mobile phone companies are hiring part time employees to provide customer services. In IT industry companies employ part time data entry operators, graphic designers and website developers etc. Recently we have observed that fast food and restaurant industry is very much ahead in employing part time workers for rendering services and working as kitchen hand. Pizza Hut is an example of successfully using the peripheral workforce. The employees of the fast food industry normally perform one particular type of activity all day long for 5 to 6 days of a week. In other industries like universities, colleges and sports clubs part time professional personnel play a key role with the full time professional personnel. On the other hand some historically female oriented industries of Bangladesh are also employing male employees at present. Previously in garments industry, most of the jobs suited female workers and were offered only for female workers, but at present garments industries are also offering production floor jobs as well as decision-making jobs for males.

HRM is used as an internal system of labor regulation by enterprises to regulate the employment of their core workforce. On the other hand, it is also used as a system of labor regulation to regulate the employment of the enterprise's peripheral or flexible workforce. In other words, it regulates the employment of workers employed by contractors, sub-contractors and suppliers right along the length of the supply chain. For the core workforce, HRM is cooperative, inclusive and participatory in orientation, concerned as it is with winning the *individual* commitment of core employees to the enterprise and the achievement of its strategic objectives. It emphasizes performance, skills and individualized monetary rewards. For the peripheral workforce, in contrast, HRM emphasizes short term and insecure employment, low hourly rates, degrading conditions of employment, lack of opportunities for training and career advancement, and so on. But it is also about "improving" the performance of the flexible workforce by speeding up or reducing the piece rate or casual hourly rates received by flexible workers, and offering them only intermittent employment, but at the same time extending the length of the working day.

This paper further argues that it is not only enterprises operating in the global economy, which have been affected by global competitive pressures. Globalization has subjected firms, which serve only national domestic markets, and even those which service local and niche markets, to exactly the same pressures as those their global counterparts face. As a consequence, such firms are under duress to organize production in exactly same way as global business enterprises organize production.

### 1.1 Objective of the study

- To examine recent trends and developments in global capitalism and analyze how these have led to the 'flexibilization' of worker and employment .
- To examine how globalization and flexibilization have given rise to the emergence of HRM as a system of labor regulation within the enterprise
- To compare HRM and national IRSs as systems of labor regulation.
- To provide insights for policy formulation in the era of globalization.

## 2. Methodology

The article has been written on the basis of secondary information. The secondary information were collected from published books, journals, research papers, and official statistical documents, most of which were published during the period of 1970- 2006.

## 3. Globalization and Global Capitalism

When we speak of global capitalism, then, we refer to a variant sub mode of capitalism that can be distinguished from two other variants extant in both present and past capitalist social formations- the competitive and monopoly variants. Capitalist social formation almost always includes more than one variant of the capitalist mode of production as well as pre-capitalist social relations. At any given time, however, one variant can be identified as dominant in relation to others.

In terming the contemporary era one of global capitalism, we are suggesting that the global variant, and thus global firms, are emerging as dominant in relation to firms that continue in monopoly or competitive sectors of the social formation.

Scholte (2000) argues that on the one hand capitalism has been a primary cause of globalization, but on the other hand the global capitalism has been one of its main consequences. Globalization has greatly strengthened capitalism to the extent that it is the prevailing, and largely unchallenged, structure of production and exchange across the globe. Surplus accumulation has been extended to the consumer, finance, information and communications sectors. The extension of surplus accumulation into these sectors has been accompanied by major shifts in the organization of capitalism, including the rise of offshore centers, trans-border companies, corporate mergers and acquisitions, and oligopoly (Scholte, 2000).

Knudsen (2001) observes that Multinational Enterprises (MNEs), or Transnational Corporations (TNCs), are increasingly responsible for the initiation and organization of global economic activities. In 1996, it was estimated that there were about 44,000 TNCs in existence worldwide (Global Governance Reform Project, 2000, p. 34). These are "parent" TNCs that controlled about 280,000 affiliated organizations, of which 7,000 were 'home-based' in the fourteen major developed OECD countries, 90% having their headquarters in the countries of the developed world (Hirst and Thompson, 1999, p. 68). Fifty of the 100 largest economies are not nation states but TNCs. Only the largest developing country economies, such as India and the People's Republic of China, are included in the 50 largest economies. Moreover, "1% of TNCs now account for 50% of world FDI" and 70% of global trade is controlled by a mere 500 TNCs (Malhotra, 1998). The global dominance of large corporations is also reflected in employment figures, with approximately one in five employees in the developed countries directly employed by TNCs. When subcontracted and franchised operations of TNCs are factored in, the proportion rises to about two-fifths (Knudsen, 2001).

Cross-border mergers and acquisitions account in large part for the spectacular growth in size and influence of TNCs over the last several years. Such acquisitions and mergers have direct and profound implications for a TNCs workforce in all the countries in which it operates.

Knudsen(2001) points out, by becoming multinational and by acquiring additional plants, a company increases its ability to apply 'divide and rule' tactics and practices in its dealings with the workforce. These tactics are particularly effective in situations where a company produces the same or very similar products at different sites. Using techniques such as benchmarking, a company collects comparative information on productivity and performance at its several plants and on this basis makes decisions on levels and types of investments. Not surprisingly, investment decisions favor those sites where productivity and performance are best, while the poorer performers face disinvestment or even closure (Knudsen, 2001).

### *3.1 HRM issues and challenges in global markets*

The coming of the 21st century globalization poses distinctive HRM challenges to businesses especially those operating across national boundaries as multinational or global enterprises. Global business is characterized by the free flow of human and financial resources especially in the developed economies of European Union (EU), the North American Free Trade Agreement (NAFTA), other regional groupings such as the Association of South East Asian Nations (ASEAN), the Economic Community of West African States (ECOWAS), the Southern African Development Community (SADC), etc. These developments are opening up new markets in a way that has never been seen before. This accentuates the need to manage human resources effectively to gain competitive advantage in the global market place. To achieve this, organizations require an understanding of the factors that can determine the effectiveness of various HR practices and approaches. This is because countries differ along a number of dimensions that influence the attractiveness of Direct Foreign Investments in each country. These differences determine the economic viability of building an operation in a foreign country and they have a particularly strong impact on HRM in that operation. A number of factors that affect HRM in global markets are identified: (1) Culture (2) Economic System (3) Political System – the legal framework and (4) Human capital (Noe, et al, 2000). Consistent with the scope of the present paper, only one dimension is treated: human capital (the skills, capabilities or competencies of the workforce). This is in consonance with the believe that competency-based human resource plans provide a source for gaining competitive advantage and for countries profoundly affect a foreign country's desire to locate or enter that country's market (O'Reilly, 1992). This partly explains why Japan and US locate and enter the local markets in South East Asia and Mexico respectively.

In the case of developing countries, globalization poses distinct challenges to governments, the private sector and organized labor. These challenges, which must be addressed through a strategic approach to human resource management, include (1) Partnership in economic recovery especially in South East Asia (2) Dealing with the "big boys", the fund managers (3) Concerns over possibility of fraud in E-commerce (such as issues of confidence and trust) and (4) Implementing prescriptions for recovery and growth taking in to consideration the development agenda and unique circumstances of individual country.



### 3.2. Globalization and consequences for workers and work places

#### 3.2.1. The impact of new information technologies

Technological innovation has always been an important factor of change in work. But changes due to the world-wide and wholesale introduction of new information technologies (NIT) in work have particularly important impacts, in part in promoting and speeding up globalization, in part of recurrently influencing work settings.

One consequence of NIT has often been noted: the switch from physical work demands to mental, information handling, “intellective” operations with their concomitant stressors like undue increase of mental workload. This virtualization of work and the switch from physical to mental activities has been labeled by Zuboff (1984) as decasualization of work. New technologies in work settings imply changed competence demands, a new division of local labor, and organizational change. The history of work in the twentieth century is a history in which machines have increasingly replaced the skills of workers of all collars. In a production process in which science and technology are central, knowledge and not skill defines the process (Aronowitz and DiFazio, 1994:92). In order to realize how fast and dramatic these technical changes occur it is sufficient to remind ourselves that it is only since the 1980s that the computer began to enter our work and private life to any noticeable extent. Today, practically every second work place in many parts of the world is affected by the “smart machine”. New information technologies have also transformed the work life for staff in universities. Most university employees spend many hours daily in front of the computer screens. Daily they are linked to their colleagues through often real-time e-mail and internet contacts. Literature search is conducted by scientists themselves through search machines in the www. The division of labor in university departments changes. Secretaries no longer need to type because scientists usually write their papers and letters themselves. Secretaries become office assistants and office managers.

Thus, the World-Wide-Web and the introduction of new and capital intensive NIT in work settings may be considered as a central precondition for globalized information access and communication. It implies the possibility of breaking down the traditional unity of time and place in work. Flexibilization of working time and the increased possibility to achieve one’s work by telemetric (Andriessen and Roe, 1994) and independently of a specific physically determined workplace offer the work force opportunities of self-determined planning and self-determined learning. This increase in autonomy is bound to have repercussions for the distribution of power in work settings as well as in families. The whole fabric of society is affected by this new flexibility.

We are confronted here with a curious irony of history. After all, the introduction of new technologies and the concomitant increase of automation in work followed the rationale of making the production process more controllable and more independent of human action. But due to the drastic increase of capital intensity of high-tech workplaces, workplaces also become more vulnerable due to the possibility of human error or sabotage. Hence, ironically, the opposite of original expectations takes place: work becomes ever more dependent on responsible, competent, and committed human work activity. Add the world-wide increase of competition and the experience of workers to be dependent on the success of their company in order to remain employed, and then we understand why those still employed are characterized by high motivation to work diligently. Threatened by unemployment people work harder. The protection and intermediate brokerage of unions becomes more and more obsolete (Streeck, 1996).

#### 3.2.2 Changing work structures in industrialized countries

However, world-wide changes in technology not only induce changes in work places, but they also engender dramatic changes in the occupational structure and the professions. We observe world-wide the emergence of new professions which is accompanied by the growing obsolescence and sometimes wholesale disappearance of traditional professions. In consequence, career patterns must change; inter-professional mobility and frequent professional changes in one’s life time are required. More importantly, these new professional categories do not follow the received professional classifications and they do not correspond any more to traditional vocational and professional educational or training programs. We note here a remarkable uncoupling of work and professional demands in the economy from the existing educational system.

Unemployment, as a characteristic of labor market structure, is one of the most prominent crisis symptoms of many Western industrialized societies. Although still claimed by many economists or politicians, this is not a consequence of economic cycles but a structural phenomenon resulting from technical progress and ensuing productivity increases which sometimes reach 200-300%. There is no question that labor productivity, if it is measured as a ratio of a unit of output to the time required for its production, has increased dramatically (Aronowitz and DiFazio, 1994). We observe a growth in productive capacities which makes “living work” (Marx), the demand for work of real people redundant. Both, global competition and outgrown productive capacities appear to be the main drivers of unemployment.

At least in Germany the daily news about the growth of unemployment figures and the imminent wiping out of jobs is staggering. Cybernetics is the most widely applied current means by which labor is being progressively freed (without

pay) from the industrial, commercial, and professional workplace (Aronowitz and DiFazio, 1994:82). Sometime ago, it was possible to read, within a time span of a couple of days, the following alarming news in German papers:

- Deutsche Bank reduces workforce by 6400.
- Association of German Banks announces to lay-off more than 5000.
- More than 5–7 million unemployed persons in Germany.
- Some regional unemployment rates reach more than 20%.
- Opel intends to reduce staff by 6000.

A split goes through most European societies. A split between those who still own workplace and those who do not. This is true for many of the so-called developing countries as well. The ratio of those deprived of a job is increasing. Some people speak of a two-thirds society; two-thirds living on the sunny, one third living on the shady side. Our societies are marked by a gap of social justice when we consider the distribution of work. Given the continued productivity growth in our economies, this trend is likely to continue even if it is periodically interrupted and temporarily even reversed. One important index of this development is also the steady erosion of traditional fixed work contracts in favor of more flexible work arrangements and self-employment. This growing casualization of work contracts (i.e. the reduction of safeguards against firing, the growth of part-time employment and temporary work agencies and the demise of life-long employment policies) is indeed a reflection of the predicament of work in our societies.

And yet, our societies define themselves as work societies. Almost half a century ago, Hannah Arendt (1958), one of the most important German philosopher of the 20th century, has heralded the troublesome problem of a society without work:

However, since the 1930s we know from the work of psychologists that the unemployment experience creates conditions for health hazards and deteriorating physical and mental health (Jahoda et al., 1960 and Warr, 1984).

When discussing work in society we can distinguish at least four perspectives (MOW, 1987):

- The philosophic-anthropological meaning of work as a fundamental human condition in the sense of Hannah Arendt;
- the objective societal significance of work as the central societal means to create and maintain culture;
- the economic role of work as the central mechanism for the distribution of goods and social opportunities; and, finally,
- the subjective, psychological meaning of work in the context of other life roles.

Already Durkheim (1960) considered work and the social division of labor as the fundamental connection among humans creating the basis for social integration. In line with Arendt, also similarly Anthony (1980) raised the questions - what is to the course and the foundation of moral order when work ceases for many or diminishes for most? If men enter society through work what will be left of society if work ends? Is it possible that man will become truly alienated from other men only when he is released from work which was said to have alienated him?

Thus, we may conclude that beyond the mere provision of income to cover basic needs, it is through the social bonding of work which links individuals to society, gives them social standing and status, serves as a basis for the construction of their personal identity. Given our cultural heritage, work is for most an existential necessity, providing livelihood and meaning in life.

As to migration: the issues that need to be addressed in connection with international migration range from basic human rights and political problems of citizenship over health issues, social rootlessness and dual ethnic loyalty of migrants and their offspring to ethnic revival and politicization of minorities in response to xenophobic radicalization of the work force (Wilpert, 1989). The entry of foreign workers also raises issues such as how European or US managers and regulators deal with the proliferation of immigrant workshops and sweatshops, which threaten to reintroduce the poor labor conditions of 19th Century Europe and 20th Century Asia into the back streets of Europe and the US. We deal here with workers who have come into our own countries (legally and illegally) from poorer countries and take the dirty jobs in our companies at low pay and often without health and retirement benefits and face many stresses and acculturation problems for themselves and their families (Oppen, 1988, Collatz, 1992 and Wilpert, 1998). Do they have the same rights as our citizens to workplace health and safety, and if they do not, what is being done or should be done? And if they have the same protections and rights but don't know how to use them, how should we adapt our regulations and policies to help them?

Women face particular problems in the migratory process. Half of the estimated 120 million migrants world-wide are women. Women generally add to the predicament of male unemployment: One of the most serious – and ironic – consequence of the feminization of the new proletariat has been to increase the pool of wage laborers and thus

contribute to male unemployment (Sassen, 1998). And it is an epochal trend towards increasing female labor market participation. But it is mainly migrant women who fill poorly paid jobs in receiving countries as domestic workers, as nannies and housekeepers, as sex workers while often being separated for years from their own families and children in their countries of origin (Ehrenreich and Hochschild, 2003).

### 3.2.3. Changing work structures in developing countries

While unemployment in industrialized countries is one of their major labor market characteristics, other problems are posed in the mean and long-term perspective for countries in the so-called Third World regions. Import of highly developed production technologies and rapid industrialization processes meet country contexts which may be far from offering appropriate receptive conditions for a balanced and sustained development (see the series of annual reports on human development by the United Nations Development Program – UNDP). Further, an unabated influx of migrants from rural areas to metropolitan centers in Third World countries creates a growing urban under-educated and under-employed proletariat on the one hand and the emergence of new elites who have mastered the new work performance demands and requisite new technologies which make their integration in the globalized economy possible, while, at the same time, contributes to growing rifts and disparities in the social fabric of the population in the developing countries.

### 3.2.4. Changing industrial relations systems

There can be no doubt that also the industrial relations system is drastically affected by competition in all world markets. Particularly, institutionally and statutorily regulated systems of industrial relations are threatened, because under prevailing conditions companies find it easier than before to escape from demanding regulatory frameworks such as the traditional German system of codetermination. As a consequence, more voluntaristic rather than obligatory systems emerge and social partners (unions and employers organizations) are predicated in their activities less institutionally than by market forces. Employment conditions are more and more determined by company policies rather than general statutory rule systems (Streeck, 1996). The general decline of union membership appears in this context as a reflex of the work force which perceives little protective potential in unions. In short: industrial relations systems, too, undergo critical changes.

By the way of an interim summary: Change, the disruption of continuity, the tearing of social fabric, uncertainty and an upheaval in all life spheres seems to be the endemic effect of globalization. “What’s peculiar about uncertainty today is that it exists without any looming historical disaster; instead it is woven into the everyday practices of a vigorous capitalism. Instability is meant to be normal” (Sennett, 1998:31).

## 4. Globalization and the ‘Flexibilization’ or ‘Informalization’ of Work

Scholte (2000) observes accelerated globalization in recent decades has affected not only the opportunities for waged employment, but also the conditions of work. What he calls the ‘flexibilization,’ other commentators have termed the ‘in-formalization,’ of work has been a particularly insidious development. The manner in which human resources are deployed in the workplace, working practices and wages, labor mobility, and the range of tasks an individual worker is routinely called on to perform have all been affected by flexibilization. Indeed, while labor flexibility has many guises, these can all generally be fit into one or other of the following categories:

- 1) Reducing the core of permanent workers
- 2) Increasing the proportion of temporary and casual employees [also known as peripheral workers]
- 3) Increasing the use of women, apprentices and migrants
- 4) Subcontracting the production of components previously manufactured within the factory
- 5) Subcontracting services like transport, packaging, maintenance, security, etc., which are carried out on factory premises
- 6) Increasing the number of shifts per day or the use of overtime; replacing pay systems based on working time and length of service by systems based on piece rates and bonuses
- 7) Introducing internal training systems which facilitate redeployment of workers within the factory or enterprise [also known as multi-skilling] and
- 8) Reducing influence from external trade union organization by either eliminating unions or establishing a controllable [company] union.

The version of globalization with which we all have had to become familiar owes much to the hold which neo-liberal ideas, strategies and policies have had over governments and policy makers in the developed world, and increasingly in the underdeveloped countries as well. As far as work and employment are concerned, the growing global demand for flexible labor which has accompanied globalization has been generated by “The deregulation of labor markets, fragmentation of production processes, de-industrialization and emergence of new areas of export specialization” (Kanji

and Menon Sen, 2001, p. 1-2). But this is only half the story. The increased demand for flexible labor has meant the feminization of labor-the prodigious growth in the numbers of low-paid, flexible female workers around the world. Jobs growth in the advanced industrial economies over recent years has been predominantly in the area of part-time and casual work. Women's employment opportunities have accordingly been restricted to such jobs, which are generally defined as unskilled or semiskilled.

Flexible jobs have proliferated in leading sectors of the global economy, such as retail, hospitality, information and communications, and banking and finance. They have also proliferated in the traditional sweated trades and industries, such as textiles and clothing, and increasingly in the industrialized countries as well. Flexibilization has also accompanied the deindustrialization of the older industrial cities and regions, and relocation of process, assembly and other labor-intensive operations to the low-wage countries. The introduction or relocation of production facilities to green field sites in cities and regions with no prior history of labor activism and union militancy has been a parallel development. Flexibilization has also become more widespread as has the widely perceived need for enterprises, industries and national economies to remain globally competitive become more and more imperative. Managers and workers alike have generally had to accept that improved wages and working conditions and more stable employment arrangements would undermine the competitiveness of the firm and lead to production and other operations moving offshore (Scholte, 2000).

#### *4.1 Globalization, Flexibilization and Human Resource Management (HRM)*

As suggested above, with increasing globalization, the international competitiveness of enterprises has become a crucial factor in their survival and growth. This is true not only for firms that operate in the global marketplace, but also for firms whose scope of operations is restricted to the national economy of a particular country and even for those that only service local or niche markets. The removal or reduction of trade barriers, dismantling of the barriers to the global movement of capital, the growth in size and influence of TNCs, and the widespread availability and use of communication, information and transportation technologies that make global transactions possible have together ensured that all firms regardless of their scope of operations are now subject to global competitive pressures. Sriyan De Silva (1998) points out in this regard that Enterprises driven by market pressures need to include in their goals improved quality and productivity, greater flexibility, continuous innovation, and the ability to change to respond rapidly to market needs and demands. Directly in line with this trend, the quality of a firm's "human resources" (employees or workers) is now a crucial ingredient in its overall competitiveness in the global economy.

The growing significance of self-management, and the corresponding decline in direct control, in modern enterprises should not be allowed to obscure the fact that HRM is an important, often indispensable, means of achieving management objectives. While employees are encouraged, even rewarded, for identifying with the enterprise and for helping it to achieve its objectives, the vast majority have no effective role in management and play virtually no part in defining the enterprise's objectives (Rix, 2001). As the quality of an enterprise's human resources becomes an increasingly important factor in its international competitiveness, so does HRM attain a more dominant position in the enterprise's overall management structure and decision-making. This is a trend which clearly demonstrates a change in power relations and highlights the supremacy of management. The management prerogative is rediscovered but in place of command and control the emphasis is on commitment and control as quality, flexibility and competence replaces quantity, task and dumb obedience. To put it another way: the managerial agenda is increasingly focused on innovation, quality and cost reduction. Human resource management makes more demands on employees, work is intensified ...there is less room for managerial slack and for indulgency patterns (de Silva, 1998).

The foregoing should make it abundantly clear that HRM is in no way to be confused with what de Silva calls the "traditional personnel function." Unlike the personnel function, HRM is fully integrated into strategic management, concerned as it is with ensuring that the enterprise's human resources are deployed in such a way as to ensure their commitment and contribution to the strategic objectives of the enterprise. Instead of emphasizing "problem-solving and mediation," HRM is chiefly interested in incorporating the enterprise's human resources into corporate strategy and planning. Employee participation and cooperation are facilitated by "programs of corporate culture, remuneration packaging, team building and management development for core employees, *while peripheral employees are kept at arms length*" (de Silva, 1998).

Scholte (2000) points out that globalization has had a decidedly corrosive effect on employment security. He also argues that the "economic logic" of flexibilization is highly questionable, leading to reduced rather than enhanced efficiency and competitiveness. Workers who are well trained, well-paid and who have stable and secure jobs may well be more "motivated, reliable and productive" than 'flexible' or 'irregular' employees. He notes that "To this extent the 'race to the bottom' in wages and other working conditions could operate not only against human security, but against efficiency as well" (Scholte, 2000).

According to Gallin (2000), the emergence and development of a global labor market is the most important social consequence of globalization. Capital mobility and the rapidity and reach of communications networks, at once

important causes and consequences of globalization, mean that workers in all countries, including the industrially advanced nations, are competitively underbidding each other in an unseemly, and from the point of view of efficiency and productivity, counter-productive global race to the bottom. As seen above, this underbidding has set in motion a relentless downward spiral of deteriorating wages and conditions through competitive deregulation and informalization of work. But, as the traditional “core” labor force shrinks in industrialized countries, there is no quid pro quo in terms of balanced social and economic development for the industrially underdeveloped countries, where unemployment is a massive and growing problem and where wages remain below poverty level in most cases. One of the reasons has been the ability of transnational capital to impose conditions on states by the threat of relocation if its conditions are not met; another related and underrated reason is state repression, which keeps in place the near slave-labor conditions that prevail at the bottom of the scale (for example in many of the Export Processing Zones (EPZs) in countries such as China, Indonesia or Vietnam) (Gallin, 2000).

The changing structure of transnational enterprises largely accounts for the rise of ‘flexibilization’ or ‘informalization.’ As Gallin (2000) notes, the transnational enterprise organizes work carried out for it by others. At the head of the corporation is the corporate headquarters, which directs production and sales, controls subcontracting, decides at short notice what will be produced where, when, how and by whom, and where certain markets will be supplied from. It is here that management and the core labor force of highly skilled technicians and others will generally be located. Production and all other labor-intensive operations are outsourced and subcontracted, the company being essentially a coordinator of elaborate, cascading chains of outsourced production.

These subcontracted operations are not part of the corporation's formal structure, but will nevertheless be wholly dependent on it, with wages and conditions deteriorating when moving from the centre of operations to the periphery (Gallin, 2000). The majority of workers in the developing countries, and a considerable and growing proportion of the labor force in the developed, industrialized countries, are employed in the informal sector.

#### 4.2 HRM and National Industrial Relations Systems (IRSs)

Fleming and Seborg (2001) points out that the governance and regulation of the relations between management and labor are determined both by a country's Industrial Relations System (IRS) and the HRM policies and practices of individual firms. The elements of a national IRS are largely determined by actors, institutions and forces external to the enterprise, namely, the legislative and regulatory framework covering industries and labor markets set by government, and by the collective agreements between management and organized labor established within this framework (Fleming and Seborg, 2001). It should not be forgotten, of course, that there is a sort of international IRS in existence, with the minimum labor standards of the ILO at its core. However even here, as Fleming and Seborg (2001) observe, the ILO minimum standards require recognition and implementation within national IRSs in order to be effective. A more effective international IRS would require, amongst other things, greater international coordination of decision-making and more concerted action by nationally-based unions and peak union bodies. The International Trade Secretariats (ITS) of the International Confederation of Free Trade Unions (ICFTU) are attempting to construct a more effective international IRS for all countries, developing and developed, but they, too, are limited by the weakness of organized labor in many countries, developed and developing, and by the consequent weakness of organized labor at the international level.

Unlike the various national or international systems of industrial relations, HRM is mainly determined *internally* in the corporation or organization, on plant, business area or global level (Fleming and Seborg, 2001). Whereas the institutions and practices of traditional industrial relations, such as collective bargaining, require the existence and active involvement of trade unions, these are a very long way from being preconditions for the formulation, development and successful implementation of HRM policies. Indeed, the successful implementation of HRM programs, including those dealing with selection and recruitment, leadership and motivation, remuneration, competency development and training, and employee retention, can be achieved without the presence, consent or cooperation of trade unions. Nevertheless, as de Silva (1998) remarks, this is not to suggest that unions should not be involved where they exist... [indeed] they have worked best in a unionized setting.

While trade unions obviously do and should have a role to play in the successful implementation of HRM programs, this must not be allowed to obscure the fundamental differences between HRM and Industrial Relations (IR) approaches to the employment relationship. As de Silva (1998) notes, IR is essentially pluralistic in outlook, in that it covers not only the relations between employer and employee (individual relations) but also the relations between employers and unions and between them and the State (collective relations). IR is also pluralist in that it recognizes that conflict, or at least disagreement, in the employment relationship is inevitable given the competing and often opposing interests of employers and employees. It is this concern with collective relations and conflict which really sets IR apart from HRM, and also explains why IR is so concerned with such institutions and practices as labor law, labor standards, collective bargaining, trade unionism, and so on.

Unlike IR, HRM is essentially unitary in outlook in that it assumes a convergence or commonality of interests between employees and employers. HRM, moreover, sees the employer-employee relationship as an individualized one and, therefore, increasingly places emphasis on monetary rewards linked to performance and skills through the development of performance and skills-based pay systems, some of which seek to individualize monetary rewards (e.g. individuals bonuses, stock options, etc.) (de Silva, 1998). The cooperative, inclusive and participatory HRM programs mentioned above are also concerned with winning the *individual* commitment of employees to the enterprise, its philosophy, values and objectives.

MNCs will commonly use HRM as part of a global strategy to bring about convergent labor-management relations within the various plants and operations of the firm regardless of where they are located around the world. In such circumstances, the actions that unions can and do take are largely governed by the national IRS. Corporate managers, on the other hand, are becoming less and less subject to these national constraints but have to be much more attentive to the global HRM strategies not only of their own enterprise but those of their competitors as well. From the corporate point of view, the reasons for this are compelling that HRM can be seen as a more flexible and effective instrument to use and develop labor resources. Industrial Relations (IR) system based on employers' and employees' rights (or restrictions of rights) as citizens. Thus IRS has a broader public and civil society dimension involving the state which is absent in HRM. HRM regulation is mainly internal to a global company. Very little is open to public scrutiny and debate, which from a management point of view may give more flexibility and freedom. The typical contractual regulation in IRS is too limited an instrument for management to maximize productivity, competence development and creativity of labor (Fleming and Soborg, 2001).

There is no doubt that, as Fleming and Soborg (2001) points out, HRM is attractive to management precisely because of its flexibility and effectiveness in the deployment and development of labor resources. Beyond this, because HRM is in effect a labor regulatory system internal to a company, it avoids or circumvents the rights-based legal regulations of national IR systems. It is well known, of course, that the appeal of HRM has grown just as governments, particularly those in the industrialized countries, have deregulated their national labor markets. Not surprisingly, this has generally entailed the dismantling of the national IRS which, because as it accorded rights to labor *and* management, increased even if it did not raise to power the bargaining power of labor vis-à-vis management. As noted above, HRM reinstates managerial prerogative generally (but not always) without the reintroduction of command and control systems. Thus, the dismantling of national IRSs reduces the bargaining power of labor allowing corporations to introduce HRM regimes virtually unimpeded. The HRM regime is tailored to the particular needs and circumstances of the individual corporation, and can be easily varied as those needs and circumstances change. TNCs and domestic companies alike benefit from labor market deregulation and the dismantling of national IRSs. HRM is attractive to both sorts of company because they are each subject to the same global competitive pressures. The growing dominance of HRM in the regulation of labor and the employment relationship has occurred in tandem with the increasing flexibilization of labor.

As seen above, the deregulation of the labor market and dismantling of the IRS (to the extent that these are separate processes) have given rise to the flexibilization of the employment relationship. There has been a corresponding shift by businesses of all sizes to the use of HRM policies and practices to internalize the regulation of labor within the enterprise. However, where firms have outsourced their labor-intensive operations to contractors and subcontractors, it is not so much that labor regulation is internalized within the firm itself, rather that it is internalized within the entire supply chain and along its entire length.

For the shrinking numbers of core workers within the enterprise, it is about performance, skills and individualized monetary rewards. For the peripheral workers-those employed by contractors, sub-contractors and suppliers-on the other hand, HRM is about short term and insecure jobs, low piece rates, lack of opportunities for training and career advancement, and so on. But it is also about performance-getting more for less by the intensification of work (speeding up, a reduction in the piece rate or casual hourly rate, etc.).

## 5. Conclusion

Globalization has subjected global companies and companies servicing national and local markets to the same competitive pressures. These pressures have led to the restructuring of global and national enterprises and the reorganization of production, in particular, the outsourcing and sub-contracting of labor-intensive operations. HRM has been widely adopted as a system of labor regulation within the firm and along the length of the supply chain, rising to dominance as national IRSs have declined in strength and significance. The rise to dominance of HRM has been accompanied by the division of the workforce into a shrinking group of core workers and a rapidly growing corps of peripheral or flexible workers, most of who are female workers. The firm at the top of the supply chain determines the employment conditions of the flexible workers, who are employed by the contractors, sub-contractors and suppliers to the top firm. Governments and trade unions have an absolutely indispensable role to play in labor regulation, particularly in the regulation and improvement of the employment conditions of flexible workers. However, any system of labor regulation will have only limited efficacy in this respect as long as workers in different countries, and in

different parts of the same country, are compelled to compete with each other for work in national and global labor markets without any effective and centralized system of regulation of these labor markets and a complementary system of social protection.

## References

- Arendt, H. (1958). *The Human Condition*, Chicago: The University of Chicago Press.
- Anthony, P.D. (1980). Work and the loss of meaning, *International Social Science Journal* (32/3) (1980), pp. 416–426.
- Aronowitz and DiFazio (1994). *The Jobless Future – Sci-Tech and the Dogma of Work*, Minneapolis : University of Minnesota Press.
- Durkheim, E. (1960). *The Division of Labour in Society*, New York: The Free Press of Glencoe.
- Ehrenreich, B. and Hochschild, A.R. (2003). *Global Woman*, London: Granta Books.
- Fleming, D. and Henrik S. (2001, June). *Towards Reflexive Governance of Management-Labor Relations? The Impact of Corporate Culture and Human Resource Management in Malaysia and Singapore*. Paper presented at IIRA 6<sup>th</sup> European Congress, Oslo, Norway.
- Gallin, D. (2000, June). *Trade Unions and NGOs: A Necessary Partnership for Development*. Paper No. 1, Civil Society and Social Movements Program, United Nations Research Institute for Social Development.
- Hirst, P. and Thompson, G. (1999). *Globalization in Question: The International Economy and the Possibilities of Governance*. Cambridge :Blackwell Publishers.
- Kanji, N. and Menon-Sen, K. (2001, August). *What does the Feminization of Labor mean for Sustainable Livelihoods?* Paper presented at World Summit on Sustainable Development, International Institute for Environment and Development (IIED). London, U.K.
- Knudsen, H. (2001, April). *Between the Local and the Global-Representing Employee Interests in European Works Councils of Multinational Companies*. Paper presented at University of Wollongong, Wollongong, Australia.
- Malhotra, K. (1998, April). *Globalization and the Economic Growth Paradigm: Some Implications for Labor Migration and Mobility*. Paper presented at International Conference on Labor Mobility and Migration in China and Asia, Beijing, China.
- MOW (1987). *The Meaning of Working*, London: Academic Press.
- Noe, R. A., Hollenbeck, J. R., Gerhart, B. & Wright, P. M. (1997). *Human Resource Management: Gaining a Competitive Advantage*. 2<sup>nd</sup> Ed. Chicago: Irwin.
- Oppen, M. (1988). Structural discrimination against foreigner and work-related health risks. *Economic and Industrial Democracy*, 20(3), pp. 43–64.
- Rix, M. (2001, July). *Multinational Enterprises, ILO Core Labor Standards and Low Wage Migrant Workers in South East Asia*. Academy of International Business South East Asia.
- Region (AIBSEAR) Annual Conference, Jakarta, Indonesia.
- Sassen, S. (1998). *Globalization and its Discontents*, New York: The New Press.
- Scholte, J. A. (2000). *Globalization: A Critical Introduction*, NY : St Martin's Press.
- Sennett, R. (1998). *The Corrosion of Character – The personal Consequences of work in the New Capitalism*, New York: W.W. Norton & Co.
- Warr, P. (1984). Work and unemployment. In: P.J.D. Drenth, H. Thierry, P.J. Willems and C.J. de Wolff, Editors, *Handbook of Work and Organizational Psychology*, Chichester: Wiley.
- Wilpert, C. (1998). Migration and informal work in the new Berlin: new forms of work or new sources of labour?, *Journal of Ethnic and Migration Studies*, 34 (2), pp. 269–294.
- Wilpert, C. (1998). Migration and informal work in the new Berlin: new forms of work or new sources of labour?, *Journal of Ethnic and Migration Studies* 34 (2), pp. 269–294.
- Zuboff, S. (1984). *In the Age of the Smart Machine*, New York: Basic Books.
- De Silva, Sriyan. (1998). Human Resource Management, Industrial Relations and Achieving Management Objectives, Bureau for Employers' Activities, International Labor Organization. [online] Available: [www.ila.orv/public/english/dialogue/actem/papersl](http://www.ila.orv/public/english/dialogue/actem/papersl) (September 15, 1998).



# Game Analysis of Strategic Partner Selection of Chinese and Foreign Technology Alliance

Xiaohua Sun

Department of Economics, Dalian University of Technology  
No. 2 Ling Gong Road, Gan Jingzi District, Dalian 116024, China  
Tel: 86-411-8470-7221 E-mail: sxh\_dut@sina.com

Lin Hu

Department of Economics, Dalian University of Technology  
No. 2 Ling Gong Road, Gan Jingzi District, Dalian 116024, China  
Tel: 86-411-8470-7221 E-mail: jacky97@163.com

*Project supported by the National Natural Science Foundation of China (Grant No.70803006).*

## Abstract

This paper makes a discussion on the strategic partnership selection problem of technology alliance using the methods of game theory. We found the complete information dynamic game through backward induction which shows that when a companies have set up a strategic alliance with foreign manufacturers, it will select the interfere strategy to prevent an alliance between the other Chinese companies and transnational corporation, therefore, the optimal strategy of the latter is to maintain the status quo, and give up the motives of the strategic alliances.

**Keywords:** Dual oligopoly, Strategic Technology Alliance, Power market, Complete information dynamic game

## 1. Introduction

At present, the competition has become increasingly intense, which poses more challenges for the competition of enterprises and their development. Since 1990's, many companies have a strategic adjustment to large-scale confrontation from mutual competition, and they set up the strategic alliance between each other, among which more strategic technology alliance happened in high-tech fields.

According to the relevant data, over 90% of the world's largest 150 transnational corporations have set up all kinds of strategic alliances with other companies, in which R&D alliances has become an important source of technology in multinationals. Such as IBM, Toshiba, Siemens have form the tripartite alliance, and they get a joint development of new type of DRAM computer chips; Boeing Company and Japan's Mitsubishi Heavy Industries form an alliance to develop Boeing 767 wide-body civilian jetliner, both them are a classic example of strategic alliances. In the face of intense domestic competition, our company may be carry out cooperate with foreign companies, and foreign companies are also seeking the chance to enter the Chinese market. Strategic alliance as one of modern enterprise organization system innovations has become an important means of modern enterprise which get sustainable competitive advantage, called "the most important organizational innovation in end of the 20th century."

## 2. Basic hypothesis

There are two oligopoly firms A, B in Chinese nuclear power market. For the current market, as both sides hope to expand the market for investment, while the U.S. Westinghouse and France AREVA are full of expectations on China's nuclear power market, and want to cooperate with the monopoly, we assume that AREVA act X, Westinghouse is Y. The two manufacturers use the same equipment, technical level, that is, marginal cost and monopoly price is the same in the balance market, for two-oligopoly firms A and B.

When monopoly output is 1, and A, B is co-operation, two manufacturers carve up the market through agreement; receive one-half of product market respectively. Maintaining such estate is the optimal strategy in the long game for the both sides, so the two sides will maintain the monopoly price and output, and prevent the entry of new firms through technical blockade, A, B get the conspiracy of

silence. Assume that cost function is  $c(Q)$  for each monopoly manufacturers, the revenue for monopoly manufacturers is  $R(Q) = P(Q)Q$ ,  $P(Q) = a - b(Q)$ , and the firm's profits function  $\pi = R(Q) - C(Q)$ .

Manufacturers face two choices, producing on their own or co-producing with foreign companies, when they choose to



product on their own, assuming that the output of the two companies is  $q_1, q_2$  respectively, the cost is  $c_1, c_2$ , prices is  $p_1 = p_2$  at this time for manufacturers, the manufacturers A, B's profits are:

$$\begin{aligned}\pi_1 &= [a - b(q_1 + q_2)]q_1 - c_1 q_1 \\ \pi_2 &= [a - b(q_1 + q_2)]q_2 - c_2 q_2\end{aligned}$$

Assume that companies A, B have the same production costs  $c_1 = c_2$ , then according to conditions of profit maximization:

$$\begin{aligned}\frac{\partial \pi_1}{\partial q_1} &= 0 \\ \frac{\partial \pi_2}{\partial q_2} &= 0\end{aligned}$$

The production of maximize profit for two companies is

$$q_1 = \frac{a - 2c_1 + c_2}{3b}, \quad q_2 = \frac{a - 2c_2 + c_1}{3b}$$

Because  $c_1 = c_2$ , then:

$$q_1 = q_2 = \frac{a - c_1}{3b}$$

Profit of two manufacturers at this time is:

$$\pi_1 = \pi_2 = \frac{(a - c_1)^2}{9b}$$

### 3. Establishment of game model

When firm A cooperate with firm X, the cost change from  $c_1$  to  $c_1^1$ , and  $c_1^1 < c_1 = c_2$ , Profit of two manufacturers at this time is:

$$\begin{aligned}\pi_1^1 &= [a - b(q_1 + q_2)]q_1 - c_1^1 q_1 \\ \pi_2^1 &= [a - b(q_1 + q_2)]q_2 - c_2 q_2\end{aligned}$$

According to conditions of profit maximization:

$$\begin{aligned}\frac{\partial \pi_1^1}{\partial q_1} &= 0 \\ \frac{\partial \pi_2^1}{\partial q_2} &= 0\end{aligned}$$

The production of two companies is:

$$q_1^1 = \frac{a - 2c_1^1 + c_2}{3b}, \quad q_2^1 = \frac{a - 2c_2 + c_1^1}{3b}$$

Profit of two manufacturers at this time is:

$$\pi_1^1 = \frac{(a - 2c_1^1 + c_2)^2}{9b}, \quad \pi_2^1 = \frac{(a - 2c_2 + c_1^1)^2}{9b}$$

Because of  $c_1^1 < c_1$ , then:

$$q_1^1 > q_1, \pi_1^1 > \pi_1, c_1^1 < c_2, \text{so } q_2^1 < q_2, \pi_2^1 < \pi_2$$

In the game equilibrium, firms A choose to co-operate with foreign companies X as a result of, the cost decline and profits are increasing, the production and profits of companies B decline. But at the same time, a manufacturer B may not be reconciled to the original market balance has been broken, and it may choose to cooperate with Westinghouse. Because A just get the advantage by establishing a strategic alliance, of course, it will carry out a series of obstructionist behavior to prevent B set up a strategic alliance with Y, this strategic game can be seen as a complete information dynamic game.

Insert Figure1 Here

When Equilibrium in the game, because firm A cooperates with foreign companies X, the cost is declining and the profits are increasing, and companies B's profits and production are declining. But at the same time, firm B is not reconciled to the original market balance has been broken, so it may choose to Westinghouse that vendors Y to cooperate. A face just established a strategic alliance advantage, of course, it should takes a series of obstructionist behavior for that B cooperates with Y, which can be seen as a strategic game is a dynamic game of incomplete information.

We assume that firm A first decision-making, firm B in the observation of the selection decision-making. We assume process for the entire game is a two-stage dynamic game of incomplete information. Equilibrium outcome is a subgame perfect Nash equilibrium. When firm A takes a series of obstructionist behavior, Cost set  $c_1^2$ , Which  $c_1^2 > c_1$ , firm B can be taken at this time cooperated with Y to deal with the conduct of firm A, due to the obstruction of firm A, firm B cost turn into  $c_2^2 > c_2$ , and assumption of  $\frac{c_1^2 - 2c_2^2}{c_1^2 - 2c_2} > 1$ , so the profit of firm A and B are:

$$\pi_1^2 = [a - b(q_1^2 + q_2^2)]q_1^2 - c_1^2 q_1^2$$

$$\pi_2^2 = [a - b(q_1^2 + q_2^2)]q_2^2 - c_2^2 q_2^2$$

In accordance with manufacturers to maximize their profits:

$$\frac{\partial \pi_1^2}{\partial q_1^2} = 0$$

$$\frac{\partial \pi_2^2}{\partial q_2^2} = 0$$

The profits of firm A and B are:

$$\pi_1^2 = \frac{(a - 2c_1^2 + c_2^2)^2}{9b}, \pi_2^2 = \frac{(a - 2c_2^2 + c_1^2)^2}{9b}$$

Because  $c_1^2 > c_1$ , so  $\pi_1^2 < \pi_1 < \pi_1^1$ , also because  $c_2^2 > c_2$ ,  $\frac{c_1^2 - 2c_2^2}{c_1^2 - 2c_2} > 1$ , there are  $\pi_2^2 < \pi_2 < \pi_2^1$

When firms do not take the B and Y co-operation, the absence of firm A for the firm B doesn't cooperate with Y to pay the cost of blocking, so the profits of firm A is  $\pi_1^1$ , as a result of firm B doesn't cooperate with the Y, and its profit  $\pi_2^1$

When firm A take the acquiescence of acts, when firm B cooperates with the Y, that is, firm A, firm B with X, Y to carry out co-operation, the costs are reduced  $c_1^*$ ,  $c_2^*$  and  $c_1^* = c_2^* < c_1$ , now firms A, B's profits are as follows:

$$\pi_1^* = [a - b(q_1^* + q_2^*)]q_1^* - c_1^* q_1^*$$

$$\pi_2^* = [a - b(q_1^* + q_2^*)]q_2^* - c_2^* q_2^*$$

Profit maximization:

$$\frac{\partial \pi_1^*}{\partial q_1^*} = 0$$

$$\frac{\partial \pi_2^*}{\partial q_2^*} = 0$$

So  $q_1^* = \frac{a - 2c_1^* + c_2^*}{3b}, q_2^* = \frac{a - 2c_2^* + c_1^*}{3b}$ ,

And also  $q_1^* = q_2^*$  so the profits are  $\pi_1^* = \pi_2^* = \frac{(a - c_1^*)^2}{9b}$ .

When firm A take the acquiescence of acts, and the firm B do not cooperate with the Y, then the profit of firm A is  $\pi_1^1$ , the profit of firm B is  $\pi_2^1$ .

This is a perfect information game, Structure of the game's strategic statements, the strategy space of firm A is  $S_A = \{\text{obstruction, acquiescence}\}$ , there are four pure strategy for firm B, so the strategy space of firm B is  $S_B = \{(\text{obstruct, cooperate with Y}), (\text{obstruction, to maintain the status quo}), (\text{acquiescence, cooperate with Y}), (\text{obstruction, to maintain the status quo})\}$ . The following table is the game of strategic form representation.

Insert Table 1 Here

From the above analysis, the above analysis of the game is a two-stage game of perfect information, we use backward induction method to solve the reverse subgame perfect Nash equilibrium: in the second phase, the firm B is the optimal action rules: (acquiescence, cooperate with Y), that is, if firm choose A in the first phase of the obstruction in the second stage firms choose B to maintain the status quo, if the firms choose A in the first stage of the acquiescence of, B in the second phase of selection and Y co-operation. Because firms will be in the first stage A to B in the forecast will be the second phase of operations in accordance with this rule, A in the first stage is the optimal choice of "obstruction."

#### 4. Conclusion

In this paper, the use of incomplete information dynamic game model, discussed the Two-oligopoly firms the choice of strategic alliance. The following conclusions to be when a firm has been set up with foreign firms the case of strategic alliance, would choose to block the strategy to prevent another firm alliances with other multinational firms, which the

optimal strategy is to maintain the status quo. However, the actual operation of the process of firm alliances is much more complex. In this paper, Union and only firms the choice of partners have done a preliminary study, in this regard need to be further in-depth analysis.

### References

- PAN, S Q. (2005). Technology spillovers oligopoly cases the efficiency of enterprise cooperation and innovation Game Analysis *Business Study*, (9).
- PARK, SH and ZHOU, DS. (2005). Firm Heterogeneity and Competitive Dynamics in Alliance Formation. *Academy of Management Review*, 30 (3):531-554.
- QIAN, H T. (2008). Dynamic alliance partners with the choice of game analysis *Journal of Xi'an University of Science and Technology*, (4).
- ZHANG, W Y. (2004). *Game Theory and Information Economics*. shanghai: Shanghai People's Publishing House.

Table 1. The game of strategic form representation of firm A and B

		Firm B			
		(C,C)	(C,K)	(K,C)	(K,K)
Firm A	obstruction	$\pi_1^2, \pi_2^2$	$\pi_1^2, \pi_2^2$	$\pi_1^1, \pi_2^1$	$\pi_1^1, \pi_2^1$
	acquiescence	$\pi_1^*, \pi_2^*$	$\pi_1^1, \pi_2^1$	$\pi_1^*, \pi_2^*$	$\pi_1^1, \pi_2^1$

Notes: C indicates cooperate with Y, K indicates to maintain the status quo.

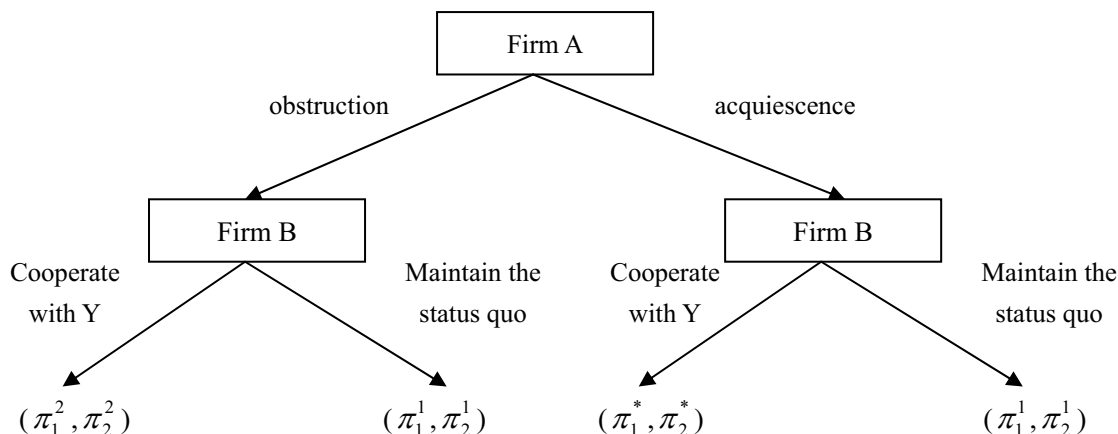


Figure 1. Firms A and B of the dynamic game



# Consumer Credit as Lifestyle Interests Facilitators for Consumers of Bangladesh

Ataur Rahman

Department of Business Administration

Southeast University, Banani, Dhaka-1213, Bangladesh

E-mail: ataurrahman74@yahoo.com

## Abstract

Limited income people in Bangladesh are not solvent enough to buy essential household durables (like TV, fridge, furniture, sofa-set etc.) to enhance the lifestyle interests after fulfillment of their basic needs. They need consumer credit to buy these products for satisfying their lifestyle interests. The purpose of the study is to identify the consumer credit impacts on lifestyle interests of consumers of Bangladesh. 576 respondents in a survey were asked to rate the importance of 15 lifestyle interests variables related to consumer credit. These data were tested via factor analysis (the principal components method with varimax rotation) by using SPSS program. The results show that people borrow money to buy household goods to gratify their desired interests to family, home, recreation, fashion and food. The thesis will make contribution to our understanding that people need consumer credit to suit their desired interest to family, home, recreation, fashion, food etc.

**Keywords:** Consumer, Consumer credit, Lifestyle interests, Family, Home, Recreation, Fashion, Food

## 1. Introduction

Bangladesh is a developing country. A sizeable portion of population of this country is coming up as a consumer class every year. Because of huge population base, this class is quite large. Precisely, middle class and fixed income group belongs to this and they are in continuous race to elevate the standard of their living and quality of life. In doing so, it can not afford to possess basic necessities of life by paying the price at a time out of their savings (National Bank Bangladesh Ltd., 2006). Because of limited income, they have no ability to buy essential household durables (like TV, fridge, furniture, sofa-set etc.) to enhance the lifestyle interests after fulfillment of their basic needs. In this situation, credit is necessary for them to buy household goods. But their financial positions do not allow them to get micro credit; because micro credit is for poverty alleviation. They have no ability to get mortgage loan. To materialize their cherished goal of becoming the owners of the durable goods, at first Islami Bank Bangladesh Ltd. offered an attractive opportunity of installment buying through a consumer credit scheme named 'Household Durable Scheme' in 1993 in Bangladesh (Islami Bank Bangladesh Ltd, 1994). It was followed by Prime Bank Ltd. and Social Investment Bank Ltd., all of which started their services in 1995. Soon several other banks joined and today 19 of the 48 commercial banks offer consumer credit services (Bangladesh Bank, 2006).

The banking sector as a whole plays an important role in the economy of a country irrespective of its level of development. The commercial banks have greater responsibility both in the areas of product growth and in the performance of individual and social obligations. By lending consumer credit, commercial banks play an important role in individuals and society. By borrowing the loan, consumers can easily buy their household products. Using products, they can satisfy their desired interests to their family, home, recreation, fashion and food etc. The objective of the present study is to identify the consumer credit impacts on lifestyle interests of consumers of Bangladesh.

## 2. Literature Review

Consumer credit/ consumer credit institutions were first introduced at Chicago in 1878(Beckman & Foster, 1969). These spread after World War II. After 1952, attitudes towards consumer credit changed dramatically. After 1968, sub-continental country began to introduce consumer credit (Suneja, 1994). At first Islami Bank Bangladesh Ltd. introduced consumer credit scheme in Bangladesh in 1993(Islami Bank Bangladesh Ltd., 1994).

Researchers have identified that consumer credit is for purchasing consumer goods and services(Stokes & Artt ,1955), personal consumption (Prather, 1969), nonbusiness use (Garman & Fogue, 1991), improving the standard of living (Suneja, 1994). So, consumer credits are loans granted by bank to individuals' for personal households or family consumption who may feel inclined to purchase consumer durables to improve the lifestyle.

Previous researchers have identified lifestyle as distinct mode of living( Lazer, 1963), way to allocate income(Zablocki and Kanter,1976), unified pattern of behavior(Berkman and Gilson, 1978), pattern of individual and social behavior

(Veal, 1989), pattern of living reflected by activities, interests and opinions (Kotler & Armstrong, 2007). So, lifestyle can be defined as: Lifestyles are consumer pattern of living in the world as expressed in their activities, interests and opinions, pattern of consumption, spending time and money along with product, service and media.

Plummer (1974) measured people's lifestyle in terms of (i) how they spend their time, (ii) their interests, what they place importance on in their immediate surroundings, (iii) their opinions in terms of their view of themselves and the world around them, and (iv) Some basic characteristics such as their stage in lifecycle, income, education, and where they live. He listed the elements included in each major dimension of lifestyle. These elements are: *activities*-work, hobbies, social events, vacation, entertainment, club membership, community, shopping, sports; *interests*-family, home, job, community, recreation, fashion, food, media, achievements; *opinions*-themselves, social issues, politics, business, economics, education products, future, culture; *demographics*-age, education, income, occupation, family size, dwelling, geography, city size, stage in life cycle. Plummer concept helps marketer to find out the basic need of the consumer and how the products fit into their lives.

From the definition and measurement of lifestyle, and definition of consumer credit, it can be assumed that there may be a relationship between consumer credit and lifestyle interests. Following discussion will help to interpret the relationship between consumer credit and lifestyle interests.

Beckman & Foster (1969) opined that the better music, drama and educational messages often heard over the radio or seen on TV are but one illustration of what has been made available through installment credit. People would deprive to get message from watching TV, if they have no opportunity to buy it by installment credit. He also added that it has aided people in securing higher standards of living, education, comforts, conveniences, efficiency, recreation and health.

People need consumer credit to buy household goods (like TV, computer etc.) to do their recreation: escaping, or being diverted from problems; relaxing; getting intrinsic cultural or aesthetic enjoyment; filling time; emotional release; sexual arousal (Chandler, 1994). TV, for example, is the most attractive and up-to-date means of recreation. It brings the scenes of different countries and people of the world before our eyes. It telecasts news, views, music, drama, films, national and international games and sports (Rob, 2008). People watch all programs on the TV screen just sitting in their drawing room. They sit before a TV set and enjoy football, cricket, tennis and other games (Rahman and Noor, 2008; Sarker & Islam, 2008). Computer helps people to play different kind of games (like chess, fighting, car racing etc.). It also helps to enjoy cultural programs. It can store music, drama, dance, sports program etc. People enjoy these programs in their convenience time (Mohiuddin and Kashem, 2008).

Amling & Droms (1982) identified the association between consumer credit and peoples' interest to solve the necessity of their personal or family needs. They are responsible for many of their occasions: birth, death, sickness and similar events, which demand a large immediate outlay. Very often credit is necessary to solve these emergency conditions. People need credit to buy household goods (like TV, fridge, furniture etc.) to get affiliation of family solidarity; family relaxant; conflict reduction and relationship maintenance (Lull, 1990).

People need consumer credit to buy TV/computer for satisfying their desired interests to fashion. Kaiser and Chandler (1985), for example, observed that older people implicitly use television for processing appearance and fashion-related information. Surprisingly, the mature market represents the second fastest growing population segment engaged in internet use. Therefore, the internet may also become a viable source of fashion information (Bernthal et al., 2005).

Assael (1998) described that the focus on time savings convenience in the 1990s has created two trends in interests to food consumption: (i) Grazing- It is the need to eat on the run. People eat breakfast in the car on the way to work, munch on a sandwich while walking, or eat lunch at their desks. (ii) Refueling refers to less time spent in preparing and eating dinner. The primary reflection of this trend is the growing importance of household goods (like microwave ovens, fridge, pressure cooker, blender etc.) in people's lives for preparing food and keeping food in store. People need consumer credit to buy these products to satisfy their interests to food.

Well decoration of a home is very much necessary to stay there for a long time. An ideal home is the abode of peace, love, and affection. It is associated with all that is sweet, pleasant and agreeable in life (Mohiuddind and Kashem, 2008). People need credit to buy furniture and others household goods for decorating their home.

Previous researchers' discussion indicated that people need consumer credit to buy household goods for satisfying their interests to family, home, recreation, fashion, food etc. It is clear that they showed clue about the association between consumer credit and peoples' lifestyle interests to family, home, recreation, fashion, food etc. But no research has been done to investigate the relationship between consumer credit and lifestyle interests of consumers of Bangladesh. This thesis seeks to make a substantial contribution in this area. Thus, this paper seeks to answer a research question. How does consumer credit help to satisfy the desired interests to family, home, recreation, fashion and food of consumers of Bangladesh?

### 3. Conceptual Frame Work & Development of Hypothesis

Based on the findings of the existed study, the major factors which may influence to borrow consumer credit to satisfy their lifestyle interests can be classified into family, home, recreation, fashion and food. A conceptual model of consumer credit impacts on lifestyle interests of consumers has then been derived and presented in appendix (figure 1). The model is a comprehensive one and should be capable of capturing the relevant factors underlying the problem. A number of variables have been included to measure consumer credit impact on the lifestyle interests of consumers of Bangladesh. The variables are involved under categories of lifestyle interests' factors. These are family, home, recreation, fashion and food

People need credit to buy products for their family members. A car, for example, gives them the convenience they seek while protecting their family (Arab Bangladesh Bank, 2005). TV, fridge, and sofa set all of the household goods are very much necessary for family members. They buy household goods (TV, fridge, bed, almira, sofa set, dinning table etc.) for decorating their home. People need household goods for recreation. People enjoy cinema, drama, and such other popular programs by watching TV and listening to radio. People who are interested to fashion want to buy different kind of fashion goods. Swing machine, furniture, sofa set, almira etc. are fashion goods. These goods help to maintain their fashion. They need fridge for fresh food, vegetables and drinks. They can maintain balanced diet by using fridge. Blender machine is necessary for juice, pressure cooker is necessary for quick food & oven is necessary for warming food.

From the above discussion, it can be said that people are interested to particular factors like family, home, recreation, fashion and food etc. They need credit to buy household goods for their interest of those factors. So it can be assumed that there may be an association between consumer credit & people's lifestyle interests. Hypotheses (H) as formulated in this section along with the expected effect on the consumer credit impacts on lifestyle interests are summarized as follows:

H1. There is a strong association between consumer credit and people's lifestyle interests.

As lifestyle interests includes family, home, recreation, fashion and food; therefore, for the purpose of the study, it can develop the following five sub-hypotheses.

H1a. There is a strong association between consumer credit and people's interests to family.

H1b. There is a strong association between consumer credit and people's interests to home.

H1c. There is a strong association between consumer credit and people's interests to recreation.

H1d. There is a strong association between consumer credit and people's interests to fashion.

H1e. There is a strong association between consumer credit and people's interests to food.

### 4. Research Methods

The strategy adopted for this study is the personal interview survey. Considering the nature of the present study, a combination of structured and unstructured interview schedules was used in order to explore both quantitative and qualitative information. Six set of questionnaires were used to collect information. Dhaka-the capital city of Bangladesh was chosen as study area for this study. Addresses & phone number of borrowers (respondents) were collected from office file of the sample branches by the employees of the banks for interview. Sample size determination formula is used for identifying total number of sample.

*Sample size determination method:*

$$N = \{p(1-p) z^2 / d^2\} * deft$$

N=size of the sample

P=the proportion to be estimated=0.5

Z=value of standard normal variate=95% level of significance=1.96

D =the amount of tolerated margin of error=0.05

Deft=design effect=1.5

$$\text{Number of sample} = [\{0.5(1-0.5) (1.96)^2\} / (0.05)^2] * 1.5 = 576$$

576 borrowers were selected as sample for interviewing. At first target population is divided into mutually exclusive and collectively exhaustive subpopulation or cluster. That means 301 clusters (branch as cluster). Random sample of cluster (branch as cluster) is selected based on probability sampling technique. Here, 30 (branches as cluster) cluster are selected as sample by using probability proportionate to size sampling method from 301 branches. All borrowers in each selected branch (cluster) are not possible to include in the sample because of time and cost constraints. For this reason, probability proportionate to size sampling of two stage cluster sampling method is used for selecting number of

borrowers from each branches. Each borrower is selected by using systematic manners of simple random sampling method.

Data were collected on relevant variables from primary and secondary sources. Primary sources included borrowers who bought household goods by consumer credit from the banks. Secondary data have been collected from journals, books, the published contents of the annual reports, relevant brochures, sales figures, and prior research reports of the listed banks internal sources and suppliers.

## 5. Data Analysis

For the analyses, cases with incomplete profiles were deleted. Further, responses to individual items of "Refused" were recorded as missing data. The statistical program, SPSS for Windows (SPSS, 2004), was used for all analyses. For identifying consumer credit impacts on lifestyle interests, respondents in a survey were asked to indicate their degree of agreement with 15 statements/ variables (appendix, table 7) using a 5-point likert scale (1=strongly disagree, 5=strongly agree). These data were analyzed via principal components analysis. The factor analysis using the principal components method with varimax rotation was run to determine the underlying benefits consumers seek of their lifestyle interests (family, home, recreation, fashion, food) from the using of household goods (TV, fridge, furniture etc.) borrowed by consumer credit.

The correlation matrix, constructed from the data obtained to understand lifestyle interest is shown in appendix (appendix, table 1). There are relatively high correlations among V1, v15; As like as, v2, v3, v13; Likely, v4, v6, v8; Similarly, v5, v7, v9, v10, v11; As like as, v12, v14. So above variables are correlated with each other. These variables may also be expected to correlate with the same factors. In appendix (table 2), it is seen that the approximate chi-square statistic is 674.072 with 105 {0.5p (p-1) where, p=number of variables} degrees of freedom, which is significant at the 0.05 level. The value of the KMO statistic (0.760) is also large (>0.5). Thus, factor analysis may be considered as an appropriate technique for analyzing the correlation matrix (appendix, table 1).

Priori determination, and approaches based on eigenvalues, scree plot, percentages of variance accounted are applied to identify the numbers of factors. Five factors are extracted from lifestyle interests' variables by priori determination method. Under "Communalities", "initial column", it can be seen that the communality for each variable, v1 to v15, is 1.0 as unities are inserted in the diagonal of the correlation matrix (appendix, table 3). In appendix, table 4, it is seen that the eigenvalue greater than 1.0 (default option) results in five factors extracted. The priori knowledge tells researcher that household product is bought for five major interests of people. The scree plot associated with this analysis is given in appendix (figure 2). From the scree plot, a distinct break occurs at five factors. Finally, from the cumulative percentages of variance accounted for, it is seen that the first five factors account for 76.52 percent of the variance, and that the gain achieved in going to five factors is marginal (appendix, table 4). Thus, five factors appear to be reasonable in this situation.

The rotated factor (component) matrix contains the coefficients used to express the standardized variables in terms of the factors (appendix, table 5). In the rotated factor matrix of appendix (table 5), factor 1 has high coefficients for variables V5 (Borrowed consumer credit to purchase household goods helps to get affiliation of family solidarity, relaxation and relationship), v7 (Borrowed consumer credit to purchase household goods helps to exhibit family status), V9 (Borrowed consumer credit to purchase sofa set helps family members to comfort sitting on sofa set), V10 (Borrowed consumer credit to purchase dinning table helps family members to make comfort sitting and eating on dinning table), V11 (Borrowed consumer credit to purchase khat (bed) helps family members to comfort sleeping on khat etc. variables). Therefore, this factor may be labeled as family interest factor.

Likewise, there are relatively high correlations among V2 (Borrowed consumer credit to purchase TV helps to stay at home for leisure time and entertainment, thereby avoiding issues such as pollution), V3 (Borrowed consumer credit to purchase household goods helps to perform household task), V13 (Borrowed consumer credit to purchase TV/ computer/ car/ motorcycle helps to collect lots of information about home). Thus factor 2 may be labeled as home interest factor.

Similarly, V4 (Borrowed consumer credit to purchase car/ motorcycle helps to maintain community), V6 (Borrowed consumer credit to purchase car/ motorcycle helps the family members to visit enjoyable place for recreation), v8 (Borrowed consumer credit to purchase TV helps to reduce emotion, worries, problem, tiredness etc.). These factors may be leveled as recreation interest factor.

Likely, v1 (Borrowed consumer credit to purchase fridge helps to keep food, fruits, and vegetables etc. fresh), v15 (Borrowed consumer credit to purchase fridge, oven, toaster machine, blender etc. helps to enjoy fast food, juice & other tasty food). So, factor 4 may be labeled as food interest factor.

Remaining, v12 (Borrowed consumer credit to purchase TV helps to find out latest fashion), v14 (Borrowed consumer credit to purchase household goods helps to decorate the home in new style) indicate factor-5, may be fashion interest factor.

From the analysis, it can be said that consumers appear to seek five major kinds' of interest (family, home, recreation, fashion, and food) from household goods bought by consumer credit. The model is very much fit because of less number of residual (appendix, table 6). So, it is justified that there is a strong association between consumer credit & people's lifestyle interests.

## 6. Findings

The findings of the study summarized in appendix (table 7) show that people borrow consumer credit to buy household goods for the interest of their family, home, recreation, food and fashion. Factors loading of variables and % of variance of the factors shown in appendix (table 7) prove the hypothesis that there is a strong association between consumer credit and people's lifestyle interests. The following is a brief discussion of each factor in the order of its contribution to the total variance.

**Factor-1: Family.** This factor contains five variables, two of which have relevance to get affiliation of family solidarity, relaxation, relationship, and exhibiting family status; and the other three to get comfort sitting, eating and sleeping. The examination of consumer credit impacts on lifestyle interests reveals that all seven variables were highly significant (table 7). People need credit to buy household goods (TV, fridge, computer etc.) for satisfying their desired interests to get affiliation of family solidarity, relaxation and relationship. Household goods help them to show their family status. The status is seen more through ownership of status products than through personal, occupational, or family reputation (Eastman et al., 1997). Sofa set, for example, is very much necessary for family members to maintain guest & to show their status to the society. A dining table is necessary for family members comfort eating on sitting. It is also necessary for a family to maintain guest & to show their status to the society. Bed (Khat) is very much necessary for a family to comfort lying, maintain guest & to show their status to the society. It is also helpful for passing leisure time by watching TV, reading book & gossip with family members.

**Factor-2: Home.** In the present analysis, this factor explained the second highest variance (table 7). Of the three variables, one was indicated to stay at home for leisure time and entertainment, another was to perform household task and next one was indicated to collect information about home. All three variables were highly significant (table 7). People need consumer credit to buy household goods for decorating their home. Well decoration of a home is very much necessary to stay there in long time. TV/ computer/ VCP etc. help them to enjoy cinema, drama, and such other popular programs without going to outside of the home (Mohiuddin & Kashem, 2008). People want to stay at home not only for leisure time but also for household task. Household goods help them to perform household tasks. Pressure cooker, for example, helps quick cooking. Blender helps to make juice, oven helps to warm food. Computer helps to store & disseminate information. It helps to calculate transactions etc. People collect lots of information about decorating the home by watching television and using computer.

**Factor-3: Recreation.** In the present analysis, this factor explained the third highest variance (appendix, table 7). Of the three variables, one was indicated to maintain community, another was to visit enjoyable place and next one was to reduce emotion, worries, problems and tiredness. All three variables were highly significant (appendix, table 7). Borrowed money to buy household goods helps people to do recreation. People can attend any community activities very easily if they have a car. A car is a prestigious product with very much relation to maintain community. The people who are very much interested to visit enjoyable place for recreation, they need a car. Some people want outdoor recreation. They want to go to park, museum, zoo, restaurant, lake and other enjoyable places. By watching TV programmes (like dance, song, drama), a person can reduce his emotion, worries, problem, and tiredness. Comfort sitting on sofa set also reduces people's tiredness.

**Factor-4: Food.** This factor contains two variables, one of which has relevance to enjoy food; the other is to keep food fresh. The examination of consumer credit impacts on lifestyle interests reveals that all two variables were highly significant (table 7). People borrow money to buy household goods (fridge, blender, oven etc.) to satisfy their desired interests to food. Consumer who is very much interested to eat varieties of food, they need food preparation materials. They make juice with the help of blender machine. They warm food with the help of oven. They make fast food with the help of toaster machine. People are now very busy. They need to eat on the run. They need to eat breakfast in the car on the way to work, munch on a sandwich while walking, or eat lunch at their desks. They need to take less time spent in preparing and eating food. Fridge, pressure cooker, blender and microwave ovens are very much necessary for solving these problems. People make bread and fry eggs in idle time. They buy food, fruits, and vegetables in holiday or idle time. They keep these into fridge. They make warm these by microwave ovens and consume it into busy time. In this way, people can activate their work by maintaining good health.

**Factor-5: Fashion.** This factor contains two variables, one of which has relevance to find out latest fashion, the other is to decorate the home in a new style. The investigation of consumer credit impacts on lifestyle interests reveals that all two variables were highly significant (table 7). People borrow money to buy household goods to satisfy their desired interests to fashion. People collect lot of information about fashion by watching television, using computer. Most of the consumers gather knowledge about the fashion from TV advertisement. They are also learning about the fashion from



film. They mainly follow the fashion of reference group (secondary) like film star, hero, heroin, sportsman, singer by watching TV. People want to decorate their house in a new style. House can be decorated by household goods like TV, fridge, sofa set, almirah, showcase etc.

From the discussion, it is clear that consumer credits have great impact on lifestyle interests' factors. People need credit to buy household goods mainly for satisfying their lifestyle interests to family, home, recreation, fashion, food.

### 7: Implication & Conclusion of the Study

The study establishes the relevance of consumer credit influence on consumer lifestyle interests. This implies that managers of banks are likely to benefit considerably in targeting and positioning and their media communication by focusing their attention on the ongoing changes in lifestyle interests of their consumers by using household goods borrowed by consumer credit.

People need consumer credit to buy household goods (TV, fridge etc.) for satisfying their desired interest to family, home, recreation, fashion and food. Furniture, TV, fridge, khat, almirah, dinning table, sofa set is very much necessary for well decorated home. Fridge, blender machine, micro oven are necessary for fresh and available food and also balanced diet. TV, computer etc. help to fulfill the recreation interest of the people circulated by different program in different channels. Households' goods show social status of the family. These help people to differentiate them from other members of the society. They learn fashion from watching TV. The findings of the thesis will be very much helpful for managers to make understand the consumer by communicating that using household goods borrowed by consumer credit helps people to satisfy their desired interest (to family, home, recreation, fashion & food) .

From the analysis of this thesis; it is proved that there is a strong relationship between consumer credit and people's lifestyle interests. So people borrow money to purchase household goods for satisfying their lifestyle interests. In a consumption environment, a person chooses a product or brand, which seems to possess a maximum possibility of the definition or elaboration of his lifestyle interests. This thesis will help manager to understand the individual's consumer credit consumption behavior by analyzing the details of his lifestyle interest system, which will help them to take marketing strategy to expand the consumer credit scheme. Consequently, this thesis showing that there is a causal effect of the individual's lifestyle interests on his consumer credit consumption behavior. This thesis will help manager to make different strategy for overcoming the limitation of existing consumer credit scheme in different banks of Bangladesh. They can make different strategy for improving the consumer credit scheme so that it can be satisfied the desired interests of people.

### References

- Amling, F. and Droms, G.W. (1982). *Personal Financial Management*. Homewood, IL: Irwin Professional Publishing.
- Arab Bangladesh Bank Limited. (2005). *Brochure of Arab Bangladesh Bank Limited*. Dhaka: Public Relations Department, Arab Bangladesh Bank Limited.
- Assael, H. (1998). *Consumer Behavior and Marketing Action*. Cincination, OH: South-Western Publication.
- Bangladesh Bank. (2006). *Scheduled Banks Statistics. Quarterly (October-December)*. Dhaka: Statistics Department, Bangladesh Bank.
- Beckman, T.N. and Foster. (1969). *Credit and Collections*. New York: Mcgraw-Hill Book Company.
- Berkman, H.W. and Gilson, C.C. (1978). *Consumer Behavior*. Boston: Kent Publishing Company.
- Bernthal, M. J.; Crockett, D. and Rose, R. L. (2005). Credit Cards as Lifestyle Facilitators. *Journal of Consumer Research*, 32 (June), 129-145.
- Chandler, D.(1994). *Why do people watch television*. UWA.
- Eastman, J.K.; Bill, F., David, C. and Stephen, C. (winter, 1997). The Relationship between Status Consumption and Materialism: A Cross-Cultural Comparison of Chinese, Mexican, and American Students. *Journal of Marketing Theory and Practice*, 52-66.
- Garman, E. T. and Forgue, R. E. (1991). *Personal Finance*. Third Edition. Boston: Houghton Mifflin Company.
- Islami Bank Bangladesh Limited. (1994). *Brochure of Islami Bank Bangladesh Limited*. Dhaka: Public Relations Department, Islami Bank Bangladesh Limited.
- Kaiser, S.B. & Chandler, J.L. (1985). Older Consumers' Use of Media for Fashion Information. *Journal of Broadcasting and Electronic Media*, 29, 201-207.
- Kotler, P. and Armostrong, G. (2007). *Principles of Marketing*. New Delhi: Prentice –Hall of India Private Ltd.
- Lazer, W. (1963). *Lifestyle Concepts and Marketing*. In Toward Scientific Marketing, Ed. Stephen A. Greyser (Chicago: American Marketing Association).

- Lull J. (1990). Family Communication Patterns and the Social Uses of Television. In *Inside Family Viewing: Ethnographic Research on Television's Audiences*. London: Routledge, pp. 49-61
- Mohiuddin, A.H.M. and Kashem, A.F.M.A. (2008). *Advanced Functional English*. Dhaka: Ideal Library.
- National Bank. (2006). *Brochure of National Bank Ltd*. Dhaka: Public Relation Department of National Bank
- Plummer, T.J. (1974). The Concept and Application of Life Style Segmentation. *The Journal of Marketing*, 38, 33-37.
- Prather, C.J. (1969). *Money and Banking*. Irwin, Proceedings of the National Consumer Credit Conference for 1951, Lehigh University, 1951.
- Rahman M. & Noor M.S. (2008). *Communicating English Grammar with Composition*. Grammar Bitan Publication, 38, Banglabazar Dhaka-1100.
- Rob, F.M.A. (2008). *Self Teaching English Language, Grammar, Translation & Composition*. Hassan Book Depot, 38, Banglabazar, Dhaka.
- Sarker, R.K. & Islam, M.N. (2008). *Discovery Communicated English Grammar & Composition*. Hassan Book Depot, Mehar Plaza (19 Th Floor), 33. Topkhana Road, Dhaka.
- SPSS. (2004). *Statistical Package for the Social Science: 12.0*. SPSS Inc. Chicago, IL.
- Stokes, L.M. and Arlt, T.C. (1955). *Money, Banking and Financial System*. New York: Ronald Press.
- Suneja, H.R. (1994). Innovation in Banking Services. *Annual Report in the Trend and Progress of Banking in India*. R. B. I., 7.
- Veal, A.J. (1989). Leisure, Lifestyle and Status: A Pluralistic Framework for Analysis. *Leisure Studies*, 8 (2), 141-54.
- Zablocki, B.D. and Kanter, R.M. (1976). The Differentiation of Lifestyles. *Annual Review of Sociology*, 269-97.

## Appendix

Table 1. Correlation(C) Matrix about some lifestyle (interests) variables related to consumer credit.

		v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12	v13	v14	v15
C	V1	1.000														
	V2	.058	1.000													
	V3	.061	.653	1.000												
	V4	-.045	.187	.170	1.000											
	V5	.090	-.070	.129	.099	1.000										
	V6	.277	.153	.265	.552	.199	1.000									
	V7	.200	-.065	.156	.105	.697	.266	1.000								
	V8	.064	.262	.263	.571	.296	.588	.333	1.000							
	V9	.074	-.136	-.034	.137	.551	.033	.473	.206	1.000						
	V10	.127	-.009	.171	.071	.692	.189	.604	.231	.587	1.000					
	V11	.052	-.121	.076	.090	.714	.164	.691	.342	.594	.719	1.000				
	V12	.075	.104	.079	.111	.025	.163	.056	.200	.124	.047	.108	1.000			
	V13	.258	.649	.637	.080	.036	.216	.144	.235	-.014	.125	.008	.167	1.000		
	V14	.008	.047	.046	.104	.001	.186	-.026	.092	.120	.041	.017	.597	.103	1.000	
	V15	.631	.127	.138	-.017	.025	.205	.136	-.003	.009	.058	-.015	.015	.330	-.025	1.000

Table 2. KMO and Bartlett's Test of Sphericity of some lifestyle (interests) variables related to consumer credit.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.760
Bartlett's Test of Sphericity	Approx. Chi-Square	674.072
	df	105
	Sig.	.000

Table 3. Communalities of some lifestyle (interests) variables related to consumer credit.

	Initial	Extraction
v1	1.000	.816
v2	1.000	.802
v3	1.000	.782
v4	1.000	.757
v5	1.000	.767
v6	1.000	.770
v7	1.000	.712
v8	1.000	.744
v9	1.000	.600
v10	1.000	.748
v11	1.000	.803
v12	1.000	.788
v13	1.000	.795
v14	1.000	.801
v15	1.000	.792

Extraction Method: Principal Component Analysis.

Table 4. Total Variance Explained of some lifestyle (interests) variables related to consumer credit.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.084	27.225	27.225	4.084	27.225	27.225	3.613	24.084	24.084
2	2.736	18.239	45.464	2.736	18.239	45.464	2.334	15.563	39.647
3	1.768	11.785	57.248	1.768	11.785	57.248	2.128	14.185	53.832
4	1.503	10.019	67.268	1.503	10.019	67.268	1.774	11.827	65.659
5	1.388	9.254	76.522	1.388	9.254	76.522	1.629	10.863	76.522
6	.611	4.073	80.594						
7	.505	3.366	83.961						
8	.396	2.641	86.602						
9	.357	2.378	88.980						
10	.330	2.203	91.183						
11	.321	2.140	93.323						
12	.299	1.995	95.318						
13	.262	1.745	97.063						
14	.235	1.566	98.630						
15	.206	1.370	100.000						

Extraction Method: Principal Component Analysis.

Table 5. Rotated Component Matrix of some lifestyle (interests) variables related to consumer credit (a)

	Component				
	1	2	3	4	5
v1	.090	.035	.051	.896	.037
v2	-.131	.875	.137	-.011	.030
v3	.103	.866	.145	.006	-.009
v4	.018	.055	.861	-.105	.040
v5	.867	.021	.110	.011	-.047
v6	.106	.106	.809	.283	.108
v7	.807	.055	.160	.170	-.056
v8	.270	.206	.789	-.041	.073
v9	.749	-.112	.023	-.015	.163
v10	.857	.105	.033	.046	.012
v11	.888	-.031	.107	-.038	.028
v12	.059	.084	.095	.031	.876
v13	.047	.839	.047	.274	.113
v14	.005	.019	.074	-.017	.891
v15	.007	.148	.004	.877	-.029

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

a Rotation converged in 5 iterations.

Table 6. Reproduced Correlations (RC) of some lifestyle (interest) variables related to consumer credit.

		v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12	v13	v14	v15
RC	v1	.816(b)	.017	.052	-.045	.093	.312	.233	.038	.057	.124	.051	.074	.286	.023	.791
	v2	.017	.802(b)	.764	.167	-.081	.190	-.039	.256	-.188	-.016	-.127	.104	.734	.053	.118
	v3	.052	.764	.782(b)	.174	.124	.221	.156	.320	-.018	.183	.080	.085	.739	.019	.135
	v4	-.045	.167	.174	.757(b)	.108	.679	.135	.702	.036	.045	.111	.119	.063	.102	-.082
	v5	.093	-.081	.124	.108	.767(b)	.181	.723	.321	.642	.748	.779	.022	.061	-.030	.021
	v6	.312	.190	.221	.679	.181	.770(b)	.263	.685	.100	.143	.170	.196	.222	.154	.265
	v7	.233	-.039	.156	.135	.723	.263	.712(b)	.344	.590	.710	.724	.024	.132	-.036	.165
	v8	.038	.256	.320	.702	.321	.685	.344	.744(b)	.210	.278	.321	.171	.219	.129	-.003
	v9	.057	-.188	-.018	.036	.642	.100	.590	.210	.600(b)	.632	.676	.179	-.044	.148	-.029
	v10	.124	-.016	.183	.045	.748	.143	.710	.278	.632	.748(b)	.759	.075	.143	.018	.062
	v11	.051	-.127	.080	.111	.779	.170	.724	.321	.676	.759	.803(b)	.083	.013	.037	-.032
	v12	.074	.104	.085	.119	.022	.196	.024	.171	.179	.075	.083	.788(b)	.185	.789	.016
	v13	.286	.734	.739	.063	.061	.222	.132	.219	-.044	.143	.013	.185	.795(b)	.116	.362
	v14	.023	.053	.019	.102	-.030	.154	-.036	.129	.148	.018	.037	.789	.116	.801(b)	-.037
	v15	.791	.118	.135	-.082	.021	.265	.165	-.003	-.029	.062	-.032	.016	.362	-.037	.792(b)
Residual(a)	v1		.041	.009	.000	-.003	-.036	-.033	.027	.017	.002	.001	.001	-.028	-.015	-.160
	v2	.041		-.111	.020	.011	-.037	-.026	.005	.052	.007	.007	.000	-.085	-.006	.008
	v3	.009	-.111		-.004	.005	.044	.000	-.057	-.016	-.013	-.004	-.006	-.102	.027	.004
	v4	.000	.020	-.004		-.010	-.127	-.030	-.132	.101	.026	-.021	-.008	.016	.002	.065
	v5	-.003	.011	.005	-.010		.017	-.027	-.025	-.090	-.056	-.065	.002	-.025	.031	.004
	v6	-.036	-.037	.044	-.127	.017		.003	-.098	-.067	.046	-.006	-.033	-.005	.033	-.060
	v7	-.033	-.026	.000	-.030	-.027	.003		-.011	-.117	-.106	-.033	.032	.012	.011	-.030
	v8	.027	.005	-.057	-.132	-.025	-.098	-.011		-.004	-.046	.021	.029	.016	-.037	.000
	v9	.017	.052	-.016	.101	-.090	-.067	-.117	-.004		-.045	-.082	-.055	.030	-.029	.038
	v10	.002	.007	-.013	.026	-.056	.046	-.106	-.046	-.045		-.041	-.027	-.018	.022	-.003
	v11	.001	.007	-.004	-.021	-.065	-.006	-.033	.021	-.082	-.041		.025	-.006	-.020	.017
	v12	.001	.000	-.006	-.008	.002	-.033	.032	.029	-.055	-.027	.025		-.019	-.193	.000
	v13	-.028	-.085	-.102	.016	-.025	-.005	.012	.016	.030	-.018	-.006	-.019		-.013	-.031
	v14	-.015	-.006	.027	.002	.031	.033	.011	-.037	-.029	.022	-.020	-.193	-.013		.012
	v15	-.160	.008	.004	.065	.004	-.060	-.030	.000	.038	-.003	.017	.000	-.031	.012	

Extraction Method: Principal Component Analysis.

a Residuals are computed between observed and reproduced correlations. There are 21 (20.0%) nonredundant residuals with absolute values greater than 0.05.

b Reproduced communalities

Table 7. Some lifestyle (interests) variables, eigenvalue, factor loading of variables and % of variance of factors related to consumer credit.

Brief name of Factors	Factors interpretation (% of variance explained)	Eigen value	Factors loading	Name of Variables
F1	Family (27.23)	4.08	.867	V5: Borrowed consumer credit to purchase household goods helps to get affiliation of family solidarity, relaxation and relationship.
			.807	V7: Borrowed consumer credit to purchase household goods helps to exhibit family status.
			.749	V9: Borrowed consumer credit to purchase sofa set helps family members to comfort sitting on sofa set.
			.857	V10: Borrowed consumer credit to purchase dinning table helps family members to comfort sitting and eating on dinning table.
			.888	V11: Borrowed consumer credit to purchase bed (khat) helps to comfort sleeping on bed (khat) for family members.
F2	Home (18.24)	2.74	.875	V2: Borrowed consumer credit to purchase TV helps to stay at home for leisure time and entertainment, thereby avoiding issues such as pollution.
			.866	V3: Borrowed consumer credit to purchase household goods helps to perform household task.
			.839	V13: Borrowed consumer credit to purchase TV/ computer/ car/ motorcycle helps to collect lots of information about home.
F3	Recreation (11.79)	1.77	.861	v4: Borrowed consumer credit to purchase car/ motorcycle helps to maintain community.
			.809	V6: Borrowed consumer credit to purchase car/ motorcycle helps the family members to visit enjoyable places for recreation.
			.789	V8: Borrowed consumer credit to purchase household goods helps people to reduce emotion, worries, problem, and tiredness.
F4	Food (10.01)	1.50	.877	V15: Borrowed consumer credit to purchase blender machine/ oven/ pressure cooker helps people to enjoy fast food, drink juice & other tasty food.
			.896	V1: Borrowed consumer credit to purchase fridge helps to keep food, fruits, vegetables etc. fresh.
F5	Fashion (9.25)	1.39	.876	V12: Borrowed consumer credit to purchase TV/ computer helps to find out latest fashion.
			.891	V14: Borrowed consumer credit to purchase household goods helps to decorate the home in a new style.

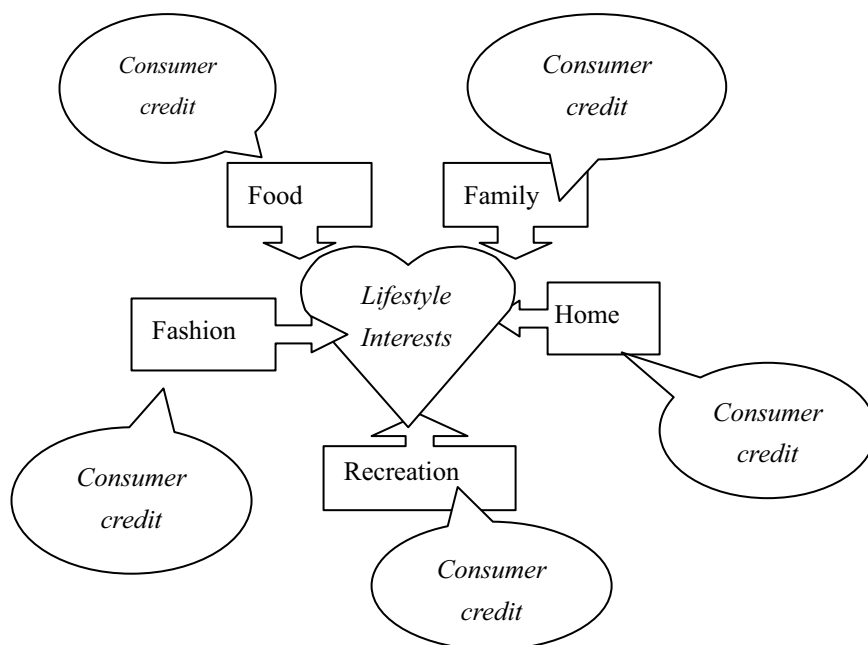


Figure 1. The conceptual model of consumer credit impacts on lifestyle interests of consumers.

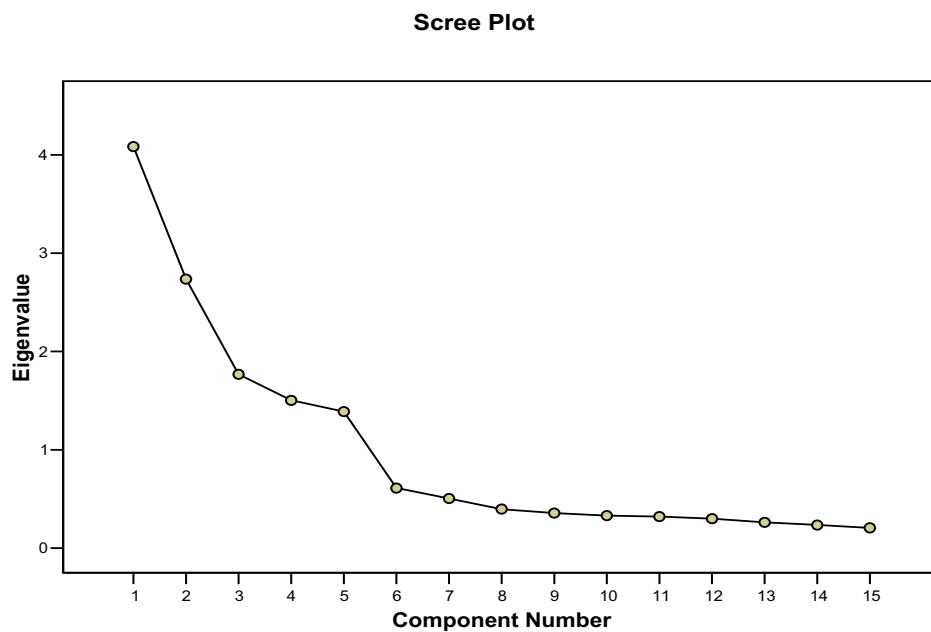


Figure 2. Scree plot of some lifestyle (interests) variables related to consumer credit.



## Disclosure Quality on Governance Issues in Annual Reports of Malaysian PLCs

Rusnah Muhamad (Corresponding author)

Faculty of Business and Accounting, University of Malaya

50603 Kuala Lumpur, Malaysia

Tel: 60-3-7967-3934 E-mail: rusnahm@gmail.com

Suhaily Shahimi

Faculty of Business and Accounting, University of Malaya

50603 Kuala Lumpur, Malaysia

Tel: 60-3-7967-3905 E-mail: suhaily@um.edu.my

Yazkhiruni Yahya

Faculty of Business and Accounting, University of Malaya

50603 Kuala Lumpur, Malaysia

Tel: 60-3-7967-3905 E-mail: yazkhiruni@um.edu.my

Nurmazilah Mahzan

Faculty of Business and Accounting, University of Malaya

50603 Kuala Lumpur, Malaysia

Tel: 60-3-7967-3962 E-mail: nurmazilah@um.edu.my

### Abstract

This paper investigates the disclosure quality of governance issues in annual reports of Malaysian PLCs. In recent years, the issue of corporate governance (CG) has received more attention than it would ordinarily have as a result of a series of corporate failures. Corporate collapses like Enron Corporation (US), Barings Empire (UK) and in Malaysia cases such as Perwaja and Pan Electric Inc. are all rooted in the lack of a proper governance system. As a result, the Finance Committee on Corporate Governance was established in 1998 to undertake a review of the legal and regulatory infrastructure, specifically to evaluate its effectiveness in promoting sound CG standards in Malaysia. Following this development, a few guidelines on CG have been released, particularly addressing the principles and best practices such as the Malaysian Code of Corporate Governance (the Code), the Capital Market Master Plan, and the Financial Sector Master Plan. The main purpose of these guidelines is to strengthen CG standards and practices in Malaysia by focusing on the role and responsibilities of various CG participants, mainly the management, board of directors, audit committee (AC), external and internal auditors. Secondary data is used in this study. A disclosure index is established following the Bursa Malaysia Governance Model, the Code's guidelines and Committee of Sponsoring Organizations of the Treadway Commission (COSO) guidelines. This study also aims to examine factors that possibly affect both the quality and quantity of disclosure. In general, it may be concluded that Malaysian companies have complied with the standards requirements. Only three factors under observation namely leverage, size and type of industry were found to have relationship with the quality of disclosure relates to governance issues.

**Keywords:** Disclosure quality, Corporate Governance, Management, Board of directors, External auditors, Internal auditors.

### 1. Introduction

Corporate governance (CG) has been a dominant policy issue in developed market economies for more than a decade. Hashim (2009) defines CG as *"a combination of processes and structures conducted by the board of directors to authorize, direct and oversee management towards the achievement of the organization's objectives"*. He proposes the

involvement of four different parties in the CG process. The first party would be the oversight group which particularly includes board and committees of the board in the organization; the second group suggested is the stewardship group which mainly comprises of executive management of an organization; thirdly, he has suggested the involvement of the performance group which basically consists of the operating and supporting management staffs within an organization; and finally, he has included the assurance group which encompasses of internal and external auditors. In the similar line of thought, Rezaee (2009) describes CG as “*an ongoing process of managing, controlling, and assessing business affairs to create shareholder value and protect the interests of other stakeholders*”. According to him, there are seven essential functions of CG namely, oversight, managerial, compliance, internal audit, advisory, external audit, and monitoring.

In Malaysia, the revised Listing Requirements of 2001 delineates the requirements for financial reporting disclosures on matters relating to CG and continuing listing obligations. Non-compliance signifies a lack of integrity and poor CG practices. Further, for any non-compliance, companies are subject to fines and sanctions by Bursa Malaysia. Hence, effective Internal Audit Practices (IAP) in an organization will ensure conformance to the laws and regulations. According to Faudziah, Hasnah and Muhamad (2005), the Bursa Listing Requirements have established the industry taskforce to formulate the “Statement on Internal Control: Guidance for Directors of Public Listed Companies” in order to assist public listed companies (PLCs) to make disclosures in their annual reports on the state of internal control. They further mentioned that in May 2001, with reference to the requirements of the Code relating to the Internal Audit Function (IAF), the Securities Commission (SC) appointed the Institute of Internal Auditors Malaysia (IIAM) to establish a separate industry taskforce to formulate the Guidelines for the establishment of an IAF. Risk assessment, control environment, control activities, information and communication and monitoring are five significant characteristics in this guideline (Faudziah *et al.*, 2005).

The paper is organized as follows; the first section provides a review of relevant literature on issues related to CG, followed by a discussion on the research methodology adopted in this study. The remaining sections report the findings and conclusion of the study.

## 2. Literature Review and Research Questions

### 2.1. Corporate Governance and Quality of Financial Reporting

The Sarbane-Oxley Act 2002 (SOX) was enacted to improve CG, quality of financial reports, and the credibility of the audit (internal and external) functions. Pursuant to this, the SOX Act described that interaction between the AC members, the external auditor, internal auditors, members of the board, and the management is crucial for effective governance and to achieve high quality financial reporting. Cooper, Leung and Wong (2006) conclude that the SOX Act has added the dimension of internal financial reporting assurance expected of internal auditors and AC. In recent years, there has been growing recognition of the importance of effective CG in ensuring sound financial reporting. Effective CG ensures credible accounting and high quality financial reporting, which provides the transparency of information that enables users, especially shareholders and investors to make informed decisions. Rezaee (2005) states that the members of the board are elected to act as shareholders’ eyes and ears to ensure the creation of shareholders’ value. Mallin (2003), on another note, states that CG has developed and grown significantly in the last decade. Numerous countries have issued CG codes including Malaysia (i.e. the Code) and the recommendations of these codes, that symbolize “good” CG, undoubtedly contribute towards increased transparency and disclosure. Yuan and Yuan (2007) suggest that CG has a greater impact on improving business efficiency than an internal control system. They emphasize that instead of strengthening the internal control system, improving CG is a more efficient way to prevent fraud and improve business efficacy (ICS). Nevertheless, there is an interaction between CG and ICS. Therefore, ICS will be improved along with the improvement of CG (Yuan and Yuan, 2007). Cohen, Krishnamoorthy and Wright (2004) suggest that CG can be one of the important functions in ensuring the quality of financial reporting. However, the notion of “quality financial reporting” remains a vague concept. A review of the extant literature reveals that despite providing a clear definition of what constitutes “quality financial reporting” researchers have focused on factors that can clearly inhibit the attainment of high quality financial reports (Cohen *et al.*, 2004). According to them, factors such as earnings management, financial restatements and fraud have been used as evidence of failure in producing quality financial reporting. It was found that companies with financial reporting problems are less likely to have an AC that are dominated by outside directors, and few meet more than three times a year (Beasley 1996; McMullen and Raghunandan 1996; Beasley, Carcello, Hermanson and Lapides, 2000). Beasley *et al.* (2000), for example, found that the percentage of AC composed entirely of outside directors was lower for fraud related companies. They also found that AC for fraud companies met less often (generally once per year) compared to those of the fraud-free companies (generally two or three times per year).

### 2.2. Required Disclosure about Internal Control Effectiveness

Globalization of business, technological advancements, increasing business failures, and extensively publicized fraud in the US and abroad have encouraged organizations to stress their internal controls and IAF (Rezaee 1995). He notes that



the COSO report re-emphasized the importance of internal controls in achieving an entity's objectives and gives momentum for entities to refocus attention on their systems of internal controls in an effort to make certain responsible CG and reliable financial reporting processes.

The Institute of Internal Auditors (IIA), in one of its newsletters, has highlighted that the SOX Act 2002 requires management of public companies both large and small to annually assess and report on the effectiveness of internal control over financial reporting (IIA, 2005). The Institute further suggested that businesses can rely on an industry standard, *Internal Control – Integrated Framework*, to evaluate and enhance their control systems. The COSO *Framework*, which was issued in 1992, was mentioned by the Institute for use as a blueprint to establish internal controls that promote efficacy, mitigate risks, and help ensure the reliability of financial statements as well as complying with laws and regulations. The framework is well known for its comprehensiveness, effectiveness, and principles of strong internal control.

With regards to the Malaysian environment, the Bursa Listing Requirements established an industry taskforce, which formulated the "Statement on Internal Control: Guidance for Directors of Public Listed Companies", to assist PLCs in making disclosures in their annual reports on the state of internal control, to comply with the Listing Requirements of the Bursa. Originally, it affirmed:

"...that a listed issuer must ensure that its board of directors includes in its annual report a statement about the state of internal control of the listed issuer as a group".

Bursa Listing Requirements (Paragraph 15.27(b))

In May 2001, with respect to the requirements of the Code on the subject of the IAF, the SC appointed the IIAM to set up a discrete industry taskforce to create these Guidelines to help the board of PLCs to effectively discharge their responsibilities in respect of establishing an IAF. There are five key characteristics in this guideline, namely, risk assessment, control environment, control activities, information and communication and monitoring (Faudziah *et al.*, 2005). Further, the guidance requires directors to *exercise judgment* in reviewing how the company successfully implements the requirements of the Code relating to its internal control and subsequently reports the judgment to shareholders.

### 2.3. Disclosure Quality and Related Theories on CG Issues

There is no single model for CG but there are common elements that can be custom tailored to companies (Taher, 2003). According to him, the common elements generally pointed out are disclosure, transparency and accountability. Transparency in disclosing information enables governments and companies to respond to economic problems in a timely manner, and is necessary to prevent corporate scandals.

According to Mallin (2003) CG can be viewed from an *agency perspective*. The agency theory posits an inherent moral hazard problem in principal-agent (owner-manager) relations that gives rise to agency costs (Coles, McWilliams and Sen, 2001; Jensen and Meckling, 1976). Mallin (2003) argues that the report of the UK Committee on the Financial Aspects of CG, published in 1992 has significant influence on the development of CG not just in the UK, but in numerous other countries. Among others, the recommendations made include the establishment of key board committees comprising *audit* (composed of non-executive directors and responsible to the board); *remuneration* (responsible to the board for recommending remuneration of directors); *nomination* (a formal and transparent procedure for the appointment of new directors to the board); there should be at least three independent non-executive directors. The board should include a balance of executive and non-executive directors, so that no individual can dominate the board's decision making; and there should be separation between the roles of chair (responsible for running the board) and the chief executive officer responsible for running the business). These elements are also being emphasized in the Malaysian environment under the Bursa Listing Requirements.

In respect of other theories that relate to governance issues is the stewardship theory, which is another perspective that seeks to elucidate the behaviour of managers. Coles *et al.* (2001) have viewed this perspective as being complementary in respect to the agency and contracting explanations. Coles *et al.* (2001) have examined whether or not the presence of a steward as the manager would be able to mitigate agency problems and, thus, allow the corporation to reallocate resources that would have earlier been spent to provide additional monitoring and/or incentive mechanisms.

Naser and Nuseibeh (2003) note that the degree of compliance and the extent of corporate disclosure were used as a proxy of quality financial reporting; a high degree of compliance and more disclosure were viewed as better quality. They found that there is a high compliance with the mandatory requirements in all industries observed in their study except for the electricity sector. They further concluded that Saudi companies comply with the standards and disclose more than the minimum information required by law. However, in their opinion the level of voluntary disclosure is relatively low. Hasan and Karim (2005) investigated factors that influence the level of compliance by Bangladeshi companies with mandatory disclosure requirements. They state that the firm size, the qualifications of the accounting staff that prepare the financial statements and the reputation of the auditing firm have a significant positive impact on

the quality of compliance to the mandatory disclosure requirements. This study aims to examine the information content of the selected statements related to the CG elements in the published annual reports of the selected PLCs on Bursa Malaysia, namely, the Statement of Internal Control, Statement of Corporate Governance and Audit Committee Report. This study aims to seek answers to the following research questions.

Research question 1: Do Malaysian PLCs comply with the requirements of mandatory disclosure?

Research question 2: Do Malaysian PLCs disclose additional information in accordance with the Best Practices/Voluntary standards?

Research question 3: Is there any association between disclosure quality and audit committee, board composition, size of company, profitability, auditor, and industry?

#### *2.4. Factors influencing the Disclosure Quality*

The review of the extant literature found that among others, audit committee, board composition, size of company, profitability, auditor, and industry have got an impact on the disclosure quality. Therefore, all these factors are examined in the context of the quality of disclosure relating to the selected governance issues.

##### Audit Committee and Board Composition:

According to Goodwin and Seow (2002) the Cadbury report published in 1992 recommended that the board of directors of a company should have a separate committee for overseeing the remuneration of executive directors and the auditing of the financial reporting. In other words, companies should have separate AC and remuneration committees. The same requirement is found under the Bursa listing requirements. Goodwin and Seow (2002), and Beasley *et al.* (2000) found that investors, auditors and directors believe that a strong and effective AC is able to assist external auditors in auditing the fraudulent accounting records and increase the level of quality disclosure. Ho and Wong (2001) found that companies, which have an AC, are more likely to have a higher extent of voluntary disclosure. It was found that a higher percentage of outside directors or independent directors within an AC can effectively monitor the management of a company, thus, reducing the opportunity for fraudulent reporting. Therefore, it is posited that the proportion of independent directors is positively related to the company's performances and its disclosure quality. The empirical evidence regarding this matter is mixed. Bujaki and McConomy (2002) stated that companies with a majority of independent directors are significantly more likely to disclose more information relating to CG issues than those that do not have a majority of independent directors. In another study, Eng and Mak (2003) found that there is negative relationship between the board composition and disclosure. Rationally, if there is a majority of unrelated directors, the monitoring process will be more effective since this group of directors does not have a direct personal interest in a particular company. Therefore, it is posited that:

H1: The number of independent AC members and the proportion of outside directors are positively related to the level of CG disclosure.

H2: The existence of an AC is positively related to the level of voluntary disclosure made on CG information.

Size of company, Profitability and Leverage: The most common measures used by previous researchers to represent firm size includes capital stock turnover, market capitalization, total assets, market values of equity shares (McMullen, 1996; Forker, 1992; Wallace and Naser, 1995; Owusu-Ansah, 1998; Ho and Wong, 2001; Camfferman and Cooke, 2002; Eng and Mak, 2003 and Meek *et al.*, 1995). In this study the total assets of a company has been used as a proxy for the firm size (Murphy, 1999; McMullen, 1996 and Ho and Wong, 2001). Various studies found a positive relationship between the firm size and the extent of disclosure in the corporate annual reports (Bujaki and McConomy 2002; Chau and Gray 2002; Laing and Weir 1999). McNally, Eng and Hasseldine (1982) argue that firm size is a dominant corporate characteristic in establishing the "leaders" in disclosure practices because of the great pressures from inside and outside of the company. According to Singhvi and Desai (1971), large companies normally use such information for managerial purposes, especially for monitoring internal reporting of the top management. The larger companies normally tend to disclose more information in order to convince and to promote their goodwill. The higher disclosure enables these large companies to maintain their reputation in the eyes of the public and to attract investors (Camfferman and Cooke 2002; Wallace and Naser 1995). Profitability is also another factor that is found to affect the extent of disclosure (Ahmad and Karim, 2005). The extant literature posits that a profitable company is likely to disclose more information to support the continuation of their position. Singhvi and Desai (1971) support this argument where they opined that higher earnings motivate management to provide greater disclosure of information in order to provide assurance to investors. In contrast, Bujaki and McConomy (2002) assert that firms facing a slowdown in revenue tend to increase their disclosure on issues relating to CG. However, previous researchers such as Wallace, Naser and Mora (1994) found that the association between the profitability and comprehensiveness of disclosure is not significant. In their study, profitability is measured using the net profit margin. Nevertheless, Owusu-Ansah (1998) found that there is a positive relationship between profitability and mandatory disclosure. This study aims to investigate whether there is any association between profitability and the disclosure quality related to the governance issues. The results suggest that

highly leveraged firms have a wider obligation to disclose the information, especially the financial information in order to convince their long-term creditors that they have enough sources to fund the business. Empirical findings from the extant literature established that the relationship between leverage and the level of CG disclosure is mixed. Various studies provide support that leverage is positively correlated with disclosure (see for example, Bujaki and McConomy 2002), others found an insignificant effect (Chow and Wong-Borren, 1987). The agency theory predicts that the level of voluntary disclosure increases as the leverage of the firm grows. Jensen and Mekling (1976) argue that more highly leveraged companies incur higher monitoring costs whereby the board or management tends to increase the level of disclosure for monitoring purposes. Nevertheless, according to Eng and Mak (2003) increased leverage is expected to reduce disclosure because leverage helps to control the free cash flow problem and the agency costs of debt are controlled through restrictive debt covenants in debt agreement rather than increased disclosure information in annual reports. On the other hand, Ho and Wong (2001) found that the level of voluntary CG disclosure is not influenced by the agency cost of debt in Hong Kong listed companies. In this study leverage is represented by the total debt to equity ratio (Ho and Wong 2001). It indicates the ratio of debt on a companies' balance sheet to the amount of funds provided by the owner. Therefore, the third hypothesis for this study is:

H3: There is a positive association between the size of company, profitability, and leverage and the level of CG disclosure.

**Auditor and Industry:** According to Mallin (2003), CG can be viewed from an agency perspective. Coles *et al.* (2001) suggest that the presence of a steward as the manager may mitigate agency problems and enable the corporation to reallocate resources that would have earlier been spent on providing additional monitoring and/or incentive mechanisms. The size of the agency cost will also influence the choice of audit quality. The employment of a high quality auditor (big audit firm) may enhance good CG in one organization taking into consideration that the external auditor is one of the pillars of good CG. The review of the extant literature reveals that the type of industry is also one of the variables determining the level of disclosure in the corporate annual reports (Meek *et al.*, 1995). The result of the empirical findings related to the type of industry and the level of disclosure is varied. For example, Meek *et al.* (1995) argue that the type of industry is the most important factor in explaining the level of the voluntary disclosures. Whereas, according to Eng and Mak (2003) there is no significant relationship between disclosure and the industry. According to Bujaki and McConomy (2002), the vast majority of firms in all industries provided CG disclosure but companies in the consumer products industry were particularly likely to provide more CG disclosure. Hence, the fourth hypothesis to be tested in this study is:

H4: There is a positive association between the auditor and the industry concerning the level of CG disclosure.

### 3. Research methodology

Annual reports represent one of the important sources of information for companies in Malaysia (Idris, 1997; Rahman, 2001; Yatim, 2004; Rusnah, 2006). Therefore, in this study annual reports of the selected PLCs were analysed to evaluate the quality of disclosure made on CG issues. For the purpose of this study, the disclosure indexes are based on the one developed in the two recent studies by Naser and Nuseibeh (2003) and Bujaki and McConomy (2002). Before the coding of the index is done for each company in the sample, a scoring sheet is prepared based on the mandatory and voluntary items stated in the Code, the Bursa Malaysia listing requirements, the COSO guidelines and the adjusted disclosures index developed by Bujaki and McConomy (2002). A scoring sheet was also used in previous research (Eng and Mak, 2003; Bujaki and McConomy, 2002; Chau and Gray, 2002). The scale of disclosure used in this study is either "0" or "1". The contents of each annual report are reviewed and are compared to the discretionary items on the list and coded as "1" if disclosed or else "0" for the non-disclosure. Three disclosure indexes are constructed, which relate to the governance issues (particularly the information in the Statement of Internal Control, Statement of Corporate Governance and Audit Committee Report) taking into consideration the Bursa Malaysia Governance Model, the Code's guidelines and the COSO guidelines. To answer the first and second research questions, the disclosure index scored by each company is then divided with the maximum score (Naser and Nuseibah, 2003) to represent the disclosure quality. This can be presented mathematically as follows:

$$I_x = \left[ \sum_{t=1}^{n_x} T_{tx} \right] / n_x$$

where  $I_x$  is the index scored by company,  $x$ ,  $0 \leq I_x \leq 1$ ;  $T_{tx}$  is the information item disclosed by company  $x$ ;  $n_x$  is the maximum number of items expected to be disclosed by a company.

For the third research question, a hypothesis is developed to examine the relationship between the disclosure quality (dependent variable) and the independent variables, namely, audit committee, size of company, profitability, leverage, auditor and industry as established in previous studies on disclosure quality (Eng and Mak 2003; Bujaki and McConomy 2002; Meek, Roberts and Gray 1995). The next section discusses the variables used in this study.

Based on the above four hypotheses, the following model is formulated. The measurement of the dependent and experimental variables is based on the disclosure index developed by previous researchers (Bujaki and McConomy, 2002; Eng and Mak, 2003; Chau and Gray, 2002; and Meek *et al.*, 1995).

$$\text{DScore} = \beta_1 \text{AUDITCOM} + \beta_2 \text{OUTSIDERS} + \beta_3 \text{FSIZE} + \beta_4 \text{PROFIT} + \beta_5 \text{LEV} + \beta_6 \text{AUDITOR} + \beta_7 \text{IND} + e_j$$

Where:

DScore	= Mandatory and Voluntary disclosure (Best Practices) scores
AUDITCOM	= Proportion of independent non-executive directors on the audit committee
OUTSIDERS	= Percentage of outside directors on the board
FSIZE	= Total assets
PROFIT	= Net profit margin
LEV	= Total debt to equity ratio
AUDITOR	= Dummy variables, 1 if big audit firm, 0 otherwise
IND	= Dummy variables, 1 if the firm is in consumer product sector, 0 otherwise; 2 if the firm is in the industrial product sector, 0 otherwise; 3 if the firm is in the trading/services sector, 0 otherwise; 4 if the firm is in the infrastructure project sector, 0 otherwise; 5 if the firm is in the hotel sector, 0 otherwise; 6 if the firm is in the properties sector, 0 otherwise; 7 if the firm is in the plantation sector, 0 otherwise; 8 if the firm is in the construction sector, 0 otherwise; 9 if the firm is in the technology sector, 0 otherwise
$e$	= Error term

A sample of 159 companies from the year 2006 was chosen randomly, comprising nine sectors (excluding the finance sector) listed on the main board of Bursa Malaysia. Secondary data was compiled from the annual reports of companies, which are available on the Bursa Malaysia website ([www.bursamalaysia.com.my](http://www.bursamalaysia.com.my)) and the Bursa library. The information for variables can normally be found on the Statement of Corporate Governance, Statement of Internal Control, Reports from Audit Committee and director's profiles whilst variables such as total assets, total revenues, total debts and profit after tax can be found in the Profit and Loss Statement and the Balance Sheet. Data was analysed using: (1) Descriptive statistics and (2) Multivariate test (Multiple Regression Analysis).

## 4. Findings

### 4.1. Degree of compliance with standards requirements

As mentioned earlier, the degree of compliance and the extent of corporate disclosure are used as a proxy for quality; looking at the individual items of disclosure that formed the index reported in Table 1, the conclusion is that all companies under observation disclosed information on most of the items in the index. For items forming the mandatory disclosure index, only a few companies failed to mention clearly about “*the communication policy-management and shareholders*” as well as “*board should review the adequacy and form of director's compensation*” (elements in the Code). A number of companies did not report on the human resources policy and procedures and reporting deficiencies (principles of internal control). However, in general, it may be concluded that the companies successfully complied with the standards requirements. The finding is consistent with the previous finding established by Naser and Nuseibeh (2003) who found a relatively high compliance with mandatory requirements among Saudi companies.

In addition, an examination of the descriptive statistics on individual disclosure items that formed the index in respect of the voluntary disclosures is depicted in Table 1. It shows that the Malaysian PLCs disclose most of the items except for the few companies that did not state clearly the part on the AC's role, mainly the item “*To review the quarterly and year-end financial statements of the board, focusing particularly on the going concern assumption*”. It was found that the sample companies disclose detailed information on fifteen of the listed items, implying that the level of the voluntary disclosure is high. This is contrary to the findings obtained in the study done by Naser and Nuseibah (2003) due to the fact that the major proportion of companies in Saudi Arabia are owned either by families or the government, thereby giving little impetus to disclose the voluntary information. Further, major investors, and governmental agencies, either have access to company records or can demand whatever information they want. Therefore, public financial disclosure in Saudi Arabia is kept to a minimum. On the other hand, Malaysian PLCs face different challenges. In the context of the Malaysian economic and business environment, Malaysian companies are expending more effort to enhance the level of investors' confidence through solidarity of CG in the respective companies. Our findings also support the proposition that the outside directors have been effective in monitoring managers (the function of the AC) and protecting the interests of shareholders. It also shows that CG in Malaysia ensures that credible accounting and high quality financial reporting provides the transparency that enables users, especially shareholders and investors (most of them are public) to make informed decisions. Besides, it is consistent with the statement made by Rezaee (2005) in

which the election of the board is to act as the eyes and ears of the shareholders to ensure the creation of shareholders' value.

The above findings can be attributed to the issuance of the revised Listing Requirements by Bursa Malaysia in 2001, which prescribed the requirements for financial reporting disclosures on CG matters and continuing listing obligations for Malaysian PLCs. Any non-compliance indicates a lack of integrity and poor CG practices. For any non-compliance, companies are subject to fines and sanctions by Bursa Malaysia. Consequently, an effective IAF in an organization will help to ensure compliance with laws and regulations.

#### 4.2. Results of hypotheses testing

Table 2 reports the results of the linear regression for the sample companies. The dependent variable is the total disclosure score that was developed based on the Code, the Bursa Malaysia listing requirements, the COSO guidelines and various studies (Bujaki and McConomy, 2002; Eng and Mak, 2003; Chau and Gray, 2002; Meek *et al.*, 1995). Table 2 presents the  $R^2$  (coefficient of determination), F-ratio, beta coefficients and t-statistics for the model and summarizes the multiple regression results of Y (the Mandatory and the Voluntary disclosure scores) on the explanatory variables.

The results reflected in Table 2 show that there are no significant relationships between disclosure quality with the CG index score (mandatory disclosure) and AC's role index score (the voluntary disclosure) as well as with all the company characteristics (as indicated earlier including board composition; size; profitability; leverage; auditor and industry) except for the internal control index score (the mandatory disclosure). Overall, it may be concluded that Malaysian companies have complied with the standards requirements. It shows that Malaysian companies are aware of the sanctions for non-disclosure, whereby failure to disclose the matters set out in *para* 4.1 (the Code) in their annual reports, may result in companies facing action from the Bursa as stated in the Bursa listing requirements and section 11 of the Security Act 1983.

As reflected in Table 2, the value of  $R^2$  is 0.257 ( $F=3.304$ ) denoting that a slight percentage (approximately 26%) of the variation in Y (principles of internal control that refers to the mandatory disclosure) can be explained by the variations in the set of independent variables (adjusted  $R^2 = 0.180$ ). At the 0.05 level of significance, the hypothesis that all explanatory variable coefficients are simultaneously equal to zero is rejected. Only three independent variables entered the equation with a regression coefficient that was significant at the 0.05 level in the regression model. These variables include: size of company, leverage and one industry dummy variable (infrastructure industry).

The most significant independent variable is leverage followed by the size of company with  $p$ -values of 0.004 ( $t = 2.898$ ) and 0.033 ( $t = 2.156$ ), respectively. The results provide support for Hypothesis 3 except for profitability (which is not significant). The results indicate that more highly leveraged companies incur higher monitoring costs whereby the board or management tend to increase the level of disclosure for monitoring purposes. According to Bujaki and McConomy (2002), highly leveraged companies do provide more detailed discussion on the implementation of CG guidelines, consistent with an effort to convince investors and potential investors that they are effectively governed (LEV significant at the 0.07 level). The results obtained are also consistent with the argument made by Jensen and Meckling (1976).

In addition, large Malaysian PLCs normally use such information for managerial purposes, especially for monitoring internal reporting of top management. The results suggest that large companies tend to disclose more information in order to maintain their image and reputation in the eyes of the public and to attract investors. The finding is consistent with previous empirical studies, which found that large companies disclose more information to attract investors as the large companies need more financing than smaller companies (see Bujaki and McConomy 2002; Chau and Gray 2002; Camfferman and Cooke 2002; Ho and Wong 2001; Laing and Weir 1999; Wallace and Naser 1995; Singhvi and Desai 1971).

Another factor that influenced the disclosure quality on governance issues (internal control disclosure index score) is the type of industry i.e. infrastructure ( $p$ -value = 0.035,  $t = 2.128$ ), others are not significant. This is consistent with the findings established in Eng and Mak (2003) and Ho and Wong's (2001) studies but is inconsistent with the conclusion made by Bujaki and McConomy (2002). They concluded that the majority of larger companies in all industries provided CG disclosure, particularly companies in consumer products. Meanwhile, Ho and Wong (2001) found that the Banking and Finance industry was more likely to have a higher extent of voluntary disclosure as reputation is very important for companies in this industry.

#### 4.3. Discussion of findings

Hypothesis 1, which states that the number of independent AC members and the proportion of outside directors are positively related to the level of CG disclosure was not supported. This finding is inconsistent with the findings established by McMullen (1996), which found that there is a strong correlation between the presence of AC and a high reliability of financial reporting. The previous empirical evidence relating to this issue is mixed. Bujaki and McConomy (2002) found that companies with a majority of outside directors are significantly more likely to disclose more CG

issues than those that do not have a majority of outside directors. Eng and Mak (2003) found that there is a negative association between board composition and disclosure. They mentioned that the difference is due to the role played by independent directors. Outside directors may be elected by blockholders (who own a block of shares) to represent their interests and may be able to acquire information directly, rather than through public disclosure. Thus, a possible explanation of this result is that while AUDITCOMM and OUTSIDERS in Malaysia are likely to ensure that the company has complied with the mandatory as well as the voluntary disclosure requirements, they are still not actively pressing the company to disclose such information. Also there are questions about the independence of so-called 'independent' non-executive directors in Malaysia and their effectiveness as a monitoring device as many of them are appointed by the chief executive officer or the chairman of the board.

Hypothesis 2 states that companies that have an AC are more likely to have a higher extent of voluntary disclosure. Although the hypothesized direction was correct, it is not significant. Thus, implying that the existence of an AC does not effectively improve the transparency of information. Ho and Wong (2001) found that companies, which have an AC, are more likely to have a higher extent of voluntary disclosure. Forker (1992) only found a weak relationship between the existence of an AC and the quality (extent) of disclosure.

Hypothesis 3 states that there is a positive correlation between the size of company, profitability, and leverage, and the level of CG disclosure. Only size of company and leverage are significant and positively related to the level of CG disclosure. This is consistent with the findings of various studies such as Bujaki and Conomy (2002), Camfferman and Cooke (2002) and Wallace and Naser (1995). The finding implies that large Malaysian companies are likely to disclose more information with respect to CG information to maintain their image and reputation to gain public confidence as well as investors' interests. However, there is no evidence that profitability has an influence on the level of CG disclosure. This is consistent with the findings established in Wallace, *et al.* (1994) and Ho and Wong (2001). Bujaki and McConomy (2002) and Camfferman and Cooke (2002) found a negative relationship between profitability and the level of CG disclosure.

Hypothesis 4, which states that there is a positive association between the auditor and the industry with the level of CG disclosure, is not supported except for one industry dummy variable (infrastructure industry). In Malaysia, highly qualified auditors (big audit firm) may enhance CG in a company but to what extent they are actively involved in determining the level of disclosure with respect to governance issues in the corporate annual reports is still questionable. The result indicates that the Malaysian infrastructure industry is more likely to have a higher extent of CG disclosure compared to companies in the other industries. Eng and Mak (2003) found no evidence of a relationship between industry and the level of CG disclosure in Singapore. Bujaki and McConomy (2002) found that the consumer products industry is likely to provide more CG disclosure in Canada.

## 5. Summary and conclusion

In recent years, regulatory bodies have promulgated new CG requirements in order to enhance corporate transparency. In Malaysia, the Bursa listing requirements have raised the standards of CG of PLCs in order to enhance investor confidence and to further improve the integrity of the capital market. This study is aimed at examining various issues relating to the quality of information disclosed in the annual reports of the selected Malaysian PLCs. The descriptive statistics indicate that there is a relatively high compliance with the mandatory requirements as well as voluntary disclosure. The results of the analysis show a relatively high compliance with the mandatory requirements as well as voluntary disclosure in all companies under study, implying that they are aware of the sanctions that they might face for non-compliance.

The results also provide empirical evidence supporting certain hypotheses proposed in this study. It is found that only the size of company, leverage and the type of industry (i.e. the infrastructure industry) are positively related to the level of CG disclosure. The results suggest that companies that are big in size and highly leveraged as well as companies in the infrastructure industry tend to have a high level of CG disclosure.

Since Bursa Malaysia has promulgated various listing requirements to raise the standards of CG for PLCs in enhancing investor confidence it will be interesting to examine whether there is any association between the quality of disclosure on CG issues and the share prices among the Malaysian PLCs. If CG disclosures are able to enhance investor confidence then it is expected that the quality of disclosure on CG issues will positively associate with the share prices of a PLC. Future research may also consider conducting in-depth interviews to explore the possible issues, problems and challenges facing the relevant CG actors such as members of AC, external auditors and internal auditors in maintaining good CG in a company.

## 6. References

Ahmad, J. U. & Karim, A K M. W. (2005), Determinants of IAS disclosure compliance in emerging economies: Evidence from exchange listed companies in Bangladesh, Working Paper Series (21), Victoria University of Wellington, New Zealand.

- Beasley, M.S. (1996). An empirical analysis of the relation between the board of director composition and financial statement fraud. *The Accounting Review*, 71(4), 443-465.
- Beasley, M.S., Joseph V. C., Dana R. H. & Paul D. L. (2000). Fraudulent financial reporting: consideration of industry traits and corporate governance mechanisms." *Accounting Horizons*, 14(4), 441-454.
- Bujaki, M. & McConomy, B. (2002). Corporate governance: factors influencing voluntary disclosure by Publicly Traded Canadian Firms. *Canadian Accounting Perspective*, 1,105-39.
- Cadbury Committee Report. (1992). Report of the Cadbury Committee on the financial aspects of corporate governance, Gee, London.
- Camfferman, K. & Cooke, T., E. (2002). An analysis of disclosure in the annual reports of U.K. and Dutch companies. *Journal of International Accounting Research*, 1(1), 3-30.
- Chau, G.K. & Gray, S.J. (2002). Ownership structure and corporate voluntary disclosure in Hong Kong and Singapore. *International Journal of Accounting*, 37(2), 247-265.
- Chow, C.W. & Wong-Boren, A. (1987). Voluntary financial disclosure by Mexican Corporations. *The Accounting Review*, 62(3), 533-541.
- Cohen, J., Krishnamoorthy, Ganesh. & Wright, A. (2004). The Corporate Governance Mosaic and Financial Reporting Quality." *Journal of Accounting Literature* 23: 87-152.
- Coles, J. W., McWilliams, V. B. & Sen, Nilanjan. (2001). An examination of the relationship of governance mechanismst performance. *Journal of Management*, 27 23-50.
- Cooper, Barry J., Philomena, L. & Grace, W. (2006). The Asia Pacific literature review on internal auditing. *Managerial Auditing Journal*, 21(6), 822-834.
- Eng, L. L. & Mak, Y.T. (2003). Corporate governance and voluntary disclosure. *Journal of Accounting and Public Policy*, 22, 325-345.
- Faudziah, H. F., Hasnah, H. & Muhamad, J. (2005). Internal auditing practices and internal control system. *Managerial Auditing Journal*, 20(8), 844-866.
- Forker, J.J. (1992). Corporate governance and disclosure quality. *Accounting and Business Research*, 22 (86), 111-124.
- Goodwin, J. & Seow, J. L. (2002). The influence of corporate governance mechanisms on the quality of financial reporting and auditing: perceptions of auditors and directors in Singapore. *Accounting and Finance*, 42, 195-223.
- Hasan, T. & Karim, A K M. W. (2005). Regulatory change and the quality of compliance to mandatory disclosure requirements: evidence from Bangladesh, Working Paper Series (34), Victoria University of Wellington, New Zealand.
- Hashim, M. (2009). Control and Governance - Organisational Performance, Paper Presented at the *Half Day Seminar on Control and Governance* organized under the Internal Audit Education Partnership (IAEP) Program with the US IIA Inc, 14 February, Kuala Lumpur.
- Ho, S.S.M. & Wong, K.S. (2001). A study of the relationship between corporate governance structures and the extent of voluntary disclosure. *Journal of International Accounting, Auditing and Taxation*, 10(2), 139-156.
- Idris, F. (1997). Islamic Banks' Financial Reporting and its Usefulness to Investors. Unpublished Doctoral Dissertation. University of Cardiff, UK.
- Institute of Internal Auditors [IIA]. (2005). Putting COSO's Theory Into Practice.
- Jensen, M. C. & Meckling, W. H. (1976). Theory of the firm: managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics*, 3, 305-360.
- Laing, D. & Weir, C.M. (1999). Governance structures, size and corporate performance in UK firms. *Management Decision*, 37(5), 457-464.
- Mallin, C. (2003). The relationship between corporate governance, transparency and financial disclosure [Part I], United Nations Conference on Trade and Development, Geneva.
- McMullen, D. A. (1996). Audit committee performance: an investigation of the consequences associated with audit committees. *Auditing: A Journal of Theory and Practice*, 15(1), 87-103.
- McMullen, D. A. & K. Raghunandan. (1996). Enhancing audit committee effectiveness. *Journal of Accountancy* 182(2), 79-81.
- McNally, G.M., Eng, L. H. & Hasseldine, C.R. (1982). Corporate financial reporting in New Zealand: an analysis of user preference, corporate characteristics and disclosure practice. *Accounting and Business Research* 13(49), 11-20.
- Meek, G. K., Roberts, C.B. & Gray, S.J. (1995). Factors influencing voluntary annual report disclosures by U.S., U.K

- and Continental European Multinational Corporations. *Journal of International Business Studies*, 3<sup>rd</sup> Quarter, 555- 572.
- Murphy, A. B. (1999). Firm characteristics of Swiss companies that utilize International Accounting Standards. *The International Journal of Accounting*, 34, (1), 121-131.
- Naser, K. & R. Nuseibah. (2003). Quality of financial reporting: evidence from the listed Saudi nonfinancial companies. *The International Journal of Accounting*, 38(1), 41-70.
- Owusu-Ansah, S. (1998). The impact of corporate attributes on the extent of mandatory disclosure and reporting by listed companies in Zimbabwe. *The International Journal of Accounting*, 33(5), 605-631.
- Rahman, A. A. (2001). The Use and Perceived Important of Annual Reports by Accountants in the Service Industry in Malaysia. *Asian Review of Accounting*, 9 (2), 117-128.
- Rezaee, Z. (1995). What the COSO Report means for internal auditors. *Managerial Auditing Journal*, 10 (6), 5-9.
- Rezaee, Z. (2005). Causes, consequences, and deterrence of financial statement fraud. *Critical Perspective on Accounting*, 16, 277-298.
- Rezaee, Z. (2009). The Role of Internal Auditors in Corporate Governance, Paper Presented at the *PhD Colloquium* organized by Faculty of Business and Accountancy, 4 June, Kuala Lumpur.
- Rusnah, M. (2006). Islamic Corporate Reports (ICRs) and Muslim Investors: The Case of the Islamic Banking Industry in Malaysia. Unpublished Doctoral Dissertation. University Malaya, Kuala Lumpur.
- Singhvi, S. & Desai, H.B. (1971). An empirical analysis of the quality of corporate financial disclosure. *Accounting Review*, 46 (1), 621 -632.
- Taher, M. N. (2003). Corporate governance & the Saudi capital market law. Arab News. [Online] Available: <http://www.arabnews.com> (November 3, 2003)
- Wallace, R.S.O. & Naser, K. (1995). Firm-Specific determinants of comprehensiveness of mandatory disclosure in the corporate annual reports of firms on the stock exchange of Hong Kong. *Journal of Accounting and Public Policy*, 14(4), 311-368.
- Wallace, R.S.O., Naser, K. & Mora, A. (1994). The relationship between the comprehensiveness of corporate annual reports and firm characteristics in Spain. *Accounting and Business Research*, 25(97), 41-53.
- Yatim, M. M.N. (2004). Investors' Perception on the Usefulness of Corporate Annual Reports Issues by Islamic Financial Institutions in Malaysia. Paper Presented at *UNITEN Conference*, Kuala Lumpur.
- Yuan, J. & Yuan, C. (2007). How to improve China's enterprise internal control system: based on the perspective of corporate governance. *The Business Review*, 7(2), 91-97.

Table 1. Descriptive statistics on items formed disclosure indexes

Item disclosed	2006	
	Mean	SD
<i>Items formed mandatory disclosure index</i>		
<i>Corporate governance (CG)</i>		
Board has responsibility for strategic planning process	0.96	0.19
Board has responsibility for identification of risks and risk management system	0.99	0.11
Board has responsibility for succession planning	1.00	0.00
Communication policy-management and shareholders	0.56	0.50
Internal control and management information system	1.00	0.00
Reviewing the adequacy and the integrity of company's internal control system and management system.	1.00	0.00
Board should be constituted with a majority of unrelated directors	0.96	0.19
The circumstances of the company, whether it practices duality or separates the duties between Chairman and CEO.	0.92	0.26
Firms should have a committee of directors for nominating new directors and assessing directors on an ongoing basis	1.00	0.00
Have a majority of whom are independent	1.00	0.00
Firms should implement a process for assessing the effectiveness of the board, its committee, and individual directors	0.90	0.30
An orientation and education programme should be provided to new board members	1.00	0.00
Supply of information	1.00	0.00
Board should consider its size and the potential for reduction	1.00	0.00
Remuneration procedure that indicates company has a formal and transparent procedure for developing policy	0.99	0.08
Remuneration that indicates the rationale and objective remuneration policy	0.81	0.39



Board should review the adequacy and form of director's compensation	0.52	0.50
Remuneration committee should be a majority of whom are unrelated	0.99	0.11
Remuneration committee should be remuneration information	0.99	0.11
Audit committee should be composed only of outside directors	1.00	0.00
Audit committee should have its responsibilities specifically defined	0.79	0.41
Audit committee should have direct communication channels with internal and external auditors	0.96	0.21
Audit committee should have oversight responsibility for system of internal control	1.00	0.00
Audit Committee meeting that disclose in an informative way, details of the activities of audit committee	0.96	0.21
Affirmation on the duties of audit committee	0.94	0.24
Dialogue between companies and investors that states AGM become a place to communicate between company and shareholders.	0.99	0.11
Dialogue between companies and investors that states they conduct dialogue with investor.	0.98	0.14
<i>Internal Control (IC)</i>		
Integrity and ethical values	0.99	0.11
Importance of board of directors	1.00	0.00
Management philosophy and operating styles	0.98	0.14
Organizational structures	1.00	0.00
Commitment to financial reporting competencies	0.62	0.49
Authority and responsibility	1.00	0.00
Human Resources	0.57	0.50
Importance of financial reporting objectives	0.92	0.26
Identification and analysis of financial reporting risks	0.97	0.16
Assessment of fraud risk	0.77	0.42
Elements of a control activity such as performance reviews, information processing controls, physical controls and segregation of duties.	1.00	0.00
Control activities linked to risk assessment	1.00	0.00
Selection and development of control activities	0.99	0.08
Information technology	0.79	0.41
Information needs	0.98	0.14
Information control	1.00	0.00
Management communication	0.97	0.16
Upstream communication	0.83	0.38
Board communication	1.00	0.00
Communication with outside parties	0.97	0.18
Ongoing monitoring	0.92	0.26
Separate evaluation	1.00	0.00
Reporting deficiencies	0.53	0.50
Management roles (regular management supervisory activities in performing their duties)	1.00	0.00
Board and audit committee	0.99	0.08
Other personnel	0.99	0.08
<i>Voluntary disclosure</i>		
<i>Audit Committee's roles (ACR)</i>		
To consider the appointment of the external auditor, the audit fee and any questions of resignation or dismissal	1.00	0.00
To discuss with the external auditor before the audit commences, the nature and scope of the audit, and ensure coordination where more than one audit firm is involved	1.00	0.00
To review the quarterly and year-end financial statements of the board, focusing particularly on any changes in accounting policies and practices	1.00	0.00
To review the quarterly and year-end financial statements of the board, focusing particularly on significant adjustment arising from the audit	0.99	0.08
To review the quarterly and year-end financial statements of the board, focusing particularly on the going concern assumption	0.70	0.46
To review the quarterly and year-end financial statements of the board, focusing particularly on compliance with accounting standards and other legal requirements	0.96	0.19
To discuss problems and reservations arising from the interim and final audits, and any matter the auditor may wish to discuss (in the absence of management where necessary)	0.98	0.14
To review the external auditor's management letter and management's response	0.99	0.08
Review the adequacy of the scope, functions and resources of the internal audit function, and that it has the necessary authority to carry out its work	1.00	0.00
Review the internal audit programme and results of the internal audit process, and where necessary, ensure that appropriate actions are taken on the recommendations of the internal audit function	1.00	0.00
Review any appraisal or assessment of the performance of members of the internal audit function	1.00	0.00
Approve any appointment or termination of senior staff members of the internal audit function	0.95	0.22
Inform itself of resignations of internal audit staff members and provide the resigning staff member an opportunity to submit their reasons for resigning	0.94	0.24
To consider any related party transactions that may arise within the company or group	0.99	0.11
To consider the major findings of internal investigations and management's response	0.98	0.14
To consider other topics as defined by the board	0.77	0.42

Table 2. Empirical test on the relationship between disclosure quality on governance issues (DSCORE) and its attributes for all samples

Model Summary						
Model	R-Square		Adjusted R-Square		F	
Corporate governance (CG)	.106		.012		1.131	
Internal control (IC)	.257		.180		3.304	
Audit committee's roles (ACR)	.097		.003		1.029	
Coefficient						
Variables	CG		IC		ACR	
	Coef ( <i>t</i> )	Sig.	Coef ( <i>t</i> )	Sig.	Coef ( <i>t</i> )	Sig.
FSIZE	.004 (.046)	.963	<b>.163</b> <b>(2.156)</b>	<b>.033*</b>	.021 (.252)	.801
AUDITOR	.055 (.667)	.506	.017 (.227)	.821	.059 (.705)	.482
AUDITCOMM	-.038 (-.457)	.648	.129 (1.717)	.088	.105 (1.269)	.207
OUTSIDERS	-.051 (-.600)	.550	-.063 (-.809)	.420	.046 (.529)	.598
LEV	-.033 (-.326)	.745	<b>.265</b> <b>(2.898)</b>	<b>.004*</b>	.102 (1.008)	.351
PROFIT	.041 (.452)	.652	.111 (1.341)	.182	.095 (1.040)	.300
IND						
-consumer product	.056 (.172)	.864	.090 (.305)	.761	-.039 (-.121)	.904
- industrial product	-.041 (-.130)	.896	.196 (.676)	.500	.131 (.410)	.682
- trading/services	.080 (.303)	.763	.386 (1.604)	.111	.062 (.235)	.814
- infrastructure	.153 (1.352)	.178	<b>.220</b> <b>(2.128)</b>	<b>.035*</b>	-.111 (-.973)	.332
- hotel	-.171 (-1.250)	.213	.120 (.958)	.339	.083 (.603)	.548
- properties	-.138 (-.184)	.854	.081 (.430)	.668	.081 (.389)	.698
- plantation	-.025 (-.138)	.890	.142 (.857)	.393	.051 (.278)	.781
- construction	.151 (.598)	.551	.031 (.564)	.574	.123 (.486)	.628

Note: \* significant at 5% significance level



## Analysis on Financial Risks of Derivation and Preventive Measures

Yu Pan

School of Accounting

Southwestern University of Finance and Economics, SWUFE

Zhu B-618, LiuTai Avenue 555, SWUFE, 611130, Sichuan, China

E-mail: [panpan\\_py1988@hotmail.com](mailto:panpan_py1988@hotmail.com)

Fan Wu

School of Accounting

Southwestern University of Finance and Economics, SWUFE

Yi B-328, LiuTai Road 555, SWUFE, 611130, Sichuan, China

E-mail: [eileen890830@hotmail.com](mailto:eileen890830@hotmail.com)

### Abstract

Financial derivatives, as innovative financial instrument, have been designed for enterprises to avoid financial risks. Most of these derivatives rely on future trends of traditional tools, such as valuation, interest rates and exchange rates. Such expected future transactions or events can not be recognized as assets because they do not meet the definition of assets, economic resources owned or controlled by enterprises and only made by past transactions. The use of the traditional accounting model does not accurately disclose this kind of "off-balance-sheet items," and their impact on financial statements. This paper provides some methods for enterprises and government to appropriately recognize and reveal the risks and benefits of financial derivatives.

**Keywords:** Financial derivatives, Fair value, Market risk, Financial statement

### 1. Introduction

Financial Derivatives have been designed based on the traditional tools. Also known as innovative financial instruments, financial derivatives, which rely on future trends of financial instruments, such as valuation, interest rates and exchange rates, pay a small amount of bonds or gold and sign an inter-period contract or swap transactions of different forms of new financial instruments. They are principal instruments for enterprises to avoid financial risks. So therefore judging from the nature of financial derivatives, it is a contacting access to speculative profits with lower initial investment requirements. So far, there have been 1200 different types of financial derivatives in the international financial market.

In contrast, China's financial derivatives markets have been lagged behind, till the formal launch in 1991. At present, the publicly traded financial derivatives in China are: convertible bonds, foreign currency futures, stock index futures, warrants, bonds, futures and so on.

Financial derivative transactions, excluding futures, which are known as the "off-balance-sheet items," are outside the main financial statements of economic issues. The use of the traditional accounting model does not accurately disclose these transactions and the impact on of enterprises' financial situations are not reflected in the statements, and this is inappropriate to the extremely alarming risk caused by financial derivatives. Many users of accounting information discontented with the sufficiency of the existing financial statements revealed. And thus how to appropriately recognize, measure and reveal the risks and benefits of financial derivatives has become urgent in current accounting theory field. In the following passage, the author will talk about this issue.

### 2. The Financial Derivatives' impact on traditional financial accounting

#### 2.1. *The impact on basic concepts of financial accounting*

From the concept of assets and liabilities, the assets are economic resources owned or controlled by enterprises; they can only be made by past transactions and the expected future transactions or events that can not be recognized as asset. However, the major feature of financial derivatives is that the contract embodied in the transactions or events to occur in the future. Therefore, according to the traditional concept, financial derivatives can not be recognized as an asset and so reflected in accounting statements. If the financial derivatives are reduced to assets, it is necessary to change the "assets" concept. If the financial derivatives are reduced to liabilities, it is only a contingent liability that can never be translated into reality liabilities. Once the concept of assets and liabilities are changed, other basic concepts of financial

accounting will also need a series of corresponding changes.

### *2.2. The impact on recognized accounting standards*

Traditional recognized accounting standards are accrual basis and request that income be realized. Both accrual basis and cash basis identified are occurred transactions or events rather than occurring transactions. But financial derivatives transactions indicate a number of financial changes in the future. The sign of forward contracts, a common financial instrument, indicates a certain priced-transaction between financial assets buyer, seller and a series of changes in collection and payment between a certain amount of currency and interest rate during swaps. Such transactions or events, not recognized or reflected in the financial statements, are unpredicted risk faced by user of accounting information. The imperceptibility of off-balance-sheet business has a significant risk and that also explains why effective monitor was difficult to conduct in controlling constant financial derivative chaos these days.

### *2.3. The impact on the disclosure of financial report*

Existing accounting theory is based on realization, matching and conservatism principles, treating the major role of accounting as reflecting corporate occurred profits and request the matching of income and expenses. The fair value of futures contract rate fluctuates with the changes in interest rate while the profit and loss are only related to purchase decision rather than production activities, which makes the achievement of profit no longer the most critical issues. In addition, any change in fair value can not be confirmed in any separate transaction for the period existing between the signing contracts and the final performance. Therefore, the current accounting theory suggests that profits and losses arising from the changes in fair value of interest rate futures contracts are "not achieved", thus should not be confirmed for reliability considerations. The huge amount of risk arising from the frequently fluctuating transaction is not reflected in the balance sheet and will lead to a misleading financial statement, apparently violating the full disclosure principles.

## **3. Proposed control measures for the financial risks of derivatives**

Through the transactions of financial derivatives, part of traders achieves the purpose of hedge and the other part can get high earnings for undertaking risk. Such transactions contribute to economic development and we should not deny the positive role of derivatives. In order to limit the financial risks of derivatives transactions to a certain level, from a macro perspective, the government should establish a sound law and regulation system, carry out seriously and make the best use of such situation; also from a micro perspective, the monitors should strengthen management, make full use of advantage, avoid disadvantage and set models.

### *3.1 Government should limit the degree of an open financial derivatives market.*

The creation of financial instruments has given birth to an unprecedented, prosperous and blooming financial market, changed the traditional areas of business and trading rules of banking system. Derivatives trading business tends to replace the traditional deposit and lending business and becomes the dominant business in commercial banks, investment banks, trust and investment company. Financial enterprises, especially those multinational financial giants rich in operating experience will compel the government to open the market and facilitate it as a perfect profit machine. So the crucial point is whether the government could determine the degree of open market according to its control ability of derivatives and the actual economic condition and create a rational fair market by strengthening internal risk control and clear the responsibility of each trading body. China's financial derivatives have been strictly controlled and the variety and scale of financial instruments are extremely limited until the issue of "Interim Measures for the Administration of financial derivatives transactions" in 2005. All above this show that China's financial derivatives market is still in the initial stage, in terms of the regulatory standards, risk awareness among investors, business level and self-regulatory mechanism. Our country should gradually open the financial derivatives market in accordance with the specific circumstances and the management standards.

### *3.2. Corporate should divide the confirmation time of financial derivatives into initial stage, follow-up and termination.*

Initial recognition is the first confirmation of any item. Generally speaking, initial recognition should be made when a specific and criteria-met transaction occur. Unlike most items, confirmed once, financial derivatives need to be recognized again in follow-up and termination stage because they are on behalf of each forward contract holder's rights and obligations and the period between the signing and the final performance cannot be eliminated. International Accounting Standards No. 39 (IAS39) set the initial confirmation standard as, "Only when enterprises have been one party of a derivative contract, they should confirm it as a financial assets or liabilities in its balance sheet". American Financial Accounting Standard Board (FASB) also points out, "the recognition should record not only the occurrence of relevant items but also their consequences after eliminated from financial report." If an item occurs after the initial recognition, the value changes most, for example, the fair value of financial derivatives. Termination and confirmation set the purpose of a contract's final result. IAS39 sets out the termination standards for financial assets and liabilities. To the termination of financial assets, whether it changed into "out of control" is the key issue. To the termination of financial liabilities, only when the liability (or part of liability) abolishes (the discharged, canceled or expiration of obligation), the enterprise should recognize it as financial liability and remove it from the balance sheet.

### 3.3 Enterprises should enhance the financial information disclosure of derivatives.

First of all, they should improve the structure of traditional accounting statements. For those trading companies with frequent transaction of derivatives which accounted for a larger proportion of turnover, they can increase the content of financial assets and financial liabilities, or change the assets and liabilities according to its liquidity. Assets can be classified as "financial assets" and "non-financial assets", liabilities as "financial liabilities" and "non-financial liabilities." In addition, enterprises can prepare some special statements, such as "financial instruments" and "comprehensive income".

Moreover, we should gradually expand the application of the conservation principle in order to prevent risks. This is a method avoiding risks without revising accounting theory. Specific operation is as follows: First, use a certain method to measure different types of risks. Market risks can be measured by "risk matrix"; credit risk can be calculated by replacement cost; liquidity risk can be based on daily turnover and open positions; operational risk and legal risk can be combined with management mechanism, operating level, and the degree of social law and the quality of employees. Secondly, companies can prepare risk reserve in accordance with the level of risk, the amount of margin and risk factor. Such conduction can ensure the authenticity and accuracy of reserve and has a strong interoperability. Thirdly, company should provide derivatives risk reserve. Debit on "management costs" and credit on "derivative risk reserve" when extraction occur; actual loss, debit on "derivatives risk reserve" and credit on corresponding "financial assets subjects" when actual loss occur. Such information disclosure will help users realize the market supervision from authorities and analyze the current status of company.

Furthermore, we should pay attention to the risk of "off-balance-sheet". The first thing is to increase the number of notes for a sound realization of financial derivative transactions, which are complex and changeable transactions with a great deal of uncertainty. The specific subjects should include the used accounting methods and policies and its related risks with derivatives. Notes should also include other off-the-balance items, such as a special terms contract. Other important factors, affecting the future cash flows, timing and certainty, should also be considered. The second thing is to use the VaR (Value at Risk) risk management techniques. VaR can be regarded as a dynamic risk management techniques and its value will be revealed in an accounting report. The application of this technique makes an excellent supplement to the traditional static accounting report.

### References

- \_\_\_\_\_. (2004). Korea. Accounting factors and avoidance methods of derivatives' investment risk *Market Forum*, (4):64-65.
- Shan Liu. (2004). Risk control methods of derivative instruments. *Accounting Communications*, , (8):23-25.
- Yanping Duan. (2004). Financial derivatives' impact on financial accounting. *Zhengzhou Institute of Economic Management Journal*, (9):38-39.
- Yi Liu. (2004). Analysis on accounting treatment of derivatives. *West China University of Technology (Social Science Edition)*, (4):36-38.



## The Explanation of Anti-Citizenship Behaviors in the Workplaces

Aryan Gholipour (corresponding author)

APublic Administration Department, University of Tehran, Tehran, Iran

E-mail: agholipor@ut.ac.ir

School of Management, University of Tehran, Chamran Highway, Ghisha Bridge

P.O.Box 14155-6311, Tehran, Iran

Tel: 98-21-6111-7745, Fax: 98-21-8800-6477

Majid Saeidinejad

Master of Urban Management, Public Administration Department, University of Tehran, Tehran, Iran

E-mail: saidinejad@acecr.ac.ir

Mona Zehtabi

Master of Urban Management, Public Administration Department, University of Tehran, Tehran, Iran

E-mail: zehtabi@ut.ac.ir

### Abstract

Human capitals are the best competitive advantage in organizations, and have been an important element in any organizational achievement. The reverse is also true. The human resource may be a serious obstacle against organizational effectiveness. In this article, we investigate the anti-citizenship behaviors, and examine the relationship of organizational stress, injustice, personality and culture, and anti-citizenship behaviors. Experimental results suggest that there is a significant correlation between organizational injustice and anti-citizenship behaviors. Hence, when anti-citizenship behavior is increased, the organizational effectiveness is extremely decreased.

**Keywords:** Anti-Citizenship Behavior, Counterproductive Behavior, Deviance, Injustice, Personality

### 1. Introduction

The most important and the greatest resource of any organization, especially any science-based organization, is its humanitarian resource that affects other investments of the organization. One of the problems of today's organizations is the existence of behaviors such as work avoidance, aggression, oppression, obstinacy, intimidation, and revenge. These behaviors affect both performance of the organization and inter-personal relations and cooperative sense of workers. These kinds of behaviors are considered as anti-citizenship behaviors (ACB) and are in contrary to organizational citizenship behaviors (OCB) that lead to improvement of performance and effectiveness of organizations, satisfaction and faithfulness of clients, social interest, etc (Bolino et al., 2002; Podsakoff et al., 2000; Yoon and Suh, 2003). ACB can act as obstacles on the way of the performance of organizations (Ball et al., 1994), lead to decrease of income or damage of its credit, and have negative consequences for the society. While in the private section, dismissing workers, loosing clients, and bankruptcy of weak institutions are considered as negative consequences of ACB. The appearance of ACB in organizations and public institutions- because of their importance and enormity- may cause more serious crisis. Commonality of ACB among workers of organizations that should normally be trusted by people will damage public trust and will interrupt the public functions of these organizations. Therefore, it is necessary to find out the reasons behind ACB in order to be able to control them. At the same time, by strengthening other factors that lead to citizenship behavior increase the function and effectiveness of organizations. Being aware of the causes of such behaviors *i.e.* theft of the sources of organization, enforcing personal and unrelated expenses to organizations (Jelinek and Ahearn, 2006), and other behaviors that decrease physical and humanitarian sources and the credit of organizations] helps the managers to avoid them as much as possible. Therefore, in this article the attempt is to discuss the effects of some organizational, contextual, and personal factors that lead to ACB in organizations through research in a non-governmental and public institution.

### 2. Literature review

While ACB leads to the loss of millions of dollars annually (Pearce and Giacalone, 2003), studies recently done on ACB are not comprehensive. After the appearance of the concept of ACB in the management language, Ball, Trevino, and Sims (1994) have defined it as a misbehavior that decreases the output of work; also some terms such as aggression

(Neuman and Barron, 1998), antisocial behavior (Giacalone and Greenberg, 1997), counterproductive work behavior (CWB) (Fox et al., 1999), delinquency (Hogan and Hogan, 1989), retaliation (Skarlicki and Folger, 1997), revenge (Bies et al., 1997), and deviance (Robinson and Bennett, 1995; Hollinger, 1986) are used to describe ACB. The researchers working in this field have found out that these behaviors may include a vast continuum of reactions such as problem-making, theft, revenge, fighting, aggression or even fun making (Pearce and Giacalone, 2003).

In many cases an improper behavior is in contrast to proper citizenship behavior. For example, the citizenship behavior due to work conscientiousness will become more evident when it is observed in contrast to work avoidance, being absent and having delay (Spector and Fox, 2002). But it is so important to be aware that ACB is not the low level of citizenship behavior. It is in accordance with Puffer's idea that ACB is not the opposing point of positive aspects of social behaviors and is not necessarily considered as deviant behaviors (Mackenzie et al., 1998). Studies on ACB mainly have focused on the damaging effects of these behaviors on operation of trading organizations. For example in the language of buyer-seller the behavior and manner of seller affects the process of trading (Crosby et al., 1990; Dwyer et al., 1987; Ramsey and Sohi, 1997).

The concept of ACB has been also used under different names. Although these concepts do not totally overlap but the extent of similarities between them is interesting. We will provide a brief description on such terms used in the literature representing ACB (Table 1).

*Table 1: Interchangeable Concepts*

Employee deviance behavior- Robinson and Bennett (2001) consider the abnormal behavior of employees as an optional act that violates the important organizational norms and threatens the credit of an organization, its members, or both. They have made a difference between the abnormal and the unethical behavior of employees. In their opinion abnormality defines those behaviors that violate organizational norms, while unethical behaviors violate the laws and traditions of a society. Authors have also proposed a bilateral type of workplace behavior: "non-important" against "seriously important" and "interpersonal" against "organizational" (Robinson and Bennette, 2001).

Anti-social behavior- Giacalone and Greenberg (1997) define anti-social behavior as a behavior that brings damage to organization, employees, and the stakeholders. Some of the anti-social behaviors can be named as follows: arson, blackmail, bribery, discrimination, espionage, extortion, fraud, kickback, lying, sabotage, theft, violations of confidentiality and violence. This definition includes the behaviors inside and outside the organization and also the behaviors that bring damage to individuals and organizations (Giacalone and Greenberg, 1997).

Dysfunctional behavior- Griffin et al., (1998) believe that dysfunctional behavior in organizations causes negative consequences for individuals and organizations. This conceptual framework includes behaviors that based on their purpose are functional and dysfunctional. These behaviors can be divided into two general groups: behaviors that directly damage individuals or groups behaviors. It is clear that so many of dysfunctional behaviors may finally damage both individual and organization; but the fact that which group receives more damage is the base of this division. As it can be seen the behaviors related to outside of organizations are not included in this division. Also, the separating lines of this division are not clear; for example some behaviors such as unsafe working acts may be included in more than one group.

Counterproductive work behavior (CWB)- Spector and Fox (2002) define counterproductive work as a behavior that damages organizations or their members such as potential damaging act. Some of these behaviors are as follows: work avoidance, improper way of working, physical abuse, using insulting words, problem making and theft. Some acts such as abusing or insulting directly affect individuals while others such as improper way of working and problem making directly affect organizations. Some behaviors such as theft may affect both.

Organizational misbehavior (OMB)- Any act of organization members that violates social or organizational norms is an organizational misbehavior. In this kind of behavior like unproductive behavior the purpose and intention of the employee has an important role. Behaviors that are in harmony with organizational values but in contrast with social values (such as lying for the sake of organization) are considered as organizational misbehavior, as well as behaviors in harmony with social values but in contrast with organizational values (such as revealing the secrets of organization). This approach contains most damaging behaviors, behaviors that damage inside and outside of the organization and both individuals and society (Vardi and Wiener, 1996).

Workplace aggression- In the current literature, aggression in workplace, considering individuals attempt to damage the others, is defined in a vast continuum of diverse and surprising behaviors (Baron and Richardson, 1994). Baron introduces aggression in the workplace three stages: (1) non-cooperation, dissemination of rumours, ill-speaking, continuation of struggle, and using insulting and abusive words; (2) serious argument with supervisors, colleagues, and clients, sabotage, threatening, and hurting other people's feelings; (3) showing anger through threatening to suicide, fighting, destroying belongings, using weapon, murder, raping, and inflaming (Baron, 1994).

Other terms that likewise describe negative behaviors are: "retaliation" as a revengeful behavior with damaging consequences (Skarlicki and Folger, 1997), "Revenge" as a kind of behavior with permanent and long-term damage for the interests of others (Bies et al., 1997); "noncompliant behavior" as a kind of behavior that leads to violation of

existing norms and regulations (Puffer, 1987); “workplace incivility behavior” as a kind of deviant behavior with vague intention and a little force for harming others (e.g. impoliteness and showing indifference towards others) (Andersson and Pearson, 1999)

### 3. Aspects of anti-citizenship behaviors

The concept of ACB in this study includes the following terminologies:

**Defiance-** This kind of ACB is any apparent behavior of the employee that is directly in contrast to the policies and expectations of organization. Such behavior is expressed continually, in front of public, to show one’s claim and enmity. For example in a commercial organization, the defiant sellers try to attract other’s attention to their dissatisfaction, and to stress on their disagreement with the organization, its members and its policies; like obvious deny of regulations and the sale methods of company, avoidance from sharing the information related to clients to organization or sale manager, and apparent declaration of one’s disagreement with the sale organization.

**Resistance-** In contrast to *defiance* that is visible, this aspect of ACB is generally more internal and is done without public protest. People who show resistance against power of organization and its management, are considered as an opposing force with a different idea, that are mostly hidden; such as general opposition against organization, not respecting private boundaries, and one-sided attempts to take handle of the affairs of the group, deceiving or putting aside the managers.

**Work avoidance-** Any kind of behavior that includes avoidance, flee, denial, and disregarding work and responsibilities is defined as *work avoidance*. In case of occupations that physical presence of the worker is not important (e.g. market-makers that mostly work outside the organization) *work avoidance* becomes more evident. Fleeing from work is a common problem through all organizations especially governmental organizations: stop working early, not restoring the accounts, not answering emails and telephone calls related to work, delay in submitting the report, cancelling sale appointments, and non-availability when colleagues or managers call.

**Revenge-** Any kind of behavior done to reflect over some past mistakes or harms is defined as *revenge* (Jelinek and Ahearn, 2006). Examples of *revenge* are spending non-commercial expenses, stealing the requirements and materials of the company, and sharing the secrets of the oppressions of the organization with people outside of the organization.

**Aggression-** Expressing physical sensations and personal excitements to express opposition, protest, and anger towards colleagues, supervisors, or clients in order to hurt them define *aggression*. Distinguishing between aggression in workplace and harshness in workplace, Neuman and Baron believe that *aggression* in a workplace is the individual’s attempts to bring harm to the people or organizations affiliated with the company (Neuman and Baron, 1998). Misbehavior in appointments, full attempt for having control or ownership of the group, hostile protest to colleagues, using improper words, having proud gestures, and criminal threatening of colleagues are examples of *aggression*.

### 4. Causes of anti-citizenship behaviors

Although most researches implied that ACB is the result of dissemination of injustice in organizations (Ball et al., 1994), yet other studies consider other factors for the appearance of ACB. Jelinek and Ahrean (2006) claim that special organizational factors such as organizational justice and inter-organizational competition, and contextual factors, such as job stress and organizational balance, directly affect ACB; while characteristics of the employees, such as Locus of Control, introversion, and compatibility with situation, adjust the functionality of these effects. In this research injustice and culture as organizational factors and job stress as contextual factor have been chosen as causes of ACB. Researchers believed that in the organization under study, the organizational culture is effective in appearance of ACB. The lack of organizational balance is also considered as one of the reasons of the appearance of tension or the factors leading to ACB. Therefore, the study was limited to tension with the supposition that this factor is itself under the effect of organizational balance. In this study also, in spite of locus of control and self - monitoring, the moderating role of personality is studied.

It is the guiding culture that shows what employees can do and how they should do them. An organization recommends the proper and accepted behaviors which mean “what employees should do”; although what really happens depends on the situation, suppositions and what happens around them, will be different, these differences are the results of the practical theories that determine the actual behavior of experts (Argyris and Schon, 1974). Therefore it is possible that are differences among the bureaucratic recommendations of organizations, the logically accepted behaviors, and the actual behavior that happens in practice. The differences among espoused value, practical theories, and used theories can be explained by considering cultural characteristics of organization. Czarniawska (1992) introduced the perceptible and imperceptible issues of culture as follows: “*culture is the actual way of doing things that have been obviously recommended in documents, decisions and rules.*” Khademian (2002) also believed that the perceptible signs of culture describe the manner of doing the work. Additionally Kunda (1992) noted that culture defines some rules for behavior, way of thinking and feeling. Finally, Schein considers culture as containing main suppositions and beliefs that are common among the members of an organization and work unconsciously (Schein, 1985: 6). Although in the literature, there has not been any study about the effect of organizational culture on the appearance of ACB, according



to the description of organizational culture, it seems that the culture of employees of an organization have effects on the appearance of negative behaviors. Hence the first hypothesis is proposed as follows:

**H1:** There is a significant relationship between organizational culture and ACB.

The concept of organizational justice is the understanding of an employee about correctness or incorrectness of the way of administering the company and the behavior of employees (Greenberg, 1986). The preliminary studies focused on two different types of justice understanding: distributive justice and procedure of justice. Organizational justice has gradually attracted the attention of many scholars, because many important organizational approaches and behaviors are in direct contact with the understanding of employees from justice. Till the year 1975, study of justice in organizations was mainly related to distributive justice (Colquitt et al, 2001). Studies on justice started by Adams theory of equity in which, Adams emphasizes on understood fairness of consequences that is distributive justice (Cohen-charas and Spector, 2001). Later, theory-makers of organizational justice differentiated between the concept-makings of justice that consider the content of decisions (distributive justice) and concepts that focus on the fact that how decisions are made (procedure of justice). Also, the concept of interactional justice focuses on interpersonal aspect of organizational acts, especially behavior and relation between managers and employees. It can be claimed that the basis of the concept of distributive justice is the theory of Adams (1965). In the equation theory, by comparing the inputs and outcomes, it has been discussed that people come to a judgment about concept of justice in organization by comparing these two in their own and other's acts. Therefore if they feel that there is injustice, they will stand against it.

The model of a fair judgment is a four-stage process that the individuals can evaluate consequences based on:

- (1) Individuals decide to use the law that seems just in their opinion and then evaluate it.
- (2) Based on their definition of just, individuals estimate the extent and type of the consequences that they deserve to receive.
- (3) Considering the law, individuals estimate the consequences they deserve.
- (4) Individuals evaluate the extent of fairness of the real consequences they have received by comparing them to the consequences they deserved to receive.

Ball et al., (1994) indicated that distributive justice and procedure of justice have effects on ACB; for example it has been seen that sellers mostly feel that rewards and punishments are not distributed fairly among them (Donath, 1999). Even some of them claim that when the rate of sale is high, the company considers them as kind of products and gives rewards to those whose researches have led to increase of products. But when the rate of sale is low they consider the sellers responsible for this problem. Either way, it should be noticed that the sellers have the potential to react to the unfair behaviors of company by ACB. Hence the second hypothesis is proposed as follows:

**H2:** There is a positive and significant relationship between organizational injustice and ACB.

Job stress of sellers is defined based on their understanding of workplace environment and the factors that put them under pressure. Sager and Wilson (1995) encourage the researchers of marketing and sale to study the damaging effects of stress on sellers (Sager and Wilson, 1995; Srivastava and Sager, 1999).

There is a hypothesis that job stress increases ACB. For example, the stress that is due to the paradox between the will of sale managers and clients, if accompanied by the necessity of having missions outside the city and the promise of a compressed working program, may put sellers into a situation that they feel "*we are dying because of too much work*". Hence, when they are burnout, they may start fighting (aggression) or may stand against the factor of stress (e.g. work avoidance) in order to free themselves from the intolerable pressure. Workers, who are under too much pressure, intend to ignore any relation at work; this status may lead to ACB. When such phenomenon happens, the sellers do not consider their colleagues and the sale managers as their friends and may restrain from giving them information (revenge) and when people try to make fun of them, they will show aggression. (Jelinek and Ahearn, 2006). Hence the third hypothesis is proposed as follows:

**H3:** There is a positive and significant relationship between job stress and ACB.

Locus of control is a degree in which the individuals believe that promotion and improvement of each person depend on their own attempt, chance, accident and unexpected events. People, who have internal locus of control, believe that their success and their activities are the result of their own attempt, while those who have external locus of control believe that they do not have any role in what happens. Research shows that locus of control reference affects behavior (Chung and Ding, 2002); management experts say that the employees with internal Locus of Control are more responsible for their acts, while the researchers of sale affairs believe that the sellers with internal locus of control are more practical and more reformist towards stresses (Srivastava and Sager, 1999).

The reference of locus of control in analysis of the effects of the mentioned outcomes on ACB is considered as an adjusting factor. For example when sellers with external locus of control feel that they have lots of stress or believe that they are threatened by their organization in an unfair manner (feeling of organizational injustice), most probably it will

lead to ACB. From these sellers point of view, there is no relation between ACB and their consequences. Therefore when they are punished because of their behavior, probably they see themselves as victims (Jelinek and Ahearn, 2006).

There is a tendency to see the social signs of environment and to make use of them to direct one's own behavior when facing changing outcomes (Synder, 1974). Management researchers have taken the concept of self-monitoring from psychology and have used it to study organizational behavior (Miller and Cardy, 2000; Synder and Copeland, 1989). People, who have a good self-monitoring ego, want to adapt themselves to workplace environment; it has been shown that high self-monitoring is correlated with the outcomes of well-employment (Miller and Cardy, 2000).

Since sellers are usually evaluated from various aspects such as manager's point of view, the belief that sellers adapt their behavior to the preferences of their managers seems reasonable. Therefore, self-monitoring acts as an adjusting factor in analysis of relations between mentioned outcomes and ACB (Kilduff and Day, 1994).

In contrast to Freud who considered men as a wandering creature between two opposing poles, Jung believed that the individuals will finally find the way to the perfection in the challenges of life. Freud gave too much importance to the first years of life and considered that people's personalities are under those years effect until death. On the contrary, Jung believed that both past and the probable future are effective in forming one's personality. According to Jung, wishes and dreams have an amazing effect on individuals' behaviors (Gholipour, 2007: 200). There are different theories about the method of evaluating aspects of personality. For example in recent years, studies and researches put emphasis on five-factor model. These factors are as follows:

**Introversion/Extroversion:** Jung used two terms of introversion and extroversion to name two aspects of human's personality and believed that each person from the psychological point of view is in one of these categories. According to Jung an extrovert is a person who is more interested in the outside world, real things and people, while an introvert is more concerned with his own thoughts, and feelings. It can be said that in contemporary history of psychology there has been no other definition that could have attracted as much attention as introversion and extroversion of Jung. In the literature of social sciences, extroversion and its opposing point introversion are considered as one of the five important and effective characteristics on the behavior of human (Saucier, 1994; Wiggins, 1996). Introversion is defined as the degree of isolationism and reservation and is measured based on the amount of passiveness. Sale researches have studied the effect of personal characteristics on behaviors and acts (Brown et al., 2002) and some researchers have shown that it is much more difficult for introverts to deal with problems (Windower, 2002). Probably introversion acts as an adjusting factor between the effects of organizational and contextual factors and ACB. Moreover as introverts have tendency for isolation, they face social changes with more calmness and less experience. They are not capable enough for having productive, healthy and methodological discussion and do not express their disagreement in free discussions; but usually stand and behave against their managers by concealed acts (Jelinek and Ahearn, 2006).

**Agreeableness:** Agreeableness is the extent of paying respect to others. Agreeable people have a cooperative character, are intimate and reliable, while disagreeable people are unfriendly, competitive and aggressive.

**Conscientiousness:** Conscientiousness is the extent of one's reliability. Conscientious people are responsible, stable, ordered, and reliable, while those who get low scores in this aspect are usually disordered, unreliable and confused.

**Neuroticism/Emotional stability:** Neuroticism is the measure for one's capability for tolerating the factors that produce stress and tension. People, who are emotionally stable, are usually safe, self confident, stable, and calm, while people who do not have emotional stability, are usually nervous, angry, unsure, unsafe, depress, anxious and have psychological problems.

**Openness:** Openness focuses on the interest of an individual towards new experiences. *Open* people are creative, curious and sensitive. While on the other side of the continuum people follow tradition, and are more relaxed in familiar situations (Gholipour, 2007: 209). It seems that added to introversion, other aspects of personality also have adjusting role in relation to the effect of organizational and contextual factors on ACB.

## 5. Methodology

**5.1. Sample:** The population under study are the employees of a public but non-governmental institution in Tehran with more than 2600 workers. It is a proper population for a functional and descriptive research, whose results can be generalized, as there are different levels of education, occupation, and various responsibilities in service, culture, education and research centres in an almost newly established organization and on the way of development. The sample is made of 244 random people out of 300 people who were given the questionnaires.

**5.2. Data collection:** Data collection was done through questionnaires. Subjects have been guaranteed that their names will not be revealed, therefore there was no question demanding personal information about people. Data collection was through questionnaire with eight general questions and 131 questions for measuring independent, dependent and moderating variables. The questions were five choice based on Likert scale of (5) strongly agree, (4) agree, (3) neutral, (2) disagree, and (1) strongly disagree.

**5.3. Reliability and Validity:** In preparing the questionnaire, we made sure to make questions simple and clear. In order to measure the validity of the questionnaire a pre-sample including 30 questionnaires was prepared and then using the data collected, after omitting some questions, its reliability was measured using Kronbach multiple alpha; for 25 questions of ACB 87%, for 11 questions of organizational culture based on Robins categorization 78%, for 10 questions of organizational justice 80%, for 6 questions of stress 91%, for 3 questions of Locus of Control 70 %, for 5 questions of self-monitoring 88%, and for 44 standard questions of personality 71% were measured. These numbers show that the questionnaire has enough reliability. To measure its validity more than contextual analysis, factor analysis was also used.

Analysing the data, copy 15 of SPSS software and LISREL 8.53 were used and 1% error level was considered for hypothesis test. The causal relation between independent and dependent variables were tested using structural equation modelling. As it can be seen in Figure 1, the model is suitable considering ratio indicators; as the amount of  $\chi^2/df$  is 2.35 and is less than the permitted amount of 3, and the amount of RMSEA is also less than .08. Among the effective factors on ACB, only injustice has considerable effect (.50), in other words, it seems that probably with one unit increase in injustice, there will be .50 unit increase in ACB. Two other factors of “stress and culture” do not have that much effect on ACB.

Figure 1, standard model

Figure2, significant model

Figure 2 shows that only the effect of injustice on ACB is significant and the effect of two other variables of stress and culture on ACB is not significant. The amount of determining model score is R-Square=0.37; which means that from 100% change of ACB, about 37% is because of injustice.

To test and identify the effect of moderating variables on independent and dependant variables, the Subgroup analysis method was used; firstly Regression model was performed in different amounts and situations of moderating variables (low and high quantity), and then their results were compared in cases where the results of models (especially regression score) had great difference. We understood that the effect of adjustment on the considered relation was significant. The results of the test using this method are given in Table 2:

Table 2: the comparison of the moderating effect of moderating variables:

## 6. Discussion and conclusion

**6.1. Results:** According to the results of the comparison of models of analysis with low and high quantity of moderating variables, We derived the following statements:

- The variable of Locus of Control reference is moderating only for the effect of culture and stress on ACB.
- The variable of self-monitoring has moderating effect only on the relation between culture and stress with ACB.
- The variable of introversion does not have any moderating effect on the relation of culture, stress, and injustice with ACB.
- The variable of agreeableness has moderating effect on the relation of all three variables of culture, stress, and injustice with ACB.
- The variable of conscientiousness has moderating effect on the relation of culture, stress, and injustice with ACB.
- The variable of neuroticism has moderating effect on the relation of culture, stress, and injustice with ACB.
- The variable of extroversion has moderating effect on the relation of culture, and injustice with ACB.

The results of testing hypotheses indicate that there should be some reforms in the research model of researchers. The results of research can be summed up as follows:

According to the results of this research, there is a negative relation between organizational culture and ACB (with standard score of -.12) that indicates the existence of a reverse relation. This relation seems to be logical as by development of the basis and improvement of cultural indicators, it is expected that ACB decreases; but this relation is weak, it means that with the increase of organizational culture for one unit, ACB will be decreased only for .12 unit; it should be mentioned that this relation is not significant in the certainty level of .95 (with the significant score of -.66). Hence the first hypothesis is not fully confirmed with following reasons:

The organization under study has a special culture that makes it greatly different from other organizational cultures, especially non-Iranian organizations.

Studies on ACB in organizations started recently. Especially no field study has been done on the relation between culture and ACB. Jelinek and Ahearn (2006) reviewing the literature of this field in their article under the name of “the ABC of ACB” in which they have only given some hypotheses in this regard, and have closed the discussion in their article without providing results of field studies.

Researches related to organizational citizenship behavior and ACB are generally done in commercial organizations and marketing. It is common to assume that mainly, organizational culture in such fields and organizations, that even their

social responsibilities are affected by the factor of benefit, is different from organizational culture in public and governmental organizations.

The results of the research show that there is a significant, positive and considerable relation between injustice and ACB (with the standard score of 5/0 and significant score of 06/2). Therefore the data and the results of analysis confirm this hypothesis. This relation shows that with one unit increase in injustice, ACB will be increased to 5/0 units.

Table 1 shows a really weak but positive relation between job stress and ACB (with the standard score of 01/0). The level of significant in this relation is not certain and it has been completely rejected (with significant 08/0).

**6.2. Conclusion:** Normally in field studies, phenomena that are not directly visible are considered and evaluated based on their effects and consequences. As it was mentioned in theoretical bases, stress has three groups of consequences; psychological, physical, and behavioral. Medical doctors and psychiatrists normally consider some psychological and physical effects as the result of stress in patients. But the stressful behavior usually may have other reasons rather than stress, and one cannot question the people under stress like a doctor or psychiatrist. The standard questionnaires that exist in this regard are prepared for the field of medicine and psychology. Therefore the proposed questions in questionnaire of this research are asking about the special factors that may potentially produce tension. On the other hand, stress has an increasing characteristic, can exist in a person but may not be seen directly, and its levels are different in different people. Probably the existence of religious feelings and beliefs can increase the capacity of people in dealing with stress.

In factor analysis some of the prepared questions to measure this variable were omitted due to the lack of the required factor loading. Hence only three questions as the indicators of evaluation were involved. This number of questions may not be enough to cover all aspects of job stress.

The results of statistical analysis, for moderating role of the “internal locus of control” on the effect of independent variables of “organizational culture”, “injustice”, and “stress” on “ACB” show that there is a great difference between the effect of culture on ACB in low and high quantity of “internal locus of control (with the difference of 24/0 in standard score) and the effect of “stress” on ACB. On the other hand, the difference between the results of statistical analysis of the effect of “injustice” on ACB in low and high quantity of the variable of “internal locus of control” (with the difference 23/0 in standard score), is not visible. Analysis of the results of these two situations shows that the variable of “internal locus of control” is only affecting the relations between “organizational culture” and ACB, and “stress” and ACB. In other words, the fourth hypothesis of the research about the internal locus of control is only confirmed for the first and the third hypotheses. The point that “internal locus of control” in second hypothesis does not have moderating role, may be due to the fact that “injustice” in contrary to “culture” and “stress” that have interpersonal sources, has external source. This means that employees of the organization believe that the understood “injustice” is due to some decisions that they had not been involved in. “locus of control” is not a binary attribute: it is not the case that one person has “internal locus of control” and the other “external”, but all individuals are on a continuum that depending on which end they are closer to, they are tagged as one. In other words, in different cases one person may have internal or external locus of control. The event and the situation they are dealing with is a good explanation of the type of locus of control they have.

Statistical analysis shows that there is a great difference among the effect of culture on ACB in low and high quantity of the variable “self-monitoring” (with the difference .11 in standard score), and the effect of stress on ACB in low and high quantity of the variable “self-monitoring” (with the difference .28 in standard score) and a little difference in the effect of injustice on ACB in low and high quantity of the variable “self-monitoring” (with the difference .03 in standard score). This comparison shows that the variable of “self-monitoring” only has moderating role for the effect of “organizational culture” on ACB and the effect of “stress” on ACB. In other words, the fourth hypothesis about “self-monitoring” is confirmed for the first and third hypothesis. In this case also the reason of lack of moderating role of “self-monitoring” in the relation between “injustice” and ACB can be sought in identity of injustice; which means that most responders, not considering the extent of the characteristic of self-monitoring in them, had the same kind of reaction towards injustice.

Considering the five aspects of personality, the results of statistical analysis of the research show that introversion does not have moderating role in relation to any of the first and third hypotheses about the effect of organizational culture, injustice, and stress on ACB. Agreeableness has moderating role in relation to the first and third hypotheses about the effect of organizational culture, injustice, and stress on ACB. Conscientiousness has moderating role in relation to the first and third hypothesis about the effect of organizational culture, injustice, and stress on ACB. Neuroticism has moderating role in relation to the first and third hypotheses about the effect of organizational culture, injustice, and stress on ACB. The fourth hypothesis about the variable of extroversion is only confirmed about the effect of culture and injustice on ACB. This variable does not have moderating role in relation to the effect of stress on ACB.

Limitations such as the variety of independent variables, the quantity of questionnaire, limitations in subjects, time and expenses, on this area of research did not let the researchers enter other fields of ACB. For the future work, it would be interesting to see research on the following subjects: The effect of organizational factors on appearance of ACB in organizations such as banks, municipals, and service organizations that deal with so many clients, Study of factors outside organizations such as social justice, poverty, suburban life, and television programmes including internal and satellite on ACB, Study of the role of public culture on appearance of ABC, Study of the relation between organizational citizenship behavior and public citizenship behavior, Study of the relation between effective managing of feelings and ACB, Study of the relation between personal power and ACB, Study of the relation between opposing management styles and ACB, and Study of the relation between the system of organizational relations and ACB.

## References

- Adams, J.S. (1965). Inequity in social exchange. In L. Berkowitz (Ed.), *Advances in experimental social psychology*, (pp. 267-299). New York: Academic Press.
- Andersson, L.M. & C.M. Pearson (1999). Tit for tat? The spiraling effect of incivility in the workplace. *Academy of Management Review*, 24, 452-471.
- Argyris, C. & Schon, D. A. (1974). *Theory in practice: Increasing professional effectiveness*. San Francisco: Jossey-Bass.
- Ball, G. A., Trevino, L. K. & Sims Jr., H. P. (1994). Just and unjust punishment: Influences on subordinate performance and citizenship. *Academy of Management Journal*, 37(2), 299.
- Baron, R. A. (1994). The physical environment of work settings: Effects on task performance, interpersonal relations, and job satisfaction. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior*, 16, (pp. 1-46). Greenwich, CT: JAI Press.
- Baron, R. A. & Richardson, D. R. (1994). *Human aggression* (2nd ed.). New York: Plenum.
- Bies, R. J., Tripp, T. M. & Kramer, R. M. (1997). *At the breaking point: cognitive and social dynamics of revenge in organizations*. In R. A. Giacalone, & J. Greenberg (Eds.), *Antisocial behavior in organizations*, (pp. 18-36). Thousand Oaks, CA: Sage.
- Bolino, M.C., Turnley, W.H. and Bloodgood, J.M. (2002), Citizenship behavior and the creation of social capital in organizations, *Academy of Management Review*, 27(4), 5-522.
- Brown, T. J., Mowen, J.C., Donavan, T. & Licata, J.W. (2002). The customer orientation of service workers: Personality trait effects on self and supervisor performance ratings. *Journal of Marketing Research*, 9(1), 110.
- Castro, C.B., Armario, E.M. and Ruiz, D.M. (2004), The influence of employee organizational citizenship behavior on customer loyalty, *International Journal of Service Industry Management*, 15(1), 27-53.
- Chung, Y. Y. & Ding, C. G. (2002). Development of the sales locus of control scale. *Journal of Occupational and Organizational Psychology*, 75, 233.
- Cohen-Charash, Yochi. & Paul E. Spector (2001). The role of justice in organizations: A meta-analysis. *Organizational Behavior and human decision processes*, 86(2), 278-321.
- Colquitt, Jason. A, Donald E. Conlon, K. Yee Ng, Michael J. Wesson & Christopher O.L.H. Porter. (2001). Justice at the Millennium: A Meta-Analytic Review of 25 Years of organizational Justice Research, *Journal of Applied psychology*, 86(3), 524-445.
- Crosby, L. A., Evans, K. R. & Cowles, D. (1990). Relationship quality in services selling: An interpersonal influence perspective. *Journal of Marketing*, 54(3), 68.
- Czarniawska-Joerges, B. (1992). *Exploring complex organizations: A cultural perspective*. Newbury Park, CA: Sage.
- Donath, B. (1999). Get marketing, sales on same wavelength. *Marketing News*, 33(19), 16.
- Doney, P. M. & Cannon, J. P. (1997). An examination of the nature of trust in buyer-seller relationships, *Journal of Marketing*, 61(2), 35.
- Dwyer, F. R., Schurr, P. & Oh, S. (1987). Developing buyer-seller relationships, *Journal of Marketing*, 51(2), 11.
- Dyne V.L, Graham JW, & Dienesch RM. (1994). Organizational Citizenship Behavior: construct redefinition, measurement, and validation, *Academy of Management Journal*, 37(4), 765-802.
- Fox, S., Spector, P. E. & Miles, D. (1999). *Counterproductive work behavior (CWB) in response to job stressors and organizational justice: the moderator effect of autonomy and emotion traits*. Paper presented at the annual meeting of the Society for Industrial and Organizational Psychology, Atlanta (April-May).
- Giacalone, R. A. & Greenberg, J. (Eds.) (1997). *Antisocial behavior in organizations*, Thousand Oaks, CA: Sage.

- Gholipour, A. (2007). *Organizational Behavior*, Tehran: Center for social science.
- Greenberg, J. (1986). Determinants of perceived fairness of performance evaluations, *Journal of Applied Psychology*, 71(2), 340.
- Griffin, R.W., A. O'Leary-Kelly. & J. Collins. (1998). *Dysfunctional work behavior in organizations*. In C.L. Cooper and D.M. Rousseau (Eds.) Trends in organizational behavior. Vol 5. John Wiley & Sons.
- Hogan, J. & Hogan, R. (1989). How to measure employee reliability, *Journal of Applied Psychology*, 74,273–279.
- Hollinger, R. C. (1986). Acts against the workplace: social bonding and employee deviance, *Deviant Behavior*, 7,53–75.
- Jelinek,R.; Ahearn,M. (2006). The ABC's of ACB: Unveiling a clear and present danger in the sales force, *Industrial Marketing Management* , 35: 457-467.
- Khademian, A. M. (2002). *Working with culture: The way the job gets done in public programs*, Washington, DC: CQ Press.
- Kilduff, M., & Day, D. V. (1994). Do chameleons get ahead? The effects of self-monitoring on managerial careers, *Academy of Management Journal*, 37(4).
- Kinney, J. A. (1993). Breaking point: The workplace violence epidemic and what to do about it. Chicago, IL: National Safe Workplace Institute Press, *Journal of Management*, 24(3).
- Kunda, G. (1992). *Engineering culture: Control and commitment in a high-tech corporation*, Philadelphia: Temple University Press.
- MacKenzie, S. B., Podsakoff, P. M., & Ahearne, M. (1998). Some possible antecedents and consequences of in-role and extra-role salesperson performance, *Journal of Marketing*, 62(3), 87.
- Miller, J. S. & Cardy, R. L. (2000). Self-monitoring and performance appraisal: Rating outcomes in project teams, *Journal of Organizational Behavior*, 21(6), 609.
- Neuman, J. H., & Baron, R. A. (1998). Workplace violence and workplace aggression: evidence concerning specific forms, potential causes, and preferred targets, *Journal of Management*, 24, 391–419.
- Pearce, C. L. & Giacalone, R.A. (2003). Teams Behaving Badly: Factors Associated With Anti-Citizenship Behavior in Teams, *Journal of Applied Social Psychology*, 33(1), 58-75.
- Podsakoff, P.M., MacKenzie, S.B., Beth Pain, J. and Bachrach, D.G. (2000). Organizational citizenship behaviors: a critical review of the theoretical and empirical literature and suggestions for future research, *Journal of Management*, 26(3), 513.
- Puffer, S. M. (1987). Prosocial behavior, noncompliant behavior and work performance among commission salespeople, *Journal of Applied Psychology*, 72(4), 615–621.
- Ramsey, R. P. & Sohi, R. S. (1997). Listening to your customers: The impact of perceived salesperson listening behavior on relationship outcome, *Journal of the Academy of Marketing Science*, 25(2), 127.
- Robinson, S. L. & Bennett, R. J. (1995). A typology of deviant workplace behaviors: a multidimensional scaling study, *Academy of Management Journal*, 38, 555–572.
- Sager, J. K. & Wilson, P. H. (1995). Clarification of the meaning of job stress in the context of sales force research, *The Journal of Personal Selling and Sales Management*, 15(3), 51.
- Saucier, G. (1994). Separating description and evaluation in the structure of personality attributes, *Journal of Personality and Social Psychology*, 66(1), 141–154.
- Schein, E. H. (1985). *Organizational culture and leadership*, San Francisco: Jossey-Bass.
- Skarlicki, D. P. & Folger, R. (1997). Retaliation in the workplace: The roles of distributive, procedural, and interactional justice, *Journal of Applied Psychology*, 82(3), 434.
- Snyder, M. (1974). Self monitoring of expressive behavior, *Journal of Personality and Social Psychology*, 30(4), 526–537.
- Snyder, M. & Copeland, J. (1989). *Self-monitoring processes in organizational settings*. In R. A. Giacalone, & P. Rosenfeld (Eds.), *Impression management in the organization*, England' Lawrence Erlbaum Associates, Inc.
- Spector P. E. Fox, S. (2002). An emotion-centered model of voluntary work behavior: Some parallels between counterproductive work behavior and organizational citizenship behavior, *Human Resource Management Review*, 12, 269-292
- Srivastava, R. & Sager, J. K. (1999). Influence of personal characteristics on salespeople's coping style, *The Journal of Personal Selling and Sales Management*, 19(2), 47.

Wiggins, J. S. (1996). *The five factor model of personality: Theoretical perspectives*, New York: Guilford Press.

Windover, A. K. (2002). *The roles of dispositional coping, personality, and situational characteristics in situational coping behavior*, dissertation abstracts international.

Vardi, Y. & Y. Wiener. (1996). Misbehavior in organizations: A motivational framework, *Organizational Science*, 7, 151-165.

Yoon, M.H. and Suh, J. (2003). Organizational citizenship behaviors and service quality as external effectiveness of contact employees, *Journal of Business Research*, 56, 597-611.

Table 1. Interchangeable Concepts

Interchangeable Concepts	Scholars
Employee deviance behavior	Robinson and Bennett, 2001
Anti-social behavior	Giocalone and Greenberg, 1997
Dysfunctional behavior	Griffin et al., 1998
Counterproductive work behavior (CWB)	Spector and Fox, 2002
Organizational mis-behavior (OMB)	Vardi and Wiener, 1996
Workplace aggression	Baron and Richardson, 1994
Anti-citizenship behaviors (ACB)	Jelinek and Ahrean, 2006

Table 2. the comparison of the moderating effect of moderating variables:

Moderating variables	Effect of culture on ACB	Effect of injustice on ACB	Effect of stress on ACB
Locus of Control	Really important 24/0	Non-important 06/0	Really important 23/0
Self-monitoring	Really important 11/0	Non-important 03/0	Really important 28/0
Introversion	Non-important 04/0	Non-important 05/0	Non-important 07/0
Agreeableness	Really important 20/0	Really important 55/0	Really important 28/0
Conscientiousness	Really important 10/0	Really important 10/0	Really important 27/0
Neuroticism	Really important 25/0	Really important 51/0	Really important 26/0
Extroversion	Really important 22/0	Really important 15/0	Non-important 07/0

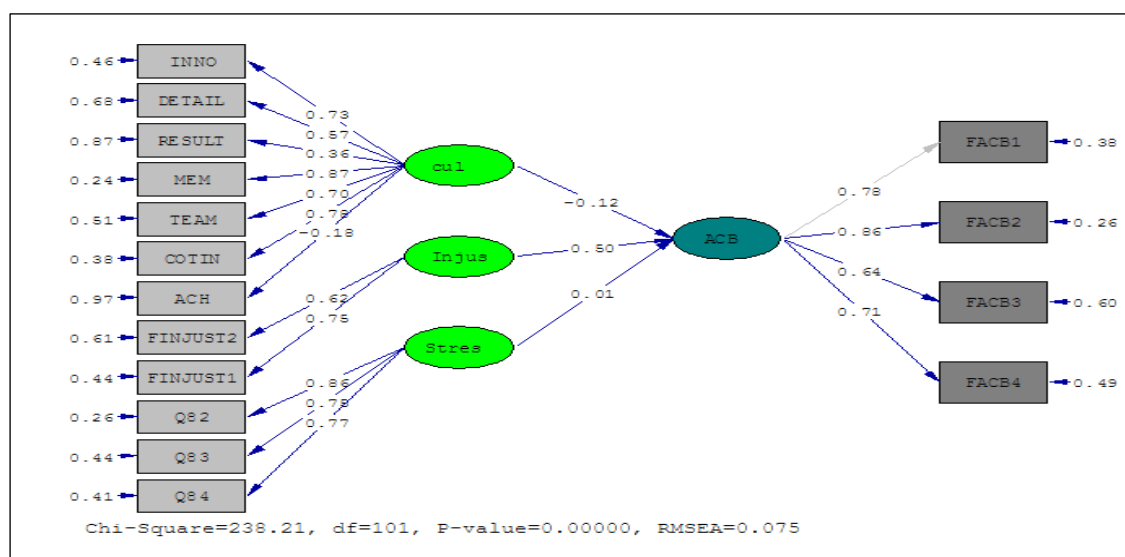


Figure 1. standard model

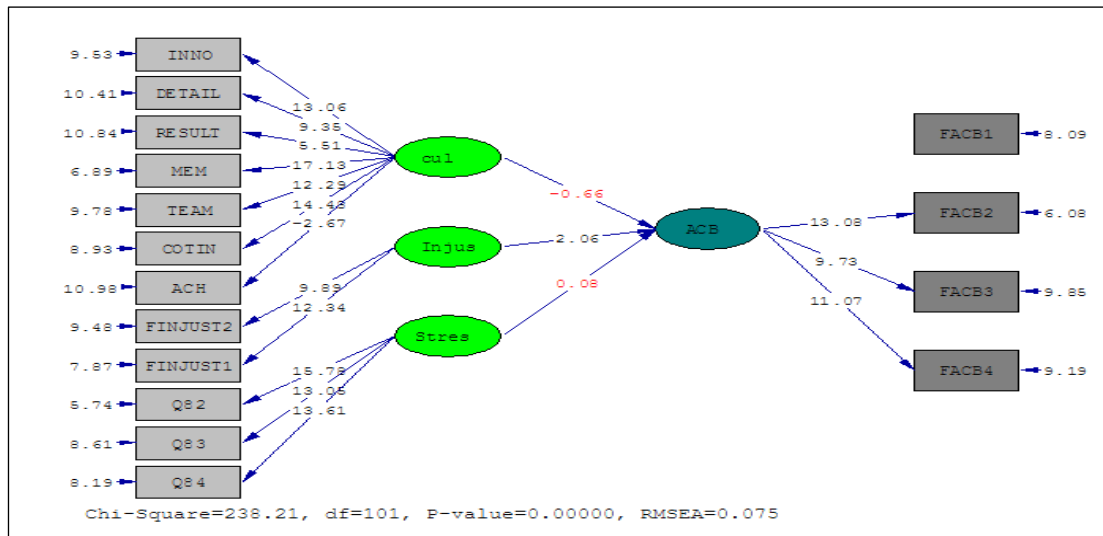


Figure2. significant model





## Performance and Volatility of Oil and Gas Stocks: A Comparative Study on Selected O&G Companies

Shaharudin, Roselee S (Corresponding author)

Faculty of Business and Accountancy, University of Malaya

Tel: 60-3-7967-3955 E-mail: [roseleeshah@um.edu.my](mailto:roseleeshah@um.edu.my)

Samad, Fazilah

Faculty of Business and Accountancy, University of Malaya

Bhat, Sonal

Faculty of Business and Accountancy, University of Malaya

### Abstract

This paper examines the effect of oil prices movements on the stock price of Oil and Gas companies in three different markets (US, India and UK). Using daily data; the dynamic interaction between oil prices and stock prices is investigated in the presence of economic variables like interest rates and industrial productions. The results suggest that there exists significant short run and long run relationship between oil price and the oil stocks including the effect of the other variables such as interest rate and the stock index. The oil price volatility transmission has a persistent effect on the volatility of the stocks of the oil companies in all the countries that were studied.

**Keywords:** Oil, Volatility Determinant, Transmission & Risk Management

### 1. Introduction

The stock markets have certainly taken a hit from the latest surge in oil prices; oil prices affect the companies' earnings and their bottom lines, which in turn affect their dividends, retained earnings, and the prices of their stocks. This is the reason that a large literature is devoted to the study of energy and its effects on macro-economic variables such as economic stability, economic growth, and international debt. For example, Hamilton (1983) studies the relationship between oil price and the Gross National Product (GNP). He concluded that increase in oil prices is responsible for decline in real GNP. Gilbert and Mork (1984) modeled the macro effects of an oil supply disruption and survey alternative policy options for dealing with the problem. Mork, Olsen, and Mysen (1994) assert that "the negative correlation between oil prices and real output seems, by now, to have been accepted as an empirical fact." In addition to the extensive investigation of the macroeconomics of energy issues, large research has been devoted to the repercussions of energy shocks on financial markets. Investigations by Charles Jones and Gautam Kaul (1996) using on reaction of the US and Canadian stock market to oil shocks show that stock prices rationally reflect the impact of news on current and future cash flows and there are no evidences of overreaction, while stock market in Japan and United Kingdom are different. However, there are very few studies that examine the relationship between oil price and the stock prices of the oil industries. One among them is a study by Huang, Masulis and Stoll (1996) who have examined the link between daily oil future returns and daily United States stock returns. Also, Al-Mudhaf and Goodwin (1993) examined the returns from 29 oil companies listed on the New York Stock Exchange. Not surprisingly, most of them are limited only to United States.

"Does the performance and volatility of oil stocks vary with respect to the changes in oil prices?" This paper looks at the relationship between the oil prices and the stocks of oil companies in three different countries. The objective is to examine the effects of oil prices on the oil stocks in different countries, whether there are long-run relationships or co-movements among the oil prices and oil industry's stock. Specifically, the dynamic interaction between oil prices and stock prices is investigated in the presence of economic variables like interest rates and industrial productions. This paper will also concentrate on the effects of volatility of crude oil prices on the oil stocks using daily data. The scope of this study extends to six oil companies from three different countries that are geographically apart and have different economic conditions; two each listed on New York Stock Exchange, London Stock Exchange and National Stock Exchange of India respectively. The results of the study should be useful to the various oil companies who are engaged in different phases of this industry and whose shares are traded on those stock exchanges. They should be of interest to the individual investors, policy makers, hedgers, arbitrageurs who buy the shares of these companies and analysts who

wish to understand how the stocks of the different companies react to changes in the level and volatility of the oil prices.

## 2. Effect of Oil Prices on Oil Stocks

Researchers in International Finance have focused on the sensitivity of the world's oil industry stocks and oil-sensitive industries stock to the oil price growth. Some researchers (e.g., Strong, 1991) have examined how well investors are able to hedge oil price risk using oil equity portfolios. Others, such as Miller and Upton (1985a, 1985b) and Crain and Jamal (1991), have investigated how well Hotelling's valuation principle applies to oil and gas companies. Malliaris and Urrutia (1995) provided evidence of a negative reaction of share prices to the Persian Gulf crisis. Nandha and Faff (2007) examined whether and to what extent the adverse effect of oil price shocks impacts stock market returns. They analyzed 35 DataStream global industry indices for the period from April 1983 to September 2005. Their results show that oil price rises have a negative impact on equity returns for all sectors except mining, and oil and gas industries.

Hamilton (1983, 1986) conducted detailed analysis on oil price changes in US and concluded that particular timing of changes in the nominal crude oil prices reflects largely exogenous developments specifically to petroleum sector. Jimmy and Albert (1984) studied the economic performance of 4 major oil (Exxon, Mobil, Texaco, Standard Oil of California) and 4 major automobile companies in the US for the period 1970-1979, when oil prices were rising rapidly. They measured the compound yields and risk-adjusted yields on common stock for equity performance. Their results show that Oil firms' compound yields were higher than auto firms' and world oil prices were significantly related to changes in shareholders' wealth. US gasoline prices, the indicator of which most consumers are aware, did not satisfactorily explain the yields of either oil or auto firms. The impact of world oil spot prices was not significantly impounded in general yield proxies such as value weighted stock market or Treasury bill yields. In another industry focused study, Faff and Brailsford (1999) investigated the sensitivity of Australian industry equity returns to an oil price factor over the period 1983–1996. They report significant positive oil price sensitivity of Australian oil and gas, and diversified resources industries. In contrast, industries like paper and packaging, banks and transport appear to demonstrate significant negative sensitivity to oil price hikes. A firm-specific study by Al-Mudhaf and Goodwin (1993) examines the returns from 29 oil companies listed on the New York Stock Exchange. Their findings suggest a positive impact of oil price shocks on ex post returns for firms with significant assets in domestic oil production. Huang et al. (1996) conclude that the returns of the petroleum stock index and the three oil stocks (Chevron, Exxon and Mobil) are significantly correlated with current and lag one oil futures returns.

Sardosky (2001) used a multifactor market model to estimate the expected returns to Canadian oil and gas industry stock prices. Results show that exchange rates, crude oil prices and interest rates each have large and significant impacts on stock price returns in the Canadian oil and gas industry. In particular, an increase in the market or oil price factor increases the return to Canadian oil and gas stock prices while an increase in exchange rates or the term premium decreases the return to Canadian oil and gas stock prices. Hammoudeh, Dibooglu and Aleisa (2002) studied the relationships among U.S. oil prices and oil industry equity indices. Their study reports that oil price systems have a few numbers of common trends, suggesting little potential for long-run portfolio diversification. On a daily basis, none of the oil industry stock indices explains the future movements of the NYMEX oil futures prices, while these prices can explain the movements of independent oil companies engaged in exploration, refining, and marketing, confirming our results that the oil exploration companies and refiners take their cues from the oil market. Boyer and Filion (2007) use a multifactor framework to analyse the determinants of Canadian oil and gas stock returns. They find a positive association between energy stock returns and appreciation of oil and gas prices, with growth in internal cash flows and proven reserves, and negative association with interest rates. In addition, production volume and a weakening of the Canadian dollar against the US dollar have a negative impact. Finally, they found that the influence of the exchange rate, the market return and prices of natural gas on Canadian oil and gas stocks changes significantly over the years 1995–1998 and 2000–2002.

Further, Hammoudeh and Eleisa (2004) consider five oil-exporting countries, Bahrain, Kuwait, Saudi Arabia, and the UAE. In their study only the Saudi Arabian stock market exhibits some dependence on oil prices; the smaller Gulf stock markets are apparently invariant to oil price changes. In some studies, oil price sensitivity is investigated at the sector or industry level. Hammoudeh and Li (2004), using an international factor model, conclude that both world market integration and oil prices are significant determinants of stock prices at country and industry levels. Scholtens and Wang (2008) on the other hand assessed the oil price sensitivities and oil risk premiums of oil and gas firms listed on the NYSE by using two-step regression analysis using two different arbitrage pricing models. They found that the returns of oil stocks are positively associated with the returns of the stock market, the increase of spot crude oil prices and negatively with the firm's book-to-market ratio. Thus, based on the above studies, the first hypothesis for study is stated as follows:

*H<sub>1</sub>: Oil prices influence the oil stocks*

### *2.1 Effect of Interest Rates on the Oil Stocks*

The Vector Auto Regressive (VAR) model takes account of the simultaneous interaction of the time series of oil futures returns, stock returns, and t-bill returns. T-bill returns are incorporated into the VAR system to control for the effect of interest rate changes on the variables of interest -- stock returns and oil futures returns. For example, stock prices depend on expected earnings discounted to the present.

Oil price changes might affect stock prices by affecting expected earnings, but it is important to control for interest rate changes that could also affect stock prices which directly affect the discount rate on expected earnings. Also, interest rates can affect futures prices relative to cash prices through the cost-of-carry model. Earlier studies of stock returns have shown that stock returns exhibit a number of important seasonalities. These seasonalities are accounted for in the analysis by introducing dummy variables in the VAR model. Huang et al., (1996, p22) argued that "Interest rate variability is probably not as important over the one-day intervals we examine as it is for the analysis in Sims (1982), where the importance of including interest rates is stressed".

Spiro (1990) reported that a significant movement in stock prices is explained by two fundamental economic variables, GNP and the interest rates. He also adds that interest rate is most responsible for the short term volatility of stock price indices. Ferson and Harvey (1991) state that real interest rates and market return are the most important determinants in explaining the return of American petroleum shares. Sadorsky (2001) also observes that crude oil prices and market return have a positive effect on stock prices whereas a depreciation of the Canadian dollar and an increase of interest rates have a negative effect on Canadian oil and gas stocks. Sadorsky (2001) deepens his analysis of the Canadian oil and gas industry by using a model where the Toronto Stock Exchange (TSE) Oil and Gas Index is explained by the Canadian market return, crude oil prices, the Canada-US exchange rate and the short term Canadian interest rates. He finds that the four factors have an influence on Canadian energy stocks, although the first two have a much larger impact. Hondroyannis and Papapetrou (2001) showed that real stock returns are negatively related to interest rate shocks. Thus, the second hypothesis can be written as:

*H<sub>2</sub>: Interest rates have an influence on the oil stocks*

### *2.2 Stock Index*

A stock market index is a method of measuring a section of the stock market and a broad-base index represents the performance of a whole stock market. The time series of composite stock price index is one of the best data reflecting economic conditions. The index data is used to analyze and predict the perspective of markets. Jensen and Meckling (1976), page 485 argue that "the existence of a well-organized market in which corporate claims are continuously assessed is perhaps the single most important control mechanism affecting managerial behavior in modern industrial economies". Morck et al. (1990) examine whether the stock market has an influence on investment beyond forecasting future fundamentals and they find that there is a statistically significant relation. Okyu Kwon and Jae-Suk Yang (2007) investigated the strength and the direction of information transfer in the US stock market between the composite stock price index of stock market and prices of individual stocks using the transfer entropy. The results of their study indicate that there is a stronger flow of information from the stock index to the individual stocks. Thus, the third hypothesis is stated as:

*H<sub>3</sub>: The Stock Index influences the oil stocks*

### *2.3 Industrial Production*

Jones and Kaul (1992) find an effect of fuel prices on stock prices but that effect disappears when future industrial production is included in the analysis. Serletis and Shahmoradi (2005) examined the dynamic comovements of natural gas prices, industrial production, and consumer prices. Ewing and Thompson (2007) examined the empirical relationship between oil prices and several key macroeconomic variables. In particular, they investigate the cyclical comovements of crude oil prices with output, consumer prices, unemployment, and stock prices. They have reported a number of important cyclical relationships using three different time series filtering methods and their results suggest that crude oil prices are procyclical and lag industrial production. Also, that oil prices lead consumer prices. The crude oil prices lag industrial production and lead consumer prices are consistent with those reported by Serletis and Shahmoradi (2005) for natural gas prices. Koutoulas and Kryzanowski (1994) find that the pure domestic components of the interest rate structure, lagged industrial production, pure international components of the differential in the Canada/US leading indicators, and the interest rate of Euro deposits have a significant influence on Canadian oil and gas assets. On the other hand, Mittoo (1992) notes that only the 3-month Treasury-bill interest rate explains these returns.

Results reported in the abovementioned literatures suggest that higher oil prices are generally bad news for economic growth and for the stock market returns. As a consequence of the negative impact of oil price shocks on the economy and oil being a direct or indirect input for many industries, one might expect a negative impact on most of the industries except a few like oil producers and explorers. In addition, interest rates and industrial production also have an impact

on the stock returns of any company. Thus, the third hypothesis is:

*H<sub>4</sub>: Industrial production index has an influence on the oil stocks.*

#### 2.4 Volatility

Ross (1989) argues that the volatility of price changes can be an accurate measure of the rate of information flow in a financial market. It is possible that no significant lead or lag cross-correlations are observable in the returns but that price volatility - the rate of information flow - in one market leads volatility in the others. Evidence that volatility is correlated across markets would imply dependence in the information processes. The expected market risk premium (the expected return on a stock portfolio minus the Treasury bill yield) is positively related to the predictable volatility of stock returns. There is also evidence that unexpected stock market returns are negatively related to the unexpected change in the volatility of stock returns. This negative relation provides indirect evidence of a positive relation between expected risk premiums and volatility (Schwert and Stambaugh, 1987).

Hammoudeh et. al. (2002) with the autoregressive conditional heteroskedasticity (ARCH)/GARCH analysis they suggested that the oil futures market's volatility has a matching resonant or volatility-echoing effect on the stocks of the oil exploration, production, and domestic integrated companies, and a volatility-dampening effect on the stocks of oil international integrated and oil and gas refining and marketing companies. Again, Malik and Hammoudeh (2005) examined the volatility and shock transmission mechanism among US equity, global crude oil market, and equity markets of Saudi Arabia, Kuwait, and Bahrain. Their results show significant transmission among second moments. They showed that in all cases, Gulf equity markets receives volatility from the oil market but only in the case of Saudi Arabia a significant volatility spillover from the Saudi market to the oil market.

*H<sub>5</sub>: Volatility in the crude oil prices effect the oils stocks.*

#### 2.5 Theoretical Framework

The basic definition of efficient market hypothesis suggests that given the assumption that relevant information is fully available to the public, all changes will immediately reflected in the stock's price. In other words, securities in an efficient market are traded and priced on the basis of all known relevant facts. If this happens, all buyers and sellers buy and sell shares on the basis of having access to full information about the securities in question. And when faced with new information whether firm specific or macroeconomics changes, some investors may over react and some may under react. However the degree of efficiency across market globally is different. This will hypothetically reflect on the speed of adjustment that each individual market will react.

[FIGURE 1]

### 3. Data and Methodology

#### 3.1 Data

Three stock markets were selected: New York Stock Exchange (NYSE), London Stock Exchange (LSE) and the National Stock Exchange India (NSE). The New York Stock Exchange (NYSE) is a stock exchange based in New York City. It is the largest stock exchange in the world by dollar volume and, with 2,764 listed securities, has the second most securities of all stock exchanges. It ranks third in the world in terms of company listings with 3,200 companies. The London Stock Exchange or LSE is a stock exchange located in London, United Kingdom. Founded in 1801, it is one of the largest stock exchanges in the world, with many overseas listings as well as British companies. The LSE is part of the London Stock Exchange Group plc. NSE is a Mumbai-based stock exchange. It is the largest stock exchange in India in terms of daily turnover and number of trades, for both equities and derivative trading. Though a number of other exchanges exist, NSE and the Bombay Stock Exchange are the two most significant stock exchanges in India and between them are responsible for the vast majority of share transactions.

The six stocks of oil companies two each from the above three stock exchanges was chosen. The selection of the oil companies was based on the performance and thus those having the height Return on Equity (ROE) based on 5 years average ROE were selected. Thus, Exxon Mobil and Valero from the New York Stock Exchange, Royal Dutch Shell and Gazprom from the London Stock Exchange and Reliance Industries and Indian Oil Corporation Limited from the National Stock Exchange of India were chosen for study. The Oil prices are based on the London Brent Crude Oil Index. Brent Crude is the biggest of the many major classifications of oil consisting of Brent Crude, Brent Sweet Light Crude, Oseberg and Forties. Brent Crude is sourced from the North Sea. The Brent Crude oil marker is also known as Brent Blend, London Brent and Brent petroleum. It is used to price two thirds of the world's internationally traded crude oil supplies.

The daily interest rates and industrial productions are used as control variables in the analysis. The interest rates are based on the three month Treasury bill with respect to each stock exchange. Industrial production is an economic report that measures changes in output for the industrial sector of the economy. The industrial sector includes manufacturing, mining, and utilities. Although these sectors contribute only a small portion of GDP (Gross Domestic Product), they are

highly sensitive to interest rates and consumer demand. This makes Industrial Production an important tool for forecasting future GDP and economic performance. All the data was obtained from DataStream, Thomson DataStream being the world's largest most respected financial statistical database. The empirical analysis has been carried out using the daily data for the period of August 08, 2003 to August 08, 2008.

### 3.2 Methodology

The Cointegration of variables will be tested using Vector Auto Regressive and Error Correction Method. Cointegration refers to linear combination of non-stationary time series that result in stationary time series in the presence of cointegration among the variables (Granger, 1986). Cointegration is a method of defining long run relationship amongst a group of time series variables (Hamilton, 1987). The variance decomposition and impulse response were employed to analyze the short-run dynamics of the variables. The volatility of oil stocks with respect to the volatility of oil prices using ARCH and GJR GARCH.

## 4. Research Results

The short run relationship between the variables is tested using the VAR model. The lag order of the VAR which is behind the cointegration analysis is been selected according to the Akaike Information Criterion (AIC). Table 1 shows the results of the unrestricted VAR for all the oil stocks. Table 1 show that the standard error of the equation provides a measure of how different the predicted values of the dependent variable are from the actual values. In general, smaller values are better because they indicate a tighter fitting model (less dispersion about the regression line). The results indicate that the Exxon Mobil stocks are influenced by both the first and second lag of oil prices, interest rates, the stock index and the Exxon Mobil stock itself. However, the Industrial production index does not significantly impact the Exxon Mobil stock prices.

[TABLE 1]

The co-efficient of the VAR model suggest that the price of the stock decreases by 0.0377% for every 1% increase in the first lagged difference of the Exxon Mobil stock prices and by 0.07% for every 1% increase in the second lagged difference of the Exxon Mobil stock prices. For every 1% increase in the first lagged difference and second lagged difference of the NYSE, the price of Exxon Mobil stocks decrease by 0.10% and increase by 0.0913% respectively. For every 1% increase in the first lagged difference of the Oil prices, the price of Exxon Mobil stocks increase by 0.0216% and 1% increase in second lagged difference of oil prices, the Exxon Mobil stocks decrease by 0.0081%. For every 1% increase in the first lagged difference and second lagged difference of the Interest rates, the price of Exxon stocks decrease by 0.0039% and 0.0018% respectively.

Identical relationship between the Chevron stocks, oil price and the other variables is seen. All the variables at their first and second difference have significant short run relationship (at 5% and 10% significance level) with the Chevron stocks except for the industrial production index. It should be noted that over all oil prices have positive significant impact on the US oil stocks. Industrial production index in US does not have a significant impact on the oil stock prices. However, industrial production index does have a significant impact on the Indian oil stocks (Reliance and IOCL). As in case of US oil stocks, oil stocks in UK also are influenced by all the variables except for the industrial production index. In addition the Johansen cointegration test was run (with respect to each company stocks) to test the long run relationship. The Johansen cointegration test indicated the presence of 5 cointegrating equations in the long run. The results of the test are shown in Table 2.

[TABLE 2]

Similarly, the Johansen cointegration test indicated the presence of 5 cointegrating equations in the long run for the Indian and UK oil stocks as well.

### 4.1 Vector Error Correction Model (VECM)

The finding of the presence of cointegration sets the stage for using the error-correction model. If a set of nonstationary variables is cointegrated then an unrestricted vector autoregression model (VAR) comprised of the first differences of these variables will be misspecified. The reason is that the first differences of nonstationary variables impose too many unit roots, and information on long-run equilibrium relationships among the variables will be lost. In such a case the error-correction model (VECM) must be used. This model includes a vector of error terms that represents deviations from the long-run equilibrium and lagged short-term deviations. VECM provides information on how the dependent variable, EXXON is adjusted to restore long run equilibrium in response to the error correction term. In estimating the VECM, the lag interval was specified based on the results obtained in the VAR lag selection, this VECM is a restricted VAR with two lags. The number of cointegrating equations was specified based on the Johansen cointegration test. Table 3 presents the VECM for the stocks. In the VECM, the estimates show that the error-correction terms in the equation, which measure the long-run disequilibrium, are significantly different from zero. The addition of the error terms results in a positive value, implying that the Exxon Mobil stock prices show divergence from the equilibrium and

that they do not have the tendency to restore back to equilibrium. The co-efficient of the error terms indicate the backward (if negative) or forward movement (if positive) towards equilibrium following a shock to the model over the respective period of time. In the long run, oil prices have significant positive impact on the oil stocks, while the interest rates and NYSE influence negatively, the relationship with industrial production index however is not significant. For every 1% increase in the first lag of the Exxon Stocks, the price of Exxon Mobil stocks decrease by 0.0281%. If the first lag of the interest rates increase and NYSE by 1%, the stock price decreases by 0.007% and 0.114% respectively. However, oil prices have positive effect on the oil stocks; increase in oil prices by 1% would increase the stock prices by 0.0138%.

[TABLE 3]

Long run relationship using vector error correction was also tested for oil stocks picked from India and UK. Incase of Reliance Industries, the sum of error terms is positive indicating divergence from equilibrium. However, for IOCL stocks, the error terms sum up to negative number, showing that the stocks have a tendency to converge to equilibrium. All the variables, including industrial production index have a significant long run relationship with the oil prices and oil price negatively affect the oil stocks in India. For stocks of Shell and Gazprom, the error correction term is positive. Here, we see that stocks of both the companies like most of the other stocks in this study show divergence from equilibrium. The results are similar to that of oil stocks in US, all the variables show long run relationship except for industrial production index. Also, mixed behavior of oil stocks is seen under the influence of oil prices.

#### 4.2 Variance Decomposition and Impulse Response

Next, the generalized variance decomposition and the generalized impulse response functions are employed to analyze the short-run dynamics of the variables. The purpose of the investigation is to find how oil stock prices respond to shocks by the other variables of the system. The generalized impulse responses provide an estimate of the response of a variable in the case of innovation in another variable.

The analysis of variance decomposition on Exxon Mobil as per table 4 tends to suggest that each of the variables used in the empirical analysis can be explained by the disturbances in the other variables. Specifically, in the short-run period more than 99% of the variability in the stocks of Exxon Mobil changes is explained by its own innovations, Next, NYSE and industrial production index contribute to 0.4% and 0.2% respectively variations in the Exxon Mobil stock prices, while 0.06 % of the variability in the stock price is explained by innovations in the price of oil and a very minimal effect of interest rates affect the Exxon Mobil stocks.

[TABLE 4]

The results of variance decomposition for Chevron stocks are shown in Table 5. In short-run period more than 96% of the variability in the stocks of Chevron stocks changes is explained by its own innovations. Chevron stocks are affected by NYSE (more than 2%), and then by oil price (0.4%), interest rates (0.18%) and industrial production index (0.03%). Unlike Exxon Mobil stocks, Chevron stocks are affected quite significantly by interest rates.

[TABLE 5]

Table 6 shows the results of variance decomposition for Reliance stocks. In short-run period almost 99% of the variability in the stocks of Reliance stocks changes is explained by its own innovations. Reliance stocks are affected by interest rates (0.44%), then by industrial production (0.23%), oil price (0.18%) and NSE (0.07%).

[TABLE 6]

Table 7 shows the results of variance decomposition for IOCL stocks. In short-run period more than 98% of the variability in the stocks of IOCL stocks changes is explained by its own innovations. 0.8 % of variability in IOCL stocks is explained by oil prices, 06% by NSE, 0.09% by interest rates and a minimal 0.015% by the industrial production index.

[TABLE 7]

Table 8 shows the results of variance decomposition for stocks of Royal Dutch Shell. In short-run period more than 99% of the variability in the stocks of Shell is explained by its own innovations. More than 0.1 % of variability in Shell stocks is explained by oil prices, 04% by LSE, 0.42% by interest rates and a minimal 0.015% by the industrial production index.

[TABLE 8]

Table 9 shows the results of variance decomposition for stocks of Gazprom. In short-run period more than 99% of the variability in the stocks of Shell is explained by its own innovations. More than 0.1 % of variability in Shell stocks is explained by oil prices, 047% by LSE, 0.4% by interest rates and a minimal 0.05% by the industrial production index.

[TABLE 9]

Figure 2 below shows the impulse response of all the stocks. It can be seen from the graph that the Exxon Mobil stocks restore back to equilibrium in 3 days after any shock in oil prices. Similarly, for any shocks in interest rates and the stock index, the Exxon Mobil stock prices come back to equilibrium in five to ten days. However, shocks from industrial production take a longer period to stabilize. The Chevron stocks restore back to equilibrium in 4 days after any shock in oil prices. Similarly, for any shocks in interest rates and the stock index, the Exxon Mobil stock prices come back to equilibrium in five to ten days. It is evident from the graph that the Reliance stock restore back to equilibrium within 4 days from most of the shocks, however, shocks by interest take up to 8 days for recovery. It is evident from the graph that IOCL stocks restore back to equilibrium within 4-5 days from most of the shocks. For Shell, it took 5-6 days for the stock to restore back to equilibrium. The response of Gazprom the stocks restore back to equilibrium within 5-6 days from most of the shocks.

[FIGURE 2]

#### 4.3 Volatility

The LM tests for all the oil stocks (individually) and oil price indicate that the ARCH effects are significant at the 1% level, suggesting the use of the ARCH/GARCH methodology is warranted (see Table 10).

[TABLE 10]

Based on the methodology, the volatility of oil prices coming on the oil stocks was examined using the GJR GARCH model. From the Q-Q plots it was seen that the time series data for oil price and all the oil stocks was not normal and hence, Student's t distribution was used in the estimation of GARCH model. The estimates of the GJR GARCH model for the oil stocks and oil prices are provided in Table 11.

[TABLE 11]

The four coefficients in the variance equation are listed as C, the intercept; ARCH (1), the first lag of the squared return; the dummy variable and GARCH (1), the first lag of the conditional variance. The ARCH term is significant while the GARCH term is not significant. This entails that, the long term moving average volatility of oil prices has an impact on the oil stocks while the short term volatility does not significantly affect the oil stocks. Notice that the coefficients sum up to a number less than one, which is required to have a mean reverting variance process. Since the sum is very close to one, the volatility has quiet persistent shocks. The dummy term is not significant which implies that the oil shocks to the oil stocks are positive. In addition, the sum of the co-efficient of the error term and the dummy variable is greater than zero, which implies that any bad news increases volatility and its effects.

### 5. Summary of Results

The overall results suggest that there exists co-integration between oil stocks, oil prices, interest rates, industrial production and the stock index and there is a significant short term as well as long term relationship between them. It was seen that oil prices affect the oil stocks and this relation is influenced by the stock index and interest rates. Thus, the hypotheses  $H_1$  through  $H_3$  are accepted. The influence of the industrial production index could not be warranted as it is not significant in case of US and UK, while in India the effect is significant. Hence, hypothesis  $H_4$  is indecisive. The results of variance decomposition implies that oil prices account to 0.1% to 0.9% variance in the oil stocks depending on the extent of the effect of other variables. The impulse response function suggest that the in the short run, the oil stocks recover from most of the shocks from the variables in a period of 4-8 days. From the GARCH results it is clear that volatility shocks of oil prices on the oil stocks are quite persistent and that long-run average shocks are more influential than the immediate volatility shocks.

#### 5.1 Conclusion and Recommendations

This study investigates the effects of oil prices on oil stocks of three different markets (US, India and UK) using daily data for the available period August 08, 2003 to August 08, 2008. The oil price is the London Brent Crude Oil Index. The oil stocks include the Exxon Mobil and Chevron stocks from the New York Stock Exchange, Reliance Industries and Indian Oil Corporation Limited stocks from the National Stock Exchange of India, and Royal Dutch Shell and Gazprom stocks from the London Stock Exchange.

The empirical investigation employs unit root tests, cointegration tests, variance auto regression, error-correction models with variance decomposition and impulse response, and ARCH/GARCH models. The cointegration tests for the variables (oil price, stock price, stock index, interest rates and industrial production index) system indicate that these variables have long-run relationship and have five cointegrating relationship. Moreover, the VAR and VECM for the system suggest that there exists significant short run and long run relationship between oil price and the oil stocks including the effect of the other variables such as interest rate and the stock index. According to the estimated coefficients of the structural part of the model it is noted that oil prices in US have a positive impact on the oil stocks. The results in for US oil stocks are in agreement with those achieved by Nandha and Raff (2007) which say that oil price rises have positive impact on the equity returns of oil and gas companies.

In case of Indian oil stocks the impact of oil price is negative, while in case of UK, the impact is mixed, negative for Royal Dutch Shell and positive in case of Gazprom. One way to explain the variation in these results would be based on the oil reserves owned by these countries. The Oil & Gas Journal, Vol. 103, No. 47 (Dec. 19, 2005) estimated the US has oil reserves of 21.4 billion barrels while India has only 5.8 billion barrels. Thus, increase in oil price is good news to US and not for India. Accordingly, after acquisition of the oil company Sibneft, Gazprom, with 119 billion barrels ( $1.89 \times 10^{10}$  m<sup>3</sup>) of reserves, ranks behind only Saudi Arabia, with 263 billion barrels ( $4.18 \times 10^{10}$  m<sup>3</sup>) and this explain the positive relationship of its stocks with the increase in oil price while this is not the case with Shell. The industrial production index except for India does not have any influence on the stock prices. The effect of interest rates on the stocks prices of the oil companies can relate to the D/E ratio of the company. It was seen that the D/E ratio for Exxon Mobil, Chevron, Reliance and IOCL was over 0.5 and they have a negative impact of the interest rates. While, Royal Dutch Shell and Gazprom have a debt to equity ratio (D/E) of less than 0.4 and are positively related with interest rates. If the oil company has high liability the effect on its stock is negative and vice versa. Cassar, Gavin John (2005) explains financing-investment linkages play an important role in both the future operating performance of firms and how the market prices the firm.

The variance decomposition and impulse response analysis suggests the existence of instantaneous, temporary effect of oil price innovations on the oil stock prices. However, the effects of all the variables vary with each company. The impulse response function also indicates that the UK (London) market is more efficient than the other markets under study. The volatility analysis using GJR GARCH for the oil stocks suggests that the oil price volatility transmission has a persistent effect on the volatility of the stocks of the oil companies in all the countries studied here. It also implies that oil volatility effects of higher oil prices are more than that during the low oil prices. These results are similar to that obtained by Hammoudeh, Dibooglu and Aleisa (2002) where the studies the relationship between the oil price and oil equity indices in US. It was also observed historical prices to be responsible for more volatility transmission than the spot price.

### 5.2 Suggestions for Future Research

This study can be extended further by considering more oil companies in each stock exchange and also including other important countries. By doing so, the results obtained will be more generalized. It is also evident that there is no simple correlation between crude oil price and oil stocks. The complexities brought on by vertical integration, multinational organization and the regulatory climate should also be considered for the analysis.

### 5.3 Implication

This paper contributes to the knowledge of the dynamic relationships between oil stock and oil prices, including other macro-economic variables and stock index. The results highlight the varying significance of the variables in explaining the stock prices in the markets. The results of the study should be useful to the various oil companies who are engaged in different phases of this industry and whose shares are traded on those stock exchanges. For the oil companies, they can adjust their liabilities knowing the effect of interest rates on their stocks. The oil companies can also study their comovement with the market. With this they can track the systematic risk the company hold and can adjust their beta. The results should also be useful to the individual investors, hedgers, and arbitrageurs who buy the shares of these companies and wish to understand how the stocks of the different companies react to changes in the level and volatility of the oil spot/futures prices. If an increase in the oil price leads to a decrease in the stock prices, this increase should be a precursor for the investors to avoid these stocks. Moreover, the presence of long-run relationships among the oil prices, oil stocks and other macro-economic variables also throws light on having these oil stocks in the portfolio in the long run taking the economic condition into account. The impulse response analysis for various stocks also throws light on the efficiency of the markets in response to shocks. Thus, investors can decide on the market they wish to invest based on their efficiency. The policy implication for oil volatility transmission is that, at times of oil volatility, traders should choose the oil company stocks that match their tolerance for volatility and use the right financial derivative to profit from this volatility.

## 6. Limitations

This study was intended to become a preliminary prior to analyze thirty oil companies listed on all the major stock exchanges across the world. It covers six oil and gas companies (two each from the three stock exchanges mentioned above). Only two macro-economic factors are included i.e. the industrial productions and interest rates as controlling variables even though we believed that there might be other factors that could influence the findings. Future research is necessary to determine other potential macro-economic variables.

## References

Abugri, Benjamin A. (2008). Empirical relationship between macroeconomic variables and stock returns: Evidence from Latin America. *International Review of Financial Analysis*, 17, 396-410.



- Aktham Maghyreh and Al-Khandari, Ahmad. (2007). Oil prices and stock markets in GCC countries: new evidence from non-linear cointegration. *Journal of Managerial Finance*, 33 (7), 449-460.
- Cologni, A, Manera, M. (2008). Oil prices, inflation and interest rates in a structural cointegrated VAR model for the G-7 countries. *Energy Economics*, 30, 856-888.
- Al-Mudaf, Anwar, A, Goodwin, Thomas H. (1993). Oil shocks and Oil stocks: an evidence from 1970s. *Applied Economics*, 25, 181-190.
- Hayo,B, Kutun, A. (2005). The impact of news, oil prices, and global market developments on Russian financial markets. *Economics of Transition*, Volume 13 (2), 373-393.
- Boyer, Martin M. and Filion, Didier. (2009). Common and fundamental factors in stock returns of Canadian oil and gas companies. *Energy Economics*, 29, 428-453.
- Buono, Mark J. (1989). The relationship between the variability of inflation and the stock returns: An empirical investigation. *The Journal of Financial Research*, 12 (4), 329-339.
- Papapetrou, E. (2001). Oil price shocks, stock market, economic activity and employment in Greece. *Energy Economics*, 23, 511-532.
- Ewing, Bradley T. & Thompson, Mark A. (2007). Dynamic cyclical co movements of oil price with industrial production, consumer price, unemployment and stock prices. *Energy Policy*, 35, 5535-5540.
- Faff, Robert, Mohan, N. (2008). Does oil move equity prices? A global view. *Energy Economics*, 30, 986-997.
- Farooq Malik, T. and Hammoudeh, S. (2007). Shock and volatility transmission in the oil, US and Gulf equity markets. *International Review of Economics and Finance*, 16, 357-368.
- Gallegati, M. (2008). Wavelet analysis of stock returns and aggregate economic activity. *Journal of Computational Statistics and Data Analysis*, 52, 3061-3074.
- Hondroyannis, G. & Papapetrou, E. (2001). Macroeconomic influences on the stock market. *Journal of Economics and Finance*, 25 (1), 33-49.
- Hammoudeh, S. & Huimin, L. (2005). Oil sensitivity and systematic risk in oil sensitive market, *Journal of Economics and Business*. 57, 1-21.
- Hammoudeh, S., Dibooglu, S. and Aleisa, E. (2004). Relationship among US oil prices and oil industry equity indices, *International Review of Economics and Finance*. 13, 427-453.
- Henriques, I. & Sadorsky, P. (2008). Oil price and stock price of alternative energy companies. *Energy Economics*, 30, 998-1010.
- Huang, R. D., Masulis, R. W. and Stoll, H. R. (1996). Energy Shocks and Financial Markets. *Journal of Futures Markets* 16(1): 1-27.
- Jones, C.M., Kaul, G. (1996). Oil and the stock markets. *Journal of Finance*, 51(2), 463-491.
- Miller, M. and Upton, C. (1985a). A test of the Hotelling Valuation Principle. *Journal of Political Economy*. (Feb), 1-25.
- Miller, M. and Upton, C., (1985b). The pricing of oil and gas: Some further results. *The Journal of Finance*, (Jul), 1009-1018.
- Park, J. & Ratti, R. (2008). Oil price shocks and stock markets in the U.S. and 13 European countries. *Energy Economic*, 30 (5), 2587-2608.
- Narayan, P.K., Narayan, S. (2007). Modelling oil price volatility. *Energy Economics*, 35, 6549-6533.
- Roger D. Huang, R. D., Masulis, D.W and Stoll, H.R. (1996). Energy shocks and financial markets. *Journal of Futures Markets*. 16(1), 1-27.
- Lardic, S., Mignon, V. (2006). The impact of oil prices on GDP in European countries: An empirical investigation based on asymmetric cointegration. *Energy Policy*, 34, 3910-3915.
- Perry, S. (2001). Risk factors in stock returns of Canadian oil and gas companies. *Energy Economics*, 23, 17-28.
- Scholten, B., and Wang, Lei (2008). Oil risks in oil stocks. *The Energy Journal*, 29, 89-112.
- Smith, R.T., Bradley, M. and Greg, J.I. (1986). Studying firm-specific effects of regulation with stock market data: an application to oil price regulation. *Rand Journal of Economics*, 17 (4), 467-489.
- Spiro, P.S. (1990). The impact of interest rate changes on stock price Volatility. *Journal of Portfolio Management*, 16 (2), pg. 63-68.
- Strong, J.S. (1991). Using Oil Share Portfolios to Hedge Oil Price Risk, *Quarterly Review of Economics and Business*. 31, 48-63.
- Waff, R.W. and Brailsford, T.J. (1999). Oil price risk and Australian stock market. *Journal of Energy Finance and Development*, 4, 69-87.
- Huang, Y. and Guo, F. (2007). The role of oil price shocks on China's real exchange rate. *China Economic Review*, 18, 403-416.
- Zhang, D. (2008). Oil shock and economic growth in Japan: A nonlinear approach. *Energy Economics*. 30 (5) 2374-2390.

## Appendixes

Table 1. Unrestricted Var on O&amp;G Stocks

Variables	Exxon Mobil	Chevron	Reliance Industries	Indian Oil	Royal Dutch Shell	Gazprom
Stock (-1)	-0.037781	-0.145776	0.033633	0.142511	-0.014597	0.036855
Stock (-2)	-0.070088	-0.085133	0.034315	-0.038403	0.084724	-0.032582
Stock Index (-1)	-0.100694	0.360543	0.017396	0.151595	-0.000962	-0.000148
Stock Index (-2)	0.091261	0.282498	-0.059029	0.282498	-0.000345	0.001890
Oil Price (-1)	0.021586	0.023186	-0.061513	-0.159796	-0.026152	0.007508
Oil Price (-2)	-0.008140	0.092351	-0.006317	0.059803	-0.008814	0.068050
Int. Rates (-1)	-0.003986	-0.063896	-0.130785	-0.070665	0.218664	0.307284
Int. Rates (-2)	-0.001775	0.037204	0.006888	0.027659	-0.015141	-0.229933
Ind. Prod. (-1)	Not Sig.	Not Sig.	0.029760	-0.010354	Not Sig.	Not Sig.
Ind. Prod. (-2)	Not Sig.	Not Sig.	0.044845	0.007859	Not Sig.	Not Sig.
C	0.000706	0.000506	0.001921	0.000147	0.000221	0.001199
S. E. Equation	0.013109	0.020209	0.022850	0.026508	0.013438	0.024338

Table 2. Unrestricted Cointegration Rank Test for Exxon Mobil Stocks

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.340135	1799.941	68.52	76.07
At most 1 **	0.315134	1258.675	47.21	54.46
At most 2 **	0.256429	765.8253	29.68	35.65
At most 3 **	0.224518	380.0536	15.41	20.04
At most 4 **	0.036930	48.99378	3.76	6.65

\*(\*\*) denotes rejection of the hypothesis at the 5%(1%) level

Trace test indicates 5 cointegrating equation(s) at both 5% and 1% levels

Table 3. Results of Vector Error Correction Model

Variables	Exxon Mobil	Chevron	Reliance Industries	Indian Oil	Royal Dutch Shell	Gazprom
Error Correction						
ECT1	-0.016485*	-0.066536**	-0.002580*	-0.020353*	-0.015848*	-0.004004*
ECT2	0.026571**	0.044106***	-0.001285*	-0.005019*	0.002349*	0.005332*
ECT3	0.001549*	-0.008475*	0.000645*	0.003454*	0.001734*	0.005026*
ECT4	0.015319*	0.083252**	0.012763**	0.008572*	0.012232*	-0.011017*
Stock (-1)	-0.028572**	-0.093057**	0.035799**	0.146869**	-0.011910**	0.030222**
Stock Index (-1)	-0.114773***	0.261799***	0.013113***	0.135063***	-0.001792*	-0.002686*
Oil Price (-1)	0.013854**	0.014667**	-0.061013**	-0.139311**	-0.004739**	0.005510**
Int. Rates (-1)	-0.007544**	-0.055539**	-0.134683***	-0.085721***	0.204060***	0.295498
Ind. Prod. (-1)	Not Sig.	Not Sig.	0.031770**	-0.016169**	Not Sig.	Not Sig.
C	0.000686	0.000700	0.001918	0.000231	0.001918	0.001158
Log Likelihood	3810.378	3248.423	3083.791	2896.642	3776.331	3002.416
Akaike	-5.828800	-4.966907	-4.714404	-4.427365	-5.776582	-4.589594
Schwarz Criteria	-5.789128	-4.927235	-4.674732	-4.387693	-5.736910	-4.549923

\* Significant at the 1% level. \*\*Significant at the 5% level., \*\*\*Significant at the 10% level.

Table 4. Variance decomposition analysis of Exxon Mobil Stocks

Period	Exxon Stocks	Mobil Industrial Production	Interest Rates	NYSE	Oil Price
1	100.0000	0.000000	0.000000	0.000000	0.000000
2	99.61699	0.084124	0.000746	0.242096	0.056045
3	99.40715	0.116843	0.000880	0.414438	0.060689
4	99.37416	0.146580	0.001135	0.415490	0.062635
5	99.35638	0.163551	0.001512	0.415665	0.062892
6	99.34024	0.179486	0.001520	0.415843	0.062915
7	99.32705	0.192688	0.001535	0.415808	0.062925
8	99.31588	0.203828	0.001556	0.415797	0.062939
9	99.30625	0.213439	0.001569	0.415795	0.062949
10	99.29799	0.221679	0.001581	0.415792	0.062957

Table 5. Variance decomposition analysis of Chevron Stocks

Period	Chevron Stocks	Industrial Production	Interest Rates	NYSE	Oil Price
1	100.0000	0.000000	0.000000	0.000000	0.000000
2	97.68585	0.029788	0.116766	2.137656	0.029937
3	96.70228	0.030413	0.169100	2.688601	0.409603
4	96.59847	0.030871	0.176496	2.783547	0.410621
5	96.58421	0.032209	0.181532	2.787244	0.414804
6	96.58086	0.033234	0.182652	2.788270	0.414983
7	96.58034	0.033581	0.182667	2.788321	0.415092
8	96.57991	0.033967	0.182725	2.788308	0.415095
9	96.57952	0.034347	0.182724	2.788315	0.415094
10	96.57922	0.034650	0.182724	2.788310	0.415094

Table 6. Variance decomposition analysis of Reliance Industries Stocks

Period	Reliance Stocks	Ind. Oil Price	NSE	Interest Rates	Industrial Production
1	100.0000	0.000000	0.000000	0.000000	0.000000
2	99.35354	0.172656	0.007670	0.402088	0.064050
3	99.08097	0.177713	0.076668	0.431928	0.232721
4	99.07331	0.177700	0.076683	0.439489	0.232821
5	99.07085	0.177798	0.077083	0.441450	0.232820
6	99.07043	0.177801	0.077092	0.441852	0.232830
7	99.07034	0.177801	0.077092	0.441934	0.232830
8	99.07033	0.177801	0.077092	0.441951	0.232831
9	99.07032	0.177801	0.077092	0.441955	0.232831
10	99.07032	0.177801	0.077092	0.441956	0.232831

Table 7. Variance decomposition analysis of IOCL Stocks

Period	IOCL Stocks	Oil Price	NSE	Interest Rates	Industrial Production
1	100.0000	0.000000	0.000000	0.000000	0.000000
2	98.52072	0.811767	0.577281	0.084735	0.005492
3	98.48235	0.812676	0.599983	0.090118	0.014874
4	98.47521	0.818083	0.600857	0.090729	0.015123
5	98.47471	0.818378	0.600913	0.090801	0.015194
6	98.47465	0.818378	0.600925	0.090833	0.015211
7	98.47464	0.818382	0.600925	0.090843	0.015214
8	98.47463	0.818382	0.600926	0.090845	0.015214
9	98.47463	0.818382	0.600926	0.090846	0.015214
10	98.47463	0.818382	0.600926	0.090846	0.015214

Table 8. Variance decomposition analysis of Royal Dutch Shell Stocks

Period	Royal Shell Stocks	Dutch Oil Price	LSE	Interest Rates	Industrial Production
1	100.0000	0.000000	0.000000	0.000000	0.000000
2	99.44573	0.083652	0.039557	0.418462	0.012599
3	99.41445	0.108288	0.043695	0.418344	0.015220
4	99.41010	0.110768	0.043829	0.419883	0.015415
5	99.40984	0.110824	0.043839	0.419951	0.015548
6	99.40983	0.110825	0.043839	0.419953	0.015548
7	99.40982	0.110825	0.043839	0.419953	0.015563
8	99.40981	0.110825	0.043839	0.419953	0.015569
9	99.40981	0.110825	0.043839	0.419953	0.015575
10	99.40980	0.110825	0.043839	0.419953	0.015580

Table 9. Variance decomposition analysis of Gazprom Stocks

Period	Gazprom Stocks	Oil Price	LSE	Interest Rates	Industrial Production
1	100.0000	0.000000	0.000000	0.000000	0.000000
2	99.70388	0.002207	0.000295	0.253707	0.039913
3	99.34976	0.172296	0.047377	0.390748	0.039817
4	99.33467	0.177760	0.047423	0.393651	0.046500
5	99.33162	0.177766	0.047542	0.394717	0.048353
6	99.32942	0.177780	0.047541	0.394710	0.050551
7	99.32770	0.177784	0.047541	0.394716	0.052257
8	99.32615	0.177786	0.047540	0.394716	0.053806
9	99.32482	0.177787	0.047539	0.394715	0.055135
10	99.32366	0.177788	0.047539	0.394715	0.056296

Table 10. The ARCH Lagrange multiplier (LM) test for the oil stocks and oil price

Stocks	Exxon Mobil	Reliance Industries	Royal Dutch Shell
Constant	0.000382	0.004377	0.000194
AR(1)	0.970257	0.977934	0.978343
Probability	0.0000	0.0000	0.0000
F-statistics	19614.06	28836.11	16065.04
Probability	0.0000	0.0000	0.0000

The null hypothesis is no ARCH.

All ARCH effects are significant at the 1% level.

All variables are in logarithmic form

Table 11. Estimates of GJR GARCH

	Exxon Mobil	Reliance Industries	Royal Dutch Shell
<i>Mean equation</i>			
Oil price	0.620847* (248.7385)	1.863194* (205.7621)	0.515737* (258.2248)
Constant	1.572677* (161.2549)	-4.895373* (-132.4518)	1.282430* (173.7750)
<i>Variance equation</i>			
Constant	0.000160* (4.379959)	0.001117* (3.367979)	0.000124* (6.854251)
ARCH	0.840256* (3.998672)	0.942672* (3.035662)	0.925324* (5.374756)
I(Dummy variable)	0.029910 (0.142617)	0.032610 (0.092621)	0.011570 (0.058585)
GARCH	0.128752 (1.533471)	0.046100 (0.993239)	0.058918 1.177387

All variables are in logarithmic form. Z statistics are in parentheses.

\* Significant at the 1% level. \*\*Significant at the 5% level. \*\*\*Significant at the 10% level.

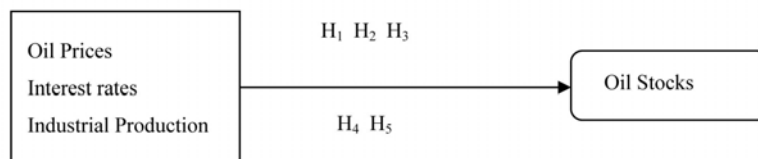


Figure 1. Theoretical Framework

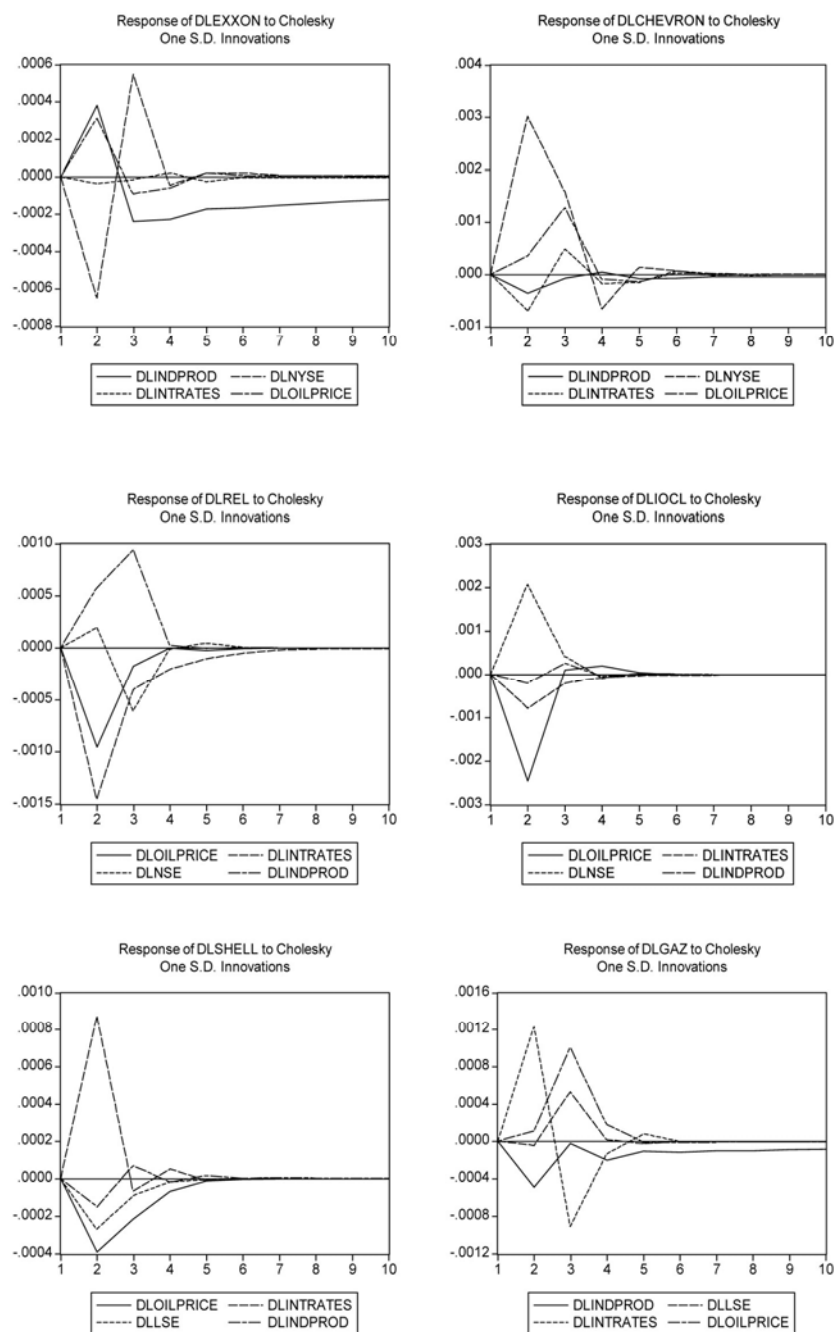


Figure 2. Impulse response of stocks



## On effects of Foreign Direct Investment on Economic Growth

Xinglong Xie & Hongqi Wang

School of Business Administration, Xi'an University of Technology, P.R. China, 710048

E-mail:long86886@yahoo.com.cn

*The paper is sponsored by the National Natural Science Foundation of China NO.0673080 and the University Doctor Program NO.107-210611.99398*

### Abstract

Through the individual fixed effects model, the article makes the empirical study of 23 developing host countries, concluding that FDI weakly influences on the economic expansion rate directly and indirectly, the interaction term of FDI with regime affects the growth rate significantly and what is more, FDI's interaction with regime contributes to the economic increase extensively through crowding in domestic investment. The regime in host countries imposes the positive effect on economic development mainly by means of two channels: one is crowding in FDI inflows into the host countries and the other one is to promote the increasing in domestic investment strongly. Therefore, good institutes are the critical determinant of the beneficial effects of FDI reaped in host countries. Consequently, developing governments should design the quality institute and make the innovation in regime for obtaining benefit from the technological spillovers of FDI so as to enhance their economic growth persistently.

**Keywords:** Regime; Foreign Direct Investment; Individual Entity Fixed Effects Regression Model

### 1. Introduction

Foreign direct investment has been on the rise rapidly in the world, particularly developing transitional countries since 1980s. During the period of 28 years from 1980 to 2007 its annual growth rate reached 121% globally and stood at 237% in developing countries. By 2007 FDI stocks had been million USD 4246739 in developing economies, accounting for 28.9% of the global amount. Developing governments have been improving their investment climate, formulate policies and measures in favor of FDI for the sake of attracting more FDI into their homes.

FDI is regarded as the incubator of capital stocks, special knowledge and technology, an important channel of transferring technology. Compared with domestic investment, FDI is featured by spilling its technology, expertise, management skills, new modes of business and marketing ideas to the local enterprises for the host countries into which it moves and this can promote the host countries' technological capability and economic sustainable expansion. They absorb FDI's technology, management methods, marketing philosophy and commercial models to actualize the optimizing of the resources disposition, shift useable production resources into the sectors which have comparative advantages and turn potential comparative advantages into real competitive ones, accelerating national economic expansion and bolstering the economic growth in the long run, and finally takes the way of endogenous development in their national economy.

However, the empirical evidence shows the difference regarding the relationship between FDI and economic growth. To sum up, the researches at the industry level show spillover effects more than at the enterprises level; compared with other types of data, panel data leads to significant effects ;given the same level and data types, results form the researches of advanced countries propose more positive effects from FDI than ones from developing counterparts.

In recent years a large number of researchers take into consideration more production elements for exploring the relationship between FDI and economic growth and introduce more explainable variables into the growth model with the view to exactly analyzing the contribution FDI makes to economic expansion for host countries. Balasubramanyam et al.(1996) note that openness to trade is essential for growth effects of foreign investment. Borensztein et al.(1998) find that countries need a particular educational attainment level to benefit from FDI. Hermes and Lensink(2003),Durham(2004) and Alfaro et al.(2004), dealing with the relationship of regulations of financial markets, FDI and growth, find that the countries, if have better financial systems and financial market regulation, can develop full use of FDI in the more efficient manner and accomplish a higher growth rate in their national economies. Zhao et al.(2007) holds that it is the important factor why FDI exercises the negative effects on China that China lags behind in financial system and marketization. Wand and Li (2004), through a quasi endogenous growth model including FDI, conclude all the regions can be benefited from FDI spillovers only if they span the thresholds of human resources. Jiang (2008) argues that the improvement of China's economic institutes is in favor of the realization of technological spillovers from FDI and sound regime is the determinant of bringing into full play FDI's effects .Zhao(2009) maintains that China's financial market doesn't expedite the utilizing of the potential of FDI for promoting its national economic

expansion.

The existing literature has one serious problem that economic regime is ignored in analyzing the effect of economic variables on growth. Except a few models, most researches impliedly assume that economic institutes are reasonable and proper for economic expansion. And this means that economic parties including individuals and organizations are motivated feasibly under the circumstance of governmental intervention, which can insure economy on the optimal track. But in fact, this doesn't comply with the economic practice so the existing literature's conclusions are biased and not convincing. This paper is directed at filling the blank in this regarding and its novelty is embodied by its unique perspective of regime that is referred to as the basic factor for exploring the relationship between FDI and economic growth and by the individual fixed effects model that is used to deal with the interactional laws between regime, FDI, spillovers and economic expansion. The fixed effects model includes three kinds: entity fixed effects, time fixed effects, time and entity fixed effects models. When researchers adopt the fixed effects model, most of them don't distinguish the three forms and adopt one form generally: the intercept signifies difference for each cross-section. As a matter of fact the intercept can be divided into two components: one stands for  $\delta$  indicating the common effects on all the cross-sections and the other one is  $\lambda_i$  representing the effect that is subject to a certain cross-section  $i$  ( $i=1,2,3,\dots,23$ ). We are aware of this point fully and employ the more accurate model for research so that our results are more scientific and objective. Against this backdrop, we will introduce regime as one explainable variable into the production function and use the entity fixed effects model, based on the panel data of 23 developing countries (China, India, Indonesia, Malaysia, Philippine, Thailand, Turkey, Poland, Russia, Czech, Slovakia, Slovenia, Hungary, Romania, Argentina, Brazil, Chili, Columbia, Mexico, Venezuela, Egypt, Morocco and South Africa), which attract the most foreign direct capital from 1999 to 2006, through the analysis of covariance estimation (ANCOVA), to probe into the law of FDI, technological spillovers and economic growth in linkage.

This paper proceeds as follows. Section 2 depicts the theories regarding institutes, FDI and economic growth. Section 3 explores the specification of econometric model, data and the results of econometric analysis. Finally section 4 will provide the main concluding remarks and concludes with policy suggestions.

## 2. Literature Review on Regime of FDI and economic growth

### 2.1 Regime and economic growth

The effect of regime on economic growth is obvious. In certain sense, just as technological progress, institutes can promote production efficiency and achieve the higher ratio of output to input. Advanced technology is the resource of economic expansion but it is just one prerequisite instead of the sufficient condition. In order to put into practice technology efficiently and extensively, there must be the adjustment in regime and idea for the sake of correctly utilizing innovative knowledge to promote economic growth. Institutes can motivate economic individuals and organizations. Technological innovation is just one kind of human being's occasional activity whose function in stimulating and driving economy may be partial and not continuous. What makes those random points form line segments and those segments be connected into lines? It is none other than institutes, which make human being's technological innovation become an unbroken activity. Firstly, institutes have the deep linkage with capital, labor forces and technology. Regimes can harmonize capital inputs and their direction. And so appropriate systems can bring into full play capital-owners and users so as to accelerate capital circulation and regeneration and prompt speed of economic running. Next, institutes have a profound effect on individuals and groups in production activities. Systems can harmonize interpersonal relationships, intergroup relationships and the relationships between individuals and groups. Appropriate regimes that are in line with economic development can steer laborers into cooperation and division of labor in each domain. Third, institutes function as a driving force of technological progress. Technology, as a single production element, has been emphasized and its high development speed is attributed to institutes basically. Particularly, the system of intellectual proper rights protects equity of knowledge product owners, consequently motivating people to make innovation in technology and quicken the technological stride. Finally, institutes take on knowledge property, which pick up the efficiency in output. Meanwhile, systems can be considered as one sort of knowledge. In this stance, the corporation's regulations can be looked upon as a strip of management knowledge which directly influences the development of business of all kinds.

### 2.2 Regime and FDI

A large number of documents have explained why multinational corporations make investment abroad rather than in their own countries. Hymer thinks that market imperfection is the ultimate condition for overseas investment and the enterprise's monopoly advantage is the determinant for its making investment abroad. R. Vernon argues that the enterprise's overseas investment is subject to the different stages in product life cycle, the product's comparative advantage and competitive conditions. The internalization theory maintains that foreign investment is attributed to market imperfection such as market failure, which may induce the rising transaction costs in the enterprise, and the enterprise organizes its internal transactions by this form of organization—"enterprise" so as to reduce the transaction

costs for the purpose of maximizing earnings. Kojima is of the opinion that it is the comparative advantage for multinational corporations to invest abroad.

Dunning argues that three determinants of multinational corporations making foreign direct investment are ownership advantage, internalization advantage and location advantage. Policies and institutes in host countries are playing a more important role in location and internalization advantages (Victor, Jeffrey and Bistra, 1988). Dunning points out (1998) that the location theory is being featured by the new trends: firstly, multinational corporations are inclining to move into those countries and regions for direct investment which have sounded legal systems, attach great importance to the protection of intellectual property rights, are abundant in supply of intellectual resources and high qualification talents; secondly, they choose those places to make investment which can strengthen or supplement their core competitiveness; Finally, the determinants of FDI in location are comprehensive. According to Narula and Dunning, the host country's institutes, as an important component of creative assets, are becoming increasingly significant in attracting and utilizing FDI to serve national economy.

Regime is increasingly emphasized in attracting FDI inflows as foreign investors must adapt their commercial strategies into the host country's institutes (Oxley, 1999, Peng 2000). Otherwise their enterprises can't be put in operation smoothly and their interests will be not realized because of the conflict with the host country in objective. More researches have been proving that the goals of multinational corporations are to expand their resources and upgrade their ability through exercising effect on the regions where they make investment as well as utilizing these nations' resources. Therefore, the more favorable the regime in the host country is in increasing resources and capability for FDI, the more attractive the country will be to it. Institutes with bad quality may contribute to the rising costs for transactions, negotiations and executions (Antal, 1998), which suggests that FDI must bear higher transaction costs when establishing new enterprises in the nation, and meanwhile hampers potential trade (Meyer, 2001). Globerman and Shapiro (2002) hold that the same factors have the impact on FDI inflows or outflows. Levchenko (2004) argues that the gap in institute is the origin of comparative advantages and some sectors are regime-denser than others so as to create more business opportunities. Alfaro et al. (2005) think that bad institutes can explain why poor countries attract a small quantity of FDI and Fan et al. (2009) maintain that the deficiency in China's system may provoke that it can't have more FDI.

Regime, being one crucial aspect regarding location advantage in the host country, has an impact on the location choice for foreign direct investment and is playing a more important and obvious role in attracting FDI than natural resources. Therefore, we maintain that FDI is one potential element to drive the economic growth and turning its potential into reality needs a proper institute arrangement. In the absence of high quality institutes, FDI may give rise to the negative result, even blocks economic expansion and this may be of assistance to investment return for the multinational corporation but not in favor of the host country's welfare. Forasmuch, the good institutes in the host country is vital to fully effect the potential from FDI as well as attracting FDI.

### 3. Models and Empirical Analysis

#### 3.1 Production Function, Data Origins and Panel Data Models

##### 3.1.1 Production Function and Data Origins

According to the above analysis, we introduce the institute into the production function as well as investment made up of domestic and foreign capital. In addition, in terms of economic theories, growth also depends on infrastructure and stability in economic environment. So, we define the production function as follows:

$$F_{it} = F(GCF_{it}, FDI_{it}, REGI_{it}, CTRL_{it}) \quad (1)$$

Suppose the equation is linear, we construct the following empirical model by replacing  $F_{it}$  with  $OUTPUT_{it}$ :

$$F_{it} = c_0 + c_1 GCF_{it} + c_2 FDI_{it} + c_3 REGI + \sum_{j=4} c_j CTRL_{ijt} + \mu_{it} \quad (2)$$

OUTPUT is the independent variable, denoting economic growth, proxied by GDPPC, originated from UNCTAD; GCF is gross capital formation representing domestic investment, originated from UNCTAD; FDI is foreign direct investment, proxied by its real stocks, originated from UNCTAD; REGI symbolizes institute, proxied by freedom index abstracted from Frazer Data; CTRL is other explainable variables, including labor, stability of economic climate and infrastructure level;  $i$  ( $i=1,2,3,\dots,23$ ) and  $t$  ( $t=1999,\dots,2006$ ) stand for the  $i$ th country and the  $t$ th year;  $\mu$  is the residual term. Labor is proxied by primary enroll rate (EPG), second enroll rate (ESG) and tertiary enroll rate (ETG), all originated from the world bank, the stability in economic environment is proxied by inflation (INFL), from the world bank, infrastructure is proxied by the number of people having fixed and mobile phones in per 100 persons (FMP), from the world bank. The interaction term of regime and FDI (FDISTOCKREGI) is equal to freedom index multiplying FDI stock. All the data are processed by normalization for tackling the difference in dimension, then time 10 to obtain the



final data which are used through E-views 5.1 to make the estimation of the model.

### 3.1.2 Classification of panel (time series /cross section) data model

In terms of difference in slope coefficients and intercepts, the panel data model is divided into three kinds. The first one is postulated as:  $y_i = \alpha + x_i\beta + \mu_i, i=1,2,...,N$  (3)

Which means both slope and intercept coefficients are the same, implying there is neither effect from individuals nor structure difference; The second is the variable intercept model:  $y_i = \alpha_i + x_i\beta + \mu_i, i=1,2,...,N$  (4)

where regression intercepts are the same, and slope coefficients are not. The last model is the variable coefficient one:  $y_i = \alpha_i + x_i\beta_i + \mu_i, i=1,2,...,N$  (5)

Where neither regression slope coefficients nor intercepts are identical, implying that the difference exists in the effect from cross sections and the structure is variable among the entities.

The variable intercept model is the most widely used of all the panel data models, in which the effects from the individuals are considered, embodied by intercepts. Attributable to the different modes of individual effects, it is classified into 3 types: entity fixed effects regression model (EFERM), time fixed effects regression model time entity fixed effects regression model. In this paper we will adopt the first type so we just describe it. From the perfectives of time and entity, variables in panel data regression models have the same marginal impact on independent one and other variables' influencing on the independent variable is subject to individuals rather than time as well as the model's explainable variables. Under this circumstance, the model should be established as EFERM:

$$y_{it} = \delta + \lambda_i + \sum_k^K \beta_k x_{kit} + \mu_{it} \quad (6)$$

### 3.2 Testing models

We first test what model the sampling data are suitable for. If they fit panel data models, we then test which models are more appropriate, fixed or random effects. If fixed effects models are better, we test which fixed ones are the most proper of the 3 types. In testing whether the fixed model is used or not, we don't employ Hausman method, for it can test the validity of fixed model but can't judge exactly what kind of fixed model is suitable. We use the covariance analysis (aforesaid) to make the test of related models, results being presented on table 1 and all critical values calculated through SPSS. In the following tables, symbols of \*,\*\* and \*\*\* denotes the significance at the level of 1%、5% and 10% respectively.

Specifically, we define the flowing statistics for model testing:

$$F_1 = \frac{(S_2 - S_1)/[(N-1)k]}{S_1/[NT - N(k+1)]} \sim F[(N-1)k, N(T-k-1)]$$

$$F_2 = \frac{(S_3 - S_1)/[(N-1)(k+1)]}{S_1/[NT - N(k+1)]} \sim F[(N-1)(k+1), N(T-k-1)]$$

$$F = \frac{(RRSS-URSS)/_{(N-1)}}{URSS/_{(NT-N-K+1)}} \sim F(N-1, N(T-1)-K+1)$$

Where N is the number of sections, T the time length and k the number of independent variables. In addition, RRSS is the restricted residual sum of squares for equation (6) (pooled regression model) and URSS is the unrestricted residual sum of squares for equation (6). It can be seen from the table 1 that because F2 in model 1 is more than its critical value and F1 less than its critical value at the significant level of 5%, showing the model rejects hypothesis H2 but doesn't reject  $H_1: \beta_1 = \beta_2 = \dots = \beta_N$ ;  $H_2: \alpha_1 = \alpha_2 = \dots = \alpha_N$   $\beta_1 = \beta_2 = \dots = \beta_N$ , the model the fits varying intercept one. Likewise, models 2 and 3 both at the significant level of 10%, models 4 and 5 both at 1%, all reject hypothesis H2 but don't reject H1, these models fits the varying intercept one. To sum up, 5 selected models all are suitable for variable intercept ones (equation 4) at low levels.

F in all models is more than the critical value, resulting in the conclusion of rejecting the null assumption. Hence, it is reasonable and proper to adopt the entity fixed effects model, equation 6. The results are estimated through E-views 5.1, being showed on the table 2. Since individual cross-sections are different in heteroscedasticity, estimation results by LSDV are biased. So we adopt GLSDV for making the estimation of parameters and the residual variance is used as the weight to smooth away the problem of heteroscedasticity of cross sections. The empirical estimations are showed on the table 6 where \*, \*\* and \*\*\* denote the significant level of 1%, 5% and 10%, t value is in parentheses.

It is noting that we proxy regime value at time t-1 for t and ETG value at time t-1 for t for estimation because of time

lagging. There are 5 models which have different explainable variables.  $F$  in all the models exceeds the critical value, suggesting that models pass the examination of significance, adjusted  $R^2$  more than 0.99 means good the degree of fitting of models,  $t$  value exceeding its critical value implies coefficients for explainable variables are significant at the low level. Hence, models and explainable variables are powerful and persuasive to account for the economic issues. The sums of constants for cross sections, which mean the effects from unobserved elements or the elements except explainable variables, are all in 5 models respectively close to 0 or equal to 0.

Covariance matrix reflects the volatility of two variables. Positive covariance indicates two variables have the same direction in change and minus covariance means the different direction. Covariance, if being 0, hints the independence of two variables. The numbers on and outside the diagonal line in the coefficient covariance matrixes, which is not shown because of the limited page, are all extremely small, almost close to 0, respectively hinting no autocorrelation of each variable and no collinearity and dependence among variables. This satisfies the requirement of strict exogeneity so covariance analysis is consistent and the estimated results are of high convincing. However, owe to limited pages, we didn't list the covariance matrix of models.

In order to test robustness of our findings, we add one explainable variable of rule to every model (see the table 3). The results show that adjusted  $R^2$  is more than 0.99, suggesting that models are significant and still of a good fit,  $t$  value for each variable is significant at the low level. More important, the coefficient of each variable in all the models is small in change, compared with the original ones, and this infers that our findings are very robust. It is worth noting that the value for rule at time  $t$  is proxied by at time  $t-1$  because of time lag in model 5.

In tables 2,3,4 and 5 numbers in small brackets are value  $t$ , donating whether the variable is significant or not. The coefficients of FMP in model 1, 2, 3 and 4 are 0.1, 0.06, 0.13 and 0.06 (table 2), suggesting good infrastructure has the positive effect on economic growth. The coefficients for INFL are minus, indicating that volatility in economy influences economic expansion negatively. Labor with tertiary education makes the greater contribution than second and primary school education because the former coefficients are 0.07, 0.09 and 0.1 in model 2, 4, and 5 but the two latter coefficients are both just 0.03. This indicates that the higher labor is, the more powerful it will promote economic progress.

The coefficients for FCF in models 1,2,3,4 and 5 are 0.76, 0.78, 0.77, 0.78 and 0.83 respectively and are significant at the low level, which are much larger than any other variables, suggesting that domestic investment exercises the positive effect on economic expansion powerfully and makes the greatest contribution to economy of all variables. So, economic growth in selected developing countries depends on mainly domestic investment. The coefficients for FDI in models 1, 2, 3 and 5 are 0.11, 0.8, 0.1 and 0.08 and are significant at the low level, which means that foreign investment imposes economy positively but not strongly. The coefficients for regime in models 1, 2 3 and 5 are 0.07, 0.07, 0.05 and 0.05 respectively, showing that regime influences economy positively but more weakly than domestic and foreign domestic.

It is worth noting the coefficient for the interaction term of regime and FDI is 0.114. That is larger than regime and FDI, meaning that their mutual action makes the greater contribution to GDPPPC positively than individual regime or FDI. Hence, it is under the good institutes that FDI can further promote economic growth. The high quality in regime is the sufficient condition for FDI to be fully utilized for well serving economic performance in the host developing countries.

It is understood that the coefficients for variables from regression describe the common information for individuals and differences among chosen cross sections exist, whose information is reflected by the constant for each cross section. Furthermore, the constant of each section describes the effect on economy of unobserved variables or the variables not included in the models, which is subject to individuals rather than time. Therefore, the cross section's constant embodies the effect of individual entity difference variables on growth, such as the host country's economic volatility, political regime, economic structure, technological level, management style, demographic feature and entrepreneur group. We average the constants for each country in 5 models, the table of which is not provided because of the limited page, so as to find out that in 3 African countries, 3 eastern European countries in 6, China, India and Turkey the individual difference variables have the positive effect on economy but in 4 Latin American countries in 6, 3 southeast Asian countries in 4 (excluded China), Russia, Czech Republic and Slovakia they have the negative effect.

Compared with Egypt (2.57325) and India (0.367561), China has the smaller constant for individual difference variable of 0.160153, meaning China is not satisfactory in many aspects concerning economic development and potential such as its industrial structure, democracy, fairness and legal system. As a matter of fact, existing factors in China, for instance unsounded economic institutes, have been placing the restriction on economic growth somewhat.

### 3.3 Regime, FDI and domestic investment

Domestic investment makes the greatest contribution to economic growth so we determine to explore the effect of regime and FDI on domestic investment for further finding out the law regarding their linkage. For this purpose, we adopt the following model arising from UNCTAD(1999)

$$GCF_t = \alpha + \beta_1 F_t + \beta_2 G_t + \varepsilon_t \quad (7)$$

$GCF_t$  denotes domestic investment,  $F_t$  presents FDI,  $G_t$  is output and  $\varepsilon_t$  is random error. For embodying regime's effect on domestic investment, we add variables, institute and the interaction of institute and FDI. Replacing  $F_t$  and  $G_t$  with values of FDI STOCK and GDPPC, we obtain the following model:

$$GCF_{it} = \alpha + \beta_1 GDPPC_{it} + \beta_2 REGI_{it} + \beta_3 FDI STOCK_{it} + \beta_4 FDI STOCK REGI_{it} + \varepsilon_{it} \quad (8)$$

Considering time lag of regime, we proxy its value at time t with t-1. Regression results are shown on table 4.

Then we deal with the effect of regime on FDI. Based on UNCTAD, the determinants of FDI are classified into two kinds: traditional factors in which the market size of the host country is the most important and non-traditional ones. With the economic growing in developing countries at the high speed, non-traditional elements play an increasingly important role in attracting FDI inflows, such as openness, governmental interventions and economic institutes, mainly because multinational corporations seek for long-term interests and attach great importance to the regime environment of affecting economic efficiency. Therefore, we use GDPPC, FMP (infrastructure) and REGI (institute) as explanatory variables and FDI as the independent one, hypothesizing linearity existing, to define the following regression equation:

$$FDI_{it} = c + c_1 GDPPC_{it} + FMP_{it} + REGI_{it} + \mu_{it} \quad (9)$$

FDI STOCK is the proxy for FDI and  $\mu_{it}$  is the error correction term. Owe to time lag, we use the value for GDPPC at time t-1 to proxy t for estimations (see table 5).

Table 4 reveals that GDPPC has the biggest effect on domestic investment with the coefficient being 0.79, domestic regime has the smallest effect with coefficient being -0.05, the interaction term of regime and FDI are more powerful in influencing domestic investment than FDI, the coefficients being 0.18 and 0.08 respectively. Obviously the interaction of regime and FDI has the much greater effect on domestic investment than FDI and this suggests that it is under the good institutes that FDI can crowd in domestic capital. Besides, in terms of table 11, regime has the positive crowded-in effect on FDI, with the coefficient being 0.11.

To sum up, regime promotes economic growth for host countries (see table 6): first, it positively affects economic expansion directly; then, it indirectly drives economic growth through pulling FDI into host countries; finally, coupled with regime, FDI crowds in domestic investment to bolster economy for host nations and this has the greatest effect on economic increasing with direct and indirect effect indexes being 1.83 and 2.34 respectively.

With regard to FDI, it co-functions on economic growth together with regime in the direct manner (interaction of FDI and regime). What is more, it imposes the indirect effect on economy by crowding in domestic investment. Therefore, the institutes with high quality in host developing countries are the prerequisite of achieving the technological spillover effects from FDI. Whether the potential of FDI is fully developed to serve the host country's economy well depends on the quality of the host country's regime.

### 3.4 FDI's positive effect on developing host countries is not fully materialized from regime

The coefficients for the regime variable in Models 1, 2, 3 and 5 are equal to 0.07, 0.07, 0.05 and 0.05 correspondingly, showing that regime has the positive effect on economic growth but very marginally. Besides, it negatively influences domestic investment. Hence, the regime variable's effect on growth is not significant. From the historic point of view, this is mainly due to the validity and inefficiency in institute structures with the shortage of pricing mechanism. After World War 2, developing countries adopted the "large and public" model of property rights under the influence of the Stalinist mode, featured by high centralization at the dominant position in resources allocation and ignoring the market's function, as the result that validity in allocation of social resources and the efficiency of regime can't be guaranteed. The shortage of private ownership contributed to the shortage of the driving force for innovation. Under the circumstance of property rights being not protected, it is a rational choice for individuals to avoid the risk of innovation. Thus, a variety of economic factors can not play their desired effects and economy is in a state of low growth, even stagnation. So, regime in developing countries has been in a non-equilibrium state for long time and the supply in regime can't meet the demand, causing a small net income, even to 0, far away from attaining the "Pareto optimal".

In order to shake off stagnation of regime and to achieve the realization of "Pareto optimal", developing nations adopt the strategy of attracting FDI and regard it as an effective way to speed up economic liberation, marketization and privatization process. Take China as one example. Since 1978 China has rolled the ball of making economic system reform and regarded the utilization of FDI as the catalyst to serve economic development. In 1979 she established 4 special economic zones such as Shenzhen, opened up 14 coastal cities in 1985, opened up northern coastal areas in 1988, opened up Pudong in 1990 and decided to further expand the scope of opening up to the outside world in 1992 so as to accomplish such an opening-up pattern as "opening up along coasts, rivers and boarders" "opening up from coasts to

inlands” and “opening up from the south to the north”. In 1997 China drafted and promulgated legal documents to encourage FDI to invest in central and west regions. FDI inflows into China have been surging high. Up to 2006, it has been for 14 years to be ranked No. 1 in attracting FDI in all the developing countries. So, China’s 30 years process of economic development and reform is the process of FDI inflowing, which is also the process of breaking the traditional monopoly of state-owned economy. Essentially it is a process of China’s economic institute transformation.

However, because of the old system’s inertia and the new system’s time lag, the FDI’s effect on economic growth has not been brought into full play, which is reflected by small variable coefficients in the above regression models. From economics, these developing countries are being at the economic transitional stage, featured by dual economic regimes, the market system being intertwined with the traditional one, and the larger degree in market distortion. Hence, the element structure is not reflected through the market information, the difference of which the policy guidance in host countries doesn’t reflect. Under such circumstances, the developing countries have conflict with multinational corporations in economic dominance and market resources, which is not conducive to building competitive advantages for host nations during the process of using FDI so its positive effect on economic growth is very marginal.

#### 4. Concluding remarks and policy suggestions

The paper, built on the panel data of 23 developing host countries that attract the most FDI, through the individual fixed effects regression model and covariance analysis of GLS to deal with the correlation of FDI and economic growth. The above research shows that regime and FDI both have the direct and weak effect on economic expansion. However, their interaction term has the positive effect on growth significantly in both the direct and the indirect manners. In case of FDI, the channels to support economic growth are interacting with regime to advance economy and at the same time crowding in domestic capital to drive economy. Hence, a good institute can ensure technological spillovers from FDI. Further, whether FDI’s potential for expansion is fully developed, whether FDI’s spillovers are materialized in economic practice and to what extent FDI’s positive externalities are realized to serve economy depend on the institute quality. Therefore, efficient institutional arrangements are the ultimate cause for achieving FDI’s spillover effects to promote economic growth for developing host countries. In addition, we find that the regimes of developing nations don’t make the big contribution to economic development, the coefficients being 0.07 or 0.05 and have the negative effect on domestic investment for the coefficient being -0.05. It is implied that the defects in regime of developing economies is the critical reason why FDI doesn’t bring into expected play in the development of their national economy and this can explain why developing nations implement the preferential policies to inspire and motivate foreign capital into their markets to start business in different forms. The existence of preferential policies implies the defects of regime and market distortion in developing countries, meaning that economic resources such as fund resources are not allocated as per market rules. Existing literature and experience prove that preference plays the limited role in location choice of FDI. Only Under the condition of the involvement of other production elements can policies in favor of FDI matter much economically. Hence, developing economies should highlight a package of operational resources (including technology, knowledge, expertise, market opportunities and business model) to be introduced into their markets through FDI inflows for the sake of maximizing the realization of spillover effects and enhance endogeneity for national economy. To this end, the host countries need to make the innovation in economic regime, strengthen the reform for property rights, and actualize taking-in and utilizing of technologies arising from FDI through the market mechanism. Further, the developing countries should strengthen the reform in political institutes. Olsen’s proposal of establishing of market-augmenting government is worth learning and putting into practice. Developing countries can draw on this as the reference, experience and guideline for making political reform.

#### References

- Douglas C North. (2003). *Empirical studies of changes in institution*. Beijing: Economic Science Press.
- Gao, Tiemei .(2006). *Econometric analysis and Modeling*. Beijing: Tsinghua University Press.
- John Robertson. Budge Lin. (2008.). *Econometric panel data analysis*. Tianjin: Nankai University Press.
- Luo, Biliang. (2005) .*New Institutional Economics*. Taiyuan: Shanxi Economic Press.
- Matthias Musse. Jose Luis Groizard. (2008) Foreign Direct Investment, Regulations and Growth. *The world Economy*. PP.861-886.
- Nicole Madariaga and Sandra Poncet. (2007). FDI in Chinese cities: spillovers and Impact on growth. *The World Economy* .PP837-861.
- Philippe Aghion. (2004).*Endogenous growth theory* . Beijing; Beijing University Press.
- Shen, Guilong. (2007) *On performance of FDI in China*. Shanghai: Shanghai people publisher.
- Tommy. (2008) .With economies in transition, foreign direct investment and technology spillover effects. *Economic Research* . PP26-38.

Wang, Zhi-peng and Li, zinai. (2004) Foreign direct investment, spillovers and endogenous economic growth. *Wenhui world economy*. PP23-23.

Yu, Junnian. (2006). *Econometric software (Eviews use)*. Beijing: Foreign Trade and Economic University Press.

Zhang ,Cheng Zhao. (2006) Financial deepening, economic growth, FDI spillover effects and regional economic growth. *The number of economic and technical economic studies* .PP74-82.

Table 1. Testing models

	Model 1	Model 2	Model 3	Model 4	Model 5
Independent variable	GDPPC	GDPPC	GDPPC	GDPPC	GDPPC
Explainable variable	GCF FDISTOCK REGI INFL FMP ESG	GCF FDISTOCK REGI INFL FMP ETG	GCF FDISTOCKREGI INFL FMP EPG	GCF FDISTOCKREGI INFL FMP ETG	GCF FDISTOCK REGI ETG
S1	16.73751	20.86029	12.77012	33.25165	60.25082
S2	151.1038	151.8433	149.2115	156.7099	157.9668
S3	251.3582	257.7802	257.2774	265.8306	267.9779
RRSS	130.6963	132.3283	128.9412	147.0247	142.8310
URSS	16.737508	20.8602878	12.8775253	33.25165	60.250821
Critical value for F1	1.58 *** 1.81 ** 2.35 *	1.58 *** 1.81 ** 2.35 *	1.58 *** 1.81 ** 2.35 *	1.40 *** 1.54 ** 1.85 *	1.35 *** 1.46 ** 1.72 *
Critical value for F2	1.58 *** 1.80 ** 2.33 *	1.58 *** 1.80 ** 2.33 *	1.58 *** 1.80 ** 2.33 *	1.39 *** 1.53 ** 1.83 *	1.33 *** 1.44 ** 1.69 *
Critical value for F	1.45 *** 1.61 ** 1.95 *	1.45 *** 1.61 ** 1.95 *	1.45 *** 1.61 ** 1.95 *	1.45 *** 1.61 ** 1.95 *	1.45 *** 1.61 ** 1.95 *
F1	1.398793	1.094079	1.86168	1.552645	1.271654
F2	2.093546	1.696244	2.859591	2.43748	2.162652
F	48.27908	37.89063	63.90956	24.41761	9.843448

The residual sums of square for Equations (5), (4) and (3) are  $s_1$ ,  $s_2$  and  $s_3$  respectively.

Table2. Estimation Results

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
C	-0.307644** (-2.506964)	-0.32 44327* (-2.987131)	-0.419256* (-3.460977)	-0.201262** (-2.349241)	-0.487822 (-6.732819)
GCF	0.761088* (21.30281)	0.784022 (22.24051)	0.769801 (21.59747)	0.782645 (21.84777)	0.834254 (23.03530)
FDISTOCK	0.108174* (2.819797)	0.076587** (2.006221)	0.099182** (2.600336)		0.079213** (2.113416)
REGI	0.066593* (5.021493)	0.068197 (6.303747)	0.053968 (4.236976)		0.053154 (4.491910)
INFL	-0.061101* (-4.795396)	-0.046150* (-3.950121)	-0.061010 (-4.836375)	-0.044302 (-4.381320)	
FMP	0.096854*** (2.774869)	0.062617** (2.109830)	0.128475* (3.910108)	0.058398** (2.015560)	
ETG		0.070561* (3.503840)		0.086044** (3.258525)	0.098581 (4.373623)
ESG	0.026814*** (1.772594)				
EPG			0.031216*** (2.815023)		
FDISTOKREGI				0.113841** (3.347033)	
REGULATION					
	0.990521	0.994306	0.989215	0.993409	0.990828
F	598.1248	998.7664	525.1189	894.1807	665.7535
D-W	1.696135	1.832317	1.775156	1.653562	1.845642

Table 3. Checking robustness of models

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
C	-0.464449* (-3.658992)	-0.388850*(-3.433268)	-0.530774(-4.246675)	-0.290063* (-3.096830)	-0.552743 (-7.530155)
GCF	0.716546 (18.35161)	0.728858 (18.99615)	0.742130(19.58209)	0.744960 (20.39520)	0.831518 (22.20232)
FDISTOCK	0.098862*** (2.586100)	0.073968*** (1.896635)	0.087829** (2.323276)		0.078415** (2.043411)
REGI	0.046976* (3.208969)	0.046144*** (3.437092)	0.044285* (3.155535)		0.036939* (3.176719)
INFL	-0.062349 (-4.471802)	-0.051226* (-3.995798)	-0.060645 (-4.735776)	-0.048960 (-4.605796)	
FMP	0.147471* (3.943896)	0.113424** (3.068475)	0.162265 (4.773442)	0.101918* (3.108184)	
ETG		0.076100*** (2.735219)		0.081013* (2.935841)	0.097561 (4.456348)
ESG	0.032757*** (1.912237)				
EPG			0.031116*** (2.750235)		
FDISTOKREGI				0.087832** (2.575415)	
REGULA	0.045898*** (2.624322)	0.036811 (2.361247)	0.036008** (2.282934)	0.042882 (2.964797)	0.044078* (3.322721)
R <sub>ad</sub> <sup>2</sup>	0.987753	0.987723	0.987195	0.992528	0.991903
F	364.3321	444.8931	426.3539	760.0614	726.9496
D-W	1.663764	1.705245	1.741149	1.737913	1.780480

Table 4. Effect of FDI and regime on domestic regime

	C	GDPPC	REGI	FDISTOCK	FDISTOCKREGI	R <sub>ad</sub> <sup>2</sup>	D.W.
GCF	0.348186 (5.207076)	0.787834 (22.13596)	-0.050893* (-3.749940)	0.077325** (2.282046)	0.177032 (4.400974)	0.983414	1.905659

Table 5. Regime's effect on FDI

	C	GDPPC	REGI	FMP	R <sub>ad</sub> <sup>2</sup>	D.W.
FDISTOCK	0.657615* (-3.822704)	0.404924 (6.964508)	0.106755 (2.688304)	0.617655 (12.38804)	0.917149	1.665907

Table 6. Degree of FDI and regime effects on growth and mode

Variable	Mode	Coefficient	Effect index	Channel	Degree
Regime	direct	0.06	1	Promote FDI inflows	weak
	indirect	0.11	0.17		very weak
FDI	direct	0.0925	1.54	crowd in domestic investment	weak
	indirect	0.08	1.05		weak
Interaction of regime and FDI	direct	0.11	1.83	crowd in domestic investment	modest
	indirect	0.18	2.34		strong

Coefficient is average of coefficients in each model. 0.06 is used as the basic point to calculate the effect index; the direct effect index multiplying the coefficient of functioned variable to yield the indirect effect one.



## Communication Skill of the Business Executives: An Empirical Study on Some Local Private Business Concerns in Bangladesh

Nargis Akhter

Department of Business Administration, East West University

43 Mohakhali C/A, Dhaka-1212, Bangladesh

Tel: +880 2 9882308, 9887989, Ext.- 307, +880 01711807133

E-mail: nargis@ewubd.edu, nargis\_252@yahoo.com

Sardana Islam Khan

Department of Business Administration, East West University

43 Mohakhali C/A, Dhaka-1212, Bangladesh

Tel: +880 2 9882308, 9887989, Ext. - 105, +880 01711615500

E-mail: saradana@ewubd.edu

Md. Kamrul Hassan

Department of Business Administration, East West University

43 Mohakhali C/A, Dhaka-1212, Bangladesh

Tel: +880 2 9882308, 9887989, Ext. - 160, +880 01711683387

E-mail: kamrul@ewubd.edu

### Abstract

The study which is mainly based on primary data attempts to focus on the facts relating to the communication skill of the different levels of business executives of local private business concerns in Bangladesh and their level of awareness regarding the importance of communication skill in their professional career. The study reveals that majority of the executives have positive opinions regarding the importance of communication course designed for executives. Most of the respondents have completed communication course, but majority of them are dissatisfied with it. The study also discloses that many of the executives have received training on communication skill; however majority of them are dissatisfied with course content and quality. Although majority of the executives think that there should be compulsory training program on communication skills in business organizations, still compulsory training programs on communication skill do not exist in any of the respondents' business organizations. Academicians should design and conduct communication courses keeping their application perspectives in view. Moreover employers should arrange compulsory training program on communication skill for their own executives.

**Keywords:** Communication Skill, Training, Communication Course, Business Executive, Local Private Business Concern

### 1. Introduction

Business Executives irrespective of their areas and levels spend much of their working hours to communicate because they get things done by and with people and in getting things done by and with people there is no alternative to communication skill.

It has been estimated that at all organizational levels at least 75% of each workday is consumed in communication. Today, business executives must have the quality of leadership. Empirical research supports the statement that there is positive correlation between effective leadership and effective communication (Lussier and Achua, 2001).

Our economy is moving from the agro-based economy to industrial economy and the private sector is getting much importance to face the challenges of the global market. Although business executives spend much of their working hours in communication, there is poor knowledge-base regarding the communication skill of our business executives, their level of awareness regarding the importance of communication skill and their levels of satisfaction and

expectations regarding the training program on communication skill of their organizations.

The researcher tried to address the following specific study issues relating to the communication skill of the business executives of local private business concerns in Bangladesh:

- (1) Do the executives think that the communication course is important for the executives?
- (2) Did the executives under this study complete communication course?
- (3) Did the executives (who have completed communication course) get any help from the communication course?
- (4) What benefits have they received from the communication course?
- (5) Did the executives get any training on communication skill?
- (6) Who organize this training on communication skill?
- (7) What are the opinions of the executives towards the training, which they have attended regarding communication skill?
- (8) Do the executives think that communication course is important for the executives?
- (9) Do the executives think that there should be compulsory communication training program for executives at organization?

## 2. Objectives of the Study

In light of the above-mentioned study issues, the following are the objectives of the study:

- (1) to make a knowledge-base regarding the executives' opinions towards the importance of communication course for executives ;
- (2) to make a knowledge-base regarding the completion of communication course by executives and their opinions regarding the benefits received by the completion of communication course;
- (3) to focus on the executives' training on communication skill and their opinions regarding it;
- (4) to determine the different levels of executives' opinions regarding their own communication skill ;
- (5) to determine the different levels of executives' opinions regarding the existence of compulsory training program in the organizations on communication skill for executives.

## 3. Methodology of the Study

### 3.1 Data Collection

The study focused on both secondary and primary sources. The secondary sources of data include relevant books and journals. The study collected most of the data from primary source through structured questionnaire. The Likert-type five (05) point's scale was used to know about executives' opinions regarding different relevant study issues. In this five (05) point's scale 5 indicates 'highly satisfactory'/ 'strongly agree'; 4 indicates 'satisfactory'/ 'agree'; 3 indicates 'neither satisfactory nor dissatisfactory'; 2 indicates 'dissatisfactory'/ 'disagree' and 1 indicates 'highly dissatisfactory'/ 'highly disagree'.

### 3.2 Area Surveyed

The study collected data from Dhaka City because Dhaka is the main centre of the local private business concerns in Bangladesh. Time and cost were other important reasons for this decision.

### 3.3 Selection of Sample

The study selects 10 sample local private business concerns which had production experience for a minimum of 4 years. So, purposive sampling was adopted in selecting sample enterprises. Initially, the study took 250 sample executives belonging to different levels using convenient sampling and among these 250 executives 50 executives were selected from top level, 75 were selected from mid level and the rest 125 were selected from bottom level i.e. from each of the sample enterprise 2, 3 and 5 executives were selected from top, mid and bottom level respectively. After screening finally the study took 200 executives as sample for this study and among these 200 samples 40 belonging to top level, 60 belonging to mid level and the rest belonging to bottom.

### 3.4 Analysis of the Data

The collecting data have been analyzed using percentage, mean and standard deviation.

## 4. Literature Review

Most of the studies conducted on the communication skill of the executives have been reviewed in the following section:



Bennett and Olney (1986) in "Executives Priorities for Effective Communication in an Information Society" found that executives in selected Fortune 500 companies throughout the United States opined that effective communication skills are more important now than ever before for business success and these skills will remain as a critical component of the information society. The researchers mentioned that the educators should give emphasis on the findings of this research in reviewing and developing realistic business communication curricula.

Papa and Tracy (1988) in "Communicative Indices of Employee Performance with New Technology" found significant positive relationships between each of the communication variables and employee productivity with new technology.

Barker and Others (1992) used a listening effectiveness inventory to measure perceived listening ability among managers who were leaders in a professional management association in the United States and Canada. The study found statistically significant differences for training and gender and insignificant differences were found for age.

Dowd and others (1994) in "What Corporations Seek in MBA Hires: A Survey" conducted a study among MBA candidates and found that 85% of the recruiters hold communication skill as the most important skill.

Swanson and others (1994) in "Business Communication: A highly valued course in Business Administration" asked 500 undergraduate and graduate students to rank all core business courses and they ranked business communication first among all core courses.

Smeltzer and Thomas (1994) in "Managers as Writers" expressed that managerial writing is performed within a unique context. So, it is important to review the extant research within that context to understand managerial writing.

Moss (1995) in "Perceptions of Communication in the Corporate Community" conducted a study on chief executive officers and directors of personnel or training and the author found that the respondents believe that oral communication before a small group is important and that principles of communication should be stressed over formats for letters and memos and they also believe that reading and editing as well as grammar skills are very important.

Fisher and Ann (1998) in "The High Cost of Living and Not Writing Well" conducted a study among 1000 employers in the United States and showed that Employees must have good communication skill.

Welch and others (1999) in "Communication Change: Ideas from Contemporary Research", researchers summarized the 29 articles and reports to help communicators to change leaders.

Williams and others (1999) in "Key Elements of Effective Supervisor /Employee Communication" found out 21 key principle of Effective supervisor / Employee communication based on comprehensive review of 200 supervisor/employee communication studies.

Clutterbuck (2001) in "Communication Competence and Business Success" mentioned that how the communication differ in successful and less-successful organization. In that study he also examined the link between the communication competence and business success.

Whalen and others (2001) in "How Communication Drives Merger Success" explored the strategy and qualities of mergers companies and offered training tools and diagnostics on the basis of findings.

Roberts and others (2003) in "Intangible Assets and Communication" found the relationship between intangible assets and communication and also suggested analysis and diagnostic tool which can be applied in organizational communication.

Kandath and others (2003) in "Communication Behavior of Virtual Workforces" explored the impact of communication in virtual workforces and observed which communication processes and methods are suitable for virtual workforces.

Bowen (2006) in "The Business of Truth – A Guide to Ethical Communication" mentioned about issues in today's ethical communication. In this article the researchers observed that what type of ethics and frequency the training practitioners receive and their feelings about their role in ethics. They also examined the measurement of their organizations about ethics and their action in conscience of the organization.

Greenwald & Associates Inc. (2009) in "Survey of Generational Communication Differences around the Globe" identified trends of industrialized countries and emerging economics regarding business communication with diverge age around the world. Researchers addressed that how the expectations and satisfaction of employer's communication and engagement method of Gen Y and Boomers differ in specific areas and also addressed the changes which are needed to improve engagement and teamwork.

Hearn and others (2009) in "Application and implementations of new media in corporate communications: An action research approach" mentioned that advances in new media and web technology are making it easier for organizations, their employees and other concerned members to participate in the creation and management of content . So, it is very much helpful to understand how a corporate communication strategy can leverage these trends.

Bakar and others (2009) in "LMX quality, supervisory communication and team-oriented commitment: A multilevel

analysis approach”, documented the impact of dyadic communication and relationships on individual behavior in workgroups, in this study communication remains as the background element in leadership and management literature as opposed to being the primary process in leader-member relationships development.

Gilsdorf in “Executives’ and Academics’ Perceptions on the Need for Instruction in Written Persuasion” surveyed communication executives and business communication teachers and expressed that probably business communication classes don’t prepare students adequately for persuasive writing.

The above review of the studies conducted on communication skill of business executives reveal that business executives think that effective communication skill is important for the success of business and academicians should offer realistic business communication course curricula. It is also clear from the above review of the studies that not a single study has been conducted on the communication skill of the business executives of Bangladesh. So, it is worthwhile to conduct a study on communication skill of the business executives of Bangladesh.

## 5. Findings of the Study

### 5.1 Opinions towards the Importance of Communication Course

The table 01 reveals that majority (97.30%) of the executives’ opinion is positive regarding the importance of communication course for the executives. The table 01 also reveals that although a very few percentage of the mid and low level executives think that communication course is not important for the executives but none of the top level executives agree with this opinion.

The Table 02 shows that executives belonging to different levels have completed communication course and their number is more (58.11%) than that of executives who did not (41.89%) complete the communication course.

The table 03 shows that among those executives who have completed communication course (58.11%) majority (90.70% ) of them informed that they have been not benefited by the communication course. The table 03 also reveals that majority of the executives belonging to the three different levels have not been benefited by the communication course.

### 5.2 Design and execution of the Communication Course

A question was asked to those executives who have completed communication course but think that they did not receive any benefit from the completion of communication course. The question was, whether they think that the communication course was not designed and executed from the practical point of view. All of them opined that their course was neither designed nor executed from the practical point of view. Academicians should give emphasis on this comment in designing communication course.

### 5.3 Training on Communication Skill

The table 04 reveals that the number of executives (52.70%) who received training is more than that of the executives who (47.30%) did not receive training. The table also reveals that among different levels of executives the top management is in highest position (58.33%) and the lower level management (47.22%) in the lowest position in receiving training.

### 5.4 Organizer of the Training on Communication Skill

The table 05 shows that in case of the majority (61.53%) of the executives training program has been arranged by the organization.

### 5.5 Opinions towards the quality of the training program on Communication Skill

The table 06 shows the mean scores (with standard deviations) of the executives’ opinions towards the quality of the training program on communication skill. The mean scores of top, mid and bottom level executives’ degree of satisfaction reveal that they are dissatisfied with most of the different areas of the communication skill of the training program except for the non-verbal skill regarding which they are neither satisfied nor dissatisfied.

### 5.6 Degree of Satisfaction regarding the Executives’ Own Communication Skill

The table 07 shows the mean scores (with standard deviations) of the executives’ opinions towards their own communication skill. The mean scores of top, mid and lower level executives’ degree of satisfaction regarding oral area of their own communication skill are 4.12, 4.11 and 3.93(near about 4) respectively. So, the top, mid and lower level executives are satisfied with their oral communication skill. It is clear from the mean scores of the top, mid and lower level executives’ degrees of satisfaction regarding writing and listening skill that all of them are satisfied with their writing and listening skill. The table 07 shows that the mean scores of the top, mid and bottom level executives’ degrees of satisfaction regarding their non-verbal communication skill are 3.44, 3.97 and 3.72 respectively and in each of these three levels the mean scores are near about 4. So, the top, mid and bottom level executives are satisfied regarding their non-verbal communication skill also. Further, the aggregate mean scores show that the executives

irrespective of their levels are satisfied with their oral, writing and listening communication skill. The aggregate mean score of the executives' degree of satisfaction regarding their non-verbal communication skill is 3.76 which is near about 4. So, the executives irrespective of their levels are satisfied with their non-verbal communication skill also. This question was asked to find out perception regarding their own communication skill and does not necessarily reflect the real picture.

#### 5.7 Opinions regarding the Compulsory Training Program on Communication Skill

The table 08 reveals that majority (91.89%) of the executives think that there should be compulsory training program on communication skill for the executives. The table 08 also reveals that although a very few percentage of the mid and low level executives do not think that there should be compulsory training program in the organizations on communication skill but all the executives belonging to top-level think that there should be compulsory training program on communication skill.

#### 5.8 Existence of the Compulsory Training Program on Communication Skill

The study found that compulsory training program on communication skill does not exist in any of the organizations.

### 6. Conclusions

The study revealed that majority of the executives of local private business concerns in Bangladesh thinks that both course on communication and communication skills are important for them and their professional delivery and career success. The study found that the number of executives (belonging to different managerial levels of local private business concerns in Bangladesh) who have completed communication course is greater than those executives who did not complete such course. This is a very positive sign for the local private concerns in Bangladesh because there is little doubt about the significance of communication skill for the executives. However, majority of the executives who have completed communication course expressed dissatisfaction and informed that they have not been benefited from completing communication course. There is no dearth of doubt that although the effectiveness of communication course might vary, but there will be an impact of course completion on participants' communication skill.

All the executives who are not satisfied with communication course think that the course contents of the communication course are not targeted to practical usage or application. The academicians who design such courses should consider this feedback seriously. Like communication course completed by the executives, the researchers found negative information regarding the number of executives who received training on communication skill. The study revealed that majority of the executive training on communication skill was conducted by the organization. The executives are not satisfied with the oral, writing and listening areas and they are neither satisfied nor dissatisfied with the non-verbal areas of the training program on communication skill. However, the executives are satisfied with their own skill on different areas of communication. This may be their wrong perception about their communication skill. The study found that although majority of the executives suggested that there should be compulsory training program on communication skill for business executives, there is no such training program in any one of the sample organizations under survey. The employers of the local private business concerns should consider this matter seriously and take initiative in the right direction.

The study can be helpful for the employers of the local private business concerns in Bangladesh to know about their executives' expectations regarding the relevant issues of communication skill that they need to possess for efficient delivery of their work. The study can also be helpful for the relevant academicians in developing their insight and awareness in designing and conducting communication course integrating the practical usage of such skills in professional job delivery and career success. Findings of this research can initiate conduction of further research to find out the relationship between executives' communication skill and their job performance and also the importance of cultural influences and adaptation in developing course content and conduction of training. Based on this research a comparative study may also be carried out between the executives of local private business concerns and those of multinational business enterprises operating in Bangladesh.

### References

- Bakar, Hasan Abu, Mustaffa, Vhe Su. & Mohamad, Bahtiar. (2009). this is emerald insight online journal, [online] Available: <http://www.emeraldinsight.com/Insight/viewContentItem.do?jsessionid=05C7E28B3F0C38A23BCE91914986D89D?contentType=Article&contentId=1769079>.
- Barkar, Randloph, T. and others. (1992). "An investigation of perceived managerial listening ability", *Journal of Business and Technical Communication*, Vol. 6 (4). 438-457.
- Bennett, James, C. and Olney, Robert, J. (1986). "Executive priorities for effective communication in an information society", *Journal of Business Communication*, Vol. 23 (2). 13-22.
- Bowen, Shannon, Ph. D. (2006). this is International Association of Business Communication (IABC). Available: <http://www.iabc.com/rf/reports.htm>.

Clutterbuck, David. (2001). this is International Association of Business Communication, Available: <http://www.iabc.com/rf/reports.htm>.

Dowd, Karen O. and Liedtka, Jeanne. (Winter 1994). "What Corporations Seek in MBA Hires: A Survey", Vol. 10 (2). 34-39.

Fisher, Ann. (December 7, 1998). The High Cost of Living and Not Writing Well. *Fortune*, 244.

Giltsdorf, Jeanette, W. (1986). "Executives' and academics' perceptions on the need for instruction in written persuasion", *Journal of Business Communication*, Vol. 23(2). 55-68.

Greenwald, Mathew & Associates Inc. (2009). this is International Association of Business Communication, Available: <http://www.iabc.com/rf/reports.htm>.

Hearn, Greg, Foth, Marcus. & Gray, Heather. (2009). Available: <http://www.emeraldinsight.com/Insight/viewContentItem.do?jsessionid=05C7E28B3F0C38A23BCE91914986D89D?contentId=1769081>.

<http://iabcstore.com/IABCRFRpts/generations.htm>.

<http://www.emeraldinsight.com/Insight/viewContainer.do?containerType=Journal&containerId=11210>.

<http://www.iabc.com/rf/reports.htm>.

Kandath, Krishna P., Ph. D., Oetzel, John, Ph. D., Rogers, M. Everett, Ph. D. and Guell, Ann, Ph. D. (2003). this is International Association of Business Communication, Available: <http://www.iabc.com/rf/reports.htm>.

Lesikar Raymond, V. and Flatley Marie, E. (2002). "Basic Business Communication", New Delhi, Tata McGraw-Hill Publishing Company Limited.

Moss, Frederick, K. (1995). "Perceptions of communication in the corporate community", *Journal of Business and Technical Communication*, Vol. 9 (1). 63-76.

Papa, Michael, J. and Tracy Karen. (1988). "Communicative indices of employee performance with new technology", *Communication Research*, Vol. 15 (5). 524-544.

Roberts, Hanno, Ph. D., Bronn, Simcic Peggy, Ph. D. and Breuing, Karl Joachim, Norwegian School of Management. (2003). this is International Association of Business Communication, Available: <http://www.iabc.com/rf/reports.htm>.

Swanson and Others. (1994). "Business Communications: A highly valued core course in business administration", *Journal of Education for Business*, 237.

Welch, Nancy & Goldstein, Mark. (1999). this is International Association of Business Communication, Available: <http://www.iabc.com/rf/reports.htm>.

Whalen, T. Patricia, Ph. D. and APR. (2001). this is International Association of Business Communication, Available: <http://www.iabc.com/rf/reports.htm>.

Williams, Linda & Dong, Qingwen. (1999). this is International Association of Business Communication, Available: <http://www.iabc.com/rf/reports.htm>.

Table 1. Opinions towards the Importance of Communication Course

Response	Top	Mid	Low	Total
Yes	100%	96.15%	97.22%	97.30%
No	-	3.85%	12.78%	2.70%

Source: Field Survey, 2008

Table 2. Completion of Communication Course at Undergraduate/Graduate Level

Response	Levels of Executives			Total
	Top	Mid	Low	
Yes	58.33 %	61.54%	55.56%	58.11%
No	41.67%	38.46%	44.44%	41.89%

Source: Field Survey, 2008

Table 3. Benefits Received from the Communication Course

Response	Levels of Executives			Total
	Top	Mid	Low	
Yes	9.09%	12.50%	6.25 %	9.30%
No	90.91%	87.50%	93.75%	90.70%

Source: Field Survey, 2008

Table 4. Training on Communication Skill

Training	Top	Mid	Low	Total
Yes	58.33%	51.69%	47.22%	52.70%
No	41.67%	42.31%	52.78%	47.30%

Source: Field Survey, 2008

Table 5. Organizer of the Training on Communication Skill

Organizer of the Training	Top	Mid	Low	Total
Organization	42.86%	53.33%	76.47%	61.53%
Self	57.14%	46.67%	23.53%	38.46%

Source: Field Survey, 2008

Table 6. Opinions towards the Quality of the Training Program on Communication Skill

Levels	Areas of Communication Skill							
	Oral		Writing		Listening		Non-verbal	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Top	2.50	.463	2.29	.488	2.14	.690	3.00	.632
Mid	2.32	.894	2.14	.990	2.20	1.105	3.00	1.173
Low	2.33	.620	2.24	.663	2.19	.681	3.00	.954
Aggregate	2.24	.711	2.20	.786	2.19	.848	3.00	.988

Source: Field Survey, 2008

Table 7. Degree of satisfaction regarding the Executives' Own Communication Skill

Levels	Areas of Communication Skill							
	Oral		Writing		Listening		Non-verbal	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Top	4.12	.993	4.28	.752	4.22	.808	3.44	1.031
Mid	4.11	.900	4.08	.924	4.06	1.013	3.97	1.129
Low	3.93	.925	4.10	.617	4.07	.677	3.72	.679
Aggregate	4.03	.923	4.12	.767	4.10	.830	3.76	.932

Source: Field Survey, 2008

Table 8. Opinions regarding the Compulsory Training Program on Communication Skill

Response	Top	Mid	Low	Total
Yes	100%	88.46%	91.67%	91.89%
No	-	11.54%	8.33%	8.11%

Source: Field Survey, 2008



## Developing Competitive Advantage through Ethical and SR Practices: The Case of SME in Australia and Malaysia

Noor Hazlina Ahmad

Universiti Sains Malaysia

11800 Penang, Malaysia

Tel. 60-4-653-2894 E-mail: hazlina@usm.my

Pi-Shen Seet

Business School, University of Adelaide

North Terrace Campus, SA 5005, Australia

Tel. 61-8-8303-6460 E-mail: pishen.seet@adelaide.edu.au

### Abstract

This study contributes to existing research by exploring the prevailing attitudes towards ethics and socially responsible considerations among Australian and Malaysian SME owners. Based on interviews conducted with 20 entrepreneurs from Australia and Malaysia who operated in the manufacturing and service sectors, a content analysis of the data revealed three clusters of ethical behaviours: (1) concern for ethical practices; (2) maintenance of honesty and integrity; and (3) taking responsibility and being accountable. The socially responsible behaviours that the respondents perceived to be important were grouped in four clusters: (1) responsibility towards society; (2) responsibility towards staff; (3) responsibility towards customers; and (4) responsibility towards entrepreneurship. The results showed that both Australian and Malaysian business owners considered and exercised ethical and socially responsible practices in their businesses. The study concludes by proposing a framework for empirically testing the links that ethical and social responsibility practices have with a firm's competitive advantage.

**Keywords:** Ethical, Social Responsibility, SME, Australia, Malaysia

### 1. Introduction

More than ever, SME entrepreneurs face new challenges that may hamper business growth and success. Debates surrounding the importance of ethical (Román & Munuera, 2005; Spence & Rutherford, 2003; Ushedo & Ehiri, 2006) and social responsibility practices (Luken & Stares, 2005; Zairi & Peters, 2002) suggest that the associated behaviours may be linked with business success. Gibb (2005) states that socially responsible behaviours among smaller firms should be considered as a key competency that lays the ground for the way the business should operate. The same applies to ethical business practices. Despite this, in a study on Hungarian firms, Fülöp et al. (2000) found that smaller firms were rated negatively by non-business respondents in terms of ethical and social responsibility practices. This raises concerns as to the applicability of such concepts among small business owners.

In addition, there are three further reasons as to why ethical and socially responsible practices in smaller firms should be examined more closely. Firstly, there is a large disparity in the number of studies of ethical and social responsibility issues between large firms and small firms (Quinn, 1997). To date, work on ethics and social responsibility has been largely concentrated on large firms (Morris, Schindehutte, Walton, & Allen, 2002) particularly in the context of Malaysia (see, for example, Rashid & Ibrahim, 2002; Thompson & Zakaria, 2004). As noted by Spence and Rutherford (2001), the size of firms is a significant differentiator for ethical issues whereby such issues identified in the larger firms do not reflect what is actually happening in smaller firms. Secondly, smaller firms have strong interconnectedness with the local community in which they operate in (Gibb, 2005). Often, they deal with the same cohort of customers who reside in their local areas (Spence, 1999) and the conduct of ethical and socially responsible business is an important factor in creating a harmonious 'business-customer' relationship in the local community. Thirdly, there is an increasing awareness about ethics and social responsibility, thereby leading societies to disapprove of firms that are found to be ethically ill and irresponsible. In light of the notion, 'good ethics is good for business' (Zairi & Peter, 2002), failure to adhere to such practices would have a major negative impact on business. Similarly, Vyakarnam, Bailey, Myers, and Burnett (1997) argue that ethical behaviour is one of the reasons why a firm is able to stay longer in business.

The research gap is even more significant in comparative international studies on ethical and socially responsible practices in small firms. There have been calls for more research of this nature in order to understand the prevalence of these behaviours in divergent cultural settings (Spence, 1999). Moreover, it has been observed that the ethics and social responsibility agenda in developing countries (e.g., Malaysia) lags behind developed countries (e.g., Australia). For example, the 2006 Corruption Perception Index (CPI) reported that, of the 163 countries studied, Australia was among the top ten scorers of 'highly clean' countries whereas Malaysia was ranked 44<sup>th</sup> (Transparency International, 2006). Even though the CPI report is not limited to small businesses, it is a reflection of the general ethical standards in these countries. With regards to social responsibility, the Council of Small Business Organisations of Australia (2000) reported that two-thirds of the small businesses surveyed (from a sample of 9000) revealed strong socially responsible behaviours especially in terms of providing support for the local community. More recently, Madden, Scaife, and Crissman (2006, p. 57) found that "there was a genuine enthusiasm for the notion of corporate social responsibility which was viewed as duty" among the Australian SMEs. In contrast, it was observed that the awareness in regards to ethics and social responsibility among smaller business is still relatively lacking in Malaysia. This is because the focus on such issues in Malaysia is often directed to large firms compared to smaller firms (see, for example, Rashid & Ibrahim, 2002; Thompson & Zakaria, 2004).

Following Zsolnai's (2004) suggestion that "ethics is not a luxury of advanced economies, it is an indispensable means to foster economic development" (p.57), it is crucial for the small businesses in developing economies to understand the importance of such constructs in their daily business activities. Hence, drawing evidence from these two countries can be seen as a modest attempt to trace and explore the extent to which ethics and socially responsible considerations are prevalent among small business owners operating in Australia and Malaysia. The study aims to therefore provide some answers to the question: "To what extent do entrepreneurs in small firms, particularly in the context of Australia and Malaysia, perceived ethical and socially responsible behaviours as important in managing their business?"

## **2. Literature review**

### *2.1 Ethical and Socially Responsible Practices in SMEs*

Various studies have shown that ethical considerations are important for business (Hornsby, Kuratko, Naffziger, LaFollete, & Hodgetts, 1994; Spence, 1999; Spence & Lozano, 2000; Quinn, 1997). Ethical practices within a commercial context make claims about 'what ought to be done or what ought not to be done' in managing a business (Kuratko, Hornsby, & Naffziger, 1997). Ethics as a code of conduct in larger firms has been the centre of attention in business ethics research. With a view that ethical practices should be the guiding principle for all businesses, large or small, studies investigating ethics in smaller firms have started to gain momentum. One such study conducted by Vyakarnam et al. (1997) found that ethical issues experienced by smaller firms in the UK revolved around the issues of conflict of interest among the stakeholders, protection of knowledge and information, legal and moral obligation, and personal versus business decisions. Also using a dilemma-based approach, Spence and Rutherford (2001) identified that there are four major dilemmas facing small business owners including profit maximisation, subsistence priority, enlightened self-interest, and social priority.

Closely related to ethical practices is social responsibility. We follow Fülöp et al. (2000)'s definition of social responsibility as "the positive activities a company undertakes in the society in which it operates" including responsibility towards customers, employees and the public. When the concept was first developed more than twenty years ago, organisations found it difficult to operationalise it in their business practices, as it required sacrifices to be made on the financial level. However, recently, organisations' leaders have started to acknowledge the importance of being socially responsible in business affairs. For example, Fülöp et al. (2000) found that there is a growing commitment to social responsibility among smaller firms, which is comparable to that of larger firms. Specifically, they found that small firms have demonstrated willingness to make arrangements to meet the requirements of social responsibility especially to their customers, their employees, and the public.

Notwithstanding this, the issues of ethics and social responsibility in small firms may be to some extent different from their larger counterparts due the nature and characteristics of these firms. Small firms are, by nature, independent and self-managed (Spence & Lozano, 2000). Presumably, the key aspects of ethics would revolve around the personal values and beliefs of the owners themselves, rather than governed by the ethical codes of conduct as in larger firms. 'Multitasking' is another key criterion of small businesses (Spence, 1999). The variety of tasks facing small business owners may leave them with less time to consider ethics in their daily business management. In addition, according to Vyakarnam (1997), "what constitute personal and business ethics are probably closer in situations where the owner is also the manager in a business. Relatively speaking, recession has greater impact on small firms compared to larger ones, making business survival one of the top agenda among smaller firms" (p.1627). Given these constraints facing small business owners, it is therefore crucial to closely examine the extent to which ethical and social responsibility considerations is applicable in smaller firms.

### 3. Method

Given the limited studies of ethical and social responsibility practices in small firms, this study follows Spencer's (1999) suggestion that exploratory research that builds upon qualitative interviews is needed as this will allow researchers to delve into ethical and social responsibility issues that are of particular relevance to smaller firms. Moreover, according to Morse and Richards (2002), employing a qualitative approach is appropriate if "the purpose is to learn from the participants in a setting or process the way they experience it, the meaning they put on it, and how they interpret what they experience" (p. 28). In view of these suggestions, semi-structured interviews were conducted on an individual, face-to face basis. In the interviews, respondents were asked to comment on various aspects of their approach to managing their businesses that they perceived to be important to the success of a business. The interviews did not highlight any issue pertaining to ethical practices and socially responsible behaviours to avoid 'socially desired responses' (Spence & Rutherford, 2001). Instead, the study was presented to the participants as being about practices for small business owners in managing their business. Interviews were transcribed and behaviours that reflected ethical and social responsibility practices were extracted.

According to Curran and Blackburn (2000), access to small firms and getting them to participate in a study is often difficult. We found the same issues and hence, participants were recruited based on recommendations by the director of South Australian Young Entrepreneurs Scheme program (Australia) and a contact person at the National Productivity Council (Malaysia) who dealt with small business owners. The sample consists of ten entrepreneurs each from South Australia and Northern Malaysia. The sample selection criteria are as follows: (a) business founder who played an active role in the business, (b) companies with less than 50 employees. A summary of the participants' profile is depicted in Tables 1 and 2.

### 4. Findings

The management literature generally is increasingly highlighting the importance of ethical management behaviours and the researcher made reference to this literature when defining this competency domain (e.g., Fülöp et al., 2000; Hornsby et al., 1994). Specifically, the definition of ethical business behaviour proposed by Lewis (1985) was used to define ethical practices as behaviours that indicate the use of "rules, standards, codes, or principles which provide guidelines for morally right behaviour and truthfulness in specific situations" (p. 381). In the present study, comments suggesting that participants demonstrated the application of ethical rules and principles within a commercial context and considered them important in running a business were categorised as "ethical practices". Generally, this was reflected in comments about "what is right and good for human" (Jones, 2000). Also, comments that are related to the social responsibility theme were also extracted from the interviews. Social responsibility has been referred to as "the positive activities a company undertakes in the society in which it operates" including responsibility towards customers, employees, and the public (Fülöp et al., 2000). In the present study, behaviours and comments by the participants that demonstrated these "positive activities" were categorised as socially responsible practices.

To begin the analysis process, transcripts of interviews with both Australian (10) and Malaysian (10) participants were examined for evidence of behaviours reflecting competencies that are perceived to be important by them. Transcripts were read several times to ensure familiarity with the data before the process of identifying and organising themes commenced (Easterby-Smith, Thorpe, & Lowe, 1991). It has been suggested that the familiarity created by reading transcripts increases the researcher's "awareness of the patterns, themes, and categories" (Patton, 1987, p. 150) that exist in the data. The process of data analysis was conducted concurrently with data collection, to allow for the identification of important issue pertaining to the research and to probe for further information in the following interviews.

A content analysis of the interview data revealed themes associated with ethical and socially responsible practices. To facilitate the description of the findings, behaviours were regrouped into 'clusters'. As there is no *a priori* cluster that has been developed for ethical practices, thus, behaviours reflecting ethics, as described earlier, were aggregated, on a logical basis, to form clusters of ethical behaviours. In this case, it is debatable however, that one cluster is equally different to another cluster. Notwithstanding this point, clusters were used to enhance descriptions of the data. Clusters for social responsibility were mainly based on the work of Fülöp et al. (2000), who identified four main clusters of social responsibility including (1) responsibility towards customer, (2) responsibility towards employees, (3) responsibility towards public, and (4) responsibility towards entrepreneurship. Selected quotes are presented in the discussion to highlight the issues identified by the participants.

#### 4.1 Ethical Practices

Based on the qualitative data gathered, behaviours that were related to ethical practices in business dealings were traced. In this study, ethical practices are defined as practices related to "the rules of moral values that guide decision making; the understanding of the difference between right and wrong" (Hatten, 2006, p. 67). Eleven behaviours that were grouped into 3 clusters representing ethical behaviours are shown in Table 3 below.



Both Australian and Malaysian participants viewed ethical behaviour as important to their business. Thirteen participants (six from Australia and seven from Malaysia) highlighted issues of ethical practices in business. Entrepreneur D (owner of a computer and related services company, Australia) noted that ethical considerations outweighed the material or financial considerations. Business people, according to him, should not be caught up in the “culture of greed and materialism” but need to uphold the ethical standards in their business dealings. This entrepreneur also conveyed his frustration that some business owners refused to pay taxes when he said,

I have got no time for somebody that sort of rips somebody else off or rips the government off by saying they didn't pay their taxes, I don't like that. Entrepreneurs should pay their fair dues to the society by conducting their business in an ethical manner.

Some of the participants highlighted strong concern for maintaining honesty and integrity in their business practices. For example, entrepreneur F (owner of a public relations consulting firm, Australia) confirmed that she had an unquestioning belief in the importance of being honest, open, and transparent in business dealings and relationships with customers and staff. For her, absolute openness and integrity were hugely important, arguing that “...anything less than absolute honesty and absolute ethical behaviour will hinder you in the long run”. She added,

I think ethics is becoming a real issue for business. There's much more emphasis on corporate governance. There's much more interest in how directors behave and how executive behave. So I strongly believe that ethics goes without question.

Others (two Australians and three Malaysians) strongly felt that entrepreneurs should admit their mistakes and tell the truth to their customers, especially when it comes to product or service safety issues, so as to avoid harming the public. An example reflecting this behaviour is;

The toughest thing is when you are making mistakes and having to tell the customer that they have occurred. But you have to do it no matter what...no compromise on that (Entrepreneur F, the owner of a public relations consulting firm, Australia).

The importance of being transparent in business dealings was also being highlighted by one participant from Malaysia (entrepreneur K, owner of a cosmetics manufacturing company).

It is a common practice in my business that during consultation sessions with the customers and potential dealers I will explain in detail the effects of each of the products and how the products could help solve the problems that customers have, and at the same time explain the side effects of using the products. I would also disclose to my customers the potential hazards for those who have specific medical problems. As a result, I gained 100% trust from my customers (translation).

She added, her first priority in business was to be transparent to her customers during consultation sessions and not risking the customers' safety simply to gain more profit.

Similarly, entrepreneur M (owner of a steel trading company, Malaysia) admitted that he first started a humble ‘two-dollar’ company and in the first decade of operation, as he had dealt with his suppliers and financial institution with honesty, he had not faced any problems with reliability in supply or financial support. He suggested that the most important criteria were honesty and sincerity in business dealings because if money is the prime motivation, one may not last long in business.

Being trustworthy was another area that was highlighted during the interviews. Entrepreneur N (owner of a motor trading and insurance company, Malaysia) believed that the most important criteria in business was to be trustworthy and this meant keeping one's promises because when doing business, ethical considerations should outweigh other personal or financial motives.

In sum, participants from both countries demonstrated concerns for ethical business practices in managing their business. Behaviours revolving around maintaining honesty and integrity, being trustworthy, engaging in fair commercial practices, not being too money-oriented, and taking responsibility as well as being accountable for one's own actions were highlighted by the participants. The finding is seen as consistent with a statement made by Fülöp et al. (2000) that “ethical business behaviour is becoming increasingly important and starting to arise in the global economy” (p. 5), even in smaller firms. The importance of upholding ethical principles and practices have proven beneficial for entrepreneurs (as identified by entrepreneurs K and M), particularly in obtaining customers' trust and support from suppliers and financial providers.

#### *4.2 Socially Responsible Practices*

Themes that are related to social responsibility were also found in the interviews. Thirteen behaviours were identified from the comments and represented in 4 clusters of social responsibility behaviours, as shown in Table 4. The findings of the current interviews indicated some overlap with those of Fülöp et al. (2000).

Among 20 entrepreneurs who participated in the interviews, 11 of them (six from Australia and five from Malaysia) pointed out the relevance of being socially responsible in handling a business. Entrepreneur I (owner of a musical instrument manufacturing company, Australia) argued that “entrepreneurs could achieve far more by helping the people around them to achieve their dreams”. She explicitly argued that entrepreneurs should consider helping the local community rather than simply using people around them to achieve their personal goals because such practices give them satisfaction. She also added that she could find what she wanted in life by making people around her happy.

I have to make others happy, so in a sense, I don't do it for myself only but if I were to make everybody else happy, and give them what they want in life, I in turn get what I want in life. That is how I see it.

Another common theme of socially responsible behaviour was demonstrated by entrepreneur Q (owner of a catering service company and a restaurant, Malaysia) who strongly believed that business practitioners should be responsible for ‘improving the well being of the society’.

In business it is not always about us...how much profit we want to achieve, how to improve our business, and how to get more customers. We have to consider people around us, the society. We should consider their welfare and how we can help them improve their well being (translation).

Participants from both countries felt that being socially responsible to the customers was important. This meant providing extra services to the customers, giving them value for their money, offering good product or services at good price, responding to customers' complaints immediately, and also demonstrating the willingness to add value to customers' well-being.

However, compared to Australian participants, Malaysian participants showed more concern for staff welfare including offering fair salaries and organising training and development programs that could improve staff knowledge and skills. As mentioned by entrepreneur T (owner of an ice cube manufacturing company, Malaysia),

To manage 26 people is not an easy task but the one thing that I know for sure is that if you take good care of your staff, they will in turn take good care of your business. So give them fair salaries and treat them well... For me, it is important that the staff welfare is taken care of and that they are happy working with me (translation).

Responsibility towards entrepreneurship as highlighted by Fülöp et al. (2000) include areas such as innovation, profitability, and survival. Interestingly, these themes were also identified in the present study, thereby confirming the earlier findings. Fourteen participants (eight Australians and six Malaysians) mentioned that it was important to reinvent, create new ways of doing things, and even create new product or services that would be perceived as valuable by potential customers. Participants from Australia highlighted reinventing the business and producing something new (i.e., innovate). Entrepreneur A, (owner of a handbag designing and manufacturing company, Australia) reported being uncomfortable doing things that other people have done. Those from Malaysia stressed the importance of having new ideas on how to market products and services; new approaches to customer service; and developing a new business concept. Profitability and survival were also mentioned. The following quote illustrates this:

If you can survive for a long period of time and make money, you've achieved something more than what a lot of small businesses achieve (Entrepreneur E, the owner of an air conditioning service company, Australia).

Despite many similarities among entrepreneurs from both countries demonstrating concern and awareness of being socially responsible to the local community, public and customers, there were a few differences. Malaysian participants however expressed greater concern for the welfare of their employees. Interestingly, the participants pointed out that being socially responsible, especially towards customers, is beneficial for their business in the long run. Two examples serve to illustrate this:

I'll go to the same old thing, if you're doing the right thing, if you're giving people the value for their dollar, they'll come back to you and you keep them. When you keep them you can't go wrong, you build your business to a certain level (Entrepreneur B, owner of a tailoring and dry cleaning business, Australia).

If you treat somebody good and they know they got a good deal from you, they will tell ten people. If you upset somebody, then they will tell fifty people (translation) (Entrepreneur N, owner of a motor trading company, Malaysia).

While ‘serving others’, a term referred to “working for others’ benefit rather than your own” (Rushworth & Gillin, 2006), was described as the reason why some entrepreneurs were concerned about social responsibility, respondents indicated that acting in a socially responsible manner, especially towards customers, has economic advantage for the business in the long run. The associated behaviours are therefore, seen as a mechanism for the firm to achieve competitive advantage. Interestingly, there was no indication of social commitment in terms of restoring and protecting the environment reported by the participants. The finding is consistent with Fülöp et al. (2000) who studied social responsibility among small and large firms in Hungary. Specifically, the authors found that responsibility towards environment was rated more importantly by larger firms than smaller ones, in which in smaller firms, the priority was placed on responsibility towards employees.

## 5. Discussion and conclusion

This study found that ethics and social responsibility issues are important aspects of entrepreneurial behaviours in smaller firms. It was also found that the behaviours identified in both countries are somewhat similar, signifying the generalisability of such considerations in smaller firms. It may be that, compared to other managerial practices, (in which Abdullah and Lim (2001) found that Australians and Malaysians differed significantly in their approach towards business management, with the former emphasising strongly on 'task' while the latter on 'relationship') ethical and social responsibility standards in smaller firms transcend cultural boundaries. Among the behaviours that were frequently identified as important among Australian and Malaysian participants included the need to demonstrate ethical practice in business dealings; honesty and integrity; willingness to admit mistakes and to tell the truth; a commitment to social obligation and social welfare; willingness to give extra service to people; to take responsibility and accountability for one's own action. A possible explanation for the concern with ethical practices and social responsibility is the strong emphasis given to these issues in modern business writings, which can be associated with a growing awareness that these practices 'pay off' in the long run (Zairi & Peter, 2002).

The notion of 'if you take good care of your staff, they will in turn take good care of your business'; 'deal with suppliers and financial providers with honesty to obtain support'; 'if you're doing the right thing, they (customers) will come back to you and you keep them'; and 'if you treat somebody good and they know they got a good deal from you, they will tell ten people' as identified in the present study demonstrates the prevalence of ethical and socially responsible concerns in enhancing commitment, trust, and satisfaction among employees, customers, suppliers, financial institutions, as well as other stakeholders. As suggested by Bejou, Ennew, and Palmer (1998), the demonstration of ethics on the part of the individual who manages a relationship (in the case of the present study, the business owners themselves) could be related to trust and satisfaction and eventually determines the success or failure of a relationship. Koh and Boo (2004) found evidence that the perception of ethics in an organisation is positively related to employee's satisfaction and commitment. More importantly, as argued by Goll and Rasheed (2004), in fast-changing and unpredictable environments, socially responsible behaviours help organisations to gain support from various external stakeholder groups. Such behaviours provide them with some protection from unpredictability they face. It is also important to note that an organisation's image and reputation may be influenced by the good ethical conduct it portrays to the public (Jones, 2000). Taken together, the benefits of ethical and socially responsible practices enable competitive advantage to be attained as a firm distinguishes itself from its competitors. For instance, highlighting fair and honest marketing practices as well as open relations with customers may be a potential marketing selling point that the firm could capitalise on. Based on the preceding discussion of the prevalence of ethical and social responsible practices, this study concludes by proposing a model for small business to create competitive advantage through such business practices (refer to Figure 1).

Based on the proposed model, the present study offers the following propositions for further research:

*Proposition 1:* Ethical practices will improve the quality of relationships between a firm and its stakeholders through enhancing commitment, building up trust, and increasing satisfaction among the stakeholders, which will subsequently lead to competitive advantage.

*Proposition 2:* Socially responsible concerns will improve the quality of relationships between a firm and its stakeholders through enhancing commitment, building up trust, and increasing satisfaction among the stakeholders, which will subsequently lead to competitive advantage.

The value of this study lies in its effort to provide an informed understanding of the ethical and socially responsible practices in smaller firms, particularly in the context of Australia and Malaysia. The identification of the ethical and socially responsible behaviours in this study signals an important message regarding the prevalence of such practices, particularly in smaller firms, because of their strong interconnectedness with employees, customers, and local community. For them, ethical and socially responsible conduct of business is seen important to create harmonious 'owner-employee', 'customer-business, and 'community-business' relationships that may have long term benefits for the firms. Also, in view of 'good ethics is good for business', it is assumed that failure to adhere to such practices will have major implication to the business well-being. The good example (in terms of the possession of ethical and socially responsible competencies) set by the smaller firms may influence the broader trading environment to improve standards of behaviour and integrity in business. The awareness of ethical business practices among smaller firms could also furnish a healthier economy (Bishop, 1992), as they make up more than 80% of all establishments in most countries.

Importantly, business practitioners should realise that ethics, social responsibility, and profit making can go hand in hand; they are not conflicting agenda. Therefore, a challenge for entrepreneurship educators and policy makers is to recognise the distinctive aspect of these practices in SMEs and not to treat the issues of ethical and social responsibility through the lens of large firms' corporate policies but as means for creating small firms' competitive advantage. As argued by Hatten (2006), ethical and social responsibility issues in smaller firms should go hand in hand with the strategic planning of the firms because the entrepreneurs' decisions of "what to do and how to go about doing it" are

largely influenced by their ethical and socially responsible values. Training programs that could portray the relationships among strategic planning, ethics, and social responsibility of the entrepreneurs is of great value.

The present study is not without its shortcomings. One limitation of the study concerns the generalisability of the results (i.e., the ecological validity). While both Australia and Malaysia are culturally diverse countries that may have implications to the way SME entrepreneurs operate their business, only a small part of the diversity pertaining to ethical and social responsible practices was captured in the study. Moreover, the study is an international comparative study of only two countries (one Western and one Eastern) and, as such, the generalisability of the results to other settings and cultures remains to be determined. An avenue for future research is therefore to empirically test the proposed model using a larger sample of small business owners to establish an informed understanding of the linkage among ethical practices, social responsibility, and small firms' competitive advantage.

## References

- Abdullah, A. & Lim, L. (2001). Cultural dimensions of Anglos, Australians, and Malaysians. *Malaysian Management Review*, 36, 1-17.
- Bejou, D., Ennew, C. T., & Palmer, A. (1998). Trust, ethics, and relationship satisfaction. *International Journal of Bank Marketing*, 16, 170-175.
- Bishop, T. R. (1992). Integrating business ethics into an undergraduate curriculum. *Journal of Business Ethics*, 11, 291-299.
- Curran, J. & Blackburn, R. (2000). *Researching the small firm*. London: Sage.
- Easterby-Smith, M., Thorpe, R. & Lowe, A. (1991). *Management research : an introduction*. London: Sage Publications.
- Fülöp, G., Hisrich, R. D. & Szegedi, K. (2000). Business ethics and social responsibility in transition economies. *The Journal of Management Development*, 19, 5-31.
- Gibb, A. A. (2005). The entrepreneur as the core competence of the firm: Implication for management educators. *Entrepreneurship, Innovation, and Small Business Network*, Issue 2.
- Goll, I. & Rasheed, A. A. (2004). The moderating effect of environmental munificence and dynamism on the relationship between discretionary social responsibility and firm performance. *Journal of Business Ethics*, 49, 41-54.
- Hatten, T. S. (2006). *Small Business Management: Entrepreneurship and Beyond* (3rd ed.). New York: Houghton Mifflin Company.
- Hornsby, J. S., Kuratko, D. F., Naffziger, D. W., LaFollette, W. R. & Hodgetts, R. M. (1994). The ethical perceptions of small business owners: A factor analysis study. *Journal of Small Business Management*, 32, 9-16.
- Jones, J. (2000). *Ethics Revisited. The 1990s: an "ethical decade" or a decade of hypocrisy?* Retrieved Dec 15, 2001, from <http://commerce.flinders.edu.au/researchpapers/00-6.htm>
- Koh, H. C. & Boo, E. H. Y. (2004). Organisational ethics and employee satisfaction and commitment. *Management Decision*, 42, 677 - 693.
- Kuratko, D. F., Hornsby, J. S. & Naffziger, D. W. (1997). An examination of owner's goals in sustaining entrepreneurship. *Journal of Small Business Management*, 35, 24-33.
- Lewis, P. (1985). Defining business ethics: Like nailing jello to a wall. *Journal of Business Ethics*, 4, 377-383.
- Luken, R. & Stares, R. (2005). Small business responsibility in developing countries: A threat or an opportunity? *Business Strategy and the Environment*, 14, 38-53.
- Madden, K., Scaife, W., & Crissman, K. (2006). How and why small to medium size enterprises (SMEs) engage with their communities: An Australian study. *International Journal of Non-profit and Voluntary Sector Marketing*, 11, 49-60.
- Morris, M. H., Schindehutte, M., Walton, J. & Allen, J. (2002). The ethical context of entrepreneurship: Proposing and testing a developmental framework. *Journal of business Ethics*, 40, 331-361.
- Morse, J. M. & Richards, L. (2002). *Readme first for a user's guide to qualitative methods*. California, USA: Sage publications, Inc.
- Patton, M. Q. (1990). *Qualitative Evaluation and Research Methods*. Newbury Park: Sage Publications.
- Quinn, J. J. (1997). Personal ethics and business ethics: The ethical attitudes of owner/ managers of small business. *Journal of Business Ethics*, 16, 119-127.

- Rashid, M. Z. A. & Ibrahim, S. (2002). Executive and management attitudes towards corporate social responsibility in Malaysia. *Corporate Governance*, 2, 10-16.
- Román, S. & Munuera, J. L. (2005). Determinants and consequences of ethical behaviour: an empirical study of salespeople. *European Journal of Marketing*, 39, 473 - 495.
- Rushworth, S. & Gillin, M. (2006). *Assessing personal value systems and motivations of successful serial entrepreneurs*. Paper presented at the 3rd AGSE International Research Exchange, 8-10 February 2006, Auckland, New Zealand.
- Spence, L. J. & Lozano, J. F. (2000). Communicating about ethics with small firms: Experiences from the U.K. and Spain. *Journal of Business Ethics*, 27, 43-53.
- Spence, L. & Rutherford, R. (2001). Social responsibility, profit maximisation and the small firm owner-manager. *Journal of Small Business and Enterprise Development*, 8, 126-139.
- Spence, L. & Rutherford, R. (2003). Small business and empirical perspectives in business ethics: Editorial. *Journal of Business Ethics*, 47, 1-5.
- Thompson, P. & Zakaria, Z. (2004). Corporate social responsibility reporting in Malaysia: progress and prospects. *The Journal of Corporate Citizenship*, 13, 125-137.
- Transparency International. (2006). *2006 Corruption Perceptions Index*. Retrieved 5 January, 2007, from [http://www.transparency.org/news\\_room/in\\_focus/2006/cpi\\_2006\\_\\_1/cpi\\_table](http://www.transparency.org/news_room/in_focus/2006/cpi_2006__1/cpi_table)
- Ushedo, B. O. & Ehiri, J. E. (2006). Ethical challenges in ecological policy: Global thinking and local action. *Management of Environmental Quality: An International Journal*, 17, 31-42.
- Vyakarnam, S., Bailey, A., Myers, A. & Burnett, D. (1997). Towards an understanding of ethical behaviour in small firms. *Journal of Business Ethics*, 16, 1625-1636.
- Zairi, M. & Peters, J. (2002). The impact of social responsibility on business performance. *Managerial Auditing Journal*, 17, 174-178.
- Zsolnai, L. (2004). Honesty and trust in economic relationships. *Management Research News*, 27, 57-62.

Table 1. Profile of the Australian Participants

Participants	Gender	Current Age	Education Level	Nature of business	No of employees	Firm Age
A	Female	28	Bachelor degree	Handbag designer and manufacturer	14	3
B	Male	63	Certificate	Tailoring and dry cleaning	15	47
C	Male	37	Certificate	Software development and computer service	5	12
D	Male	40	Halfway through university	Computer and related services	2	8
E	Male	42	High School	Air conditioner service	17	15
F	Female	45	Masters degree	Public relations consulting	3	3
G	Male	56	High school	Electrical goods and furniture retailer	15	20
H	Female	23	Masters degree	Website development	4	2
I	Female	32	Certificate	Musical instruments manufacturer	13	3
J	Female	24	Bachelor degree	Business consulting	2	2
<i>M</i>		39			9	11.5
<i>SD</i>		13.19			6.25	13.96

Table 2. Profile of the Malaysian Participants

Participants	Gender	Current Age	Education Level	Nature of Business	No of employees	Firm Age
K	Female	45	High school	Cosmetic producer/ manufacturer	13	5
L	Female	40	Diploma	Software development and computer services	8	4
M	Male	44	Masters degree	Steel trading and retail	15	5
N	Male	50	High school	Motor trading and insurance services	27	20
O	Male	43	High school	Transportation and logistics service	17	16
P	Male	42	High school	Car trading and insurance services	25	18
Q	Male	41	High school	Catering service and restaurant	11	3
R	Male	35	Bachelor degree	Optometry service	6	9
S	Male	36	High school	Printing service	5	7
T	Male	45	High school	Ice cube producer	26	15
<i>M</i>		42.1			15.3	10.2
<i>SD</i>		4.43			8.28	6.40

Table 3. Clusters and Examples of Ethical Behaviours

Cluster	Examples of behaviours
Concern for ethical business practices	<ul style="list-style-type: none"> <li>• Handle business based on ethical standard and philosophical consideration</li> <li>• Avoid being too greedy or money-oriented</li> <li>• Handle business based on corporate governance</li> <li>• Engage in fair and open marketing practices</li> <li>• Be committed to offering products/services at fair prices</li> </ul>
Maintain honesty and integrity	<ul style="list-style-type: none"> <li>• Be honest and transparent in business dealings</li> <li>• Be trustworthy</li> <li>• Keep promises</li> <li>• Hold on to integrity</li> </ul>
Take responsibility and be accountable	<ul style="list-style-type: none"> <li>• Take responsibility and be accountable for own actions</li> <li>• Admit mistakes and inform the affected party that they have occurred</li> </ul>

Table 4. Clusters and Examples of Socially Responsible Behaviours

Cluster	Examples of behaviours
Responsibility towards society	<ul style="list-style-type: none"> <li>• Engage in community activities</li> <li>• Concern for social welfare – ‘serving others’</li> <li>• Create job opportunities for local communities</li> </ul>
Responsibility towards staff	<ul style="list-style-type: none"> <li>• Concern for staff welfare</li> <li>• Provide staff with training or send them for training</li> </ul>
Responsibility towards customers	<ul style="list-style-type: none"> <li>• Provide extra services to people/customers</li> <li>• Give customers value for their money</li> <li>• Offer good product/services at good price</li> <li>• React to customers complain immediately</li> <li>• Demonstrate the willingness to add value to customers well being</li> </ul>
Responsibility towards entrepreneurship	<ul style="list-style-type: none"> <li>• Survival</li> <li>• Innovation</li> <li>• Profitability</li> </ul>

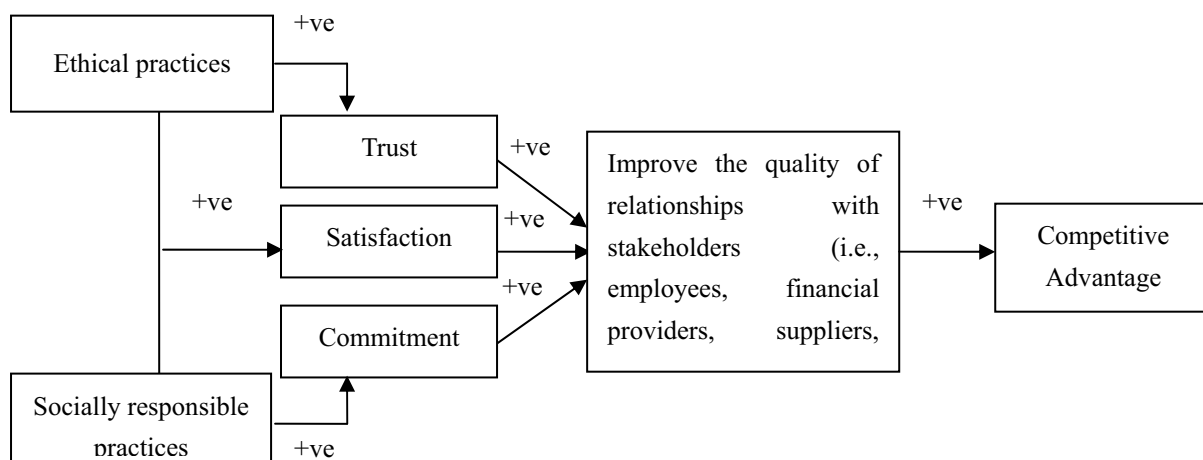


Figure 1. A Proposed Model



## Study on the Influence of Foreign Direct Investment on Chinese Foreign Trade

Mengchun Ding & Hongxin Li

School of Economics and Management, Changchun University of Science and Technology, Changchun 130022, China

Tel: 86-431-8203-0456 E-mail: [dingmengchun312@163.com](mailto:dingmengchun312@163.com)

### Abstract

Under the background that global foreign direct investment (FDI) crashed largely, Chinese foreign investments fell year on year in the first half year of 2009, but its proportion in the global FDI gross didn't drop, and China is still the first investment place for foreign investments in the world. China is the country which attracted most FDI accumulatively in all developing countries and had the most amount of foreign sub-company in the world. But many problems still exist in the process that China uses FDI to improve the development of international trade. In the article, the FDI is first introduced, and the influences of FDI on Chinese foreign trade are pointed out, and the countermeasures that Chinese uses FDI to improve the development of international trade are put forward finally.

**Keywords:** Foreign direct investment (FDI), Imports and exports, Foreign Trade

### 1. Introduction of FDI

#### *1.1 Actuality of FDI in China*

FDI means the foreign investment activities that the enterprises, governments and individuals of one country invest in the industry, the agriculture and the finance and the service industry in foreign countries by various forms and obtain all or part of the management and control rights of these investment enterprises, taking the profit acquirement as the main intention. Since 1994, the proportion of foreign investment enterprises in the total amount of Chinese imports and exports rose year after year, and this number was 35.69% in 1994, 57.74% in 2007, and 59.8% in 2008, which fully indicated that the foreign investment enterprises have occupied very important status in Chinese trade at present. To adapt the situation after China entered into WTO and opened to the world, Chinese relative departments adjusted and constitute a series of policies and laws to build more loose and transparent policy environment for multinational companies to enter into Chinese market. These policy changes mainly include broadening the sale proportion of foreign investment enterprises in Chinese market and canceling the foreign exchange balance requirement of China, further modifying the "Guiding List of Industries for Foreign Investment", issuing many laws relative to foreign mergers such as the "Using Foreign Investment to Reorganize State-owned Enterprises Tentative Provisions" and the "Merger with and Acquisition of Domestic Enterprises by Foreign Investors Tentative Provisions", and further standardizing the merger activities of multinational companies in Chinese market and improving the multiform modes that China utilizes foreign investments, issuing and implementing new policies of using foreign investments in many industries such as the finance, the telecom and the railway, which created advantages for the service industry to utilize the foreign investments. At the same time, to support the manufacturing of multinational companies transferring to China and welcoming the time of "Made in China", various local governments obviously strengthened the policy construction in integrating local resources and optimizing investment environment, and gradually modified their policies to adapt the introduction of foreign investments.

#### *1.2 Effect of FDI on international trade*

##### *1.2.1 Trade substitution effect*

One commodity can enter into the market of other country by two modes such as the trade and investment, and when the investment is selected, the trade will be substituted. Especially in the situation that two countries have same or similar technologies, as the result of the gradual course of company internationalization (from trade to FDI), FDI and trade can be substituted each other for special products in the manufacturing. The internationalization of many manufacturing multinational companies all presented by the process from exports to establishing the trade company in foreign countries and then establishing international production and management system by FDI, so the subsequent investments will certainly substitute the former trade.

##### *1.2.2 Trade creation effect*

FDI can create new trade opportunities between home country and host country, and make the trade be made in larger scale. FDI will directly induce the exports of capital products, medium investment, technology and service, and improve

the trade of home country. Especially, as the transfer of advanced production technology, FDI will reduce the costs, enhance the efficiency and improve the multinational flow of information, so for a long time, FDI will create new demand of trade, and drive the export trade from host country to home country.

### 1.2.3 Market expansion effect

The production expansion realized by FDI will not only deepen the market infiltration to host country, but further develop new third country's market, and accordingly make the production oriented by the trade to bring the increase of total trade.

In different stages of the special FDI project, above four effects will occur alternately. In the initial stage of the project, because the imports of the capital products and medium investment, the trade creation effects making for home country will occur sometimes. As the production goes along, the trade substitution effect will gradually occur. And the subsequent successful management will bring the trade compensation effect and the market expansion effect. Therefore, the review of FDI trade effect should be observed in a long time.

## 2. Influences of FDI on Chinese foreign trade

### 2.1 FDI can significantly improve the structure of Chinese export products

More and more multinational companies begin to directly invest in China by large scale, which makes the market structure of Chinese foreign trade to be improved significantly. The dispersal of risks strengthens the emergency meeting ability and releases the actuality that Chinese export markets are too centralized, which will help to implement the multi-culture strategy of exports and adapt the demands of Chinese foreign expansion. FDI can mainly drive the exports of labor and resource centralized industrial products. The essential intention that FDI swarms into China is to develop its own markets abroad by using the manufacturing base, China. Most multinational companies utilize the competitive advantages in capitals, technologies and marketing management to combine their capitals and technologies with Chinese cheap labor resources and material resources to largely develop the trade of export manufacturing, so they can certainly be in the dominant status in the export competition with Chinese non-foreign investment enterprises.

### 2.2 FDI can compensate the shortage of the production agent of China, and offer necessary material supplements for the imports and exports

The export trade is mainly restrained by the domestic production agent and influenced by the world market factor. As a developing country, China is restrained by the deficient capitals and technologies for a long time. The flow-in of FDI can largely increase the supply of Chinese production agent, improve the allocation of production resources, and expand the production ability. Most FDI enterprises in China came from Japan, Korea, US, European Union and countries in Southeast Asia. In these countries, the contents and layers of capitals and technologies in developed countries are relatively higher, but the technology-dense degree and layer of newly industrializing countries such as Korea and Singapore are lower. As viewed from the investment scale, the enterprises with large scale came from US and European Union, but the proportion of investment is relatively lower. In Japan and Korea, most FDI enterprises are middle and small-sized enterprises which belong to labor-dense type from the industry orientation, and these enterprises respectively belong to the industries such as food making, fabrics, shoes, toys, bicycle and container, and few of them belong to the capital-dense and technology-dense industries.

### 2.3 The technical overflow effect and the market entrance overflow existing in FDI enterprises can drive the development of the exports for Chinese domestic enterprises

By the association with FDI, domestic enterprises can acquire more information about international market, better establish relation with foreign groups, share the result of free trade with FDI enterprises, reduce the obstacles with the foreign market, and improve the export trade by the information, sales channel and distribution service of FDI. Through the transfer and diffusion of capitals, technologies, management and technology, FDI can enhance the ability of production and export for China, and its indirect trade effect will finally improve the development of Chinese export.

### 2.4 FDI will negatively influence the balance of payments of China

Another problem concealed in promoting foreign trade effect of foreign investment is that the over-quick increase of imports of foreign enterprises and the gradual increase of remitted profit of foreign funded enterprises entering into the mature stage will bring pressures for the international balance of payments. The main reasons of too-quick imports of foreign funded enterprises include following points. First, large numerous of foreign-funded enterprises depend on the imports too much, and quite part products are sold in domestic market but not in foreign countries. Second, the imports of the non-industrial enterprises increase too quickly. Third, the import costs of "foreign funded enterprises" in individual industries such as the car manufacturing, the air-conditioner manufacturing and the thermal power generation are too higher, and the trade deficient of foreign exchange is obvious. Fourth, the import management of second-hand equipments which belong to the practicality investment from the country to the foreign funded enterprises is not perfect, which not only increase the low-efficiency imports, but influence the exports of products with high additive values.



Starting from the corresponding relation between imports and exports, above factors will not only influence the trade balance, but restrain the enhancement of the export quality.

### **3. Using FDI to improve the development countermeasures of Chinese foreign trade**

#### *3.1 Further building stable and transparent policy environment, uniform and opening market environment and standard and high-efficient administration environment for foreign investments*

Chinese governments on various levels should perfect various regulations and management systems, constitute uniform and transparent policies, standardize the authorization procedures to adapt the demand that China enters into WTO, further strengthen the guidance for the foreign investments, encourage foreign investments to flow to newly high-technical industries, adopt measures to promote the introductions of new technology and products, encourage the R&D of foreign invested enterprises in China to enhance the technical content of export products.

#### *3.2 Enhancing the quality level of FDI and transform FDI guidance mode to improve the updating of industries*

On the base that the government fully exerts the existing comparison advantage, the government should quickly enhance the international competitive force of export industries by many approaches such as technical innovation, system innovation and structure innovation. It is possible to introduce new technologies in the development mode of competition advantage. First, the biggest advantage that undeveloped countries perform the strategy of new-technical orientation is that they have no deposited costs. Second, undeveloped countries can absorb the experiences and trainings of developed countries about the development of relative industries. The development of modern information network economy has broken the rules of industrial economy (grads development) to quite large extent, and eliminated the traditional space and time distance restraining the economic development to some extents, so if the new industries developed by the home country are defined as the new world industries, the span-development of industrial updating will be realized, and the industrial level will be quickly enhanced.

#### *3.3 Strengthening the supervision on foreign trade behaviors of foreign invested enterprises*

Quite parts of foreign funded enterprises made the feints of loss or few profit by transferring the price to escape the taxation. So it is very necessary to build a perfect supervision institution system. Many government functional departments such as the foreign economy and trade committee, foreign exchange administration, industry and commerce administration, taxation administration, commodity inspection and custom and many social agents such as accounting, auditing, asset evaluation and credit evaluation should have the functions and obligations to supervise foreign funded enterprises. To strengthen the validity supervising foreign funded enterprise, above various departments should increase associations, confirm their own functions and form an organic system, enhance the service efficiency of governmental departments, eliminate obstructions among them to make the supervision of foreign funded enterprises form an associated linkage mechanism with good management efficiency.

#### *3.4 Leading domestic enterprises to enter into the global production system and drive the updating of exports by the multinational companies*

As the matching rate of foreign funded enterprises rises, many domestic enterprises begin to enter into the global production system of multinational company. Chinese enterprises should actively grasp the opportunity of international industrial transfer, especially continually strengthen the cooperation with multinational companies, participate in the international division and competition, and realize the updating of the technical and industrial structure. Multinational companies are the leaders of global technical innovation, and their productions all over the world powerfully promote the diffusion of technologies, so to attract the investment of multinational companies is the important measure to acquire global knowledge and technology and the important approach to reduce the gap between China and developed countries in knowledge, technology and management. According to the development tendency of world economy and the capital-attraction experiences since China has opened to the world for thirty years, in the present and future terms, China should continually attract the investments of world top 500 enterprises as the emphasis and breakthrough inviting investments from overseas. One of directions guiding foreign investments is to make more Chinese enterprises enter into the global production and service network system by multiform association modes with foreign investment enterprises. In this network system, foreign investment enterprises can be the local agent institutions of the global production and service system, and make the local enterprises to be in line with the world and grow to be world components manufacturers or service suppliers.

#### *3.5 Supporting the development of FDI in the service industry and improving the development of Chinese international service trade*

At present, many problems such as the lagged development of the service industry, the undeveloped marketization and opening degree, weak international competition force of the service industry and seriously lagged laws and management about the international service trade still exist in the international service trade of China, and these problems have seriously restrained the development of Chinese exports of service trade. According to the promise to the General

Agreement on Trade in Services (GAST), China will gradually open its service trades. GAST emphasized the participation degree of developing countries to the world service trade and expanded their service exports, which is very useful for the development of Chinese service industry. However, many industries such as finance and telecom will influence the whole economic situation of China, so they should not be opened blindly. Therefore, various service industries should seriously research the promises when China entered into WTO, gradually guide the investments of FDI enterprises and open the market of service trade, develop the industries with dominant advantages to go to the international market, participate in the international competition, and expand the exports of service trade.

### References

- He, Qingguang. (2008). On the Dynamic Effects of Foreign Direct Investment on China's Economic Growth. *Economic and Social Development*. No.12.
- Li, Hao. (2008). New Trend of FDI in the World and New Characteristics of Utilizing Foreign Capital. *Forum of World Economy & Politics*. No.1.
- Wang, Shouyang et al. (2007). Analysis and Prediction of the Situation that China Uses FDI in 2007. *China Trade News*. No.1.



## Decomposition of Malaysian Production Structure Input-Output Approach

HUSSAIN ALI BEKHET

Finance and Economics Department

College of Business Management and Accounting

University Tenaga Nasional (UNITEN)

Muadzam Shah Campus, Pahang, Malaysia

Tel: (609) 455 2020 ext. 2049

E-mail: profhussain@uniten.edu.my, drhussain175@hotmail.com

### Abstract

Structural decomposition techniques are widely used to break down the growth in some variable into the changes in its determinants. Over the past two decades, input-output structural decomposition analysis (SDA) has developed into a major analytical tool. We review the development of SDA and its relationship to other methodologies. We present the fundamental principle of alternative approaches to deriving SDA estimating similarities and explore the various & decompositions of changes in I-O tables. Using I-O Tables for the Malaysian Economy 1983-2000, this comparative study focuses on changes in the economic structure with different levels of development over time (1983-2000). The change in the economic structure is decomposed into two initial components (Technology and total output). According to the results, there are similarities over time in the national structure of production patterns of intermediate use of commodities. Also, the results indicate a rather remarkable degree of commonality in the patterns of growth processes, with more significant differences between sectors than between tables. However, the most changes within sectors, and the Malaysian table as a whole, seem to result from changes in  $\underline{x}$ , and  $\underline{f}$ .  $\underline{A}$  seems to have remained relatively unchanged.

**Keywords:** Input-Output Model, Economic Structure, Structural Change, Coefficient Change, Comparative Statics, Production Techniques

### 1. Introduction:

This paper attempts an historical comparison of the economic production structure of the Malaysian economy using input-output relationships. The pioneering study in this field was by CHENERY and WATANABE [1958], which indicated that the national production structures of such developed countries (DCs) as Japan, Italy, Norway, and United States are similar. SANTHANAM and PATIL [1972] have shown that the production structure of India, a less developed country (LDC), also resembles those of the above developed countries. These studies are based on the analysis of the production structure of only a limited number of countries, however, and, as has been suggested in earlier studies, further investigation is required.

Comparisons of the production structures of different economies have largely focused on international comparisons (LENOITTEF, (1963); SIMPSON, and TSUKUI, (1965); and HELMSTADTER, 1969), but with the development in recent years of several survey-type input-output models it is possible to extend this type of analysis to comparisons of regional production structures. Such regional comparisons are appealing in that little work has been done in this area and, in contrast with international comparisons, variations in accounting conventions and relative prices should be small.

A path-breaking analysis of input-output tables of different countries was undertaken by CHAENERY and WATANABE (1958). They conclude that a general similarity in the relationships among productive sectors in industrialized countries exists, although there are substantial differences in individual input-output coefficients. The production structure was analyzed by grouping industries according to patterns of output distribution and input sources. Industries were categorized numerically according to the proportions of output sold to other industries and to final demand, and also by the proportions of inputs purchased from other industries and utilized directly. In this manner interdependence was examined from both the demand and the supply sides.

Although a large part of the analysis was approached on a coefficient-by-coefficient basis, one purpose of the study was to establish a hierarchy of sectors leading from finished to primary products and then to determine the extent to which the resulting sequence was similar in each nation

In this paper I extend the existing comparisons and consider the production structure of Malaysia in its historical perspective. The input-output tables considered for the purposes of national comparison are for 1983, 1987, 1991 and 2000.

The purpose of this paper is to find out whether the structure of production of Malaysia is in any way comparable over time, between different tables. That is, whether there has been significant change in the technical coefficients over time. The decomposition methods used BEKHET (2009) indicated that there are some changes. In this paper other techniques of decomposition will be discussed and utilized.

The rest of this paper is in five sections. Section Two considers the literature review of the structural decomposition analysis. Section Three discuss the methodology of the structural decomposition analysis. This would be including the comparability of production techniques, the comparability of intermediate use, and the overall comparison of intermediate use. Section Four examines the results analysis. Section Five presents some policy implications. Section Six offers some conclusion and remarks.

The following notation is used in this paper:

$a_{ij0}$  is the input coefficient for the base year.

$a_{ij1}$  is the input coefficient for the comparator year.

$x_{j0}$  is total output for the base year.

$x_{j1}$  is total output for the comparator year.

## 2. Literature Review of the Structural Decomposition Analysis:

The antecedents of structural decomposition analysis are the various analyses of changes in US input-output tables as performed by LEONTIEF (1941, 1953). More formal dynamic analyses in this vein, focusing on investment and technological change, were performed by CARTER, culminating in her 1970 volume (CARTER, 1970). A broader approach that used features of input-output analyses along with more general macroeconomics was developed for the examination of economic development by CHENERY et al. (1962) and CHENERY and SYRQUIN (1975).

The first formal identify-splitting derivation known to us is the three-part decomposition of sources of change in air pollution emissions as performed by LEONTIEF and FORD (1972). SKOLKA's work on structural decomposition analysis began in the mid-1970s (see, for example, SKOLKA, 1977) and culminated in the expanded set of estimating equations in his classic paper (SKOLKA, 1989), which is perhaps the most cited work in the field. However, the SKOLKA estimating equations were not formally derived, so certain desirable properties are not ensured. The most extensive derivation to date is the 14 estimating equations, comparable analytically with that of a neoclassical, two-tier KLEM (capital, labour, energy and materials) production function, by ROSE and CHEN (1991a). This was also the first paper to attempt to address the properties of the structural decomposition analysis production function and to compare them with neoclassical formulations.

Structural decomposition analysis has become a popular methodology for several reasons. First, it overcomes many of the static features of input-output models and is able to examine changes over time in technical coefficients and sectoral mix. Thus far, it has only been used for historical analysis, but some recent work indicates how it might be used as a forecasting tool (see, for example, CASLER et al., 1991; ROSE & CHEN, 1991b). In a similar vein, structural decomposition analysis enables the analyst to examine responses to price changes, which are only implicit in even value-based input-output tables. As such, it may involve an as yet undiscovered duality feature.

Another reason for the increasingly widespread use of structural decomposition analysis is that it is a pragmatic alternative to econometric estimation. Analysis of similar topics using econometrics requires a time series covering 15 years or more, and not only for output and primary factors of production but all intermediate inputs as well. In contrast, structural decomposition analysis requires only two input-output tables: one for the base year and one for the comparator year of the analysis. Moreover, it has been demonstrated heuristically at least that the structural decomposition analysis estimating equations are insignificantly more restrictive than the most advanced of the economically estimated production functions-flexible functional forms, such as the translog.

Still another asset of structural decomposition analysis arises from its input-output base-the comprehensive accounting of all inputs in production. As environmental and natural resource issues became more prominent, there was a greater need to look at root causes of pollution and depletion. These are more readily linked to intermediate sectors, which are omitted in the more standard approaches (ROSE and CASLER, 1996).

Beyond that, structural decomposition analysis has seen a broad set of applications. These include examining sources of change in international trade (for example, KANEMITSU & OHNISHI, 1989; CHEN & WU, 1995), technological change (for example, STERNER, 1985; OOSTERHAVEN & VAN DER LINDEN, 1994), energy use (for example, LIN & POLENSKE, 1995), workforce requirements (for example, WOLFF, 1985; HAN, 1995), services (for example,

BARKER, 1990) and development planning (for example, SIEGEL et al., 1996). These empirical studies have yielded valuable findings about the success of energy conservation measures; limitations of import substitution; prevalence of changing tastes; pervasiveness of factor productivity; and importance of skill attainment.

### 3. The Data and Methodology:

Basically, the present study uses secondary data based on the four input-output tables compiled for the Malaysia economy so far. These tables were produced by the Department of Statistics. For analytical and comparable purposes, the original input-output tables consisting of different number of sectors are aggregated into 39 sectors based on International Standard Industrial Classification (ISIC). These sectors are shown in (Table 1). I proposed the following decomposition for the analysis of the influence on input coefficient and output levels of changes in the technology for the two time periods 0 for base table and 1 for comparator table.

#### 3.1 Comparability of Production Techniques

When comparing the overall structure of Malaysian production in 1983 with that of the other input-output tables available for the Malaysian economy, it would be fruitful to make a detailed comparison of the production techniques of the sectors of the Malaysian input-output table of 1983 with those of 1987, 1991 and 2000. In inter-industry analysis, the technique of production of a sector is indicated by the input coefficient in the relevant column vector of the input coefficient matrix. In what follows, I will use the techniques of production of the sectors for the Malaysia, as given by the input coefficient matrices. There are two methods of measuring the comparability of production techniques, industry by industry. These two methods are dealt with in the next two subsections.

##### 3.1.1 Absolute Column Measure

The first measure of the comparability of production techniques on an industry by industry basis is derived from the sum of absolute differences in coefficients ("absolute column measure") divided by an "average column total" for two years,  $PT_j$ . The former is the ratio of the sum of absolute differences of all the coefficients of the  $j$ th column vector of these tables, divided by the arithmetic mean of all the coefficients of the two tables. The latter is the median value of the former. This measure can be expressed mathematically, by:

$$PT_j = \frac{\sum_{i=1}^n |a_{ij0} - a_{ij1}|}{(1/2) \sum_{i=1}^n (a_{ij0} + a_{ij1})} \quad (1)$$

In matrix notation this is:

$$PT_j = \frac{i' |\underline{A}_0 - \underline{A}_1|}{(1/2) i' (\underline{A}_0 + \underline{A}_1)} \quad (2)$$

Here the  $a_{ij0}$  is the base year input coefficient, and  $a_{ij1}$  is the input coefficients for the comparator year. From the definition above, it is clear that the value of  $PT_j$  is in the range (0, 2). Thus a value of zero for  $PT_j$  indicates a maximum level of measurable similarity between production techniques, while a value of two indicates the maximum level of measurable difference. If  $PT_j$  is zero, the production techniques will be identical.

In their study, CHENERY and WATANABE [1958] have accepted the value of  $PT_j = 0.80$  as the dividing line; whenever the value of  $PT_j$  is less than or equal to 0.80 the production techniques employed in both table (base and comparator) are said to be comparable. I have computed the values of  $PT_j$  for the 39 sectors between input-output table for 1983 and each of the other three tables of the Malaysian economy and between other successive tables. These results are presented in table 2.

Insert Table 2 Here.

##### 3.1.2 Frequency Distribution Method

Another useful method for comparing the production techniques of two tables would be a frequency distribution of the sectors by using the values of  $PT_j$ s as shown in Table 2. We can use them in summary form to determine the extent to which the four tables are comparable. This has been done in Table 3, in which all the possible combination two-table comparisons have been classified by the magnitude of the column difference.

Insert Table 3 Here.

#### 3.2 Comparability in Intermediate Use:

In the preceding section, we used the technique of comparing the input coefficients of the tables. Another useful approach to the problem is to examine the extent of overall similarities in the use of a given good as an intermediate product. Similarity between input-output tables for two years (base and comparator) in the intermediate use of commodity  $i$  by industry  $j$  can be analysed by comparing the intermediate use in the comparator table that would be necessary, using the input coefficients in the base table, with the actual level of use in the comparator table. This could

be done for an industry  $i$  by multiplying the production levels of the economy in the table of the comparator year with the input coefficients (along the row) of the base table year, and dividing this sum by the total intermediate use of industry  $i$  of comparator year,  $IU_i$ . This measure can be expressed mathematically as:

$$IU_i = \frac{\sum_{j=1}^n a_{ij0} x_{j1}}{\sum_{j=1}^n a_{ij1} x_{j1}} \quad (3)$$

In matrix notation this is:

$$IU_i = \frac{\mathbf{i}' \mathbf{A}_0 \mathbf{x}_1}{\mathbf{i}' \mathbf{A}_1 \mathbf{x}_1} \quad (4)$$

Here  $\mathbf{i}$  is the unit vector. From the definition above, it is clear that the value of  $IU_i$  is in the range  $(0, \infty)$ . If the value of  $IU_i$  is close to one, the similarity of the technical production between the two input-output tables will be large. On the other hand, if this value deviates from unity, the production techniques will be different.

Deviation of the value of  $IU_i$  from unity may be due to various factors, such as input substitution without compensating price variations, or conceptual differences in the definition of the products or sectors. The values of  $IU_i$  are affected by the patterns of intermediate use in the base year. This value is computed for each pair of input-output tables for the Malaysian economy by using Equation (3). These results are shown in table 4.

Insert Table 4 Here.

### 3.3 Overall Comparison

So far, our interindustry comparisons have been made in terms of columns and rows, and have been made on individual sectors separately. An equally interesting aspect of the study of input-output table comparison is the comparison of the interindustry tables as a whole for a given pair of tables. Such an overall comparison could be made in terms of the weighted average of row ratios or columns ratios, where the weights are the output levels for sectors of the table accepted as the base for comparison. The similarity of the overall pattern of the intermediate use for the input-output table as a whole can be measured by extending either the column or row comparisons. It should be noted that the weighted average of the column or row ratio leads to the same final result, the weighted average of our earlier ratio of  $IU_i$ . The weighted average ratio of  $IU_i$  may be expressed as follows:

$$IU_i = \frac{\sum_{i=1}^n \sum_{j=1}^n a_{ij0} x_{j1}}{\sum_{i=1}^n \sum_{j=1}^n a_{ij1} x_{j1}} \quad (5)$$

We can write this in matrix form as:

$$IU_i = \frac{\mathbf{i}' \mathbf{A}_0 \mathbf{x}_1}{\mathbf{i}' \mathbf{A}_1 \mathbf{x}_1} \quad (6)$$

Here,  $x_{j1}$  is the total output for the comparator year. Equation (5) has been applied for the Malaysian economy of the period under study. These results are shown in table 5.

Insert Table 5 Here.

Since the input-output table chosen as the base affects the ratio of overall comparison, it would be of interest to reduce the impact of any table as the base table by accepting a mixed base. The ratio of overall comparison with a mixed base of different output level, OC, may be expressed as follows:

$$OC = \left[ \frac{\sum_{i=1}^n \sum_{j=1}^n a_{ij0} x_{j1} \quad \sum_{i=1}^n \sum_{j=1}^n a_{ij0} x_{j0}}{\sum_{i=1}^n \sum_{j=1}^n a_{ij1} x_{j1} \quad \sum_{i=1}^n \sum_{j=1}^n a_{ij1} x_{j0}} \right]^{\frac{1}{2}} \quad (7)$$

And in matrix notation:

$$OC = \left\{ \frac{\mathbf{i}' \mathbf{A}_0 \mathbf{x}_1 \quad \mathbf{i}' \mathbf{A}_0 \mathbf{x}_0}{\mathbf{i}' \mathbf{A}_1 \mathbf{x}_1 \quad \mathbf{i}' \mathbf{A}_1 \mathbf{x}_0} \right\}^{\frac{1}{2}} \quad (8)$$

Where,  $x_{j0}$  is total output of the base year. I have used Equation (7) for the Malaysian economy for the period 1983-2000. These values of OC are presented in Table 6.

Insert Table 6 Here.

#### 4. Analysis of the Results:

In this section, interpretation will be made of the application of the techniques introduced in Section 3 above to the input-output data for the economy of Malaysia. The period of the analysis is from 1983 to 2000.

Table 2 shows the comparison between four input-output tables available for the period mentioned above. The  $PT_j$  values have been computed and compared for 39 sectors, i.e., as shown in Table 2, between all combinations of the tables. The results indicate that the Malaysian production techniques in 1983 are reasonably similar to those in 2000, and if we take the production techniques in 1987 again are reasonably similar to those in 2000. The production techniques are shown to be quite similar in Oils & Fats product, Wooden Products, Paper & Printing products, China, Glass, Cement & Other Non-met Mineral products, Building & Construction, Hotel & Restaurants, and Other Services sectors. If we take the Mean of  $PT_j$ , then the production techniques are shown to be quite similar in the case of Livestock Breeding, Foods Production other, Wearing Apparel, Paints, Lacquers & Other Chemical product, Petroleum & Coal product, Plastic products, Non-Electricity & Electricity Machinery, Transport, Banks, Finance & Insurance, and Health sectors. The maximum level of differences is in the case of Forestry & Logging product, Fishing, Industrial Chemicals, Other Transport Equipment, Electricity & Gas, and Communication sectors. This means the  $PT_j$  are greater than or closer to unity for these sectors.

However, the most similar for all combinations among input-output tables is the 1983-1987, 1983-1991 and 1987-1991 cases, where the majority of the value of  $PT_j$  is less than unity and in some cases closer to zero. Therefore, most industries show little if any change where comparability of production techniques is measured by absolute column change (See Table 3).

Following CHENERY and WATANABE [1958], if we take the value 0.8 of  $PT_j$  for judging whether the production techniques of two tables are similar, then there are only two pairs of tables which would be regarded as similar. These combinations are 1983-1987 and 1987-1991. However, this may be because these combinations of the tables were very close in time. But if the value of  $PT_j$  of one is accepted as the guiding indicator rather than 0.8, the tables for 1983-1991, 1987-1991, and 1991-2000 are the least comparable, since 37, 35 and 35 sectors, respectively, show values below unity, whereas in the case of 1983-1987, 1983-2000 and 1987-2000 the number of sectors is 34, 34 and 31 respectively (see Table 3).

For developing countries, the production techniques are similar in most of the Manufacturing Industries and are least comparable in the non-Manufacturing Industries [Al-SAID, 1985; p.158]. Following SANTHANUMA and PATIL [1972], if we take a  $PT_j$  value of 1 or less to indicate similarity, we see that the production techniques for the 1983-1991 periods are very similar. However, the  $PT_j$  value of the Fishing and Electricity & Gas sectors are slightly higher than one. This is because these sectors are producing almost finished materials which are, in fact, semi-finished and their outputs go directly to final demand.

It may be noted from Table 4 that the values of  $IU_i$  for the Malaysian economy show that the patterns of intermediate use in the various sectors is similar and close to unity only about 67%, 69% of sectors for 1983-1987 and 1987-1991 respectively. We coded these sectors with mark \* (see Table 4). However, the most comparable pairs of years are 1983-1987 and 1987-1991, and the least comparable pair is 1991-2000 and 1983-2000. The reason for this may be that the structure of the Malaysian economy changed radically after the economic plans for the period 1980-1990. If we consider the (0.8-1.2) value as critical range of judgment then the most similarity of technical production between 1983-1987 and 1987-1991 were very large. This may be because these three tables were very close in time. Also interesting is the fact that the historical comparisons indicate an increasing constancy over time in intermediate use patterns in the following sectors; Agriculture products, Rubber Primary products, Fishing, Beverages & Tobacco product, basic Metal & Other Metal product, Non-Electricity and Electricity Machinery, Wholesale & Retail Trade, Real estate & Ownership dwellings, Education and Health. Beyond that, there was decreasing constancy over time in intermediate use in Foods Production, Oils & Fats product, Textile products, Wearing Apparel, Furniture & Fixtures, Industrial Chemicals, Paints, Lacquers & Other Chemical product, Petroleum & Coal product, processed Rubber & Rubber product, Electricity & Gas, Hotel & Restaurants sectors. There are some indications that changes in intermediate relations have been associated with policies adopted during the period. The increase in intermediate use and the variation in its composition during the process of development are the result of change in the composition of demand and in technology.

Now, if we consider the input-output table comparison as a whole for any given pair of tables, we get two values of  $IU_i$  by altering the base. It may be noted from Table 5 that the overall comparison of all possible combination of pairs tables

of Malaysian economy indicates that 1983-1991, 1987-1991, 1987-2000, 2000-1983, 2000-1987, and 2000-1991 are the most comparable.

Also, if we consider the ratio of overall comparison with a mixed base of different output level, it found that 1983-198, 1983-1991 and 1987-1991 are most similar of tables (see Table 6). However, the results indicate that the most differences of all combinations of tables are 1983-2000, 1987-2000 and 1991-2000. Moreover, the similarity for the Malaysian economy has decreased over the period 1983-2000, reflecting the changes that have taken place in the economy.

### 5. Policy Implications:

The results shown in Tables 2 to 6, and discussed in the previous section, show how far the Malaysian policy has been successfully achieved.

We see that there are similarities over time in the national structure of production, patterns of intermediate use of commodities, and input coefficients between 1983-1987, and 1987-1991. It appears that the degree of continuity in the production structure is dependent to a great extent on differences in the level of development of each sectors [see Tables 2-6], and overall [see Section 4]. That is to say, the more constant the level of development of sectors of the Malaysian economy over time, shown by a comparison of the tables for any two years of the 1983-2000 period, the more similar is the production structure. Also, it shows that imports are increasing and exports of non-oil goods, decreasing over time [see [www.epu.jpm.my/](http://www.epu.jpm.my/)]. The results show that although some progress has been made, it falls far short of what the planners desired.

This result provides more evidence supporting the main finding of the studies of the structural analysis of the Malaysian economy by linkages of input-output tables (SHUJA, 2007), and the assessment of development and structural change (BEKHET, 2009).

It is important to recognize that part of the change in coefficients is due to substitution effects, resulting from changes in relative prices. Unfortunately, information on price structure by sector is not available for Malaysia. Also, the validity of these results needs to be tested further through studies covering a larger number of input-output tables for the Malaysian economy. However, the conclusions drawn from the preceding tables suggest that, except for the effects due to the new industries (new technology), there may be no significant change in the production technology during the coming five years unless a drastic change in the structure of production takes place.

It needs to be emphasised here that the level of accuracy of studies in national comparison depends primarily on comparability of national input-output tables. It should also be noted that there is considerable information loss with a high degree of aggregation [see for example FISHER, 1958; NEUDECKER, 1970; MORIMOTO, 1970; BLIN and COHEN, 1977; VAN DRIEL, 1980; and BULMER-THOMAS, 1982]. There is greater likelihood that results would be more meaningful with a higher level of disaggregation in national input-output tables.

### 6. Conclusions:

In this paper I have discussed some methods to measure the structure of production of the Malaysian economy. These methods are the comparability of production techniques, comparability of intermediate use, comparability of the overall comparison of intermediate use.

According to the results, there are similarities over time in the national structure of production patterns of intermediate use of commodities.

This and the previous two papers have discussed change in  $\underline{x}$ ,  $\underline{f}$ ,  $\underline{A}$ , and  $(\underline{I}-\underline{A})^{-1}$ . As discussed in this and the previous two papers most changes within sectors, and the Malaysian table as a whole, seem to result from changes in  $\underline{x}$ , and  $\underline{f}$ .  $\underline{A}$  seems to have remained relatively unchanged.

### References

- AL- SAID, S.A. (1985). *Comparison of the Input-Output Techniques and the Stage of Development*, unpublished Ph.D thesis, The University of Wales, Aberystwyth, UK.
- BAER, W., FONSECA, M.A.R. & GUILHOTO, J.J.M. (1987). Structural changes in Brazil's industrial economy, 1960– 80, *World Development*, 14, pp.275–286.
- BARKER, T. (1990). Sources of structured change for the UK service industries, 1979-84, *Economic Systems Research*, 2, pp.173-183.
- BEKHET, H.A. (1992). The relation between development planning and macroeconomic policy models, *Journal of Journal of Economic and Administration Science*, Baghdad University, Vol.1, No.1.
- BEKHET, H.A. (1998). Measuring the effect of final demand value for Iraqi Economy, 1976-1990, *Journal of Economic and Administration Science*, Baghdad University, Vol.5, No.14.



- BEKHET, H.A. (2000). The development of sectoral multipliers structure of the Iraqi Economy, 1978-1988, *DIRASAT Journal, Administrative Science Division*, Jordanian University, Vol.27, No.1.
- BEKHET, H.A. (2009). Assessing Economic Connectedness Degree of the Malaysian Economy: Input-Output Model Approach, *International Journal of Finance and Economics*, Vol.1, No.2.
- BEZDEK, R.H., & WENDLING, R.M. (1976). Disaggregation of structural change in the American economy: 1947–1966, *Review of Income and Wealth*, 22, pp.167–185.
- BLIN, J.M. and COHEN, C. (1977). “Technological similarity and aggregation in input-output system: a cluster analytic approach”, *Review of Economics and Statistics*, Vol.60, pp.82-91.
- BULMER-THOMAS, V. (1982). *Input– output analysis in developing countries: sources, methods and applications*. New York: Wiley.
- CARTER, A.P. (1970). *Structural Change in the American Economy*, Harvard University Press, Cambridge, MA.
- CASLER, S.; AFRIASABI, A. & MCCAULEY, M. (1991). Decomposing change in energy input-output coefficients, *Resources and Energy*, 13, pp.95-109.
- CAVES, D.W., CHRISTENSEN, L.R., and DIEWERT, W.E. (1982). The Economic theory of index numbers and the measurement of input, output, and productivity, *Econometrica*, 50, pp.1393-1414.
- CHEN, C.Y. & Wu, R.H. (1995). Effects of restructuring of international trade on changing energy use patterns and CO<sub>2</sub> emissions in Taiwan: 1981-1991, *Proceedings of the 18th IAEE International Conference*, pp. 351-360.
- CHENERY, H. & SYRQUIN, M. (1975). *Patterns of Development, 1950-1970*, Oxford University Press, London.
- CHENERY, H. & SYRQUIN, M. (1979). A comparative analysis of industrial growth. In: R.C.O. CHENERY, H.B., & Watanabe, T. (1958). “International comparisons of the structure of production”, *Econometrica*, Vol.26, pp.487–521.
- CHENERY, H., SHISHIDO, S. & WATANABE, T. (1962). The pattern of Japanese growth, 1914-1954, *Econometrica*, 30, pp. 98-139.
- DIETZENBACHER E. and LOS, B. (1998). Structural decomposition techniques: sense and sensitivity, *Economic Systems Research*, Vol.10, pp.307-2323.
- EMERSON, J., & RINGLEB, Al. (1977). A comparison of regional production structure, *Papers in Regional Science*, Vol.39, No.1, pp.85-98.
- FELDMAN, S.J., McCLAIN, D. & PALMER, K. (1987). Sources of structural change in the United States 1963– 1978: an input–output perspective, *Review of Economics and Statistics*, 69, pp. 503–510.
- FISHER, W.H. (1958). “Criteria for aggregation in input-output analysis”, *Review of Economics and Statistics*, Vol.40, pp.250-260.
- FOSSELL, O. (1989). The input–output framework for analyzing the transmission of industrial progress between industries, *Economic Systems Research*, 1, PP.429–445.
- FUJIKAWA, K.; IZUMI, H; and MILANA, C. (1995a). Multilateral Comparison of Cost Structure in the Input-Output Tables of Japan, the US and West Germany, *Economic Systems Research*, Vol.7, pp.321-42.
- FUJIKAWA, K., IZUMI, H. and MILANA, C. (1995b). A Comparison of cost structures in Japan and the US using input-output tables, *Journal of Applied Input-Output Analysis*, 2, pp.1-23.
- HAN, X. (1995). 7-65.
- HEWINGS, G. J.D., DA FONSECA, M.A.R., GUILHOTO, J.J.M., & SONIS, E.M. (1989). Key sectors and structural change in the Brazilian economy: a comparison of alternative approaches and their policy implications. *Journal of Policy Modeling*, Vol.11, No.1, pp.67–90.
- KANEMITSU, H. & OHNISHI, H. (1989). An input-output analysis of technological change in the Japanese economy: 1970-1980, in: R. MILLER et al. (eds), *Frontiers of Input-Output Analysis*, (New York, Oxford University Press).
- KUBO, Y., & Robinson, S. (1984). Sources of industrial growth and structural change: a comparative analysis of eight economies. In: *Proceedings of the Seventh International Conference on Input–Output Techniques*. New York: UNIDO, United Nations.
- LAHER, M.L., and DIETZENBACHER, E. (2001). *Input-Output Analysis: Frontiers and Extensions*, (ed), Palgrave Macmillan.
- LEONTIEF, W. & FORD, D. (1972). Air pollution and economic structure, in: A. Brody & A. Carter (eds) *Contributions to Input-Output Analysis* (Amsterdam, North-Holland).

- LEONTIEF, W. (1936). Quantitative Input-Output Relations in the Economic System of the United States, *Review of Economics and Statistics*, 18, pp.105-25.
- LEONTIEF, W. (1941). *Structure of the American economy* (New York, Oxford University Press).
- LEONTIEF, W. (1953). *Studies in the structure of the American Economy* (New York, Oxford University Press).
- LIN, X. & POLENSKE, K.R. (1995), Input-output anatomy of China's energy use changes in the 1980s, *Economic Systems Research*, 7, pp. 67-83.
- MILANA, C. (2000). "The input-output structural decomposition analysis of flexible production systems", in *Input-Output Analysis: Frontiers and Extensions*, (Ed), M.L. LAHR, E. DIETZENBACHER, Macmillan, London.
- MORIMOTO, Y. (1970). "On aggregation problems in input-output analysis", *Review of Economic Studies*, Vol.37, pp.119-126.
- MORIMOTO, Y. (1971). "A note on weighted aggregation in input-output analysis", *International Economic Review*, Vol.12, pp.138-142.
- NEUDECKER, H. (1970). 'Aggregation in input-output analysis: an extension of Fisher's method', *Econometrica*, Vol.38, pp.921-926.
- OECD, (1995). *The OECD Input-Output Database*, Paris.
- RICHARDSON, J.D. (1971). Constant-market-shares analysis of export growth. *Journal of International Economics*, 1, pp.227– 239.
- ROSE, A. & CHEN, C.Y. (1991a). Sources of change in energy use in the US economy, 1972-1982: a structural decomposition analysis, *Resources and Energy*, 13, pp.1-21.
- ROSE, A. & CHEN, C.Y. (1991b). Modeling the responsiveness of energy use to changing economic conditions, in: F. FESHARAKI & J. DORIAN (eds), *Energy Developments in the 1990s*, pp.31-51.
- ROSE, A. and CASLER, S., (1996). Input-output structural decomposition analysis: A critical appraisal, *Economic Systems Research*, 8, Issue.1, pp.33-62.
- SANTHANAM, K.V. and PATIL, R.H. (1972). "A study of the production structure of the Indian economy: an international comparison", *Econometrica*, Vol.40, pp.159-176.
- SHUJA, N., WAH, Y. and LAZIM, M.A. (2007). Identify the Key Sector of Malaysian Economy: an Input-Output Approach, *Proceeding of the 9th Islamic Countries conference of statistical science*, 12-14 Dec, Shah Alam, Malaysia, pp.1340-1354.
- SIEGEL, P.; ALWANG, J. & JOHNSON, T. (1996). Decomposing sources of regional growth with an input-output model: a framework for policy analysis, *International Regional Science Review*, Vol.17, pp.
- SIMPSON, D. and TSUKUI, J. (1965). 'The fundamental structure of input-output tables, an international comparison', *Review of Economics and Statistics*, Vol.47, pp.434-446.
- SKOLKA, J. (1977). Input-output anatomy of import elasticities, *Empirical Economics*, 2, pp.123-136.
- SKOLKA, J. (1989). Input-output structural decomposition analysis for Austria, *Journal of Policy Modeling*, 11, pp.45-66.
- SOHN, I. (1986). *Reading in Input-Output Analysis: Theory and Applications*, Oxford University Press, New York.
- SONIS, M., HEWINGS, G. J. D. & GUO, J. (1996). Sources of structural change in input-output systems: a field of influence approach. *Economic Systems Research*, 8, pp.15–32.
- STERNER, T. (1985). Structural change and technology choice: energy use in Mexican manufacturing industry, 1970-81, *Energy Economics*, 9, pp.77-86.
- SYRQUIN, M. (1976). Sources of industrial growth and change: an alternative measure. Paper presented to the European Meeting of the Econometric Society, Helsinki, Finland.
- WOLFF, E. N. (1985). Industrial composition, inter-industry effects, and the US productivity slowdown, *Review of Economics and Statistics*, 67, pp.268-277.

Table 1. Aggregation of sectors:

No.	Sectors Names	Input-Output Tables	
		1991 & 2000	1983 & 1987
1	Agriculture products other	1, 4, 5	1
2	Rubber primary products	2	2
3	Oil palm primary products	3	3
4	Livestock breeding, etc	6	4
5	Forestry, logging product	7	5
6	Fishing, etc	8	6
7	Crude oil, Gas, Mining, Quarrying Product	9, 10, 11	7
8	Foods Production other	12-15, 17-21	8-9, 11-13
9	Oils and Fats product	16	10
10	Animal Feeds product	22	14
11	Beverages & Tobacco product	23-24, 25	15-16
12	Textile Products	26, 27, 28	17
13	Wearing Apparel	29, 30, 31	18
14	Wooden Products	32, 33	19
15	Furniture & Fixtures	34	20
16	Paper & Printing Products	35, 36	21
17	Industrial Chemicals	37	22
18	Paints, Lacquers & Other Chemical Product	38-41	23-24
19	Petroleum, Coal Product	42	25
20	Processed Rubber & Rubber Product	43-44	26-27
21	Plastic Products	45	28
22	China, Glass, Clay, cement & Other Non-met Mineral Products	46-49	29-31
23	Basic Metal & Other Metal Product	50-54	32-33
24	Non-Electricity and Electricity Machinery	55-59	34-35
25	Motor Vehicle Manufacturing	61	36
26	Other Transport Equipment	60, 62, 63	37
27	Other Manufacturing Products	64-65	38
28	Electricity & Gas	66	39
29	Water works and supply	67	40
30	Building & Construction	68	41
31	Wholesale & Retail Trade	69	42
32	Hotel & Restaurants	70	43
33	Transport	71	44
34	Communication	72	45
35	Banks, Financial & Insurance	73-75	46-47
36	Real estate & Ownership dwellings	76-77	48
37	Education	79-80	50, 56
38	Health	81-82	51, 57
39	Other Services	78, 83-94	49, 52-55, 58-60

**Source:** Malaysian Input-Output Tables for 1983, 1987, 1991 and 2000.

Table 2. Comparison of production Activity by absolute column Measure.

Sector	Tables						
	1983-1987	1983-1991	1983-2000	1987-1991	1987-2000	1991-2000	Mean
1	0.375	0.576	0.726	0.389	0.624	0.796	0.581
2	0.472	0.450	1.011*	0.362	0.924*	1.111*	0.722
3	0.240	0.590	0.693	0.709	0.683	0.996*	0.652
4	0.296	0.599	0.631	0.403	0.448	0.209	0.431
5	1.037*	1.129*	0.618	0.293	1.255*	1.243*	0.929*
6	1.023*	0.985*	1.285*	1.223*	1.484*	1.008*	1.168*
7	0.633	0.771	0.856*	0.521	0.524	0.361	0.611
8	0.117	0.198	0.684	0.190	0.717	0.597	0.417
9	0.085	0.105	0.229	0.050	0.206	0.194	0.145
10	0.288	0.420	0.802	0.375	0.908*	0.702	0.583
11	0.523	0.578	0.621	0.479	0.406	0.428	0.506
12	0.347	0.566	0.745	0.368	0.720	0.573	0.553
13	0.391	0.439	0.505	0.144	0.529	0.602	0.435
14	0.308	0.381	0.419	0.178	0.208	0.201	0.282
15	0.319	0.560	0.986*	0.334	0.923*	0.758	0.647
16	0.252	0.207	0.566	0.186	0.561	0.593	0.394
17	1.040*	0.916*	0.677	0.463	1.048*	0.928*	0.845*
18	0.270	0.295	0.652	0.250	0.736	0.723	0.488
19	0.264	0.474	0.351	0.228	0.504	0.585	0.401
20	0.165	0.378	0.957*	0.450	1.050*	0.739	0.623
21	0.338	0.331	0.495	0.459	0.485	0.586	0.449
22	0.248	0.346	0.420	0.231	0.515	0.422	0.364
23	0.476	0.781	0.836*	0.372	0.532	0.392	0.565
24	0.330	0.417	0.362	0.534	0.436	0.373	0.409
25	0.505	0.438	0.758	0.442	0.646	0.432	0.537
26	1.008*	0.738	0.901*	1.142*	1.231*	0.389	0.902*
27	0.487	0.622	0.655	0.350	0.716	0.706	0.589
28	1.290*	0.634	1.184*	1.004*	1.173*	0.895*	1.030*
29	0.426	1.168*	0.739	1.013*	0.708	0.895*	0.825*
30	0.256	0.271	0.406	0.331	0.331	0.237	0.305
31	0.203	0.506	0.761	0.418	0.768	0.791	0.575
32	0.133	0.402	0.440	0.362	0.432	0.438	0.368
33	0.232	0.433	0.520	0.319	0.549	0.514	0.428
34	0.521	0.830*	1.029*	0.969*	1.044*	0.922*	0.886*
35	0.381	0.304	0.480	0.199	0.540	0.482	0.398
36	0.190	0.420	1.617*	0.375	1.555*	1.444*	0.933*
37	0.363	0.716	0.750	0.590	0.650	0.677	0.624
38	0.345	0.379	0.503	0.316	0.459	0.519	0.420
39	0.190	0.370	0.431	0.374	0.440	0.472	0.379

- Value  $\geq 0.8$ .

**Source:** Malaysian Input-Output Tables for 1983, 1987, 1991 and 2000.

**Sector Name:** As shown in Table 2.

Table 3. Classification of Columns by Frequency Distribution of PTj.

Range of Pj	83-87	83-91	83-2000	87-91	87-2000	91-2000
0.000-0.499	30	21	10	30	10	14
0.500-0.799	4	13	18	4	18	16
0.800-0.999	0	3	6	1	3	5
1.000 and above	5	2	5	4	8	4
Total	39	39	39	39	39	39

**Source:** Table 2.

Table 4. Comparison of Production Structure by Intermediate Use Measure, 1983-2000.

Sector	Tables					
	1983-1987	1983-1991	1983-2000	1987-1991	1987-2000	1991-2000
1	0.956*	1.167*	1.504	1.169*	1.463	1.356
2	0.883*	1.345	3.579	1.529	4.187	2.813
3	1.085*	1.117*	1.189*	1.029*	1.096*	1.068*
4	1.019*	1.040*	1.525	1.009*	1.430	1.326
5	0.770	0.692	0.534	0.893*	0.689	0.763
6	1.394	1.486	1.189*	1.088*	0.940*	0.884*
7	0.778	1.035*	1.403	1.191*	1.738	1.705
8	1.042*	1.085*	0.806*	1.069*	0.812*	0.774
9	0.988*	0.989*	0.839*	1.001*	0.849*	0.854*
10	1.003*	0.884*	0.915*	0.880*	0.907*	1.026*
11	0.704	0.825*	1.132*	0.994*	1.173*	1.211
12	1.216	1.631	1.500	1.323	1.206	0.875*
13	1.152*	2.134	1.934	1.336	0.725	0.560
14	0.917*	1.780	2.184	1.948	2.150	1.188*
15	0.961*	1.251	0.751	1.371	0.904*	0.461
16	1.027*	0.902*	1.116*	0.893*	1.125*	1.216
17	1.022*	1.256	0.907*	1.176*	0.810*	0.736
18	1.410	1.400	0.974*	0.980*	0.632	0.650
19	2.357	1.800	0.957*	0.809*	0.427	0.575
20	0.902*	1.008*	0.865*	1.182*	0.914*	0.747
21	0.835*	0.900*	1.776	1.022*	1.811	1.655
22	0.813*	0.836*	0.726	1.041*	0.898*	0.872*
23	0.869*	0.883*	0.964*	0.991*	0.958*	1.070*
24	1.265	0.486	0.646	0.353	0.435	1.333
25	1.196*	0.702	0.675	0.598	0.583	1.106*
26	0.538	0.265	0.400	0.343	0.568	1.506
27	1.272	0.535	0.530	0.407	0.392	0.875*
28	1.011*	1.279	1.037*	1.249	0.966*	0.729
29	1.043*	0.804*	0.844*	0.779	0.837*	0.983*
30	1.126*	1.067*	1.839	0.962*	1.614	1.776
31	0.980*	0.856*	1.037*	0.914*	1.029*	1.197*
32	0.975*	1.166*	0.917*	1.189*	0.923*	0.808*
33	1.093*	1.114*	1.308	1.034*	1.244	1.169*
34	0.772	0.787	0.680	1.008*	0.836*	0.962*
35	1.013*	1.059*	1.607	1.035*	1.633	1.608
36	0.825*	0.693	0.835*	0.828*	1.009*	1.157*
37	0.511	0.249	0.750	0.499	1.928	3.689
38	0.608	0.730	1.367	1.144*	2.125	1.951
39	1.062*	1.055*	1.356	0.976*	1.242	1.255
R(0.8-1.2)*	26	20	17	27	18	16

\* Value in critical range (0.8-1.2)

**Source:** Malaysian Input-Output Tables for 1983, 1987, 1991 and 2000 **Sector Name:** As shown in Table 1.

Table 5. Overall Comparison.

Input-Output Table	1983	1987	1991	2000
1983	–	1.002	0.980	1.040
1987	1.006	–	0.969	0.999
1991	1.026	1.026	–	1.095
2000	0.981	0.984	0.958	–

**Source:** Malaysian Input-Output Tables for 1983, 1987, 1991 and 2000.

Table 6. Overall Comparison with Mixed Combinations.

Input-Output Table	1983	1987	1991	2000
1983	0	0.160	0.977	1.029
1987		0	0.972	1.007
1991			0	1.069
2000				0

**Source:** Malaysian Input-Output Tables for 1983, 1987, 1991 and 2000.



## On the Channels of Foreign Direct Investment to Exchange Rate Pass-Through Strategies: An Analysis from Spatial Panel Data

Piriya Pholphirul

The Graduate School of Development Economics

National Institute of Development Administration (NIDA)

Serithai Road, Klong-Chan, Bangkok, Thailand, 10240

Tel: 66-2-727-3636 E-mail: [piriya.p@nida.ac.th](mailto:piriya.p@nida.ac.th)

### Abstract

Exchange Rate Pass-Through and Pricing-to-Market behavior is an important consideration in International Economics and Industrial Organization Theory. The goal of this paper is to provide both theoretically and empirically justified definition of Foreign Direct Investment (FDI) effect on extent of exchange rate pass-through. In the theoretical part, the Cournot fashion of international duopoly market is constructed to explain reaction functions between a local firm in a host country and a foreign multinational. Preliminary results of theoretical framework indicate that FDI will have an affect on the lowering degree of exchange rate pass-through and generates higher degree of Pricing-to-Market behavior. We estimate the model of exporters with multi-destination by observing samples of five U.S. exporting industries based on 4-digit SIC index. We approach the ideas of spatial econometrics with belief that disturbance terms are possible to spatially correlate across countries, based on geographic proximity measurement. The estimated results show that all types of foreign direct investments have an affect on the lowering degree of pass-through while *Joint Venture* generates the most significant prediction and *Division* generates the least. The effect of having the first foreign operation in local markets is not significant to the degree of pass-through.

**Keywords:** Exchange Rate Pass-Through, Multinational Corporation, Spatial Correlation

### 1. Introduction

Following the collapse of the Bretton Woods exchange rate system in the 1973, there has been a considerable increase in empirical researches on the relationship between exchange rates and goods prices. Two of the most striking studies are “Exchange Rate Pass-Through” which refers to the response of import prices to exchange rates and “Pricing-to-Market” which refers to price discrimination across export markets induced by the exchange rate volatility. Initially, the model of balance of payments assumed a one-for-one response of import/export prices to exchange rate as “full” or “complete” exchange rate pass-through. However, several studies suggest that exchange rate pass-through is less than complete where the prices of foreign products sold in the domestic market change by a lower percent than do exchange rates<sup>1</sup>. As a result, customers in that country do not interpret exchange rates change as relative price changes. Many studies of exchange rate pass-through are to explain the market competition status of traded goods. The rise of imperfect competition and strategic trade theory led researchers to estimate exchange rate pass-through at the industry level. Incomplete pass-through explains when markups of price over marginal cost change with exchange rate changes and performs as nonzero markups. Because the nonzero markup is a deviation against the perfect competition condition, incomplete exchange rate pass-through validates the shift towards models of imperfect competition. Firms in imperfect competitive market initially have market power and can markup their prices over the marginal cost in order to earn nonzero economic profit<sup>2</sup>.

Even though exchange rate pass-through behavior exists when a firm engages in export/import activities and can control their traded good prices in the international market, international trade is however not the only method to capture international markets. Exporting firms can behave in other ways by investing abroad through *Foreign Direct Investment* (FDI). Foreign direct investment involves the activities that multinational corporations have such as operations abroad in terms, for example, of mergers, acquisitions, or establishing new foreign branches or affiliations. In regards to the U.S. data from the Bureau of Economic Analysis (BEA) in 1998, 68% of U.S. international trades are made within and by the multinational firms and their affiliates, which provides the evidence that foreign direct investment and degree of multinationals should have an effect on export firms’ pricing strategies. These motivations build up the ideas to extend more on the scope of allowing capital to become mobile across countries in real sector and how that would affect on firms’ Pricing-to-Market behavior and degree of exchange rate pass-through.

Market demand and cost of production are treated as exogenous parameters that influence not only pricing behavior, but also some changes in market structure such as the entry decision to foreign markets or acquisition of foreign

subsidiaries. In search of a larger market of multinational firms, a manufacturer begins to access to foreign markets with difference reasons such as lower cost of production, different consumer preference in goods, different in rate of return on investment or higher transaction cost on export. Eventually, the exporting firm establishes distribution and production networks by setting up a brand new firm or by acquisition of local firms. Foreign Direct Investment then tends to be an important topic in explaining the multinational firms' strategies. Moreover, a firm that invests abroad gains market and input advantage from investment abroad. The role of new-entry firm whether in term of mergers, acquisition, or integration of firms should affect changes in the market such as prices, market demand, strategies of local firms, etc. International mergers and acquisitions seem to be an old story in the field of finance where multinational conglomerate merger/acquisition happens when multinational firms make many direct investments by purchasing the stock of foreign firms in related or other industries. This then makes the analytical setting international from the financial viewpoint of a financial theory.

Based on previous literatures, it is evident that no research has been done to explain the direct aspects of foreign direct investment and extent of pass-through. Nevertheless, there are likely to be some previous researches explaining the similarity and applicability of works that can be the guilds of explaining this relationship between international investment and degree of pass-through of exchange rates on prices. Gron and Swenson (1996) show that the incomplete exchange rate pass-through exists when firms are able to shift their production across countries or alter their location of acquiring input. Multinational firms can acquire input either from host countries or from domestic countries, which enhances ability of multinational firms to produce in multiple locations and gives more flexibility to adjust to changes in input price, resulting in a smaller pass-through of exchange rates on prices. This can imply the effect of foreign direct investment for local production on pass-through elasticity. Rangan and Lawrence (1993) use the export price index issued from the Bureau of Labor Statistics (BLS) showing that the real U.S. export prices do not change much if there is high share and high level of intra-firm export between parent companies and their foreign affiliations. Another recent research paper from Yoshida (2001) simply estimates that firms set their own *distribution agent* affect on reducing pass-through effect of yen on Japanese export prices. The results from these three articles seem to support my future research that outward foreign direct investment and capital outflow are likely to decrease the degree of exchange rate pass-through, which increases the degree of markup in local-currency pricing strategies that multinational firms should have. However, two papers from Desiraju and Shrikhande (1996) and Yoshida (1999) may contradict this result. Desiraju and Shrikhande (1996) study the effects of the international distribution channel (e.g., a dealer, an import jobber, or a retailer) in the foreign market on exchange rate pass-through. The magnitude of the pass-through depends on the presence of an incentive problem in the distribution channel. When there is no incentive problem, pass-through is complete; however, when there is an incentive problem, pass-through depends on various characteristics of intermediary and the market setting. Yoshida (1999) extends works of Desiraju and Shrikhande by examining an explicit incorporation of local distributors in an analysis of pricing behavior of exporting firms. He shows that the degree of exchange rate pass-through becomes more complete if there is vertical integration between parent export firm and local distributor firms in the local market. Section II contains the empirical studies of estimating degree of exchange rate pass-through (with foreign direct investment being independent) by considering the spatial correlation effect in Panel Data study. Section III interprets the estimated results and intuitive explanation. Section IV discusses the policy debates based on results found from in this paper.

## II. The Empirical Specification

The incentive of this framework refers to a simple model of price discrimination by an exporter selling to several export destinations (Knetter, 1989, 1992). This generates the price-cost markup function, which caused change from three components: (i) changes in marginal cost in production of goods, (ii) changes in the markup of price over marginal cost (price elasticity), and (iii) changes in exchange rates.

$$P_{it} = e_{it} MC_i \left( \frac{\varepsilon_{it}}{\varepsilon_{it} - 1} \right)$$

The Panel Data estimation of price-cost markup is formalized as follows:

$$p_{it} = \beta_1 e_{it} + \beta_2 e_{it} FDI_{it} + \gamma_1 (gdp_i) + \gamma_2 (PPI) + \gamma_3 (p_{i,t-1}) + \gamma_4 D\_YEAR + \alpha_i + \varepsilon_{it}$$

Where,  $\alpha_i$  is a country effect, and  $\varepsilon_{it}$  is a regression disturbance with  $IID \sim N(0, \sigma_\varepsilon^2)$ . The null hypothesis requires that price charged equals the marginal cost, and export prices are equal across destination nations. Therefore, in the null hypothesis, prices should vary in the correlated data such as country effect, exchange rate, or foreign direct investment variables and other control variables. Constant elasticity implies that exporters will change their prices to each destination country with a fixed markup over marginal cost. Marginal cost is common across destination regardless of consideration in other delivery charge or freight and transportation cost, but varies over time. Therefore, the time dummy  $D\_TIME$  variable reflects the time effect to capture changes of marginal cost over timing<sup>3</sup>. The individual effect or country effect ( $\alpha_i$ ) measures the specific markups to the various destination markets. Within the alternative

hypothesis, the estimated coefficient ( $\alpha$ ,  $\beta_1$ , and  $\beta_2$ ) may not be zero which implies degree of exchange rate pass-through with different circumstance of direct investment. The statistical interpretation of  $\beta$ 's is straightforward. A value of zero implies that the markup to a particular destination is unresponsive to fluctuations in the value of the exporters' currency against the buyer's. Changes in currency values will fully pass-through to buyers in terms of local currency pricing. Thus, completed exchange rate pass-through happens when  $\beta = 0$ . Negative value of  $\beta$  implies that, for example  $\beta_1 = -0.8$ , in response to a 10-percent appreciation (depreciation) of his currency, the exporter would reduce (increase) his markup by 8 percent and pass-through the remaining 2 percent price reduction (increase) to the buyer. Thus,  $(1+\beta_1)$  measures for degree of exchange rate pass-through. Positive value of  $\beta$  estimation correspond to the case in which destination-specific changes in markups amplify the effect of destination-specific exchange rate changes on the price in units of the buyer's currency. This is called "perverse exchange rate pass-through", which commonly happens if the change of export country's currency is in the opposite direction and is relatively small compared to that change of the import countries' currencies. The result is that pass-through can be greater than one if the exchange rate of the exporting country moves in the same direction of exchange rates in importing countries, so that the normal exchange rate pass-through is magnified by the rival's currencies. Therefore, including the *FDI* variables, the estimated coefficients to degree of exchange rate pass-through will be  $1+\beta_1+\beta_2$ .

The estimated coefficients of control variables and the year dummy  $D\_YEAR$ ,  $\gamma_s$ , measure effects to export unit prices that would occur from other shocks. Three control variables are included to account for both individual shock and time shock. The estimated coefficient on the log of real GDP (*gdp*) to unit value of export pricing can be either positive or negative depending on the degree of income elasticity in the local market. If income elasticity is high, consumers in domestic market tend to consume more than an additional increase in their income level. Hence, foreign multinationals tend to increase price to capture higher profit. With lower income elasticity, consumers in domestic countries partially adjust their consumption within full amount change of their income. In this case, firms tend to lower prices to protect against their profit loss that may occur. The estimation of second control variable, Producer Price Index (PPI), should be positive in that the firm increases price as they observe the incremental shock of production cost or market price. With the incremental shock of production cost, firms transfer burden to their customers by reflecting the increase of price. The last control variable, lagged period of export price ( $p_{i,t-1}$ ), allows for the possibility of a partial adjustment of export prices to exchange rates. As from the earlier discussion, the short-run relationship of exchange rate pass-through, without direct investment variables, is given by the estimated coefficient  $1+\beta_1$ . The long run pass-through is then given

by  $1 + \frac{\beta_1}{1-\gamma_3}$  and long-run pass-through with effects from foreign direct investment should be  $1 + \frac{\beta_1 + \beta_2}{1-\gamma_3}$

The price data used in this study are the export unit value from 1989-2000 calculated by the "DATAWEB" provided by the U.S. International Trade Commission (<http://www.usitc.gov>) on the quantities and values based on four-digit 1987 Standard Industry Classification (SIC) export of manufacturing products. The unit values (in term of US\$) are obtained by dividing the value of Free-Alongside Ship (*FAS*) export by the quantity of export from the U.S. to each destination country. Even though the Bureau of Labor Statistics (BLS) in the Department of Commerce publishes disaggregated export price indices, the reported price data are not classified or broken down by destination or source but rather are average figures for all destination market or source countries of exporting<sup>4</sup>. The GDP variables are collected from the World Development Report issued by World Bank and the *PPI* variables are collected from the Bureau of Labor Statistics (<http://www.bls.gov>) segregated by industry samples. In regards to the Year Dummy variable, the twelve year-dummy variables ( $D\_YEAR$ ) are generated equal to one in which that year is present and equal to zero otherwise. Therefore, variables  $D1989$ ,  $D1990$ ,  $D1991$ , .....,  $D2000$  represent time-effect but  $D1989$  is excluded from the estimation to avoid "Dummy Variable Trap". Lastly, the annual exchange rate variables ( $e$ ) are the nominal exchange rates adjusted by the *Consumer Price Indices (CPI)* of destination countries to control for the movement of cost. The annual average exchange rate and consumer price data are obtained from the International Financial Statistics (IFS) provided by the International Monetary Fund.

This foreign direct investment data is a common variable denoted as *FDI* measuring the number of U.S. foreign affiliates, subsidiaries, or other foreign operations of U.S. multinational firms located in multi-destination countries. Multinational firms, which also play a role as exporters establish their own subsidiary and/or affiliation, joint venture with other firms, or establish their internal branches or division abroad. The effect that exchange rate pass-through should matter whether exporters establish their subsidiary, affiliation, or division, should also be considered<sup>5</sup>. *FDI* variables are classified into four channels based on the "Directory of Corporate Affiliations". Directory of Corporate Affiliates issued from "Who Owns Whom" lists a number of U.S. and foreign firms that have operation both in domestic and international countries as the following terms:

- *Subsidiary*: A chartered business operating abroad and owned by the U.S. parent company at 50% or more
- *Affiliation*: A chartered business operating abroad and owned by the U.S. parent company at less than 50%



- *Joint Venture*: A business operating abroad in which the U.S. parent firm shares responsibility and ownership with one or more companies
- *Division/ Branch*: An internal unit of a U.S. parent company operating abroad, and is not incorporated

We generate dummy variables *SUBSIDIARY1*, *AFFILIATE1*, *J\_VENTURE1*, and *DIVISION1* as equal to one if international operations exist during the sample period 1989-2000. However, these variables might be overstated if the first operations are established at the end of the sample period. Therefore, we add four more dummy variables, *SUBSIDIARY2*, *AFFILIATE2*, *J\_VENTURE2*, and *DIVISION2*, taking a value of one for years in which the first operation is present. Nevertheless, these dummy variables do not cover and assess the number of subsidiaries/affiliates. The estimated coefficients may understate the effect of foreign operation of parent firms for a country with more than one subsidiary/affiliate. This case should happen if there is a large geographic area in destination countries, such as China, India, etc., where one subsidiary cannot cover the entire market. Finally, *SUBSIDIARY3*, *AFFILIATE3*, *J\_VENTURE3*, and *DIVISION3* account for the number of subsidiaries, affiliates, joint ventures, and divisions accordingly in each destination country.

We extend works of Knetter (1989, 1992) in which the estimation of a panel data model might cause problems where disturbances will be autocorrelated across the cross-sectional units. Because cross-sectional unit in this paper are worldwide countries, the issue of spatial econometrics is adapted here in the context of exchange rate pass-through and pricing-to-market. We call the disturbances as *spatial correlated*, based on some geographic or economic proximity measure. In order to account this spatial effect to international pricing strategies, we would like to answer the question that whether or not there is a pure “border” effect in international price discrimination. In the other words, is price discrimination across markets greater than discrimination within them after controlling for the border or distance effect?<sup>6</sup> In practice of regional science, there are attempts to address issues of this problem. This can be, for example, that a shock in one country ( $\varepsilon_{it}$ ) will be associated with shock of other countries ( $\varepsilon_{jt}$ ) in a certain period. This spatial shock causes inconsistent and bias estimators by using standard estimation of fixed effect panel data. To capture this problem, we, firstly, should test whether there is any spatial correlation existing in the data by using the standard testing of spatial econometric theory. Secondly, if data are found to have spatial correlation problems, we can transform and re-estimate models by using different methodologies. Due to small series of time ( $T = 12$ ), we adopt works based on Druska and Horrace (2004). See details in Appendix section.

### III. Results

The following five sample industries based on 4-digit SIC which contains the largest share of U.S. export volume during 1989-2000 are observed:

- Electronic Computer (SIC-3571)
- Telephone and Telegraph Apparatus (SIC-3661)
- Semiconductors and Related Devices (SIC-3674)
- Motor Vehicle Part and Accessories (SIC-3711)
- Aircraft (SIC-3721)

*Moran's I Statistics* and *spatial autocorrelation coefficients*  $\lambda_i$  shows that spatial autocorrelation in error component exists in three out of five sample industries (Electronic Computer (SIC-3571), Telephone and Telegraph Apparatus (SIC-3661), and Motor Vehicle Parts and Accessories (SIC-3711), which we adapt from works of Druska and Horrace (2004) (See Appendix). In addition, we apply the common fixed-effect panel data based on Knetter (1989, 1992) for the remaining two industries: Semiconductor and Related Devices (SIC-3674) and Aircraft (SIC-3721), which are not spatially correlated. Table 1 to Table 5 presents estimated results

The first column (I) for each table shows the degree of exchange rate pass-through without including Foreign Direct Investment variables. The pass-through coefficient is one plus the value of  $\beta$  coefficient when sign of  $\beta$  can be interpreted as discussed earlier. For example, the estimated coefficients of Column (I) are  $\beta = -0.008$  for the Electronic Computer industry,  $\beta = -0.006$  for Semiconductors and Related Devices,  $\beta = -0.014$  for Motor Vehicle Parts and Accessories, and  $\beta = -0.083$  for the Aircraft industry. It is straightforward to interpret that, by 10% appreciation of the US dollar or 10% depreciation of local currency, export prices in US dollar decreases by 0.08%, 0.04%, 0.14% and 0.83% respectively, while the import prices in unit of local currency increases by 9.92%, 9.96%, 9.86%, and 9.17% respectively. Therefore, exchange rate pass-through for these four industries (Electronic Computer, Semiconductors and Related Devices, Motor Vehicle Parts and Accessories, and Aircraft) are “incomplete” for the U.S. multinational firms. The traded local-currency pricing of export good in local market only changes partially with full amount of exchange rates change. However, the estimated coefficients do not seem to supply large amounts of partial pass-through. In addition, the results show that degree of exchange rate pass-through is insignificant for the Telephone and Telegraph Apparatus.

The breakdown of U.S. outward direct investment: *Subsidiaries, Affiliations, Joint Venture, and Division*, to degree exchange rate pass-through are shown in column (II) to column (VIII). Column (II) to column (V) illustrates the regressions for each variable series of *SUBSIDIARY, AFFILIATION, J\_VENTURE, AND DIVISION*, respectively. Column (VI) shows the effect of having foreign operation (*SUBSIDIARY1, AFFILIATION1, J\_VENTURE1, and DIVISION1*) in the sample year, 1989-2000, while column (VII) provides the explanation of having first foreign operation (or the first year of establishing foreign operation), which are *SUBSIDIARY2, AFFILIATION2, J\_VENTURE2, and DIVISION2*. The last column (VIII) illustrates a number of foreign operations to degree of pass-through (*SUBSIDIARY3, AFFILIATION3, J\_VENTURE3, and DIVISION3*). The estimated coefficients of time-dummy variable (D1990, D1991, ..., D2000) are not presented in the tables.

Considering foreign direct investment in term of “Subsidiary” (*SUBSIDIARY1*), we find that having subsidiary in the sample reduces degree of exchange rate pass-through in the Electronic Computer industry and the Aircraft industry. Another form of “subsidiary” (*SUBSIDIARY2*), which represents the first year effect of having U.S. subsidiaries established in the local market also shows the result of reducing degree of pass-through in only one out of five sample industries: Semiconductor and Related Devices. Having an additional number of subsidiaries (*SUBSIDIARY3*) slightly increases the degree of pass-through in the Aircraft industry but reduces the degree in the Semiconductor and Related Device industry. Therefore, establishing a number of subsidiaries in the local market is somehow ambiguous to explain whether it should increase or decrease its markup level. Foreign direct investment in terms of Affiliation and Joint Venture are found to have an effect on the degree of exchange rate pass-through by, firstly, having the U.S. Affiliation aboard (*AFFILIATION1*) reduce the degree of exchange rate pass-through in the Electronic Computer and Telephone and Telegraph industry. A number of U.S. foreign affiliations also support this effect by lowering its degree in the Telephone industry as well. Foreign direct investment in terms of international Joint Venture (*J\_VENTURE1*) shows the strongest effect on reducing degree of pass-through in all five-sample industries, while a number of joint venture projects also have significant effects on lowering the pass-through in the Electronic Computer, Telephone and Telegraph Apparatus, and Aircraft industries.

The results of estimation shows that U.S. foreign direct investment outflows in terms of U.S. foreign subsidiaries, U.S. foreign affiliations, and, especially U.S. Joint Venture with other firms in the local market having effects on reducing degree of exchange rate pass-through. Multinational firms that invest abroad can also enhance their market power so that they have abilities to have some markups or maintain the traded goods prices in the local market. In addition, some companies with global operations can shift supply locations from one country to another to overcome effects of exchange rate fluctuation. That is, increasing the number of supplier locations internationally makes the firm less vulnerable to currency changes in the export market because they can readily relocate their sourcing to a currency that is more favorable. Obviously, factors of production other than cost may permit U.S. firms exporting to the foreign markets to reduce the impact of exchange rate fluctuations, thereby reducing the extent of exchange rate pass-through (Clark, Kotabe, & Rajaratnam, 1999). Direct investment in terms of *Division* contributes the least effect in explaining the degree of exchange rate pass-through. Having U.S. foreign division in the sample year (*DIVISION1*) increases the degree of pass-through in the Aircraft industry but a number of foreign divisions show evidence in the decrease of the pass-through degree in the Semiconductors and Related Devices and the Aircraft industry. Therefore, division is the only type of foreign direct investment that generates both plus and minus sign estimation.

We can explain intuitively that division is the internal unit of firm, and is not incorporated. Therefore, it does not have any roles on production of goods, but it rather performs in terms of services such as sales office, lab institutes, research and development, and the repair and maintenance section. Since the multinational level of firms is determined by the extent of foreign production, foreign division/branch such as distribution office, research and development, etc does not exist in production of host country but in service-enhancement, which somewhat may have an affect on the increment of marginal cost. However, increase of cost from establishing international branch/division is not included into the production cost but into other kinds of cost, such as cost for research and development or other kinds of service transaction in a firm’s accounting statement. The increment of this kind of non-production cost should have an affect on reducing the price-cost margin, which explains the increase in the degree of exchange rate pass-through or lower degree of pricing-to-market. Secondly, international transaction between headquarter of multinational firms and their internal unit of branch/division is usually done by a single unit currency. Since the international branch/division is not incorporated, its earnings or expenditures have to be transferred back and forth to the headquarter. Using one unit currency (usually in the source-country’s currency) reduces the loss that may happen from exchange rate volatility or transaction cost of currency exchange. It is likely that there are fewer exchanges of currencies for international transaction between multinational and its foreign affiliates, and the direct investment in term of international branch and division does not have much affect to the degree of exchange rate pass-through. Thirdly, even if there is currency exchange between the headquarter and its international branch offices, the headquarter will not reduce the price-cost margin if it sells goods through its foreign branches/division. Since the foreign branch is not incorporated and is still in the same unit of multinational firms, increase in the transfer of pricing among internal sectors does not generate extra

profit for the whole organization. The headquarter then does not increase the price-cost margin that it changes charging to its foreign division. We can assume that branch/division performs as the sales office or distributor in this case so the headquarter may give decision power to the foreign branch itself to charge prices in domestic markets and transfer that abnormal earning back to the headquarter. Beyond research studies, people may believe that having branch/division abroad may increase performance which then leads to capture brand-loyalty and reliability from customers. These effect cause change in the demand condition that multinational firms should face in their foreign markets. This demand condition may enhance the monopolistic competition of multinational firms to be able to increase their price-cost margin, which leads to a lower degree of pass-through. However, there have been no researches done that try to explain these arguments.

Besides specifying types of foreign direct investment, the estimated results also show that foreign operations established in the first year, denoted as *SUBSIDIARY2*, *AFFILIATION2*, *J\_VENTURE2*, AND *DIVISION2*, are not significant to the degree of pass-through. We can intuitively explain it as a due to lag of demand and supply adjustment. First period of establishing foreign direct investment does not immediately have an affect on demand condition in local markets but takes a longer period for the demand adjustment. This kind of adjustment may also include the switching behavior on domestic consumers. Lag of supply is from the duration period that multinational firms spend on setting machines or penetrating international markets. Pholpirul (2006) explain the reasons why channels foreign direct investment reduces degree of exchange rate pass-through that can be analyzed as follows:

1) Performance Orientation.

Direct investment can enhance firm's market performance. That performance can be increased because of specific knowledge or managerial skills that usually come with direct investment. A performance orientation relates to how the firm defines and measures market success. Firms sometimes aim to having different performance goals. In the marketing literature, discussion of performance orientation usually deals with market based rather than finance-based measures. Such differences in performance orientation will affect the extent of exchange rate pass-through. As direct investment enhances a firms' performance and earns market share in the host market, firms pricing to maximize export market share will seek to lower export market prices and hesitate to raise them, even when exchange rates are volatile. Therefore, when the exporting countries currency appreciates, market share-oriented multinational corporations tend to pass-through less of the cost increase in the export market. However, firms pricing to maximize a financial performance measure would more likely focus on expanding margins whenever possible. Then the degree of pass-through of financial-targeting firms will be more than that of the market-share targeting firms.

2) Sourcing and Location Strategy.

Direct investment abroad also reduces cost from the sourcing strategy. For example, during the mid-1980s when the U.S. dollar depreciated sharply, U.S. firms found it increasingly difficult to use foreign supplies because they have to pay higher in U.S. dollar term. However, firms that engage in direct investment or international production usually can switch suppliers from different places. Moreover, multinational firms that invest abroad, often sign contracts with suppliers on a long-term basis with fixed input prices. Therefore, costs of production of firms would not be tremendously affected from exchange rates volatility. Firms with global operations can shift supply locations from one country to another to overcome the effects of adverse exchange rate fluctuations. That is, firms can readily relocate their sourcing locations of more favorable currency if the number of international supplier location increases. This is then obvious that direct foreign investment by production in different countries reduces degree of exchange rate pass-through. In conclusion, firms using international suppliers on a long-term contract tend to pass-through less of the exchange rate fluctuation than those relying on short purchases of supplies. Moreover, firms with many alternative sources of supplies tend to pass-through less of the exchange rate fluctuations than those with few suppliers

3) Distribution System.

Multinational enterprises that focus on foreign direct investment can establish their own distributors rather than hire local distributors. Three factors to consider in the roles of distribution systems are *Intensity of distribution*, *Channel length*, and *Integration of distribution*. Distribution intensity is important for example; a firm is unable to the respond to the increase in demand if a firm has low distribution intensity or maybe only a single importer/distributor responsible for setting contracts with retailers. This situation is called "bottleneck effect". If exchange rate change is temporary, using alternative direct investment to expand distribution will not likely be feasible, because of the time limit. However, for more permanent exchange rate changes, direct investment by foreign corporation to expand distribution intensity may reduce bottleneck effect, which leads to the fall in price proportionately, leading to increased market share. Therefore, in a currency appreciation of the exporting country, the degree of exchange rate pass-through is positively related to the firm's intensity of distribution in the export market. This result is similar to the result from Yoshida (2001).

For the channel length and integration of distribution, the relationship between channel length and exchange rate pass-through also implies the positive relationship in that increase in channel length implies an increase in degree of

pass-through. One explanation, for example, is that the channel distribution is vertical. Sellers and buyers and independent actors will act to optimize their own position. That is, they will pass-through and/or absorb changes as it suits them. However, channel integration can be measured in terms of the degree to which firms own their channel intermediary. Foreign direct investment then obviously increases degree of channel integration. Degree of exchange rate pass-through reduces in high degree of channel integration because firms do not have to optimize their own position. Therefore, the degree of pass-through will be positively related to channels length but negatively related to degree of channel integration. (Clark, Korabe, & Rajaratnam, 1999). Therefore, the effect of direct investment on exchange rate pass-through through the investment on distribution channel is still unclear depending on degree of channel intensity, channel length, and/or channel integration.

#### 4) Brand Loyalty.

Brand loyalty is a big issue in explaining the link between direct investment and degree of pass-through. Brand loyalty not only represents the firm's reputation but also reflects the customer's memory-based knowledge of the brand. Direct investment is not the only source to build brand equity or brand royalty, but it is also depends on marketing strategies such as advertisements, promotions, or worldwide recognition. Strong brand royalty implies high customer awareness, and generally assumes strong promotional support. Therefore, brand loyalty provides benefits on competitive advantage and ability of increase markup of price over production cost. It also decreases the propensity that consumers will switch brands, thereby decreasing price elasticity. Thus, it is clear that brand equity is a significant factor in the exchange rate pass-through phenomena. Therefore, foreign direct investment that can enhance its brand loyalty in domestic markets will reduce the degree of exchange rate pass-through.

### IV. Policy Debates

Understanding the determinants of foreign direct investment and pricing behavior is an important contribution to the policy debates. The policy liberalization alters many parameters of international location of multinational corporations. The liberalization of direct investment regimes strengthens international production by allowing firms greater freedom in making international location decisions and in choosing the mode to serve each market. All enterprises in the market have to raise technical efficiency and have to be more responsive to market forces to stay in business, not only in tradable activities but also in services and infrastructure. The multinational corporations have to restructure their activities and deploy their assets to compete with local firms. However, the objectives of multinational corporations differ from those of host governments: governments seek to spur national development, while multinational firms seek to enhance their own competitiveness in an international context, increase market share and market power, and maximize their long-run profit. In the other context, rapid innovation and deployment of technology, in line of logistic and market demands, are more important and are a dominant factor in enhancing market power over other existing local firms.

Moreover, the results show that in both the theoretical and empirical part, foreign direct investment is affected by the lowering degree of exchange rate pass-through where lower degree of pass-through means increasing market power of the multinational firms. Therefore, the policies debates that government in the host countries should be concerned are the debates over "competitiveness". The competitiveness debate has two perspectives, which are strongly interrelated. First, there is concern over the "competitiveness of multinational enterprises" on an international basis and second, there is concern over the "competitiveness of market and location". Competitiveness of multinational enterprises considers whether firms maintain price over changes of other factors such as exchange rate, production cost, shock in market demand, etc. Since a firm has the ability to charge differently and maintain higher price over its cost for each country is considered as its own market power. Pricing-to-Market ability, competitiveness of location and market is concerned when multinationals gain market power over price once they invest in the local market<sup>7</sup>. Market power generates market inefficiency and market distortion in which customers and producers in the local market would suffer. Thus, policymakers in host countries should study more in these possible aspects. Nevertheless, most developing countries still support foreign direct investment inflow by giving particular tax and other fiscal incentives to attract multinational enterprises. More broadly, and perhaps with greater economic implications, attracting foreign capital through low wage and flexible working condition has also become part of many countries' economic policy, and is articulated as a concern over competitiveness explained above. In regards to the "competitiveness", the effects of direct investment and degree of exchange rate pass-through found in empirical results show that direct foreign investment could either reduce or somewhat amplify degree of exchange rate pass-through. These results can be analyzed as that the foreign direct investment may improve market efficiency or distort market efficiency by increasing anti-competitive effects. With higher degree of exchange rate pass-through in the effect of investment inflows, the multinational corporations may improve market and industrial efficiency and resource allocation in their host countries by entering into industries where high entry barriers reduce the degree of domestic competition. The entry of multinational firms into these monopolistic industries is likely to raise the level of competition and force existing local firms to become more efficient. However, foreign entry may cause a fall in the number of firms in the industries if the least efficient

local companies are forced out of business. This result can be against our fear that foreign multinational corporations may out compete and generate monopoly power over local firms that are even worse than the existence of domestic oligopolies in host countries. This competitive promotion effect may also be against if there is risk in that those foreign multinational firms with market power may also repatriate profits and avoid taxation through transfer pricing. The generality of competition motivates an examination of study in foreign direct investment and industry structure in host countries. One problem to consider is whether multinational corporation entry explains industry structure or whether industry structure determines if multinational firms will enter or not. In regards to the studies of developing countries, most authors have not been able to or have not even tried to determine whether the high degrees of concentration in the industries where foreign affiliates are present have been caused by multinational corporations or whether multinational corporations have just been attracted to these industries by profit earning opportunities (Blomström & Kokko, 1996)

Therefore, in this case where foreign direct investment increases market competitiveness, it can be discussed that competition improves market efficiency and welfare, but there are cases where it might not necessarily be that way. First, economies of scale are important determinants of industrial productivity, as foreign entry increases concentration in relatively small national industries. Resource allocation and efficiency may well improve from the increase in average firm size. Whether this effect is stronger than that of the reduced competition depends on market characteristics and trade policy. For example, a fall in the number of firms from fifty to forty should not necessarily reduce the competitive environment, but a reduction from three to two producers certainly would. Similarly, increased concentration is likely to have more harmful effects in protected industries or infant industries than the import-competing or export-oriented industries. The government policies on foreign direct investment need to counter two sets of market failures. The first arises from information or coordination failures in the investment process. This failure can lead a country to attract insufficient investment or wrong quality of investment. The second is when private interests of investors diverge from the economic interests of host countries. This causes foreign direct investment to have negative effects on development or may lead to static benefits that are not sustainable over time. This also considers infant industries in which the development of local enterprises can be jeopardized when inward direct investment crowds out those enterprises. The last should be concerned with weak bargaining and regulatory capabilities on the part of host country governments, which can result in an unequal distribution of benefits or abuse of market power by multinational firms (Oman, 2000). One of the best policy debates among policymakers in host countries is to promote “linkages” between foreign affiliations of multinational corporations and domestic firms, where the linkages can be classified into *Backward Linkages*, *Forward Linkages*, and *Horizontal Linkages*.<sup>8</sup>

Extent of exchange rate pass-through is also important for monetary policymakers to launch the monetary policy. It is obvious to say that the optimal monetary policy depends in a fundamental way on the type of price stickiness. Within the partial exchange rate pass-through status where prices are stickier and not responsive to exchange rates, monetary policymakers cannot rely on the exchange rate to provide the necessary adjustment to real shocks. To the extent that consumers do not interpret exchange rate changes as relative price changes in the short run, monetary policy can only achieve an inferior outcome in which it is unable to control the relative demand for domestic and foreign goods. The benefits of floating exchange rates are then diminished in the absence of strong expenditure-switching effects. A number of papers have analyzed monetary policy behavior in the presence of imperfect exchange rate pass-through. For example, Devereux and Engel (2000) examine that the implications of local currency pricing in the case of optimal monetary policy in response to real shocks is fully consistent with fixed exchange rates. Devereux, Engel, and Tille (1999) and Tille (2000) provide the studies to support these monetary policy debates within lower exchange rate pass-through and inward foreign direct investment. If foreign subsidiaries or affiliates’ shares are held by domestic firms or local people in higher proportion, those domestic shareholders can buy from foreign producers, which are multinational firms in this case, at prices set in the producer’s currencies, and sell to domestic consumers at prices set in the consumers’ currencies. Therefore, the role of subsidiaries as intermediaries is important to distinguish exchange rate pass-through to import prices from the pass-through to consumer prices. Higher share of domestic control in foreign, which is the U.S. in this case, subsidies/affiliates over imports, vary among countries and industries of imported goods. Implementing this central role of intermediaries to reduce problem of exchange rate pass-through to monetary policy should be subjected on ownership of domestic firms or local governments in foreign subsidiaries. Those intermediary agents would absorb some of the exchange rate fluctuations in their profit margins, as indicated by the larger degree of exchange rate pass-through to import prices than to consumer prices.

Exchange rate pass-through not only reflects the debates in policy development in competitiveness and in monetary policy, but is also important in international trade policy. One of the main questions to answer is whether devaluation of domestic currency would improve domestic country’s balance of trade and its welfare implication. Within the international trade literature, the arguments about whether devaluation will improve the trade balance can be heard to follow. It is argued that the flow of goods respond only with time lags to changes in the exchange rate. Firstly, the analysis of “J-Curve” is used to describe the movement over time of the trade balance within currency devaluation. It explains that, after the currency devaluates, trade balance may deteriorate at first and improvement may come later.

Secondly, to achieve the success of currency devaluation, the “Marshall-Lerner Condition” must hold. The analysis of Marshall-Lerner Condition indicates that the devaluation will improve the trade balance and provide a stable foreign exchange market if the elasticity of demand for domestic imports plus the elasticity of demand for domestic export exceeds one. Therefore, the limited degree of exchange rate pass-through in import goods, which means smaller elasticity of demand for domestic imports within exchange rate volatility, may explain why the Marshall-Lerner Condition may not hold in reality.

Our result also supports this argument in that foreign direct investment inflows market tend to substitute import demand in domestic market, which cause lower responsiveness of import demand. Lower degree of pass-through from the presence of foreign direct investment is likely to increase the possibility of not being able to hold the Marshall-Lerner Condition. This condition also explained in Tille (1999, 2000) in that a country can benefit from the depreciation of domestic currency, called *Beggar-thy-neighbor*, or is adversely affected, by what is known as *Beggar-thyself*, depends on the degree of substitutability between goods produced domestically or internationally. If the cross-country substitutability is high, domestic customers still pay higher price for import within currency devaluation, which causes the inability of the trade balance to improve. Our result causes trade policymakers to worry as to how to implement international trade policy. One of the solutions is to have the intermediaries owned by domestic people to allow consumer prices to be independent from imported prices. With this result, the degree of cross-country substitutability would decrease and it would encourage domestic customers to purchase more domestic products and less imported goods.

## Appendix

This section considers estimation of a panel data model with disturbance that is autocorrelated, based on some geographic measure. However, estimation of spatial panel data should be considered whether time dimension is small or large. If the time dimension is large, the panel data can be considered to estimate a seemingly unrelated regression model, or an error component model to permit for cross sectional correlation, and estimate the cross sectional correlations via the time dimension of the panel. This means that, if time dimension is large, feasible and efficient estimation is preceded. Unfortunately, the usual panel data case, as well as those in this paper, is when the cross sectional dimension is large and the time dimension is small (fixed), so this small dimension of time variables violates the consistent estimation of the cross sectional correlations. Specifically, we apply the Druska and Hoxby (2004) estimation procedure to the usual panel data case and introduce a generalization of their estimator based on certain restrictions on the spatial dependence over time. It is also important to stress that the panel data presented is for the case where  $T$  is small and fixed, consequently the current discussion also hinges on the ex ante specification of a spatial weight matrix. If the time dimensions are allowed to grow, the specification of the weight matrix becomes unnecessary. In our concern to show the spatial panel data of small  $T$ , as in this paper, 12 years during 1989-2000 and more than one hundred (of U.S.) worldwide exporting countries shows that consistent estimation of cross sectional correlations in the error process may not be justified.

Consider the fixed effect model,

$$y_{it} = \alpha_i + \beta'X_{it} + \varepsilon_{it}, i=1, \dots, N; t=1, \dots, T, \quad (A1)$$

where  $\beta$  is  $(k \times 1)$  and  $X_{it}$  is  $(1 \times k)$ .  $T$  is assumed to be fixed, so we cannot rely on  $T$ -asymptotic, then collecting  $i$  the model becomes

$$y_t = \alpha + \beta'X_t + \varepsilon_t, t=1, \dots, T, \quad (A2)$$

where  $\alpha' = [\alpha_1, \dots, \alpha_N]$  and  $X_t$  is  $[N \times k]$ . Suppose that the error term is spatially lagged so that

$$\varepsilon_t = \lambda_t W_t \varepsilon_t + u_t, t=1, \dots, T,$$

$$\varepsilon_t = (I_N - \lambda_t W_t)^{-1} u_t \quad (A3)$$

where element  $u_t$  is independently and identically distributed with zero-mean and finite variance  $\sigma^2_t$ .  $\lambda$  is the scalar, spatial autoregressive parameter, where  $|\lambda| < 1$ .  $W_t$  is a  $(N \times N)$  spatial weighting matrix, which captures the spatial autocorrelations across cross sectional units. All diagonal elements of  $W_t$  are zero and the matrix.  $(I_N - \lambda_t W_t)$  is non-singular ( $|\lambda| < 1$ ). The elements of  $W_t$  are  $w_{ijt}$  chosen based on some geographic or economic measures such as contiguity, distance, or trade between regions.

The estimation of  $\lambda_t$  and  $\sigma^2_t$  allows feasible and efficient estimation of initial equation  $y_{it}$  above. It also notes that if  $\lambda_t = \lambda$  and  $\sigma^2_t = \sigma^2$ , and  $T$  is large and  $T \rightarrow \infty$  then  $E(u_t u_t')$  is constant. However, here assuming that  $T$  is fixed, the estimation  $E(u_t u_t')$  is then not reasonable consistent. Now, assume that  $\lambda_t$  and  $\sigma^2_t$  are known, collecting  $t$ ,

$$y = \iota_T \otimes \alpha + x\beta + \varepsilon, \quad \varepsilon = (\lambda^* \otimes I_N)W^* \varepsilon + u \quad (A4)$$

where  $\iota_T$  is a  $T$  dimension column vector of ones,  $x$  is  $(NT \times k)$  and

$$W^* = \begin{bmatrix} W_1 & 0 & 0 \\ 0 & \ddots & 0 \\ 0 & 0 & W_T \end{bmatrix}, \quad \lambda^* = \begin{bmatrix} \lambda_1 & 0 & 0 \\ 0 & \ddots & 0 \\ 0 & 0 & \lambda_T \end{bmatrix}$$

Then, we can notice that  $E(uu') = \begin{bmatrix} \sigma_1^2 I_N & 0 & 0 \\ 0 & \ddots & 0 \\ 0 & 0 & \sigma_T^2 I_N \end{bmatrix}$ . In this case, we can justify that the disturbance  $u$  is spatially

heteroskedastic. Now, define  $\Phi_t = (I_N - \lambda_t W_t)/\sigma$  and pre-multiply the model in equation  $y_t$  to get,

$$y_t^* = \alpha_t^* + X_t^* \beta + u_t^*, \quad (A5)$$

where,

$$y_t^* = \Phi_t y_t, X_t^* = \Phi_t X_t, \alpha_t^* = \Phi_t \alpha, \text{ and } u_t^* = \Phi_t u_t$$

Collecting  $t$ , we can generate the transformed equation as follows:

$$y^* = \alpha^* + X^* \beta + u^*, \quad (A6)$$

where  $\alpha^* = [\alpha_1^*, \dots, \alpha_T^*]'$ , and  $NT$  is the dimensional column vector. This above equation  $y^*$  now proceeds a "well-behaved" disturbance, that is  $E(u^*) = 0$  and  $E(u^* u^{*'}) = I_{NT}$ . The identification of estimates of the parameters in equation  $y^*$  hinges on estimation of the unknown parameters  $W_t$  and  $\lambda_t$  which will be ultimately undertaken in the sequel.

Because the "contiguity matrix"  $[W]_{N \times N}$  of  $N$  countries is selected by creating the  $w_{ij}$ , where  $w_{ij} = c_{ij} / \sum_{i=1}^N c_{ij}$  and  $c_{ij}$  is

equal to one if countries  $i$  and country  $j$  share a boundary, we can imply that the weight matrix is fixed over time and would match to Fully Restricted Specification procedure based on Druska and Horrace (2001).<sup>9</sup> As this case we can see that  $W_1 = \dots = W_T = W$ ,  $\lambda_1 = \dots = \lambda_T = \lambda$ , and  $\sigma_1^2 = \dots = \sigma_T^2 = \sigma^2$ , implying that  $\Phi_1 = \dots = \Phi_T = \Phi$ .

Then,  $\alpha_t^* = \Phi \alpha^*$  in equation (A5) and  $\alpha^* = I_T \otimes \Phi \alpha$  in equation (A6). In this case, the error term  $\varepsilon$  of equation (A4) is no longer heteroskedastic, but it has variance matrix  $E(\varepsilon \varepsilon') = \sigma^2 I_{TN}$ , so  $\Phi$  need not be a function of  $\sigma$  for efficiency. Therefore, the fixed effect estimation of equation (C6) under this full restriction will then be efficient for  $\alpha^*$  and  $\beta$  if  $\lambda$  and  $\sigma^2$  are known.

If we figure out that  $W_1 = \dots = W_T = W$ ,  $\lambda_1 = \dots = \lambda_T = \lambda$ , and  $\sigma_1^2 = \dots = \sigma_T^2 = \sigma^2$ , another challenging step is to find  $\hat{\Phi}_t = (I_N - \hat{\lambda}_t W_t)$ , where we can substitute  $\hat{\Phi}_t$  for  $\Phi_t$  and estimate equation (A6). The average estimates of  $\lambda$  are  $\hat{\lambda} = T^{-1} \sum_T \hat{\lambda}_t$ . We call these estimations the *fully restricted average* estimates. The estimates will

be consistent as  $N \rightarrow \infty$ . These are implied two-stage estimates, where the first-stage unrestricted estimates are calculated ( $\hat{\lambda}_t$ ) which can be used to estimate

$$\hat{\Phi} = (I_N - \hat{\lambda}_t W_t)$$

which can be substituted as  $\Phi$  and can be used to estimate the second-stage fixed effect of equation (C6)<sup>10</sup>

The spatial autocorrelation has been tested in the standard model of panel data that we estimated as the column (I) of the five industries. Then, we use the residuals from these standard fixed effect estimation to determine, which industries spatial correlation exists, by employing the most widely used test for spatial dependence, called the *Moran's I Statistic*. The test using  $\lambda$  coefficients and *Moran's I statistics* generates the same result of testing the spatial autocorrelation in error components. The results show that spatial autocorrelation in the error term existing in three out of five sample industries, which are the Electronic Computer (SIC-3571), the Telephone and Telegraph Apparatus (SIC-3661), and Motor Vehicle Parts and Accessories (SIC-3711), measure foreign direct investment variables in non-monetary units. In the other remaining two industries. Semiconductors and Related Devices (SIC-3674) and Aircraft (SIC-3721), the spatial correlation problems seems not to exist. The positive sign of  $\lambda_t$  and  $\varphi_t$  means that the spatial error component is "positively" correlated and the negative sign means that it is "negatively" spatial correlated.

## References

Clark T., Kotabe M., & Rajaratnam D. (1999). Exchange rate pass-through and international pricing strategy: A conceptual framework and research propositions. *Journal of International Business Studies*, 30(2), 249-268

- Desiraju, R. & Shrikhande, M. (1996). *Exchange Rate Pass-Through and the Role of International Distribution Channels* (Working Paper No. 96-22). Atlanta: Federal Reserve Bank of Atlanta.
- Devereux, M. and Engel C. (2000). *Monetary Policy in the Open Economy Revisited: Price Setting and Exchange Rate Flexibility* (NBER Working Paper, No. 7665). Cambridge, MA.: National Bureau of Economic Research.
- Devereux, M., Engel C., & Tille, C. (1999), *Exchange rate pass-through and the welfare effects on the Euro* (NBER Working Paper, No. 7382). Cambridge, MA.: National Bureau of Economic Research.
- Dornbusch, R. (1987). Exchange Rates and Prices. *The American Economic Review*, 77, 93-106.
- Druska V. & Horrace, W.C. (2004) "Generalized Moments Estimation for Spatial Panel Data: Indonesian Rice Farming," *American Journal of Agricultural Economics*, 86(1), 185-198
- Engel, C. & Rogers, J.H. (1995). *Regional patterns in the Law of One Price: The roles of geography vs. currencies* (NBER Working Paper No. 5395), Cambridge, MA.: National Bureau of Economic Research.
- Engel, C. & Rogers, J.H. (1996). How wide is the border?. *American Economic Review*, 88(5), 1112-1125.
- Gron, A. and Swenson, D.L. (1996). Incomplete Exchange-Rate Pass-Through and Imperfect Competition: The Effect of Local Production. *The American Economic Review*, 86(2), 71-76.
- Isard, P. (1977). How far can we push the Law of One Price?. *The American Economic Review*, 942-948.
- Knetter, M.M. (1989). Price discrimination by U.S. and German exports. *The American Economic Review*, 79(1), 198-210.
- Knetter, M.M. (1992). *Exchange Rates and Corporate Pricing Strategies* (NBER Working Paper No. 4151), Cambridge, MA: National Bureau of Economic Analysis.
- Mann, C.L. (1986). Prices, Profit Margins, and Exchange Rates. *Federal Reserve Bulletin*, 72, 336-379.
- Marston, R. (1990). Pricing to Market in Japanese Manufacturing. *Journal of International Economics*, 29(3-4), 217-236.
- Oman, C. (2000). *Policy competition for foreign direct investment: A study of competition among governments to attract FDI*. Development Centre Studies, OECD Publications.
- Pholphirul, Piriya. (2006). "An International Duopoly Model of Multinational Enterprise And Exchange Rate Pass-Through Strategy: Business Implications and Policy Debates", *International Review of Business Research Paper*, 2(3), 1-21.
- Rangan, S. and Lawrence, R.Z. (1993). The Responses of U.S. Firms to Exchange Fluctuations: Piercing the Corporate Veil. *Brookings Paper on Economic Activity*, 1993(2), 341-369.
- Tille, C. (1999). *The role of consumption substitutability in the international transmission of shocks* (Working Paper No. 67). New York: The Federal Reserve Bank of New York.
- Tille, C. (2000). 'Beggars-thy-Neighbor' or 'Beggars-thyself'? *The income effect of exchange rate fluctuations* (Working Paper, No.112). New York: The Federal Reserve Bank of New York
- United Nations Conference on Trade and Development (2001). Promoting linkages. In UNCTAD, *World Investment Report*. New York and Geneva: United Nations.
- Yoshida, Y. (1999). *The Effect of Vertical Structure on Exchange Rate Pass- Through* (Discussion Paper Series No. 5): Tokyo, Japan: Faculty of Economics, Kyushu Sangyo University.
- Yoshida, Y. (2001). *Foreign Direct Investment and Exchange Rate Pass-Through: Access to Foreign Markets* (Discussion Paper Series No. 8). Tokyo, Japan: Faculty of Economics, Kyushu Sangyo University.

## Notes

**Note 1** See, for example Dornbusch (1987), Mann (1986), and Marston (1990)

**Note 2** The markup power can be misinterpreted if the typical pass-through treats costs as directly observable, measured by the firms' marginal cost. For example, first, marginal cost can be changed from currency fluctuation if production cost depends on imported input factors. Second, currency fluctuation may also lead to a change of marginal cost and markup if the appreciation leads to a contraction in output due to reduced foreign demand, which would further reduce marginal costs if marginal costs were increasing in output.

**Note 3** Because we are going to use annual 4-digit FAS unit value data to measure the port of export, net of transportation cost, tariffs, and other costs of distribution in the destination market, thus many dimensions of the transactions are identical, apart from the location of buyers. But it is likely that there is physical product differentiation within 4-digit classifications, hence, there is no guarantee that marginal cost is common to all destinations.



**Note 4** Unit values are the only measure of price that is available on a destination-specific basis. This was firstly done by Isard (1977) to investigate the Law of One Price. However, Isard compared U.S. import unit values from Germany, Japan, and Canada in a given industry to the aggregate U.S. export unit values in the same industry. What we do here is compare unit FAS values from a single source country, which is U.S., across multiple destination markets

**Note 5** Yoshida (2001) uses similar methodology by classifying local subsidiaries as subsidiaries for “production” and subsidiaries for “distribution”. He explains that the distribution subsidiaries of exporting firms have significant effects to the independent local distributors. The bargaining power should shift from independent local distributors to exporters and its own subsidiaries for distribution. We might call this effect as “power-shift” effect. In terms of exchange rate pass-through, power-shift effect is associated with decreasing pass-through.

**Note 6** There is a paper by Engel and Rogers (1995 and 1996) which answers the first of these questions very clearly. They use CPI data for U.S. and Canadian cities to study two potentially important determinants of relative price volatility across locations: distance and border. The results show that distance does help explain the degree of price variation between city pairs, the U.S.- Canadian border, which is also very important

**Note 7** Analysis of prices alone can only give minimal information about market power. A quantitative assessment of market power requires analysis of quantity response as well. The quantity fluctuations can be significant in representing true fluctuation in demand or consumption of the export good in destination markets. Anyhow, price discrimination across countries is still the most prominent in explaining markup ability and market power that export firms would have.

**Note 8** The *Backward Linkages* exist when foreign affiliates acquire goods or services from domestic firms and the *Forward Linkages* happen when foreign affiliates sell goods or services to domestic firms. *Horizontal Linkages* involve interactions with domestic firms engaging in competing activities. Linkages can also be defined in term of non-business entities such as universities, training centers, research and technology institutes, or private institutes (UNCTAD, 2001).

**Note 9** This tends to test the border or the contiguity effect has on international pricing. Even the distance effect is not applied to test for this spatial error components. Engel and Rogers (1995 and 1996) find that border is equivalent to approximately 1,780 miles in terms of its effect on relative price variability, in spite that there are practically no trade restrictions between the two countries.

**Note 10** Based on Druska and Horrace (2004),  $\hat{\lambda}_t$  and  $\sigma_t^2$  can be estimated by using the Generalized Moments

Estimation method. And,  $\hat{\Phi}_t = \frac{(I_N - \hat{\lambda}_t W_t)}{\sqrt{\hat{\sigma}_t^2}}$ , if we impose the Partially Restricted Specification that weight matrix  $W_t$

are not constant over time, so that  $W_1 \neq \dots \neq W_T$ ,  $\lambda_1 \neq \dots \neq \lambda_T$ , and  $\sigma_1^2 \neq \dots \neq \sigma_T^2$

Table 1. Result of Fully-Restricted Average Estimation of Spatial Panel Data: 3571 (Electronic Computer)

Independent Variables	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
- <i>e</i>	-0.008** (-1.64)	0.004 (0.23)	-0.007* (-1.49)	-0.014* (-1.50)	-0.007* (-1.45)	0.002 (0.11)	-0.009** (-1.68)	-0.009* (-1.62)
- <i>gdp</i>	0.021*** (2.27)	0.022*** (2.37)	0.021*** (2.25)	0.020*** (2.16)	0.020*** (2.19)	0.021*** (2.31)	0.020*** (2.23)	0.021*** (2.25)
- <i>PPI</i>	0.016 (0.36)	0.024 (0.32)	0.016 (0.36)	0.016 (0.37)	0.016 (0.36)	0.014 (0.32)	0.016 (0.36)	0.016 (0.36)
- <i>p<sub>t</sub>(t-1)</i>	0.421*** (19.84)	0.420*** (19.76)	0.421*** (19.82)	0.418*** (19.68)	0.420*** (19.82)	0.417*** (19.63)	0.421*** (19.81)	0.421*** (19.82)
- <i>e*SUBSIDIARY1</i>	- -	-0.035* (-1.37)	- -	- -	- -	-0.047** (-1.57)	- -	- -
- <i>e*SUBSIDIARY2</i>	- -	0.045 (0.31)	- -	- -	- -	- (0.17)	0.024 (0.17)	- -
- <i>e*SUBSIDIARY3</i>	- -	0.001 (0.57)	- -	- -	- -	- -	- -	-0.001 (-0.15)
- <i>e*AFFILIATION1</i>	- -	- -	-0.005*** (-2.15)	- -	- -	0.019 (0.55)	- -	- -
- <i>e*AFFILIATION2</i>	- -	- -	-0.016 (-0.08)	- -	- -	- (-0.18)	-0.037 (-0.18)	- -
- <i>e*AFFILIATION3</i>	- -	- -	-0.037 (-0.62)	- -	- -	- -	- -	-0.052 (-0.83)
- <i>e*J_VENTURE1</i>	- -	- -	- -	-0.116** (-1.83)	- -	-0.082** (-1.64)	- -	- -
- <i>e*J_VENTURE2</i>	- -	- -	- -	0.115 (0.58)	- -	- -	0.081 (0.45)	- -
- <i>e*J_VENTURE3</i>	- -	- -	- -	-0.140* (-1.41)	- -	- -	- -	-0.010 (-0.12)
- <i>e*DIVISION1</i>	- -	- -	- -	- -	-0.018 (-0.54)	-0.027 (-1.04)	- -	- -
- <i>e*DIVISION2</i>	- -	- -	- -	- -	0.132 (0.40)	- -	0.117 (0.36)	- -
- <i>e*DIVISION3</i>	- -	- -	- -	- -	0.002 (0.39)	- -	- -	0.003 (0.38)
Adjust R-Square	.19	.19	.19	.19	.19	.19	.19	.19
Prob > F	.001	.001	.001	.001	.001	.001	.001	.001
Observations#	1,335	1,335	1,335	1,335	1,335	1,335	1,335	1,335

Note: Value enclosed in parentheses represents *t*-statistics. \*  $p < .20$ . \*\*  $p < .10$ , \*\*\*  $p < .05$ . Estimated Coefficients of Year Dummies are not shown in this table

Table 2. Result of Fully-Restricted Average Estimation of Spatial Panel Data: 3661 (Telephone and Telegraph Apparatus)

Independent Variables	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
- <i>e</i>	0.016 (0.79)	0.010 (0.41)	0.013 (0.67)	0.019 (0.97)	0.015 (0.76)	0.012 (0.48)	0.015 (0.79)	0.012 (0.60)
- <i>gdp</i>	0.071*** (4.06)	0.073*** (3.96)	0.075*** (4.26)	0.068*** (3.85)	0.071*** (4.07)	0.073*** (3.97)	0.071*** (4.04)	0.077*** (4.23)
- <i>PPI</i>	0.166*** (3.08)	0.165*** (3.06)	0.165*** (3.07)	0.166*** (3.09)	0.166*** (3.08)	0.165*** (3.07)	0.165*** (3.07)	0.166*** (3.08)
- <i>p<sub>i</sub>(t-1)</i>	0.187*** (7.91)	0.187*** (7.90)	0.185*** (7.80)	0.186*** (7.87)	0.187*** (7.91)	0.184*** (7.79)	0.186*** (7.88)	0.184*** (7.80)
- <i>e*SUBSIDIARY1</i>	- -	0.011 (0.29)	- -	- -	- -	0.008 (0.22)	- -	- -
- <i>e*SUBSIDIARY2</i>	- -	-0.021 (-0.10)	- -	- -	- -	- -	-0.016 (-0.07)	- -
- <i>e*SUBSIDIARY3</i>	- -	0.001 (0.14)	- -	- -	- -	- -	- -	0.002 (0.76)
- <i>e*AFFILIATION1</i>	- -	- -	0.060 (0.31)	- -	- -	-0.183* (-1.41)	- -	- -
- <i>e*AFFILIATION2</i>	- -	- -	0.255 (0.44)	- -	- -	- -	0.397 (0.71)	- -
- <i>e*AFFILIATION3</i>	- -	- -	0.087 (0.84)	- -	- -	- -	- -	-0.112* (-1.62)
- <i>e*J_VENTURE1</i>	- -	- -	- -	-0.069** (-1.65)	- -	-0.077* (-1.38)	- -	- -
- <i>e*J_VENTURE2</i>	- -	- -	- -	-0.078 (-0.22)	- -	- -	-0.206 (-0.63)	- -
- <i>e*J_VENTURE3</i>	- -	- -	- -	-0.047* (-1.52)	- -	- -	- -	-0.109* (-1.26)
- <i>e*DIVISION1</i>	- -	- -	- -	- -	0.041 (0.28)	0.038 (0.26)	- -	- -
- <i>e*DIVISION2</i>	- -	- -	- -	- -	- -	- -	- -	- -
- <i>e*DIVISION3</i>	- -	- -	- -	- -	0.042 (0.48)	- -	- -	0.036 (0.25)
Adjust R-Square	.17	.17	.17	.17	.17	.17	.17	.17
Prob > F	.001	.001	.001	.001	.001	.001	.001	.001
Observations#	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201

Note: Value enclosed in parentheses represents *t*-statistics. \**p* < .20. \*\**p* < .10, \*\*\**p* < .05. Estimated Coefficients of Year Dummies are not shown in this table

Table 3. Result of Fixed-Effect Panel Data Estimation: 3674 (Semiconductors and Related Devices)

Independent Variables	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
- <i>e</i>	-0.006*	-0.004	-0.001	0.002	0.004	-0.004	-0.002	0.012
	(-1.29)	(-1.12)	(-1.04)	(0.10)	(0.20)	(-1.10)	(-1.11)	(0.54)
- <i>gdp</i>	-0.256***	-0.281***	-0.226***	-0.262***	-0.275***	-0.272***	-0.256***	-0.284***
	(-9.21)	(-8.79)	(-9.00)	(-9.24)	(-9.02)	(-8.60)	(-9.13)	(-9.02)
- <i>PPI</i>	0.020***	0.022***	0.021***	0.021***	0.022***	0.021***	0.020***	0.022***
	(8.71)	(8.66)	(8.66)	(8.77)	(8.78)	(8.48)	(8.67)	(8.82)
- <i>p<sub>t</sub>(t-1)</i>	0.314***	0.308***	0.312***	0.312***	0.310***	0.310***	0.313***	0.309***
	(11.55)	(11.33)	(11.48)	(11.44)	(11.38)	(11.39)	(11.52)	(11.34)
- <i>e</i> * <i>SUBSIDIARY1</i>	-	0.033	-	-	-	0.018	-	-
	-	(0.80)	-	-	-	(0.45)	-	-
- <i>e</i> * <i>SUBSIDIARY2</i>	-	-0.118*	-	-	-	-	-0.091**	-
	-	(-1.25)	-	-	-	-	(-1.90)	-
- <i>e</i> * <i>SUBSIDIARY3</i>	-	-0.002***	-	-	-	-	-	-0.002***
	-	(-2.31)	-	-	-	-	-	(-2.04)
- <i>e</i> * <i>AFFILIATION1</i>	-	-	-0.070	-	-	-0.027	-	-
	-	-	(-0.73)	-	-	(-0.35)	-	-
- <i>e</i> * <i>AFFILIATION2</i>	-	-	-0.104	-	-	-	-0.156	-
	-	-	(-0.24)	-	-	-	(-0.36)	-
- <i>e</i> * <i>AFFILIATION3</i>	-	-	0.007	-	-	-	-	0.066
	-	-	(0.08)	-	-	-	-	(0.42)
- <i>e</i> * <i>J_VENTURE1</i>	-	-	-	-0.077*	-	-0.050	-	-
	-	-	-	(-1.27)	-	(-0.87)	-	-
- <i>e</i> * <i>J_VENTURE2</i>	-	-	-	0.002	-	-	-0.040	-
	-	-	-	(0.01)	-	-	(-0.22)	-
- <i>e</i> * <i>J_VENTURE3</i>	-	-	-	0.023	-	-	-	0.005
	-	-	-	(0.32)	-	-	-	(0.08)
- <i>e</i> * <i>DIVISION1</i>	-	-	-	-	-0.004	-0.046	-	-
	-	-	-	-	(-0.06)	(-0.76)	-	-
- <i>e</i> * <i>DIVISION2</i>	-	-	-	-	0.004	-	-0.013	-
	-	-	-	-	(0.02)	-	(-0.06)	-
- <i>e</i> * <i>DIVISION3</i>	-	-	-	-	-0.021**	-	-	-0.011
	-	-	-	-	(-1.65)	-	-	(-0.66)
Adjust R-Square	.74	.74	.74	.73	.74	.73	.74	.74
Prob > F	.001	.001	.001	.001	.001	.001	.001	.001
Observations#	1,114	1,114	1,114	1,114	1,114	1,114	1,114	1,114

Note: Value enclosed in parentheses represents *t*-statistics. \*  $p < .20$ . \*\*  $p < .10$ , \*\*\*  $p < .05$ . Estimated Coefficients of Year Dummies are not shown in this table

Table 4. Result of Fully-Restricted Average Estimation of Spatial Panel Data: 3711 (Motor Vehicles and Passenger Car Bodies)

Independent Variables	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
- <i>e</i>	-0.014*	-0.016**	-0.016**	-0.014*	-0.015**	-0.016**	-0.014*	-0.016**
	(-1.63)	(-1.67)	(-1.68)	(-1.62)	(-1.64)	(-1.67)	(-1.63)	(-1.70)
- <i>gdp</i>	0.135***	0.136***	0.136***	0.135***	0.135***	0.135***	0.135***	0.137***
	(6.61)	(6.55)	(6.60)	(6.54)	(6.58)	(5.49)	(6.59)	(6.57)
- <i>PPI</i>	0.044***	0.044***	0.044***	0.044***	0.044***	0.044***	0.044***	0.044***
	(2.17)	(2.18)	(2.17)	(2.18)	(2.18)	(2.17)	(2.17)	(2.18)
- <i>p<sub>t</sub>(t-1)</i>	0.363***	0.364***	0.363***	0.363***	0.363***	0.363***	0.363***	0.363
	(16.50)	(16.49)	(16.48)	(16.49)	(16.49)	(16.47)	(16.49)	(16.48)
- <i>e*SUBSIDIARY1</i>	-	0.001	-	-	-	0.005	-	-
	-	(0.01)	-	-	-	(0.05)	-	-
- <i>e*SUBSIDIARY2</i>	-	-0.367**	-	-	-	-	-0.610**	-
	-	(-1.72)	-	-	-	-	(-1.84)	-
- <i>e*SUBSIDIARY3</i>	-	0.002	-	-	-	-	-	0.001
	-	(0.39)	-	-	-	-	-	(0.27)
- <i>e*AFFILIATION1</i>	-	-	0.012	-	-	0.056	-	-
	-	-	(0.11)	-	-	(0.43)	-	-
- <i>e*AFFILIATION2</i>	-	-	0.006	-	-	-	0.029	-
	-	-	(0.01)	-	-	-	(0.05)	-
- <i>e*AFFILIATION3</i>	-	-	0.016	-	-	-	-	0.015
	-	-	(0.17)	-	-	-	-	(0.21)
- <i>e*J_VENTURE1</i>	-	-	-	-0.025	-	-0.056*	-	-
	-	-	-	(-1.22)	-	(-1.43)	-	-
- <i>e*J_VENTURE2</i>	-	-	-	-0.060	-	-	-0.078	-
	-	-	-	(-0.23)	-	-	(-0.29)	-
- <i>e*J_VENTURE3</i>	-	-	-	0.035	-	-	-	-0.004
	-	-	-	(0.32)	-	-	-	(-0.04)
- <i>e*DIVISION1</i>	-	-	-	-	-0.022	-0.006	-	-
	-	-	-	-	(-0.11)	(-0.04)	-	-
- <i>e*DIVISION2</i>	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
- <i>e*DIVISION3</i>	-	-	-	-	0.009	-	-	0.004
	-	-	-	-	(0.25)	-	-	(0.15)
Adjust R-Square	.18	.18	.18	.18	.18	.18	.18	.18
Prob > F	.001	.001	.001	.001	.001	.001	.001	.001
Observations#	1,310	1,310	1,310	1,310	1,310	1,310	1,310	1,310

Note: Value enclosed in parentheses represents *t*-statistics. \*  $p < .20$ . \*\*  $p < .10$ , \*\*\*  $p < .05$ . Estimated Coefficients of Year Dummies are not shown in this table

Table 5. Result of Fixed-Effect Panel Data Estimation: 3721 (Aircraft)

Independent Variables	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
- <i>e</i>	-0.083*** (-2.69)	-0.183*** (-5.43)	-0.085*** (-2.74)	-0.090*** (-2.84)	-0.090*** (-2.87)	-0.181*** (-5.37)	-0.084*** (-2.71)	-0.103*** (-3.27)
- <i>gdp</i>	0.031 (0.78)	0.022 (0.58)	0.028 (0.72)	0.033 (0.85)	0.031 (0.79)	0.017 (0.43)	0.029 (0.74)	0.024 (0.63)
- <i>PPI</i>	0.106*** (15.63)	0.108*** (16.32)	0.106*** (15.60)	0.107*** (15.62)	0.105*** (15.62)	0.108*** (16.33)	0.107*** (15.63)	0.107*** (15.91)
- <i>p<sub>t</sub>(t-1)</i>	0.118*** (3.08)	0.114*** (3.05)	0.121*** (3.14)	0.118*** (3.06)	0.128*** (3.37)	0.115*** (3.07)	0.118*** (3.05)	0.123*** (3.24)
- <i>e*SUBSIDIARY1</i>	-	-0.255*** (-5.16)	-	-	-	-0.282*** (-5.91)	-	-
- <i>e*SUBSIDIARY2</i>	-	-0.066 (0.29)	-	-	-	-	0.094 (0.41)	-
- <i>e*SUBSIDIARY3</i>	-	0.008 (0.80)	-	-	-	-	-	0.043*** (3.70)
- <i>e*AFFILIATION1</i>	-	-	0.330 (0.75)	-	-	-0.030 (-0.13)	-	-
- <i>e*AFFILIATION2</i>	-	-	0.143 (0.56)	-	-	-	0.143 (0.56)	-
- <i>e*AFFILIATION3</i>	-	-	-0.076 (-0.30)	-	-	-	-	-0.006 (-0.05)
- <i>e*J_VENTURE1</i>	-	-	-	-0.003 (-0.03)	-	-0.142* (-1.48)	-	-
- <i>e*J_VENTURE2</i>	-	-	-	-0.289 (-0.87)	-	-	-0.289 (-0.87)	-
- <i>e*J_VENTURE3</i>	-	-	-	0.165 (0.97)	-	-	-	-0.267** (-1.64)
- <i>e*DIVISION1</i>	-	-	-	-	0.199*** (2.72)	0.064 (0.75)	-	-
- <i>e*DIVISION2</i>	-	-	-	-	0.402 (0.75)	-	0.459 (0.85)	-
- <i>e*DIVISION3</i>	-	-	-	-	-0.190*** (-3.25)	-	-	-0.173*** (-2.96)
Adjust R-Square	.35	.36	.34	.34	.37	.37	.34	.38
Prob > F	.001	.001	.001	.001	.001	.001	.001	.001
Observations#	969	969	969	969	969	969	969	969

Note: Value enclosed in parentheses represents *t*-statistics. \**p* < .20. \*\**p* < .10, \*\*\**p* < .05. Estimated Coefficients of Year Dummies are not shown in this table

Table A1. Estimates of spatial error coefficients ( $\lambda_t$ ), Moran's I Statistic ( $\phi_t$ ), Z-value of Moran's I Statistic ( $z_t$ ), and Variance ( $\sigma_t^2$ ) of Non-Monetary Unit Foreign Direct Investment): Electronic Computer (3571)

Year	$\lambda_t$	$\phi_t$	$z_t$	$\sigma_t^2$
1989	0.190	0.118	1.859	0.011
1990	0.281*	0.172	2.651*	0.010
1991	0.280*	0.127	1.991*	0.014
1992	0.416*	0.213	3.273*	0.012
1993	0.288*	0.149	2.317*	0.019
1994	0.571*	0.181	2.795*	0.010
1995	0.492*	0.232	3.543*	0.014
1996	0.238	0.041	0.716	0.030
1997	0.492*	0.197	3.032*	0.015
1998	0.442*	0.213	3.272*	0.013
1999	0.528*	0.239	3.649*	0.013
2000	0.668*	0.271	4.122*	0.014

Note. \*  $p < .05$ , spatial correlation existing in the error term

Table A2. Estimates of spatial error coefficients ( $\lambda_t$ ), Moran's I Statistic ( $\phi_t$ ), Z-value of Moran's I Statistic ( $z_t$ ), and Variance ( $\sigma_t^2$ ) of Non-Monetary Unit Foreign Direct Investment): Telephone and Telegraph Apparatus (3661)

Year	$\lambda_t$	$\phi_t$	$z_t$	$\sigma_t^2$
1989	0.461*	0.194	2.859*	0.015
1990	0.230	0.091	1.396	0.017
1991	0.121	0.039	0.653	0.022
1992	0.159	0.034	0.587	0.032
1993	0.410*	0.198	2.909*	0.013
1994	0.395*	0.164	2.430*	0.016
1995	0.351*	0.150	2.231*	0.015
1996	0.024	0.007	0.204	0.024
1997	0.433*	0.143	2.131*	0.020
1998	0.075	0.025	0.457	0.021
1999	0.357	0.096	1.459	0.025
2000	0.327*	0.111	1.675	0.020

Note. \*  $p < .05$ , spatial correlation existing in the error term

Table A3. Estimates of spatial error coefficients ( $\lambda_t$ ), Moran's I Statistic ( $\phi_t$ ), Z-value of Moran's I Statistic ( $z_t$ ), and Variance ( $\sigma_t^2$ ) of Non-Monetary Unit Foreign Direct Investment): Semiconductors and Related Devices (3674)

Year	$\lambda_t$	$\phi_t$	$z_t$	$\sigma_t^2$
1989	0.138	0.063	1.006	0.016
1990	0.072	0.029	0.512	0.018
1991	-0.122	-0.045	-0.538	0.019
1992	-0.048	-0.020	-0.182	0.017
1993	0.032	0.015	0.311	0.016
1994	0.010	0.004	0.163	0.017
1995	0.031	0.013	0.296	0.016
1996	-0.017	-0.007	0.007	0.018
1997	0.116	0.050	0.822	0.016
1998	0.072	0.030	0.537	0.017
1999	0.099	0.043	0.711	0.017
2000	0.113	0.058	0.923	0.014

Note. \*  $p < .05$ , spatial correlation existing in the error term

Table A4. Estimates of spatial error coefficients ( $\lambda_t$ ), Moran's I Statistic ( $\phi_t$ ), Z-value of Moran's I Statistic ( $z_t$ ), and Variance ( $\sigma_t^2$ ) of Non-Monetary Unit Foreign Direct Investment): Motor Vehicle Parts and Accessories (3711)

Year	$\lambda_t$	$\phi_t$	$z_t$	$\sigma_t^2$
1989	0.500*	0.232	3.499*	0.013
1990	0.342*	0.223	3.359*	0.010
1991	0.348*	0.198	3.000*	0.011
1992	0.469*	0.231	3.483*	0.012
1993	0.302	0.085	1.351	0.022
1994	0.296*	0.152	2.331*	0.013
1995	0.436*	0.191	2.894*	0.014
1996	0.479*	0.205	3.093*	0.014
1997	0.510*	0.180	2.735*	0.018
1998	0.601*	0.246	3.697*	0.014
1999	0.498*	0.156	2.378*	0.020
2000	0.380*	0.173	2.631*	0.014

Note. \*  $p < .05$ , spatial correlation existing in the error term

Table A5. Estimates of spatial error coefficients ( $\lambda_t$ ), Moran's I Statistic ( $\phi_t$ ), Z-value of Moran's I Statistic ( $z_t$ ), and Variance ( $\sigma_t^2$ ) of Non-Monetary Unit Foreign Direct Investment): Aircraft (3721)

Year	$\lambda_t$	$\phi_t$	$z_t$	$\sigma_t^2$
1989	-0.141	-0.069	-0.729	0.017
1990	-0.189	-0.077	-0.826	0.021
1991	-0.026	-0.014	-0.062	0.016
1992	-0.181	-0.077	-0.826	0.020
1993	-0.029	-0.015	-0.076	0.017
1994	-0.147	-0.091	-0.987	0.014
1995	-0.060	-0.025	-0.200	0.021
1996	-0.260	-0.044	-0.429	0.050
1997	-0.128	-0.014	-0.069	0.076
1998	-0.148	-0.027	-0.218	0.047
1999	-0.010	-0.001	-0.094	0.112
2000	-0.084	-0.007	-0.023	0.107

Note. \*  $p < .05$ , spatial correlation existing in the error term.





## The Prospect of Catastrophe Securitization in China

Jong-Hag Jang

School of Economics and Management, Chang'an University

South 2<sup>nd</sup> Rd, Xi'an 710064, China

Tel: 86-29-8233-4978 E-mail: [zhang524@chd.edu.cn](mailto:zhang524@chd.edu.cn)

### Abstract

The purpose of this paper is to prospect catastrophe securitization in China. The catastrophe security market is well developed in developed countries, but in much of Asia it is in its early stages. The reason attributed for this is the close interdependencies of corporates and insurance companies in funding their risk exposures, and the lower prevalence of sophisticated risk management practices. However, things slowly started changing in Asia, especially in China, with corporate recognizing that better risk management practices have a positive affect on their financial earnings. The securitization of catastrophe risk has the potential to rapidly alter the China's risk management landscape. Through development of the catastrophe security markets, policyholders can be protected from (re)insurer's credit risk, (re)insurers can overcome the limitation of capacity, and investors investing capital markets can diversify their portfolios. The growth and survival of the catastrophe security market in China lies in coming up with the products to suit the diverse needs of various customers and act as a close substitute for the traditional insurance market.

**Keywords:** Catastrophe, Securitization, Alternative Risk Transfer (ART), Traditional Insurance Inefficiencies

### I. Introduction

Recently, the importance of the Alternative Risk Transfer (ART) instruments, including catastrophe securitization, has grown because the exposures to man-made and natural catastrophes such as hurricanes and earthquakes have increased dramatically in the world. (Note 1) Following a series of costly catastrophes, including Hurricane Catrina and the Pakistan-India Earthquake in 2005, the Asian Tsunami Disaster in 2004, primary insurers have experienced a difficult time in obtaining catastrophe coverage due to the capacity limits of the worldwide reinsurance market. Furthermore, aggregate catastrophe exposures are too great for the capital of the traditional insurance and reinsurance industry. Many experts expect that the insured losses from catastrophic disasters in the future are beyond any figures previously imagined because the insurers' exposure to natural catastrophes is constantly increasing. However, while \$100 billion represents one-third of the equity capital of US property-liability insurers, such a loss amounts to only about 0.5 percent of the value of US stocks and bonds. Therefore, if a way could be found to access securities markets directly, it would be solve the problem of financing catastrophic risks. (Note 2) That is the reason why catastrophe securitization has become a major topic of debate in the world.

China has also suffered from serious natural disasters for many years, including the Si-Chuan earthquake and snowstorm in 2008, SARS in 2003. In addition to these natural disasters, strong economic growth will continue to underpin insurance demand, but the traditional insurance market is not capable of providing economic and smart solutions in China. Experts argue that China is also confronted with serious economic problems such as finance, employment, agriculture and a big gap between rich and poor, and that the financial problem is the most important thing. Furthermore, alternative forms of risk transfer for corporate clients are still in the early stages in China. This slow development compared with other countries can be attributed to the close interdependencies between industrial companies and insurers that are controlled by government, as well as the relatively underdeveloped risk management culture. However, things slowly started changing in China. The Chinese government is aggressively taking a second look at its risk management practice. It is also considering to setting up catastrophe funds and to allow various kinds of capitalization like financial reinsurance, catastrophe bonds and insurance derivatives. At the same time, corporates have recognized that better risk management practices have a positive effect on their earnings, so they are eager to import risk management practices from developed countries.

In China the potential for the growth of catastrophe securitization is considerable. Especially, the ongoing globalization, deregulation of additional industrial and service sectors, and the rapid change in the risk landscape are paving way for the development of the catastrophe security market. At this moment, it is important to analyze the possibility of importing various risk-linked securities that could give an economic positive effect, and suggest some guidelines that can help everyone better understand catastrophe securitization. This study starts by presenting the most important ART products, and identifies the key features of ART. The second section discusses reasons for developing ART and attempts to develop a conceptual framework for the catastrophe securitization in China that follows.

## 2. Alternative Risk Transfer

The term Alternative Risk Transfer was first used in the US at the beginning of the 1990s to describe various forms of self-insurance like Captive and Risk Retention Groups that were formed by corporate to deal with risk exposures. But over years the concept of ART has become the mainstream of corporate risk management practices with the active participation of both the insurers and corporates. Catastrophe securitization is one of financing instruments used as part of ART. Types of ART are summarized on Figure 1.

Insert Figure 1 Here

ART is a blend of the use of insurance and capital market instruments and typically consists of the use of one or a combination of the following products: captive insurance, finite risk, catastrophe security. ART products aim at increasing the efficiency of the risk transfer, broadening the possibility of insurable risks and accepting the capital markets for additional capacity. The key features of ART products are summarized on table 1.

Insert Table 1 Here

## 3. Reasons for developing ART

### 3.1 Improve the Efficiency of Risk Transfer

The primary objective of developing ART is to improve the efficiency of risk transfer. That is, the inefficiencies of traditional insurance have contributed to the development of alternative risk transfer solutions. The structural inefficiencies of traditional insurance are shown on Figure 2.

Insert Figure 2 Here

The primary limitation of the traditional insurance is Information Asymmetry. An analysis of the insurance costs shows that the difference between the premium and the expected loss is high. This result is come from the information differences between insurers and policyholders. (Note 4) This limitation can be reduced through alternative risk such as captive insurance, finite risk and risk-linked securitization.

The second is Adverse Selection. Traditional insurance prices are calculated on the basis of average risks, and are therefore higher than the risk-adjusted premium rates for good risks. As a result, good risks are becoming increasingly reluctant to subsidize bad risks, and are turning to self-insurance or captive insurance instead.

The third is Moral Hazard. With insurance there is a danger that the policyholder has little incentive to prevent or contain a loss. In the case of self-insurance, the policyholder has a direct incentive to adopt suitable risk management measures to prevent losses or keep losses to a reasonable level. Various alternative risk transfer products can eliminate the problem of moral hazard by defining the loss event on the basis of a physical event. Moral hazard is also a potential problem in catastrophe securities where the contract payoff based on the losses of the insurer issuing the securities. In most of the catastrophe bonds issued so far, moral hazard is dealt with by including a percent

Coinurance in which the insurer collects only certain percentage (usually 90 percent) of its catastrophe losses after the triggering event occurs. The indexed linked products have also been developed because the moral hazard of index linked contracts is very low.

The forth is Credit Risk for the policyholders. There is danger that the (re)insurer will not have sufficient funds to cover a claim. In fact, there are many insurers going bankrupt because of large natural catastrophe losses in the 1990s. However, the credit risk of a catastrophe bond is close to zero because the trust that is hold by issuer is funded with safe securities and exists only for the purpose of this single transaction. (Note 5)

### 3.2 Increase Capacity

The policyholders' exposures to catastrophes are constantly increasing because of demographic trends and rising property values. Many experts expect that the insured losses from catastrophic disasters in the future are tremendous. However, from time to time large companies find that no cover is available for catastrophic risks that threaten their existence due to an lack of capacity on the (re)insurance markets.

Projected catastrophes like a \$75 billion Florida hurricane or a \$100 billion California earth quake would severely stress the capacity of (re)insurance market. However, while \$100 billion represents one-third of the equity capital of US property-liability insurers, such a loss amounts to only about 0.5 percent of the value of US stocks and bonds. Therefore, if a way could be found to access securities markets directly, it would be solve the problem of financing catastrophic risk. These securities are bought by investors such as hedge funds and pension plans that receive a premium above usual market yields for bearing the catastrophic risks. (Note 6)

### 3.3 Portfolio Diversification

Financial investors may find it is worth investing in risk-linked securities like catastrophe securities because it allows them to diversify their portfolio even further. That is, investors such as hedge funds and pension plans want to buy a

security that creates an exposure to a large loss in the event of a hurricane or earthquake because such investments form only a small part of their highly diversified portfolios. In principle, catastrophe securities are valuable to investors because catastrophe losses are zero-beta events with their financial portfolio. The correlation of catastrophe losses with capital market security returns is close to zero. Zero-beta securities are valuable for diversification purposes because they make it possible for investors to reduce risk for any given level of expected portfolio returns.

### 3.4 Market Innovation

Many new and innovative financial instruments have a very tremendous effect on the development of the ART market. Over years, the traditional insurance market has failed to come up with new products and process innovation. Furthermore, the insurance market is lacking speed and adaptability to meet the ever changing risk needs of corporates and risk managers. As a result, corporate started questioning about the value of insurance products and their inability to recoup major catastrophic losses and lack of flexibility in the products of insurers had also fuelled the growth of ART market. ART market continues to grow in volume and new innovative instruments. The market is also being introduced every year with new features to tackle catastrophe risks. In addition, the role of brokers, bankers and reinsurers are commendable because of their interest and eagerness to invest in new products and take additional risks in financing. The increased sophistication of risk managers, the convergence of actuarial sciences, developing financial mathematics, and capital market innovations also paved way for the emergence of sophisticated risk reduction products.

## 4. The Prospect of Catastrophe Securitization in China

According to the report, World Insurance in 2008, by Swiss Re that is one of leading insurers in the world, emerging markets will be at the frontier of insurance in the 21<sup>st</sup> century. Recently, the financial crisis and the falling stock markets have had a negative impact on insurance premium growth in the world. For the first time since 1980, world insurance premium volume fell by 2% in 2008. Premiums in the emerging markets, however, continued to register double-digit growth.

Insert Table 2 Here

Among the emerging markets, China is very much in the spotlight because of their huge populations, growing economic importance and fast liberalizing regulatory regimes. Life insurance premiums in China have grown by an annual average of 25% over the last decade, while non-life premiums have grown by 12% over the same period. In fact, China is the 6<sup>th</sup> largest life insurance markets and 10<sup>th</sup> in terms of non-life insurance worldwide in 2008. However, major losses from the severe snowstorm in January and the Sichuan earthquake in May have hurt profitability. The premium growth is expected to remain strong at 20% per year in the next decade due to robust economic growth, increased stability, favorable regulatory, as well as new product offerings and distribution channels. (Note 7)

Despite this impressive growth rates, China market is still relatively small, accounting for only 3.3% of global insurance premiums. However, its huge economy and population size, coupled with rapid industrialization and globalization will create ample opportunities for the rapid development of insurance industry. In particular, liberalization and deregulation are rendering this de-monopolized market more accessible and attractive to foreign insurers.

China has also suffered from various natural catastrophes. In 2008, natural catastrophes caused approximately 100,000 fatalities and led to economic losses of USD 150bn, making 2008 one of the costliest catastrophe year in history. The trend towards higher losses continues in view of the risk factors: higher population densities and higher concentrations of insured value, especially in endangered area. (Note 8) Top ten catastrophe disasters in China are shown on table3.

Insert Table 3 Here

It is clear that the potential loss from an even greater catastrophe could severely challenge the China's entire economy. However, many policyholders have faced that no cover is available for catastrophic risks due to a lack of capacity on the (re)insurance markets. The Chinese government considers thus to set up catastrophe funds and to allow various kinds of capitalization like catastrophe bonds and insurance derivatives. Chinese corporates also realize the importance of risk management and eager to import high-level risk management practices from developed countries. Furthermore, foreign-owned insurers that already open their branch in China aggressively try to sell their innovative products such as catastrophe bonds and insurance derivatives. Over fifty foreign-owned insurance companies are now operating in China including Lloyd's of London that is one of the biggest reinsures in the World. The China Insurance Regulatory Commission (CIRC) has already licensed several asset management companies owned by foreign shareholders like Swiss Reinsurance company under the new "Provisional Regulations on the Administration of Insurance Asset Management Companies" which came into effect on June 2004. These companies aim to develop various risk management skills to improve their profit margins while effectively handling catastrophe exposures for China's insurance industry.

Many insurance experts expect that the innovative risk management concepts can be applied to risks that were uninsurable in the past in China. That is, the use of insurance derivatives as protection against previously uninsured

threats to the earnings of an industrial or service company offers a lot of potential. Weather is a good example. The revenue of many different companies are susceptible to weather pattern such as energy producers and building firms, food and beverage manufacturers, companies in the leisure sector and many more besides. Detailed analyses of the degree to which the sales of certain companies are dependent on temperature, rain, snow, sunshine, etc will encourage the emergence of specific insurance derivatives.

At the same time, with financial markets becoming more and more volatile, a wide range of new financial instruments has come into the market for hedging systematic risks in China. Many financial derivatives already exist in the Chinese financial market and the most prominent financial instruments are futures, options and swaps. It is vital to recognize that various financial derivatives are an integral part of some of the most critical financial reforms now being carried out in the Chinese government because the lack of various financial derivative products including risk-linked securities seriously hinders active participation from domestic and foreign professional institution investors. Therefore, the China Securities Regulatory Commission (CSRC), the China Bank Regulatory Commission (CBRC) and the China Insurance Regulatory Commission (CIRC) make a joint effort to further develop the financial derivative market and provide hedging products for investors. For the first step, CSRC is considering launching stock index futures in near future. These financial instruments are creating a new challenging environment for the China insurance industry. Insurance swaps of insurance derivatives will be accepted at first. (Note 9) Many Asian multinational companies have used insurance swaps because the insurance derivative is convenient for use and more profitable. (Note 10) The presence of many professional institutional investors including QFII (Qualified Foreign Institutional investors), insurers, securities brokers and social securities companies would also make it more likely that derivatives market are run properly in China.

Meanwhile, globalization is making some industries such as energy, marine shipping and aviation vulnerable by the price fluctuation in the world market. Large companies' social liabilities and financial burdens are also rapidly increased under new statutes such as "Act of Insurance against Industrial Injury" and "Product Quality Law" in China. (Note 11) In addition, large infra-structure projects now depend increasingly on private financing. Both principals and contractors are being confronted financial risk exposure following the shift from governmental funding programs to private funding schemes. These conditions compel the parties involved to acquire the possible insurance cover. But although it is difficult to purchase appropriate coverage through the Chinese insurance markets, direct insurers cannot deal with foreign reinsurers without permission of CIRC according to Reinsurance Regulations effect on 2004. (Note 12) This will continue for a while, so both underwriters and other parties have to solve the problem in domestic insurance markets. These conditions have prompted a sharp rise in demand for new types of catastrophe securities. Securitization can also be driven by large scale corporations that issue catastrophe securities directly in capital markets bypassing the insurance and reinsurance markets.

There are a number of factors that can affect the success or failure of catastrophe securitization offerings in China. One factor is credit risk that the contracting party to the transaction will fail to when the triggering event occurs. The credit risks of catastrophe bonds and exchange traded options are low. But the credit risk of catastrophe equity put options is relatively high because the puts traded are not issued through an organized exchange much like traditional reinsurance. So it is important that organized exchanges control the credit risk through appropriate instruments. Another important factor in securitization is moral hazard. Moral hazard can be occurred that the insurer will write too much insurance in regions protected by the catastrophe securities. In most catastrophe bonds, moral hazard is dealt with by including percentage coinsurance in which the insurer collects only certain percentage of its catastrophe losses. The purpose of the coinsurance is to reassure bondholders that the insurer will not act against their interests. Another method to prevent moral hazard is to use index-based contracts. The moral hazard of index-based contracts is very low because they can eliminate moral hazard through the parametric criterion. One of the most important factors in catastrophe securities is basis risk. Basis risk is the risk that the payoff of the catastrophe securities will be less than perfectly correlated with an insurer's losses. When the payoff is based on an index, the insurer will collect more or less than it expects. Various studies is being made to solve the basis risk problems. (Note 13)

Li and Wu also point out several problems for developing of Chinese insurance industry: the issue mechanism of securitization have to change, the domestic financial market should provide a better exchange environment to securitized products, and the securitized products make more challenges for regulations. (Note 14)

Although the catastrophe securities issued to date have been private placements, the development of a public market is within the next decade. The standardization and simplification of the contracts are necessary for the development of a public market. Publicly traded catastrophe security could be issued on a wide range of events throughout the world. Recently, a guideline for securitization has been announced by the China Bank Regulatory Commission (CBRC) and the China Securities Regulatory Commission (CSRC). Following Japan and Korea that already have the law of asset-backed securitization, it is expected that a similar legislation will be passed in China. The catastrophe securitization will also affect the role of (re)insurers. Traditionally, (re)insurers have played the role of underwriters and

ultimate risk bearers for their policyholders. In the future, (re)insurers will bear less of risks directly and lay of higher proportion of risk to the catastrophe security markets. The widespread securitization of other types of insurance such as automobile, liability and life insurance will emerge in the near future. However, catastrophe securities will not replace traditional insurance cover but rather supplement them.

## 5. Conclusion

Over the past two decades, life and non-life insurance premiums have risen annually by 25% and 12% respectively in China. As a result, China is the 6<sup>th</sup> largest life insurance markets and 10<sup>th</sup> in terms of non-life insurance worldwide. The premium growth is expected to remain strong at 20% per year in the next decade due to robust economic growth, increased stability, favorable regulatory as well as new product offerings and distribution channels. On the other hand, China has suffered from various man-made and natural catastrophes. The policyholders' exposure to catastrophes is constantly increasing because demographic trends and rising property value are escalating the concentration risk in catastrophe-prone areas. Furthermore, catastrophe exposures in the future are great for the capital beyond any figures previously imagined. But policyholders have faced that no cover is available for catastrophic risks due to a lack of capacity on the (re)insurance markets. The Chinese government considers thus to set up catastrophe funds and to allow various kinds of catastrophe securities such as catastrophe bonds and insurance derivatives. Corporates also have recognized that better risk management practices have a positive effect on their earnings, and tried to import high-level risk management practices from developed countries.

The securitization of insurance risk has the potential to rapidly alter the China's risk management landscape. The customers such as policyholders, (re)insurers, investment banks and investors start demanding more innovative and customized solutions for risk management. However, the traditional insurance can not meet their needs because of its structural inefficiency such as information asymmetry, adverse selection, moral hazard, credit risk and capacity limitation. This is paving way the development of the catastrophe securities market in China. Through the development of the catastrophe securities markets, policyholders can be protected from (re)insurer's credit risk, (re)insurers can overcome the limitation of capacity, and investors can diversify their portfolios. The growth and survival of the catastrophe securities market in China lies in coming up with the products to suit the diverse needs of various customers and act as a close substitute for the traditional (re)insurance market.

## References

- The Association of Chartered Treasury Managers, *Alternative Risk Transfer*. (2000).
- China Insurance Regulatory Commission, *Economic Review for 21th Century*. (2004). 12.
- Coffin, Bill. (2003). *The Captives Migration*, Risk Management Magazine, August.
- Culp, Christopher L. (2006). *Structured Finance and Insurance: The ART of Managing Capital and Risk*, John Wiley and Sons, Inc..
- Cummins, J. David. (2007). *CAT Bonds and Other Risk-Linked Securities: State of the Market and Recent Developments*, working paper.
- Doherty, Neil A. (1997). *Financial Innovation in the Management of Catastrophe Risk*, Journal of Applied Corporate Finance, Volume 10, No. 3, Fal.
- Hull, John C. (2004). *Options, Futures, and Other Derivatives* (6th Edition), Prentice Hall.
- Jang, Jong-Hag. (2005). *The SWOT Analysis of Chinese Insurance Industry*, Yanbian University of Science & Technology Research Center.
- Jang, Jong-Hag. (2005). *The Prospect of Alternative Risk Transfer Market in China*, International Symposium, Yanbian University of Science & Technology.
- Kim, Du-Chel, (2005). etc., *Risk Management and Crisis Management*, Hyung Seul Press.
- Korea Insurance Development Institute, *The Prospect of Finite Reinsurance in Korea*, CEO Report 2002.
- Lane, Morton N. and Beckwith, Roger. (2001). *Current Trends in Risk-Linked Securitizations*, Risk Management, August.
- Li Li Song and Wu Jun. (2009). *The Catastrophe Securitization in China*, Journal of Insurance Professional College, June.
- Ma Shi. (2004). *Alternative Risk Transfer in China: Feasibility and Market Potential*.
- National Bureau of Statistics of China, *China Statistical Yearbook 2009*.
- Park, Whon-II. (2000). *Asset Backed Securitization*, Kyung Hee University, College of Law.

Skipper, Harold D. and Kwon, W. Jean. (2007). Risk Management and Insurance: Perspectives in a Global Economy, Blackwell Publishing.

Swiss Re. (2008). Insurance-Linked Securities, sigma No.2.

Swiss Re. (2009). Natural catastrophes and man-made disasters in 2008, sigma No.29.

Swiss Re. (2006). Securitization: new opportunities for insurers and investors, sigma No.79.

Swiss Re. (2003). The Picture of ART, sigma No.19.

Swiss Re. (2009). World Insurance in 2008, sigma No.39.

Tillinghast Towers Perrin, (2003). Captive Insurance Company Directory.

Warfel, William J. (2003). Reforming Risk Retention Groups, Risk Management Magazine.

## Notes

Note 1. The loss ratio for property insurance for 1992, 1994, 2001, 2003 and 2008 are very high reflecting catastrophic losses caused by Hurricane Andrew, Northridge Earthquake, Terrorist Attack on WTC, SARS and Si-Chuan Earthquake respectively.

Note 2. Cummins, J. David, CAT Bonds and Other Risk-Linked Securities: State of the Market and Recent Developments, working paper, 2007, p. 17.

Note 3. Warfel, William J., Reforming Risk Retention Groups, Risk Management Magazine 2003.

Note 4. Doherty, Neil A., Financial Innovation in the Management of Catastrophe Risk, Journal of Applied Corporate Finance, Volume 10, No. 3, Fall 1997, pp. 84-95.

Note 5. Swiss Re, The Picture of ART, sigma No.1/2003, pp 12-13.

Note 6. Cummins, J. David, CAT Bonds and Other Risk-Linked Securities: State of the Market and Recent Developments, working paper, 2007, pp. 17-20.

Note 7. Swiss Re, World Insurance in 2008, sigma No.3/2009, pp. 25-37.

Note 8. Swiss Re, Natural catastrophes and man-made disasters in 2008, sigma No.2/2009, pp. 11-13.

Note 9. Jang, Jong-Hag, The Prospect of Alternative Risk Transfer Market in China, International Symposium, Yanbian University of Science & Technology (YUST), 2005, p. 13.

Note 10. A Japanese insurer made a 2 million US dollar contract with a Swiss insurer at 2004.

Note 11. Ma Shi, Alternative Risk Transfer in China: Feasibility and Market Potential, 2004. 11.

Note 12. China Insurance Regulatory Commission, Economic Review for 21st Century, 2004. 12.

Note 13. China Insurance Regulatory Commission, Economic Review for 21st Century, 2004. 12.

Note 14. Cummins, J. David, CAT Bonds and Other Risk-Linked Securities: State of the Market and Recent Developments, working paper, 2007, pp. 18-20.

Note 15. Li Li Song and Wu Jun, The Catastrophe Securitization in China, Journal of Insurance Professional College, June 2009, pp. 5-8.

Table 1. Features of ART

Classify	Instrument	Feature
Captive Insurance	Captive Insurance	A captive is an (re)insurance vehicle that belongs to a company or group of companies that is not active in insurance industry itself, but mainly created to insure the risks of its parent company.
	Risk Retention Group (RRG)	RRG is a cooperative insurance entity or association captive made up for owners engaged in similar business practices and facing similar liability exposures. (Note 3)
Finite Risk	Multi line/ Multi year Products (MMP's)	The concepts of combining different categories of risk into one product over several years.
	Multi-trigger Products (MTP's)	Claims are only paid if in addition to an insurance event (first trigger) during the term of policy, a non-insurance event (second trigger) must also occur.
	Contingent capital	The raising of capital at pre-agreed terms is linked to the occurrence of an insurance event.
Catastrophe Security	Catastrophe Bonds	A ceding company will work with a special purpose reinsurance vehicle (SPV) that both assumes the ceding company's catastrophe exposure and issues the bonds to fund losses arising from this exposure.
	Insurance Derivatives	Instruments such as futures and options for natural catastrophe risks whose value is determined by the performance of an insurance specific index.

Source: The Association of Chartered Treasury Managers, Alternative Risk Transfer, 2000

Table 2. Top Ten Countries in Emerging Markets (Unit: USD Millions)

Life Insurance	Premium Volume	Emerging Market Share	Non-life Insurance	Premium Volume	Emerging Market Share
China	58,673	26.4%	China	33,810	17.0%
India	51,332	23.0%	India	28,973	14.6%
South Africa	34,430	15.5%	South Africa	20,501	10.3%
Brazil	18,533	8.3%	Brazil	9,763	4.9%
Poland	7,950	3.6%	Poland	8,345	2.4%
Mexico	7,653	3.4%	Mexico	7,677	3.9%
Malaysia	5,573	2.5%	Malaysia	7,402	3.7%
Indonesia	4,728	2.1%	Indonesia	7,201	3.6%
Thailand	4,521	2.0%	Thailand	6,977	3.5%
Chile	3,792	1.7%	Chile	44,71	2.2%
Total	197,177	88.6%	Total	129,619	68.0%

Source: Swiss Re, sigma No.5/2008

Table 3. Top Ten Catastrophe Disasters in China (Unit: USD Millions)

Date	Place	Event	Losses
2008. 5. 12	Si-Chuan	Earthquake	126,134
2008. 1	Southern China	Snowstorm	21,000
2002. 11-2003. 7	All Areas	SARS	17,900
1998. 7	Chang-Jiang Area	Flood	17,694
1999. 9. 21	Taiwan	Earthquake	9,200
1991. 6-7	Huai-He Area	Flood	4,146
1976. 7. 28	Tang-Shan	Earthquake	1,220
1975. 8	He-Bei Province	Flood	1,220
1954. 7	Chang-Jiang Area	Flood	1,220
2002. 7	Yun Nan Province	Flood	500

Source: National Bureau of Statistics of China, China Statistical Yearbook 2009

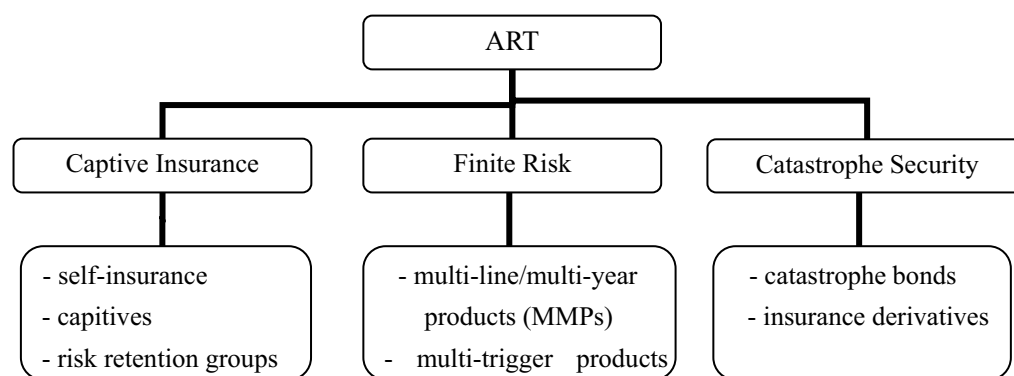


Figure 1. Types of ART

Source: Swiss Re, sigma No.2/2008

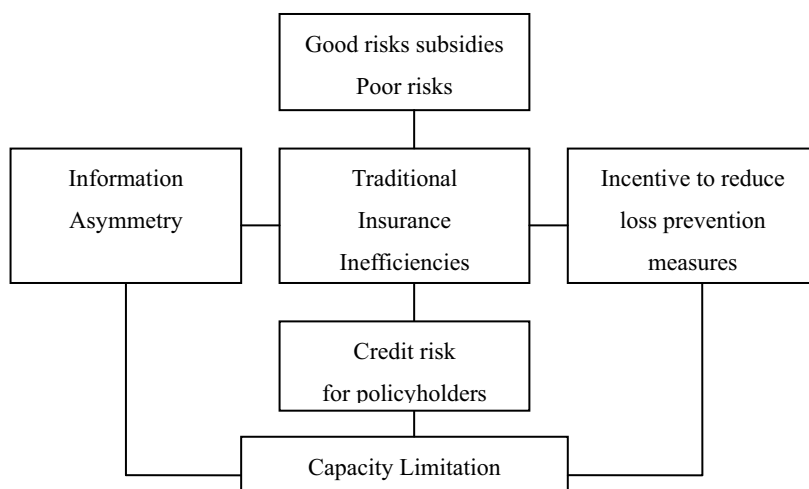


Figure 2. Structural Inefficiencies of Traditional Insurance

Source: Swiss Re Economic Research & Consulting





## Job Satisfaction of Faculty Members in Private Universities -In Context of Bangladesh

Taskina Ali (Corresponding author)

Senior Lecturer, Department of Business Administration, East West University

43, Mohakahli, Dhaka Bangladesh

Tel: 88-0171-504-0592 E-mail: [taskina.ali@gmail.com](mailto:taskina.ali@gmail.com)

Ireen Akhter

Assistant Professor, Department of Business Administration.,

Jahangirnagar University, Savar, Dhaka, Bangladesh.

Tel: 88-0171-134-5773 E-mail: [ireen\\_sm@yahoo.com](mailto:ireen_sm@yahoo.com)

### Abstract

Job satisfaction is one of the most widely discussed issues in organizational behavior, personnel and human resource management and organizational management. As teaching does require a great deal of thoroughness and commitment, so in teaching it is more important to have mental commitment and loyalty than physical presence. In this study the researchers investigated the present level of job satisfaction among the faculty members of private universities of tertiary level in Bangladesh. Based on a survey, it attempts to gain insights into the satisfaction levels from the perspective of the private university teachers. The study concluded with the facts that faculty members are overall satisfied with their present condition, except the factors like- training facilities, and some physical facilities and distribution of courses. Further it has been found that there is no significant difference between male and female faculty members regarding job satisfaction. As the job itself is not gender bias by nature so it does not play a crucial role for female faculty members while working under masculine culture. The researchers summed up with view that universities may give more attention to motivate and maintain these human resources to make them more contented and to make the most of their effort by ensuring overall excellence of organization.

**Keywords:** Job satisfaction, Faculty members, Tertiary level, Job descriptive index.

### 1. Background of the Study

Around the globe it is an established fact that a person with a high level of job satisfaction has a positive attitude towards the job, while a person who is dissatisfied with the job has a negative attitude. When people speak of employee attitude, they usually are referring to job satisfaction (Stephen P. Robbins, Mary Coulter, 2004). Job satisfaction has been defined by Locke (1976), as “. . . a pleasurable or positive emotional state resulting from the appraisal of one’s job or job experiences”. Edwin A. Locke’s Range of Affect Theory (1976) is arguably the most famous job satisfaction model. The main premise of this theory is that satisfaction is determined by a discrepancy between what one wants in a job and what one has in a job. An early form of job satisfaction theory held that all elements of one’s work environment contributed in additive fashion to the total job satisfaction which one realized. Job satisfaction has been considered as a component of organizational commitment. (Kovach, 1977), Spector (1997) believes that job satisfaction “can be considered as a global feeling about the job or as a related constellation of attitudes about various aspects or facets of the job”. There is some evidence in the literature that state moods are related to overall job satisfaction (Roberson L., 1989). Positive and negative emotions were also found to be significantly related to overall job satisfaction (Fisher D., 2000). Numerous studies have shown that dissatisfied employees are more likely to quit their jobs or be absent than satisfied employees (e.g., Hackett & Guion, 1985; Hulin, Roznowski, & Hachiya, 1985; Kohler & Mathieu, 1993).

Extensive study has shown that job satisfaction has a direct impact on the performance of employees in different levels of profession. It is related to employee motivation and performance (Ostroff, 1992). For any company or enterprise this job satisfaction of total workforce plays a vital role and with a group of satisfied worker institutions can successfully implement their plan. Job satisfaction is one of the most widely discussed issues in organizational behavior, personnel and human resource management and organizational management. In simple terms, it is the extent to which one feels good about the job. Job satisfaction is in regard to one’s feelings or state of mind regarding to the nature of their work (Shamima Tasnim, 2006).

According to the human behavior, people are more interested to work in those companies and service organizations from where they get mental satisfaction. Study found that politics-free work environment is significantly correlated to

job satisfaction of employees (Pathik and Pestonjee 1997). The work situation also matters in terms of job satisfaction and organization impact. Research studies across many years, organizations, and types of jobs show that when employees are asked to evaluate different facets of their job such as supervision, pay, promotion opportunities, coworkers, and so forth, the nature of the work itself generally emerges as the most important job facet (Judge & Church, 2000; Jurgensen, 1978).

The source of this job satisfaction not only arises from the job but also from the other factors like- work environment (both physical and social), relationship with supervisors & peers, corporate culture, managerial style. These factors have different impact on different people and in practical world it is an established fact that gender differences also influence the job satisfaction level. Herzberg, Mausner, Peterson, and Capwell (1957) observe that "the comparison of job attitudes between men and women is of less interest than a study of the effects of the societal roles of men and women on their attitudes toward jobs." They suggested that the job attitudes of the sexes depend essentially on the same determinants, but that the determinants vary in the intensity of their effects. Hulin and Smith (1964) maintain that if sources of correlated bias, such as pay, job level, promotional opportunities, and societal norms, are held constant or partially out, sex differences in job satisfaction will disappear, and they (Hulin and Smith, 1965) caution investigators "to draw distinctions between male and female."

Herzberg et al (1957) reported that the job adjustment of female workers is often made more difficult because they must divide their interests and attention between the working world and their traditional role and that the social and psychological pressures toward marriage complicate the job attitudes of the unmarried female. They take up their jobs primarily for their livelihood, which is conditioned by job satisfaction (Locke, 1976). On the other hand, Campbell (1976) reported that single men are less job satisfied than married men, but that no such difference exists for females. Lacy, Bokemeier and Shepard (1983) find no differences in the consequences of gender-specific childhood socialization for job satisfaction. Nor do they find that a wide range of job characteristics differentially affect the work attitudes of men and women. Where gender differences in work attitudes have been found in the analysis of Murray and Atkinson (1981) that women weight relations with coworkers more heavily and that men weight advancement more heavily, and these differences have been relatively small.

A variety of job characteristics are evaluated to see to what extent men and women differentially value various aspects of their jobs. These characteristics include occupational prestige, earnings, education, job complexity, level of authority exercised, how closely the worker is supervised, job pressure, being held responsible for things outside one's control, how frequently one has to get dirty on the job, being underemployed, workplace size, and level of optimism about one's future at the current job. Relationship with the supervisor is also an important factor influencing the employees. According to Herzberg et al. (1952), it is a hygiene factor that may lead to job dissatisfaction. Employees in organizations are often attracted to their supervisors for different reasons. These relationships are called functional and entity relationships (Locke, 1976). Functional relationships between supervisor and subordinate are based on which services can be provided for each other. An employee may be attracted to his or her supervisor to a degree that he or she views the supervisor or helping to attain salient job values (Locke, 1970). These values are normally related, or are related to the rewards the employee can accrue for task performance. Again, welfare (wellness) programs including benefits, bonus, overtime, transport allowance, medical allowance, etc., have positive relationships with job satisfaction of employees (Bonner 1997).

While the dimensions of job satisfaction appear fairly clear, the causal agents of satisfaction are far less so. Certainly, variables such as opportunity to participate in decision making (Daly, McCroskey, & Falchion, 1976, Vroom, 1964), job enlargement (Argyris, 1964), job enrichment (Herzberg, 1966), working conditions (Barnowe 1972), and the individual's perceptions of his or her success and the internal-external feedback one receives from his or her performance (Hackman & Lawler, 1971), all have some effect.

These and related measures of job and organizational characteristics have a long history of use in the literature on job satisfaction and have been consistently identified as major determinants of job satisfaction (Parnes, Shea, Spitz, and Zeller 1970; Quinn, Staines, and McCullough 1974). Actually, Job satisfaction results from the balancing and summation of many specific likes and dislikes of employees experienced over a period of time through gaining more and more information about the workplace (Huang 1999; Ganguli 1994).

A popular measure of job satisfaction- the Job Descriptive Index (JDI) – measure satisfaction in terms of five aspects of a person's job: pay, promotion, supervision, the work itself, and co-workers (Hellriegel and Woodman, 1995). There is even some evidence that job satisfaction positively influence organizational citizenship behavior (Organ and Ryan, 1995). In academic institution, Clarke and Keating (1995) discovered that interaction with students was the most satisfying aspect for teachers, while lack of administrative support was the least satisfying aspect. Perkins (1991) also found that teachers are most satisfied with their co-workers and least satisfied with monetary aspects of teaching. Universities that have overall salary levels that are externally competitive are more likely to have faculty members that are more satisfied with their jobs and with their pay (Terpstra and Honoree, 2004). This was also confirmed by Faruqui

and Shoma, (2005) that the most dissatisfactory issues for faculty are salary structure and untimely payment, students' quality, and the prolonged working hours.

Recently in Bangladesh private universities are greatly contributing to the higher level education because it was felt by all that the existing public universities are not enough to meet the growing demand of our students. They are providing international standard course curriculum, which helps the domestic students to study at their own home relatively at a lower cost. But they can avail the international standard degrees. In these private universities a large number of male/female faculty members are rendering their services who have national as well as international higher degrees and also having high experiences. A career in education is challenging and its impact is important. As teaching does require a great deal of thoroughness and commitment, so in teaching it is more important to have mental commitment and loyalty than physical presence (Akhter, Muniruddin & Sogra 2008). But if these faculty members are not satisfied with their profession they will not be able to increase their performance and thus will not contribute to education sector of Bangladesh. Therefore, the focus of this study is to reveal the level of job satisfaction of faculty members in private universities of Bangladesh.

## **2. Research Objectives:**

The purpose of this study is to find out the perceived job satisfaction of faculty members of different private universities of Bangladesh. The study has identified:

- The general profile of the faculty members.
- The present level of job satisfaction of faculty members of tertiary level.
- The comparison of the satisfaction level between male and female faculty members in various private universities of Bangladesh.
- Whether the masculine cultures causes any dissatisfaction among female faculty members.

## **3. Research Methods:**

### *3.1. Sources of Data:*

Comprehensive research work has been conducted to achieve the aforesaid objectives of the study. Both primary and secondary data have been used for the purpose of this study. To collect primary data a structured questionnaire was designed in the light of the objectives of the study. Faculty members from different levels of different private universities were requested to fill the questionnaire. Secondary data were collected from available books, publications, research studies, journals, websites and articles on job satisfaction of employees of different professions, including academic institutions.

### *3.2 Sample Size and Location:*

A list of private universities in Bangladesh has been taken from the University Grant Commissions (UGC). According to that list total 51 private universities (till date 23/07/09) are currently operating in Bangladesh. The sample of the study covers the faculty members from different private universities of Bangladesh. A sample of 120 [N=120] faculty members where 60 male and 60 female (50% male and 50% female) selected purposively from different levels from 10 private universities (among 51 private universities) of different areas (Annexure-A) of Dhaka city. The researchers have chosen these areas for survey, as most of the private universities are situated mainly in those areas of Bangladesh. However, most of the private universities in other districts are branches of universities located in Dhaka city. Here the researchers would like to mention the reasons behind selecting private universities instead of public universities as public universities salary structure, HR policies are same but it varies with private universities. Other reasons private universities are operating in Bangladesh for almost last 17 to 18 years. So now it is in the growth stage and we can analyze its condition. At the same time researchers did not go for departmental analysis in respective universities because all the private universities do not have similar departments.

### *3.3 Questionnaire Design:*

A structured, closed- ended questionnaire (Annexure-C) was given to respondents for collecting their opinion regarding job satisfaction. The respondents were also asked about their sex, total years of education, academic rank, and total years of work experience.

### *3.4 Techniques Used:*

In terms of scaling method, a five point likert scale (5 for highly satisfied, 4 for satisfied, 3 for neither satisfied nor dissatisfied, 2 for dissatisfied and 1 for highly dissatisfied) has been used. For analysis of data, Microsoft Excel has been used. To entry data, coding option has been used at the initial stage. Both parametric and non-parametric statistical tools were used to derive a meaningful conclusion from the empirical data. In addition, basic statistical techniques of different measures of central tendency have been used in analyzing the data.

#### 4. Study Findings:

The population of the study was all faculty members of business school of private universities of Bangladesh. And the sample was consisted of faculty members of different levels (Professor-0.83%, Associate Professor-1.67%, Assistant Professor-19.16%, Senior Lecturer-5%, and Lecturer-73.33%). Majority of the faculty members are young (between 25 yrs to 40 yrs.) and only 14.16 % are more than 40 years of age. From this study it was found that only 11.67 percent of the faculty members have higher degrees like PhD and among them male are dominant (Annexure-B).

Table-1 lists the statements and average scores received for each statement for both male and female faculty members. The range of the average scores for the male respondents for twenty statements were between 2.67 to 4.3 and the average scores for the female respondents for twenty statements were between 2.07 to 4.42. Only in one cases (statement- S-15, "Faculty members are satisfied with present training system as well as training facilities") the mean scores (2.97) of male were equal to female faculty members. In case of four statements (S-2, S-3, S-14, S-18) the mean scores of male were less than female faculty members. Similarly in case of the rest 15 statements, the mean scores of male were higher than female faculty members. The range of the average scores for both male and female respondents for twenty statements was between 2.37 to 4.36. It is very interesting that both respondents are highly satisfied with interpersonal relationship with colleagues (mean score for male is 4.3, mean score for female is 4.42, and average mean score for both is 4.36) and highly dissatisfied with present placement and course distribution (mean score for male is 2.67, mean score for female is 2.07, and average mean score for both is 2.37). But the average mean score for both male and female is 3.29, which is somehow alarming for this sector.

Table-2 lists the comparative ranking based on the average score of the each group. Only five cases, (SA-13, SA-12, SA-10, SA-9 and SA-16) both groups placed (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> and 20<sup>th</sup> respectively) same ranking. Both groups are satisfied in same way with interpersonal relationship with their colleagues (ranked 1<sup>st</sup>), with family support (ranked 2<sup>nd</sup>), teachers and students relationship (ranked 3<sup>rd</sup>) and location of the universities (ranked 4<sup>th</sup>). Again both groups are most dissatisfied in same way with present placement and course distribution (ranked 20<sup>th</sup>). For rest of the 15 statements ranking varied for both male and female. These disparities suggest that male and female faculty members have different level of job satisfaction towards various factors.

Participation of women in different jobs in Bangladesh is increasing. Open market policy of the government and increasing educational trend among women has bought them to come forward to take this challenge of socioeconomic development. (Nazrul, 2000). The researcher designed five extra questions only for female respondents to find out the correlation (r) between male and female to show whether any masculine culture works while doing job in the same profession and almost from same background. In table-3, it is shown that for all statements (statements 21 to statements 25) the relationship between gender and other factors are strong. Though the female faculty members have less opportunity to work as of male faculty members does (mean 3.05) but at the same time female members are getting recognition of performance by their male counterparts (mean 3.33). Female faculty members do think that tough jobs are always given to male faculty members (mean 2.62) and as woman they are being kept aside in decision making (mean 2.22). Also, female faculty members do not think that male teachers show rigidity in opinion while female teacher's opinion is much better (mean 1.97). So the researcher can easily end up in to a decision that there is not great difference between male and female faculty members in their satisfaction level in the environmental and social context.

#### 5. Conclusion and Recommendations:

- This study mainly focused on satisfaction level of faculty members of different private universities. From this study it has been found that faculty members are satisfied in some areas like interpersonal skills, but at the same time dissatisfied in other areas like salaries, personal room, computer facilities, office room, wash room facilities, etc.
- The old adage "you get what you pay for" tends to be true when it comes to staff members. If individuals believe they are not compensated well, they will be unhappy. Normally this sector (universities) in our country provides less compensation compare to other sectors. Universities may offer comparable salaries and benefits to retain compatible faculty members.
- The environment in which people work has a tremendous effect on their level of pride for themselves and for the work they are doing. Even a nice chair can make a world of difference to an individual's psyche. Universities should look more to provide facilities like personal room with modern computer facilities to avoid overcrowding and allow them to use their own personal space so that they can give more time for their research work besides their regular class. They should also provide clean washroom facilities.
- Faculties are also dissatisfied with training facilities. Universities must also work to develop their faculty members. Training and development enable employees to perform their present jobs effectively and to prepare for future jobs.
- Faculty members are most dissatisfied with course allocation as they claim that sometimes it creates extra burden for them. Universities are not utilizing their expertise; rather courses are distributed depending on demand. In this case, it may not be possible to ignore the demand of any course, but faculty members may be informed earlier to take necessary

preparation before starting the semester.

- In this it was also studied whether gender plays any discrimination between male and female faculty members. As the nature of the job itself is not that much discriminatory, gender does not play any critical role here. Female faculty members thought that they have same opportunity to work as of male teacher does and they are also get recognition from their male counterpart for their performance. But the mean scores are not that much satisfactory. So universities may give more room for female faculty members. As this is the place to sell knowledge and expertise, female faculty members can make more contribution if they are utilized properly.
- At the end of the research the researchers may sum up with view that universities may give more attention to motivate and maintain these human resources to make them more contented and to make the most of their effort by ensuring overall excellence of organization.

Insert Table 1, Table 2, Table 3 Here

## References

- Akhter I, Muniruddin G, and Sogra K. J., (2008) "A Trend Analysis of Faculty Turnover at the Private universities in Bangladesh: A Business School Perspective" *Journal of Business Studies*, Vol. IV, No.1.
- Argyris, C. (1964) *Integrating the Individual and the Organization*. New York: Wiley.
- Barnowe, J.T. (1972) *The relative importance of job facets as indicated by an empirically derived model of job satisfaction*. Survey Research Center, University of Michigan, Ann Arbor.
- Bonner, m. (1997). *Stages of Change, Job Satisfaction, Weight, and Activity at Two Work-Site Wellness Programs*, Doctoral Dissertation, The University of Southern Mississippi, USA.
- Brief, (1998) cited in Weiss, H. M. (2002). *Deconstructing job satisfaction: separating evaluations, beliefs and affective experiences*. *Human Resource Management Review*, 12, 173-194, p. 174
- Clarke, R., and Keating, W. F. (1995). *A fresh look at teacher job satisfaction*. ERIC document Reproduction Service No. ED 391-795.
- Campbell, A., P. E. Converse, and W. L. Rodgers. (1976) *The Quality of American Life* (New York: Russell Sage,).
- Daly, J.A., McCroskey, J.C., & Falcione, R.L. (1976) *Communication apprehension, supervisor communication receptivity and satisfaction with superiors*. Paper presented at the annual meeting of the Eastern Communication Association, Philadelphia.
- Fisher D. (2000). *Mood and Emotions while Working: missing pieces of job satisfaction?* *Journal of Organizational Behavior* 21, 185-202
- Faruqui, G.A and Islam, S. (2005) *Evaluation of faculty's job satisfaction in private universities*, *Journal of Business Studies*, 1(2):67-82.
- Ganguli, H.C. (1994). *Job Satisfaction Scales for Effective Management: Manual for Managers and Social Scientists*, Concept Publishing Company, New Delhi.
- Hackett, R. D., & Guion, R. M. (1985). *A re-evaluation of the absenteeism-job satisfaction relationship*. *Organizational Behavior and Human Decision Processes*, 35, 340-381.
- Hackman, J.R., & Lawler, E.E. (1971) *Employee reactions to job characteristics*. (Monograph) *Journal of Applied Psychology*, 55, 259-286.
- Hellriegel, D., Slocum, Jr. W. J., and Woodman, W.R (1995) *Organizational Behavior*. St. Paul: West Publishing Company.
- Herzberg, F., B. Mausner, R. O. Peterson, and D. F. Capwell (1957). *Job Attitudes: Review of Research and Opinion* (Pittsburgh, Pa.: Psychological Service of Pittsburgh).
- Herzberg, F. (1966.) *Work and the Nature of Man*. Cleveland: World.
- Herzberg, F., Mausner, B. and Synderman, B., (1952). *The Motivation to Work*, John Wiley and Sons, New York.
- Huang, H.J. (1999). "Job Rotation from the Employees' Point of View", *Research and Practice in Human Resource Management*, 7(1):76.
- Hulin. C. L., and P. C. Smith. (1964) "Sex Differences in Job Satisfaction," *Journal of Applied Psychology*, Vol. 48, 88-92.
- Hulin, C. L., and P. C. Smith, (1965) "A Linear Model of Job Satisfaction," *Journal of Applied Psychology*, Vol. 49, 209-216.

- Hulin, C. L., Roznowski, M., & Hachiya, D. (1985). *Alternative opportunities and withdrawal decisions: Empirical and theoretical discrepancies and integration*. Psychological Bulletin, 97, 233–250.
- Judge, T. A., & Church, A. H. (2000). *Job satisfaction: Research and practice*. In C. L. Cooper & E. A. Locke (Eds.), *Industrial and organizational psychology: Linking theory with practice* (pp. 166–198). Oxford, UK: Blackwell.
- Jurgensen, C. E. (1978). *Job preferences (What makes a job good or bad?)*. Journal of Applied Psychology, 63, 267–276.
- Kohler, S. S. & Mathieu, J. E. (1993). *An examination of the relationship between affective reactions, work perceptions, individual resource characteristics, and multiple absence criteria*. Journal of Organizational Behavior, 14, 515–530.
- Kovach, K.A. (1977). *Organizational size, job satisfaction, absenteeism, and turnover*. Washington, D.C. University Press of America
- Lacy, William B., Janet L. Bokemeier, and Jon M. Shepard. (1983). "Job Attribute Preferences and Work Commitment of Men and Women in the United States." *Personnel Psychology* 36 315-329.
- Locke, (1976), A. P., & Weiss, H. M. (2001). *Organizational behavior: Affect in the Workplace*. Annual Review of Psychology, 53, 279-307, p. 282.
- Locke, E.A. (1965) *The Relationship of Task Success to Task Liking and Satisfaction*. Journal of Applied Psychology, 49, 379-385.
- Locke, E.A. (1970). *Job satisfaction and job performance: A theoretical analysis*. *Organizational Behavior and Human Performance*, 5, 484-500 (b).
- Locke, E.A. (1970) *The supervisor as "motivator": His influence on employee performance and satisfaction*. In B.M. Bass, R. Cooper, and J.A. Hass (Eds.), *Managing for accomplishment*. Lexington: 57-67.
- Murray, Michael A., and Tom Atkinson. (1981). "Gender Differences in Correlates of Job Satisfaction." *Canadian Journal of Behavioral Science* 13,1 : 44-52.
- Nazrul Islam, Gour Chandra Saha, Feroz (2000) Ahmed, *An evaluation of job satisfaction of women employees in commercial banks in Bangladesh*, *Journal of Business Administration*, Vol. 26, No. 3 & 4, July & October, 2000), Institute of Business Administration, University of Dhaka.
- Organ, D.W. and Ryan, K. (1995) *A meta-analytic review of attitudinal and dispositional predictors of organizational citizenship behavior*. *Personnel Psychology*. 48: 775-803.
- Ostroff, C. (1992). *The relationship between satisfaction, attitudes, and performance: An organizational level analysis*. *Journal of Applied Psychology*, 77: 963-974.
- Parnes, Shea, Spitz, and Zeller (1970). *Gender Differences in Job Satisfaction*. *The Sociological Quarterly*; Volume 30, Issue 3. Page 385-399.
- Pathik, R.D. and Pestonjee, D. D. (1997). *Organizational Politics Orientation as Related to Job Satisfaction, Job Involvement and Job Anxiety among Research and Development Personnel*. *South Asian Journal of Management*, pp. 39-44.
- Perkins, C. M. (1991) *A study to investigate experienced teachers Job satisfaction and the teachers' perception of their principals' leadership style* *Doctoral Dissertation*, The University of North Carolina at Chapel Hill. Dissertation abstracts International, 52, A4171.
- Quinn, Robert, G. Staines, and B.C. McCullough. (1974). *Job Satisfaction: Is There a Trend?* Washington, D.C.: U.S. Government Printing Office.
- Roberson L. (1989). *Job attitude organization: an exploratory study*. *Journal of Applied Social Psychology* 19: 717±727.
- Shamima Tasnim, (Spring 2006). *Job Satisfaction among Female Teachers: A study on primary schools in Bangladesh*. M.Phil. The University of Bergen, Bergen, Norway.
- Spector, P.E. (1997) *Job Satisfaction: Application, assessment, cause and consequences*. Thousand Oaks, CA: Sage Publications, Inc.
- Stephen P. Robbins, Mary Coulter, (January 14, 2004). *Management*, Eight edition, Pearson Prentice Hall.
- Terpstra, David E, Honoree, Andre L (2004) *Job satisfaction and pay satisfaction levels of university faculty by discipline type and by geographic region*, Education, Accessed on 15.01.2008.
- Vroom. V.H. (1964). *Work and Motivation*. New York: Wiley.
- .<[http://findarticles.com/p/articles/mi\\_qa3673/is\\_200404/ai\\_n9345191](http://findarticles.com/p/articles/mi_qa3673/is_200404/ai_n9345191)> [www.ugc.gov.bd/private\\_universities](http://www.ugc.gov.bd/private_universities).

Table 1. Job Satisfaction Level of Faculty Members

	Job Satisfaction Level of Faculty Members	M Score Mean	F Score Mean	Mean Difference	Average Score Mean
S-1	Faculty members are satisfied with the present salary structure	3.17	3.12	0.05	3.15
S-2	Faculty members are satisfied with present academic qualification	3.37	3.60	-0.23	3.48
S-3	Faculty members are satisfied with present social status as a teachers	3.30	3.47	-0.17	3.38
S-4	Faculty members are satisfied with classroom	3.37	2.95	0.42	3.16
S-5	Faculty members are satisfied with office room	3.23	2.65	0.58	2.94
S-6	Faculty members are satisfied with personal room	3.10	2.37	0.73	2.73
S-7	Faculty members are satisfied computer facilities	3.00	2.87	0.13	2.93
S-8	Faculty members are satisfied with washroom facilities	3.27	2.57	0.70	2.92
S-9	Faculty members are satisfied with well communication and location of the university	3.90	3.82	0.08	3.86
S-10	Faculty members are satisfied with teacher and student relationship	4.10	3.88	0.22	3.99
S-11	Faculty members are satisfied with university managing committee	3.50	3.40	0.10	3.45
S-12	Faculty members are satisfied with family support	4.17	3.93	0.23	4.05
S-13	Faculty members are satisfied with interpersonal relationship with colleagues	4.30	4.42	-0.12	4.36
S-14	Faculty members are satisfied with career prospect of this job	3.27	3.28	-0.02	3.28
S-15	Faculty members are satisfied with present training system as well as training facilities	2.97	2.97	0.00	2.97
S-16	Faculty members are satisfied with present placement and course distribution.	2.67	2.07	0.60	2.37
S-17	Faculty members are satisfied with current supervision style ( by dept. chairman )	3.77	3.32	0.45	3.54
S-18	Faculty members are satisfied with permanency of the job	2.73	3.28	0.55	3.01
S-19	Faculty members are satisfied with power distance between faculty members and central administration.	3.03	3.00	0.03	3.02
S-20	Faculty members are satisfied with power distance between chairman and central administration	3.30	3.05	0.25	3.18
	AVERAGE	3.38	3.2	0.18	3.29

Notations: M=Male faculty members, F= Female faculty members.

Table 2. Comparative Ranking of Statements (strongest to weakest)

	Job Satisfaction Level of Faculty Members	Average Male (50%)	Average Female (50%)
S-13	Faculty members are satisfied with interpersonal relationship with colleagues	1 <sup>st</sup>	1 <sup>st</sup>
S-12	Faculty members are satisfied with family support	2 <sup>nd</sup>	2 <sup>nd</sup>
S-10	Faculty members are satisfied with teacher and student relationship	3 <sup>rd</sup>	3 <sup>rd</sup>
S-9	Faculty members are satisfied with well communication and location of the university	4 <sup>th</sup>	4 <sup>th</sup>
S-17	Faculty members are satisfied with current supervision style ( by dept. chairman )	5 <sup>th</sup>	8 <sup>th</sup>
S-11	Faculty members are satisfied with university managing committee	6 <sup>th</sup>	7 <sup>th</sup>
S-2	Faculty members are satisfied with present academic qualification	7 <sup>th</sup>	5 <sup>th</sup>
S-4	Faculty members are satisfied with classroom	8 <sup>th</sup>	15 <sup>th</sup>
S-20	Faculty members are satisfied with power distance between chairman and central administration	9 <sup>th</sup>	12 <sup>th</sup>
S-3	Faculty members are satisfied with present social status as a teachers	10 <sup>th</sup>	6 <sup>th</sup>
S-8	Faculty members are satisfied with washroom facilities	11 <sup>th</sup>	18 <sup>th</sup>
S-14	Faculty members are satisfied with career prospect of this job	12 <sup>th</sup>	10 <sup>th</sup>
S-5	Faculty members are satisfied with office room	13 <sup>th</sup>	17 <sup>th</sup>
S-1	Faculty members are satisfied with the present salary structure	14 <sup>th</sup>	11 <sup>th</sup>
S-6	Faculty members are satisfied with personal room	15 <sup>th</sup>	19 <sup>th</sup>
S-19	Faculty members are satisfied with power distance between faculty members and central administration.	16 <sup>th</sup>	13 <sup>th</sup>
S-7	Faculty members are satisfied computer facilities.	17 <sup>th</sup>	16 <sup>th</sup>
S-15	Faculty members are satisfied with present training system as well as training facilities.	18 <sup>th</sup>	14 <sup>th</sup>
S-18	Faculty members are satisfied with permanency of the job.	19 <sup>th</sup>	9 <sup>th</sup>
S-16	Faculty members are satisfied with present placement and course distribution.	20 <sup>th</sup>	20 <sup>th</sup>

Table 3. Job Satisfaction Level of Female Faculty Members.

	Job Satisfaction Level of Female Faculty Members	F Score Mean	Mean Difference	r-value
S-21	Female faculty has same opportunity to work as of male teacher does	3.05	0.41	.807
S-22	Female faculty members get recognition from their male counterpart for their performance	3.33	0.70	.854
S-23	The rigorous or the tough jobs are always assigned to the male teacher	2.62	-0.02	.835
S-24	Female faculty members are kept aside in important decision making because of being an woman	2.22	-0.42	.829
S-25	Male teachers show rigidity in opinion while female teacher's opinion is much better	1.97	-0.67	.754

Note: Average Score Mean (All) is 2.637

## Appendix

### Appendix-A: Samples in Terms of Institutions and Gender

Areas Covered	No.	Name of Institution	No. of Samples	Male	Female
A. Uttara, Banani, & Mohakhali	1	North South University	12	6	6
	2	East West University	12	6	6
	3	BRAC University	12	6	6
	4	South East University	12	6	6
	5	Asian University of Bangladesh	12	6	6
B. Mirpur, Mohammadpur & Dhanmondi	6	University of Asia Pacific	12	6	6
	7	Stamford University	12	6	6
	8	World University of Bangladesh	12	6	6
	9	Daffodil International University	12	6	6
	10	Northern University of Bangladesh	12	6	6
		Total	120 (100%)	60 (50%)	60 (50%)



Source: primary source

# Appendix -B: Features of the Respondents

Characteristic		Male		Female		All		All
Sample	Respondents	M	%	F	%	All	%	%
		60	50	60	50	120	100	100
Years of schooling	Up to 17 years	32	26.67	32	28.33	66	55	100
	17-18 years	18	15	22	18.33	40	33.33	
	19 years and above	10	8.33	4	3.33	14	11.67	
Years of Work Experience	Less than 5	26	43.33	12	20	38	31.67	100
	5-10	14	23.33	15	25	29	24.17	
	10+	20	33.33	33	55	53	44.17	
Age	Up to 30 years	30	25	23	19.17	53	44.17	100
	31-40 years	26	21.67	24	20	50	41.67	
	41-50 years	4	3.33	12	10	16	13.33	
	50 years and above	0	0	1	0.83	1	0.83	
Position	Lecturer	50	41.67	38	31.67	88	73.33	100
	Senior Lecturer	2	1.67	4	3.33	6	5	
	Assistant Professor	8	6.67	15	25	23	19.16	
	Associate Professor	0	0	2	1.67	2	1.67	
	Professor	0	0	1	0.83	1	0.83	

Note: M for Male, F for Female

(Source: Questionnaire Survey)



# Applying Multiple Linear Regression and Neural Network to Predict Bank Performance

Nor Mazlina Abu Bakar

Faculty of Business Management and Accountancy

University of Darul Iman Malaysia

21300 Kuala Terengganu, Malaysia

Tel: 60-9-665-3767 E-mail: [normazlina@udm.edu.my](mailto:normazlina@udm.edu.my)

Izah Mohd Tahir (Corresponding author)

Faculty of Business Management and Accountancy

University of Darul Iman Malaysia

21300 Kuala Terengganu, Malaysia

Tel: 60-9-665-3863 E-mail: [izah@udm.edu.my](mailto:izah@udm.edu.my)

## Abstract

Globalization and technological advancement has created a highly competitive market in the banking and finance industry. Performance of the industry depends heavily on the accuracy of the decisions made at managerial level. This study uses multiple linear regression technique and feed forward artificial neural network in predicting bank performance. The study aims to predict bank performance using multiple linear regression and neural network. The study then evaluates the performance of the two techniques with a goal to find a powerful tool in predicting the bank performance. Data of thirteen banks for the period 2001-2006 was used in the study. ROA was used as a measure of bank performance, and hence is a dependent variable for the multiple linear regressions. Seven variables including liquidity, credit risk, cost to income ratio, size, concentration ratio, inflation and GDP were used as independent variables. Under supervised learning, the dependent variable, ROA was used as the target output for the artificial neural network. Seven inputs corresponding to seven predictor variables were used for pattern recognition at the training phase. Experimental results from the multiple linear regression show that two variables: credit risk and cost to income ratio are significant in determining the bank performance. Two variables were found to explain about 60.9 percent of the total variation in the data with a mean square error (MSE) of 0.330. The artificial neural network was found to give optimal results by using thirteen hidden neurons. Testing results show that the seven inputs explain about 66.9 percent of the total variation in the data with a very low MSE of 0.00687. Performance of both methods is measured by mean square prediction error (MSPR) at the validation stage. The MSPR value for neural network is lower than the MSPR value for multiple linear regression (0.0061 against 0.6190). The study concludes that artificial neural network is the more powerful tool in predicting bank performance.

**Keywords:** Bank performance, Multiple linear regression, Neural Network, Malaysia

## 1. Introduction

Performance of the banking and finance industry plays a significant role in determining financial stability of any country. Furthermore, globalization and technological advancement has created a highly competitive market. This affects all organizations regardless of business emphasis. Banks are of no exception. They have to compete not only among the local banks, but also among the foreign banks. The situation requires the needs for the decision makers in this industry to be able to make an accurate decision. Mathematical and statistical tools can assist the decision makers to be able to make accurate predictions and face challenges ahead.

In the literature, the most common statistical technique used in predicting bank performance is by using multiple linear regression. The procedure is found to be very useful in determining bank profitability and consequently the performance of banks. In this study, two different statistical techniques will be used to predict bank performance. Multiple linear regression and artificial neural network techniques will be applied to Malaysian banks data.

Determinants of bank performance and the variables used are based from past literature and the results using both methods are obtained. The predictive abilities of the two techniques are then compared to find the more powerful tool in predicting bank performance.

The objectives of this paper are to predict Malaysian bank performance using Multiple Linear Regression and Artificial Neural Network and to evaluate which of this method is more powerful in predicting bank performance.

## 2. Literature Review

Researchers in banking and finance have indicated that bank performance is related to internal and external factors. The internal factors relate to banks' characteristics and external factors are described as the economic and legal environment (Athanasoglou, Brissimis & Delis, 2008). Multiple linear regression is a very common statistical technique used in finding the determinants of bank performance, for example Athanasoglou, Brissimis & Delis (2008), Haron (2004) and Sanusi & Mohamed (2007). The analysis of multiple linear regression often produced low coefficient of multiple determination, or  $R^2$  values and the presence of outliers is seen to be a very common problem (Midi & Imon, 2006).

The performance measures are represented by return on assets (ROA), return on equity (ROE) and return on deposits (ROD) from balance sheets (Sanusi & Mohamed, 2007). In a study on panel data in finding determinants of Islamic bank profitability, Haron (2004) found that internal factors such as liquidity, total expenditures, funds invested and profit sharing ratio have a significant effect on bank profitability. Interest rate, market share and bank size, described as external effects, are also found to have the same effect in determining bank profitability.

A similar study in finding determinants of bank profitability, Sanusi & Mohamed (2007) found that bank's characteristics and the financial structure of a country are significant variables affecting bank profitability. They also compared the results of fixed effects and random effects on the proposed model and observed low adjusted  $R^2$  values, indicating a low proportion of variation in profitability explained by the significant independent variables.

Athanasoglou, Brissimis & Delis (2008), investigated the effect of bank-specific and industry-specific and macroeconomics determinants on bank profitability in Greece. Two variables are found to have significant effect; labour productivity growth (positive effect) and operating expenses (negative effect). Variables used by Athanasoglou, Brissimis & Delis (2008), are adapted in this study to perform multiple linear regression on the Malaysian banks.

As with Artificial Neural Network, Vellido (1999) listed a variety of research that has used this method. In banking and finance, artificial neural network has been used to predict banks and firms bankruptcy, predict credit card performance, credit evaluation and also detect insurance fraud. Aiken (1999) used artificial neural network to forecast inflation and concluded that neural network is able to fairly accurately forecast the consumer price index of a country.

The future of the artificial neural network in finance is discussed by Brunell & Folarin (1997). They have looked at the promising performance of artificial neural network in debt risk assessment and its ability to improve on loan assessment. They found that the artificial neural network has helped bank managers to evaluate good or bad credit risks by estimating the likelihood that a firm's or borrower's ability to require additional capital through borrowing. The high performance of artificial neural network in many areas of banking and finance has led to the application of the artificial neural network to predict bank performance in this study.

The performance of artificial neural network has been compared with many other traditional statistical techniques. For example, artificial neural network is compared with multiple linear regression (Nguyen & Cripps, 2001 and Arulsudar, Subramaniam & Murthy, 2005), discriminant analysis and logistic regression (Leshno & Spector, 1996), decision trees and logistic regression (Delen, Walker & Kadam, 2004), stepwise regression and ridge regression (Chokmani, Quarda, Hamilton, Hosni & Hugo, 2008), logistic regression (Zhang, Hu, Patuwo & Indro, 1997). The artificial neural network has outperformed the traditional methods in all of these studies. Specifically, the artificial neural network is found to have better performance than multiple regression analysis when moderate to large data sample size is used (Nguyen & Cripps, 2001).

Comparison of artificial neural network and multiple linear regression has also been done in various fields of study. Artificial neural network is extensively being applied in predicting bankruptcy. Leshno & Spector (1996) have compared artificial neural network with multivariate discriminant analysis and logistic regression in their study on bankruptcy using a limited number of firms. Prediction capabilities of artificial neural network are found to be more accurate than the classical discriminant analysis and logistic regression. They also concluded that an ample number of examples must be provided for neural network to perform at its optimum. Another study in predicting bankruptcy is by Boritz & Kennedy (1995) who examined different types of artificial neural network and compared against other bankruptcy prediction techniques such as discriminant analysis, logit and probit techniques. Performance of the artificial neural network is found to be affected by the choice of variables. Although the artificial neural network has outperformed the traditional methods, the later has advantages of being easy to understand and use.

Nguyen & Cripps (2001) examined the performance of various artificial neural network architectures. Standard back propagation is found to perform better than other neural network architectures. The network performance is also found to improve with training size.

The applications of neural network in various fields of study have showed positive and promising results. Multiple linear regression is a very popular method but the method is non-robust, in which influential outliers can effect regression results significantly. Researchers in the field of robust statistics indicate that real data may contain about 1 to 10% outliers (Midi & Imon, 2006). The predictive ability and robustness of artificial neural network is an eye-catcher. Therefore, in this study, multiple linear regression and artificial neural network are used to predict bank performance and results of both methods are then compared. The results can then be of importance to predict bank performance in Malaysia.

### 3. Data Description and Methodology

A sample data set consisting of 13 banks for the period of 2001 – 2006 was randomly selected from a list of Malaysian banks obtained from Bank Negara Malaysia. Data for all variables, except for GDP and CPI, were collected from the BANKSCOPE database. Data for chosen variables were selected, calculated and transferred into an Excel spreadsheet. Data for Gross Domestic Product (GDP) and Consumer Price Index (CPI) were obtained from the Bank Negara Malaysia official website.

Predictor variables found to be significant in the banking and finance literature were adapted into the study. Return on assets (ROA) was used as a measure of bank performance and seven predictor variables were chosen to be analyzed. The chosen variables are listed in **Table 1**.

#### 3.1 Multiple Linear Regression Model

Multiple linear regression analysis is a technique for modelling the linear relationship between two or more variables. It is one of the most widely used of all statistical methods. In banking and finance literature, regression analysis is a very common method used to find the determinants of bank performance.

The general linear regression model, with normal error terms, simply in terms of X variables is shown in Equation 1.

$$Y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_{p-1} X_{i,p-1} + \varepsilon_i \quad (1)$$

where,  $\beta_0, \beta_1, \dots, \beta_{p-1}$  are parameters,  $X_{i1}, \dots, X_{i,p-1}$  are known constants,  
 $\varepsilon_i$  are independent  $N(0, \sigma^2)$   
 $i = 1, \dots, n$

In building the multiple linear regression model for bank performance, the 96 data collected were randomly separated into 2 sub-samples – the training (86 data) and testing samples (10 data). Training data set is used for the model building, and the testing data set is used for the model validation at the end of analysis.

Kutner, Nachtsheim & Peter (2004) has recommended 30% of sample size as adequate size for model validation. In this study, only 10% of the sample size is used as the testing sample, due to the limited available number of samples. In order to test the relationship between bank performance and its determinants, the following multiple regression equation is proposed for the bank data in Equation 2.

$$ROA_i = \beta_0 + \beta_1 LIQ_i + \beta_2 LLOSS_i + \beta_3 SIZE_i + \beta_4 COSTINC_i + \beta_5 CONC_i + \beta_6 GDP_i + \beta_7 CPI_i + \varepsilon_i \quad (2)$$

$i = 1, \dots, n$

where

$ROA_i$	=	Return on average assets which serve as performance indicator
$LIQ_i$	=	Loan-to-assets ratio as a measure of liquidity
$LLOSS_i$	=	Loan loss provision-to-loans ratio as a measure of credit risk
$SIZE_i$	=	Size of a bank based on its total assets
$COSTINC_i$	=	Cost income ratio which measures bank efficiency
$CONC_i$	=	A concentration ratio, calculated by taking the largest 3 banks divided by total assets of the banking sector
$GDP_i$	=	Gross Domestic Product
$CPI_i$	=	Consumer Price Index
$\varepsilon_i$	=	error term

The underlying assumptions of linearity, normality, constant variance and independence of error terms must be satisfied in order to get a more valid model. Diagnostics for the underlying assumptions must be done and remedial measures can then be taken accordingly.

### 3.2 Artificial Neural Network

The development and abundance of high speed computers has made artificial neural network to become an increasingly popular research subject. The method has been applied to many areas including banking and finance. Artificial neural network has been applied to areas such as determining bank bankruptcy, time series, loan assessment etc.

The idea of neural network originated from the most fascinating organ in the human body, the brain. The human brain consists of billions of basic units called neurons. The basic neuron unit is illustrated in **Figure 1**. The neuron consists of dendrites, a cell body and an axon connecting to axon terminals.

Information or inputs received by the brain are transferred into the cell body through dendrites. The cell body acts as the processing unit, where all the learned information is then transferred into outputs and passed down by the axon. The muscles or other parts of the body receive the outputs via the axon terminals for actions. This concept was first studied in 1943 by McCulloch and Pitts to form a mathematical model.

**Figure 2** illustrates a one hidden layer feed forward network with inputs  $x_1, \dots, x_i$  and output  $y_k$ . Each input is given its own synaptic weight. The weights are then transferred into the hidden layer, which consists of a number of hidden neurons. Each neuron performs a weighted summation of the inputs and then passes a nonlinear activation function. The output of the network is given by Equation 3.

$$y_k = \phi\left(\sum w_{ki}v_i\right) = \phi(v) \quad (3)$$

$y_k$  = network's output

$w_{ki}$  = synaptic weight between output of neuron  $k$  and input of neuron  $i$

$v_i = \sum w_{ki}v_k$  = activation potential of neuron  $i$  (net input)

$\phi(v)$  = activation function

The nonlinear activation function in the neuron is usually chosen to be a smooth step function. In this study, the

sigmoid function  $\phi(v) = \frac{1}{1 + e^{-v}}$  is used.

Researchers in the field of robust statistics indicated that real data are never freed from outliers. About 10% of the real data set is expected to contain outliers. Preliminary checking was done to identify any gross outliers in the bank data. A simple method, the boxplot was chosen to identify outliers and get a rough idea of the symmetry of the data.

## 4. Results

### 4.1 Results of Multiple Linear Regression

The first order regression model was considered using all the seven predictor variables. Stepwise regression was performed on the modelling dataset and the obtained results are shown in **Table 2**.

From the regression output, it was found that only two predictor variables are significant in affecting the bank performance, LLOSS and COSTINC. The significant estimated parameters were found to be  $\beta_0=3.881$ ,  $\beta_2=-0.199$  and  $\beta_4=-0.061$ . The mean square error for the residuals was found to be 0.585. The total variation explained by the two significant variables, LLOSS and COSTINC on the bank performance ROA is about 57.2%, as shown by the  $R^2$  value.

**Table 3** shows the residual statistics obtained from the bank dataset. The Mahalanobis distance shows a very large maximum value of 24.662. The maximum studentized residual value is also much larger than the cut-off value 3. This indicates the existence of at least one outlying value in the regression model. Further investigation was made to identify the outlying value(s).

Remedial measures must be taken to solve the matter concerning influential outliers. Robust regression approaches such as Least Absolute Residuals, Reweighted Least Square and Least Median of Squares (LMS) regression can be employed in the presence of outliers. The robust method gives a superior result than the ordinary least square. Mean Square Error (MSE) from the ordinary least square may be inflated when influential outlier exists in the dataset.

In this study, the Least Median of Squares Regression is applied to the data set to compare with the results obtained by eliminating the outlier. Results of LMS regression is presented in **Table 4**.

The fitted robust regression function is  $\hat{Y} = 3.4234 - 0.4197\text{LLOSS} - 0.0288\text{COSTINC}$

with a low proportion of variation in response explained by the model (28.73%). The residual scale estimate is calculated as 0.4295 with degree of freedom 78. In the presence of influential outlier(s), the robust regression method always outperformed the traditional multiple linear regression. In the absence of outlier, the two performed almost equally well, but the ordinary least square method is much preferred due to extensive calculations involved in the robust method.

#### 4.2 Results of Artificial Neural Network

The 96 data bank data collected in the study were randomly assigned into three different sub-samples as given in **Table 5**. An ample number of data is needed for the training data set. Only 10% of the data are used for testing and validation purposes, due to the limited number of available sample.

Feedforward neural network or multilayer perceptron with one hidden layer and seven inputs, corresponding to the seven variables are suggested to be used in the study. Experiments are done to determine the best number of neurons in the hidden layer and to evaluate the performance of the neural network in predicting bank performance. Under supervised learning, the desired output (ROA) for each input is given to the network. The network will then adjust weights in the hidden neuron so as to minimize the error obtained between the network's output and the desired output.

Results for different numbers of neurons are presented in **Table 6**. The number of neurons with the lowest mean square error (MSE) for the testing data is chosen to be the best number of hidden nodes for the seven inputs. Neural network with 13 hidden nodes are identified to perform at its best during the training and testing. The lowest mean square error (MSE) of 0.00687 is obtained.  $R^2$  value shows a satisfactory value at 0.66868.

The performance of the network during the training phase is very high for different numbers of neurons. The testing data set gives the lowest mean square error (MSE) value when the network contains 13 hidden neurons. The testing data gives a low  $R^2$  value of about 0.669. The value indicates the proportion of total variation explained by the results is about 66.9%. Results are said to be satisfactory if the  $R^2$  value is more than 0.80. Nevertheless, results obtained from the network has a higher  $R^2$  value than the multiple linear regression model

#### 4.3 Comparisons of Performance

Performance of the two methods under study, namely multiple linear regression and artificial neural network, in predicting bank performance is measured by using the mean square prediction error and the  $R^2$  value which indicates the proportion of variation explained by the validation model. Model validation is done by using the 10 hold-out sample.

During the validation stage, the linear relationship gives mean predicted error (MSPR) of 0.6199. The network shows a very good performance with  $R^2$  value of 0.99616 with very low means square predicted error (MSPR) of 0.0061. This indicates a very high predictive performance of the neural network with total variation explained by the factors by 99.616%. Performance of the two statistical methods can be summarized in Table 7.

From **Table 7**, the results indicate that the artificial neural network outperformed the multiple linear regression model. This finding is similar to Nguyen & Cripps (2001) with different type of data. The predictive ability of the artificial neural network is very high and gives a highly accurate prediction as a result of pattern recognition or generalization made by the network. Although the predictive ability of the artificial neural network is very accurate, it somehow lacks explanation on the parameters used. Some scholars describe artificial neural network as a 'black box'. Multiple linear regression gives an easy and simple explanation on the estimated parameters. This makes the method still very useful.

The multiple linear regression requires underlying assumptions of linearity, normality, etc. that may be violated when using real data. Remedial measures are then needed to be taken on the violation of these assumptions. Artificial neural network does not require these assumptions. It only requires a good number of data for the network to be able to recognize the pattern formed by the data. A single influential outlier can affect the estimated regression function but artificial neural network is very robust with noisy or unexpected data.

The artificial neural network has another disadvantage in which training time and determination of the optimal number of neurons can take quite some time and can be very complicated and exhaustive. The multiple linear regression method is very simple to apply by using available statistical computer software. The future of artificial neural network is promising but further research is needed on the development of computer software that can help reduce the long training time.

### 5. Conclusion

From the study, we may conclude that multiple linear regression can be used as a simple tool to study the linear relationship between the dependent variable and independent variables. The method provides two significant explanatory variables to bank performance and explains the effect of the contributing factors in a simple, understood manner. The method somehow has its limitations for its underlying assumptions are always violated when using real data. The presence of outliers also produces biased estimators of the parameters.

Violations of the underlying assumptions are often accompanied by remedial measures. Data transformation, robust regression and ridge regression are among the remedial measures to be taken. Thus, this requires the needs to understand further statistical techniques, which is out of the scope of this study.

The artificial neural network gives highly accurate results from the inputs. The method increases its performance with a large number of examples. An optimal number of neurons also need to be determined because the network tends to memorize with too many neurons but it can hardly make any generalization if too few are used. The method does not require any distributional assumptions and it is robust to outliers and unexpected data in the inputs. The artificial neural network outperformed the multiple regression in predicting bank performance but somehow, the method gives no explanation on the estimation of the parameters. Decision makers are provided with the information on the estimated parameters from the results of multiple linear regression. The prediction of the method is only made on the mean performance and thus gives a higher MSPR value.

A similar study can be performed using a larger dataset. As suggested by Kutner, Nachtsheim & Peter (2004), the validation model should consist about 30% of the dataset. Furthermore, three different sub-samples are required for the training, testing and validation in artificial neural network. The effect of different years and different banks should also be taken into considerations. Other predictor variables such as bank ownership, bank labour growth, macro or microeconomic factors are to be included which may explain the total variation in predicting bank performance.

## References

- Aiken, M. (1999). Using a Neural Network to Forecast Inflation, *Industrial Management & Data Systems*, Vol. 99/7:296-301.
- Arulsudar, N., Subramaniam, N. & Murthy, R.S.R (2005). Comparison of Artificial Neural Network and Multiple Linear Regression in the Optimization of Formulation Parameters of Leuprolide Acetate Loaded Liposomes, *Journal of Pharmacy and Pharmaceutical Sciences*, 8(2):243-258.
- Athanasoglou P. P., Brissimis, S. N. & Delis M.D. (2008). Bank-specific, Industry-specific and Macroeconomic Determinants of Bank Profitability, *International Financial Markets, Institutions & Money*, Vol. 18:121-136.
- Bank Negara Malaysia at [www.bnm.gov.my](http://www.bnm.gov.my).
- Boritz, J. E., & Kennedy, D.B. (1995). Effectiveness of Neural Network Types for Prediction of Business Failure, *Expert Systems with Applications*, Vol. 9, No. 4, p.503-512.
- Brunell, P.R. & Folarin, B.O. (1997). Impact of Neural Networks in Finance, *Neural Computation & Application*, Vol. 6:193-200.
- Chokmani, K. T. Quarda, J. V., Hamilton, S., Hosni, G. M., & Hugo, G. (2008). Comparison of Ice-Affected Streamflow Estimates Computed Using Artificial Neural Networks and Multiple Regression Techniques, *Journal of Hydrology*, Vol. 349:383-396.
- Delen, D., G. Walker, G., & Kadam, A. (2005). Predicting Breast Cancer Survivability: A Comparison of Three Data Mining Methods, *Artificial Intelligence in Medicine*, Vol. 34:113-117.
- Haron, S. (2004). Determinants of Islamic Bank Profitability, *Global Journal of Finance & Economics*, USA, 1 (1): 11-33.
- Kutner, M., Nachtsheim C. J., & Peter, J. (2004). *Applied Linear Regression Models*, McGraw Hill/Irwin Series, 4<sup>th</sup> Edition.
- Leshno, M., & Spector, Y. (1996). Neural Network Prediction Analysis: The Bankruptcy Case, *Neurocomputing*, Vol. 10:125-147.
- Nguyen, N., & Cripps, A. (2001). Predicting Housing Value: A Comparison of Multiple Linear Regression Analysis and Artificial Neural Networks, *Journal of Real Estate Research*, 22 (3): 313-336.
- Midi, H., & Imon, A. H. M. R. (2006). The Use and Abuse of Statistics, Paper presented at the National Statistics Conference, Putrajaya International Convention Centre, Putrajaya, Malaysia, 4<sup>th</sup>-5<sup>th</sup> September 2006.
- Sanusi, N.A., & Mohammed, N. (2007). Profitability of an Islamic Bank: Panel Evidence from Malaysia, *Readings in Islamic Economics & Finance*, Chapter 6:97-116.
- Vellido, A. (1999). Neural Networks in Business: A Survey of Applications (1992-1998), *Expert Systems with Applications*, Vol. 17: 51 – 70.
- Zhang, G., Hu, M. Y., Patuwo B. E. & Indro, D. C. (1999). Artificial Neural Networks in Bankruptcy Prediction: General Framework and Cross-Validation Analysis, *European Journal of Operational Research*, 116:16-32.

Table 1. Dependent &amp; Independent Variables to Predict Bank Performance

<u>Variable</u>	<u>Measure</u>	<u>Notation</u>
<b><u>Dependent Variable</u></b>		
Profitability/ Performance	Net profits/Assets	ROA
<b><u>Independent Variables</u></b>		
1. Liquidity	Loans/Assets	LIQ
2. Credit Risk	Loan Loss Provisions/Loans	LLOSS
3. Cost Income Ratio	Management Cost/Assets	COSTINC
4. Size	ln (Real Assets)	SIZE
5. Concentration Ratio	3-Bank Concentration Ratio	CONC
6. Inflation	Current Period Inflation Rate (Consumer Price Index)	CPI
7. Economic Activity	Gross Domestic Product	GDP

Table 2. Stepwise Regression Results

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	
1	0.670	0.449	0.442	0.86267		
2	0.756	0.572	0.561	0.76496	0.991	
ANOVA Results						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	50.891	1	50.891	68.383	.000
	Residual	62.513	84	0.744		
	Total	113.403	85			
2	Regression	64.835	2	32.417	55.399	.000
	Residual	48.569	83	0.585		
	Total	113.403	85			
Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.873	0.326		11.867	0.000
	<i>COSTINC</i>	-0.064	0.008	-0.670	-8.269	0.000
	(Constant)	3.881	0.289		13.410	0.000
2	<i>COSTINC</i>	-0.061	0.007	-0.637	-8.834	0.000
	<i>LLOSS</i>	-0.199	0.041	-0.352	-4.881	0.000

Table 3. Residuals Statistics

	Minimum	Maximum	Mean	Standard Deviation
Residual	-1.531	4.416	0.000	0.756
Standardized Residual	-2.001	5.773	0.000	0.988
Studentized Residual	-2.319	6.068	0.004	1.041
Deleted Residual	-2.056	4.879	0.006	0.843
Stud. Deleted Residual	-2.384	8.085	0.028	1.198
Mahalanobis Distance	0.010	24.662	1.977	4.046
Cook's Distance	0.000	1.298	0.043	0.205

Table 4. Results of LMS Regression

Coefficients:	Value	Std. Error	t-value	Pr(> t )
(Intercept)	3.4234	9.1990	0.6992	0.4865
LIQ	-0.3136	0.4006	-0.7829	0.4361
LLOSS	-0.4197	0.0606	-6.9222	0.0000
SIZE	0.0773	0.0363	2.1272	0.0366
COSTINC	-0.0288	0.0048	-6.0058	0.0000
CONC	-2.8235	5.1090	-0.5526	0.5821
CPI	0.0799	0.1574	0.5078	0.6130
GDP	-1.4113	2.5623	-0.5508	0.5833



Table 5. Sub-Samples in Artificial Neural Network

Type of Data	Percentage	Frequency
Training Data	80%	80
Testing Data	10%	6
Validation Data	10%	6

Table 6. Mean Square Error and  $R^2$  value at Selected Number of Neurons

Neurons	Training Data		Test data	
	MSE	$R^2$	MSE	$R^2$
5	0.02040	0.81364	0.17329	0.85239
10	0.00799	0.94691	0.01500	0.83672
11	0.00505	0.96707	0.02444	0.65187
12	0.00515	0.96438	0.20735	0.59641
<b>13</b>	<b>0.00358</b>	<b>0.97767</b>	<b>0.00687</b>	<b>0.66868</b>
14	0.00529	0.96644	0.00964	0.79567
15	0.00297	0.96683	0.04524	0.60258
20	0.00428	0.97182	0.00738	0.87044
25	0.00672	0.96680	0.03358	0.64716

Table 7. Comparison of Performance

Method	MSPR
Multiple Linear Regression	0.6190
Artificial Neural Network	0.0061

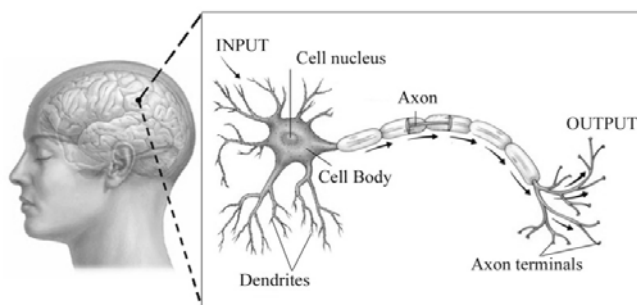


Figure 1. The Structure of the Neuron

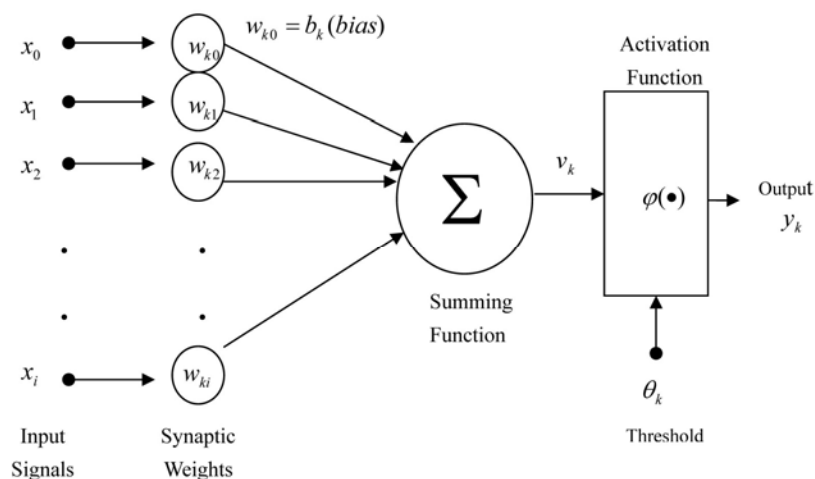


Figure 2. The Mathematical Model of the Neural Network



## Analysis of the Implementation of Fair Value in China

Xiaoyan Liu

School of Business Administration, North China Electric Power University

Beijing, P. R. China

Tel: 86-10-80798426 E-mail: [lliu716@sina.com](mailto:lliu716@sina.com)

Lin Wang

School of Business Administration, North China Electric Power University

Beijing, P. R. China

Tel: 86-10-80798426 E-mail: [wanglin1987915@163.com](mailto:wanglin1987915@163.com)

### Abstract

Since the application of New Accounting Standards, lots of attention has been concentrated on fair value measurement. This paper is an analysis of the implementation of fair value in China listed companies through an empirical method. By using the data of listed companies in 2007-2008, which belongs to the security markets of Shanghai and Shenzhen, we summarize the situation of applying the fair value measurement in listed companies, the effects of fair value measurement in profit aspect, as well as the problems to be resolved. The analysis is very helpful for both further researches on implementation guidance, and applying the fair value measurement appropriately in China listed companies.

**Keywords:** Fair Value Measurement, Listed Company, New Enterprise Accounting Standards, Financial Instruments

With the widely application of the international accounting standards, the new accounting standards for business enterprise in China were released in 2006, and applied from January 1<sup>st</sup> 2007 to reflect the economic situation more relatively. Among the new accounting standards, adopting fair value as a measurement tool is one of the biggest highlights both in theory and practice. How has it been used since 2007? In this paper, we analyze the implementation of fair value, using the data of listed companies in China, and summarize the problems in applying fair value.

### 1. The application of fair value measurement in listed companies in China

According to the New Enterprise Accounting Standards, fair value is defined as the amount that an enterprise would pay or receive to transfer an asset or a liability in an arms length transaction, between knowledgeable parties. Fair value is adopted in many standards such as “the recognition and measurement of financial instruments”, “the biological assets”, “debt restructuring”, “merger”, and “exchange of non-monetary assets”.

In the standard of “the recognition and measurement of financial instruments”, fair value is required to be adopted in initial recognition of financial assets. In the subsequent year-end measurement of financial assets, the available for sale securities and trading securities are required to use fair value as measurement tool. As shown in figure 1, in year 2007, among the 1328 listed companies, 362 companies held trading securities, covering 27% of the total; 345 companies held available for sale financial assets, covering 26% of the total, 140 owned the held-to-maturity investment, occupying 11%. In the annual reports of 2007, all of the listed companies holding financial instruments stated that they adopted fair value in related financial instruments measurement according to the new enterprise accounting standard, and disclosed the recognition and the subsequent measurement of financial assets and liabilities in notes. From the disclosure of 2007 annual report Shanghai market, 256 companies have balances in the account of gain or loss from changes in fair value, including the 169 companies owning gains and the remaining 87 companies holding losses. Comprehensively, the gains and losses from change of fair value mainly come from the trading securities and investment real estate.

Of the 1328 listed companies, 761 held the investment real estate, occupying 57% of the overall. But in the investment real estate holding companies, historical cost measurement is adopted in most companies, Only 10 companies' used fair value measurement, occupying little 1.13%. Among the 10 companies, 5 companies disclosed that the fair value are the results of asset appraisal in the notes to financial reports, the other 5 companies gained fair value base on market transaction price of similar assets.

### 2. The effect of fair value measurement on company performance

The introduction of the fair value measurement affects many aspects of enterprise such as operating performance, earnings management and financial structure at different level. This paper mainly aims at the fair value measurement applications and its effects on enterprise performance.

### *2.1 The overall effects of fair value measurement on listed companies*

By August 31st, 2008, 1619 companies of Shanghai and Shenzhen market disclosed semi annual reports, with an overall ¥553.30 billion net income, excluded Gold Molybdenum (601958) for its incomparability. It increased by 19.31%. The account “gains or loss from the changes in fair value” existed in 381 companies, totaling ¥244.95 billion losses due to the changes in fair value, which was 309.52% of last year. Compared with the large losses, these companies listed ¥116.91 billion gains on this item in 2007. As announced in the first three season reports of 2008, only less than 60 listed companies gained profits from securities investment, most companies were suffering with negative gains from changes in the fair value, and more than 20 companies' losses exceeded ¥1 billion Yuan. The total of changes in the fair value of whole listed companies is nearly ¥2.9 billion.

By 2009 April 15, 307 of 1047 companies which have their annual reports published disclosed information about gains or losses from changes in fair value, totaling a loss of ¥258.14 billion, compared with ¥128.3 billion gains from changes in fair value of the same 1047 companies in 2007. The ratio of gains or losses from investment and changes in fair value to total income before income taxes is 17.09%, 22.84% to with net income.

### *2.2 Case study*

We take China International Marine Containers (Group) Ltd (CIMC) (000039) as a case to show the effects on company performance in the following. Table 1 shows us the related performance index information such as Revenue, Operating Income and Net income of CIMC Group in 2004-2008 annual reports. In the first three years from year 2004 to 2006, as Figure 2 and Figure 3 shown, Revenue, Operating Income and Net income, all of the performance indices of the group increased smoothly; in 2007, the performance increased greatly, and conversable in 2008 it began to decline, especially the net income declines more sharply than the revenues and operating income. From the overall situation, fluctuations of performance of CIMC Group in year and 2008, in which fair value measurement has been applied are significantly greater than those of the previous year before 2007.

Table 2 summarizes the amounts and ratios of performance of CIMC Group in year 2007 and 2008, in which year the new accounting standards, especially the fair value measurement, have been were applied. In year 2007, the gains from changes in fair value amounted to ¥2.74 billion, occupying 7.93% of operating income, 8.66% of the net income of the current year. In the contract, In year 2008, the losses from changes in fair value amounted to ¥4.38 billion, occupying 24.3% of operating income, 31.13% of the net income of the current year.

By analyzing the operating details of CIMC Group in 2008, things are clear that the ¥473.27 billion revenue earned during was 2.94% dropped than last year, and the ¥14.07 billion net income in 2008 was 55.55% dropped than last year. The main reason for the revenue drop lied in the dry containers discontinuation happened in the fourth quarter of 2008. As far as the sharply falling of net income is concerned, the two main reasons are important: one is the provision for the of dry containers discontinuation for ¥6.99 billion, and the other is the stock write-down, which resulting the gains from changes in fair value fell sharply. Why net income decline far outweigh the revenue? Among these two reasons, the ¥4.38 billion loss from changes in fair value play a more important role, which is reaching 31.13% of the net income. This is apparently different from the gains earned in 2007. Furthermore, from the data of annual reports in 2007 and 2008, we can see that the decline in value of trading securities and derivatives during the reporting period is responsible for the losses from changes in fair value.

## **3. Problems in fair value applying**

In applying the fair value measurement, there are still lots of problems. Four main factors that prevent applying fair value measurement properly are concluded as follow:

### *3.1 Lack of complete theory system and operational guidelines*

Although the new accounting standards set up basic principles for the recognition and measurement of fair value, detailed theory framework and implementation guidelines are still lacked. For example, in the new accounting standards there is not any detailed principle about how to determine the fair value of assets from the similar asset transaction, such as in what kind of market, in what time, and which price to choose. In the annual reports of listed company in 2007 and 2008, some companies stated that in many subjects they have followed the new accounting standard, by using the price of similar assets in the active market quotation, to determine the fair value, In fact, due to the lack of standards. But because there is no publicly accepted principles, the fair value amounts largely depends on evaluation techniques, methods and professional judgment adopted by accounting personnel, especially those that need to use evaluation of the future cash flow of assets, the estimated amounts would differ greatly due to different date and the discount rate.

### *3.2 Inadequate disclosure of fair value information*

In the annual reports of the listed companies in China, little information related to the process of determining the fair value is found. Although most companies disclosed the amounts of trading securities and other financial assets and financial liabilities, information on how to determine the fair value of these assets and liabilities, such as the valuation

of the concrete method and parameters of selection, has not been fully disclosed in the notes. Furthermore, in the financial statements some listed companies, important items such as the major trading, important matters, important accounting policy, and accounting estimates requested by the new accounting standards have been omitted. Therefore, disclosure about whether fair value measurement after the major trading has been applied can not be found.

### *3.3 Lack of effective market environment*

According to the new accounting standards, the access of fair value should be in an active, completely competitive market condition. It is required the knowledgeable parties to participate willingly in the transactions, in which information asymmetry should be as far as possible, and any commodity market price can be open to access, and thus they can trade transactions risk factors into consideration, and determine the transaction price properly.

Although China's market economy has been established, the transition of the economic system has not been completed. There are still many disadvantages of the market condition for obtaining fair value. For instance, non-market factors still exists, non-monetary transactions between enterprise's are not regular, the markets for securities trading, property right trading market, and production material are not mature, and so on. Therefore, due to mature market condition suitable for the application of fair value, the soil and the environment, is not mature, the applying of fair value measurement in practice is not easy.

### *3.4 Lack of highly qualified and skillful accounting personnel*

Because of the difficulty of the access of fair value, the professional skill and professional judgment ability of accounting personnel are requested put forward higher request. There are about 12 million accounting professionals in China, about 80% of which are workers with inferior practicing ability, who have not been educated systemic accounting theory. It is difficult for them to correctly understand the definition of fair value measurement, let alone to use. Therefore, there will be a long way for them to increase the professional skill and professional judgment ability. The low quality of accounting personnel in businesses is considered one of the problems to be resolved in the reasonable application of the fair value.

## **4. Summary**

Based on the above analysis of data deriving from the annual reports of China listed companies in 2007-2008, we summarize the application situation of fair value measurement and its effects on performance aspects of company. In addition, we also analyze the problems existing in applying the fair value measurement.

(1) Fair value has been adopted by China listed companies widely and smoothly. With the application of the new accounting standard, fair value measurement has been adopted in many standards, the recognition and measurement of financial instruments is the case in point. Nearly one third of companies measured trading securities, the typical financial asset, at fair value.

(2) Fair value measurement affects the Net Income by the account gains or loss from change in fair value, the greater the fluctuations of market, the larger the effects. From this aspect, fair value is like a double-edged sword, that is, it can sensitively reflect the market situation. When the market is in prosperity time, fair value can boost the performance; in contrast, when the market setback, it also can suffer the listed company with great loss. Performances in 2007 and 2008 are examples in the above two cases.

(3) In applying fair value measurement, there are still some problems to be resolves in the future. Both problems in the external environment such as system and market environment and internal factors are considered. There is a long way to go until qualified accounting personnel are developed, and related information about fair value measurement are fully disclosed.

## **References**

- Xie, Shifen. (2004). Fair Value: Research on International Accounting Frontier Problem. Hunan Renmin Press.
- Ministry of Finance. Accounting Standards for Business Enterprises. (2006). Economic Science Press.
- Wang, Jiancheng, Hu Zhenguo. (2007). The Present Situation of Fair Value Measurement and Research on Related Issues. Accounting Research, (5):10-16.
- FASB. (2005). Fair Value Measurement. [www.fasb.org](http://www.fasb.org).
- FASB. (2006). SFAS 157, Fair Value Measurement. [www.fasb.org](http://www.fasb.org).

Table 1. Performance of CIMC Group in 2003-2008 (Unit: Billion Yuan)

	2003	2004	2005	2006	2007	2008
Revenue	138	265.68	309.59	331.68	487.6	473.27
Operating Income	9.58	30.13	30.23	27.6	34.57	17.67
Net Income	6.83	23.89	26.69	27.72	31.65	14.07

Table 2. Proportion of Gains or Losses from Changes in Fair Value to Performance of CIMC Group (Unit: Billion Yuan)

	2007	2008
Gains or losses from changes in fair value (1)	2.74	-4.38
Operating Income (2)	34.57	17.67
Net Income (3)	31.65	14.07
Ratio:(1)/(2)	7.93%	24.30%
Ratio: (1)/(3)	8.66%	31.13%

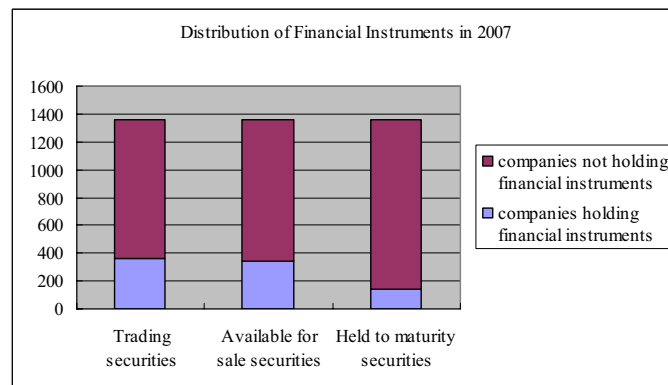


Figure 1. Distribution of Financial Instruments in 2007 of CIMC Group

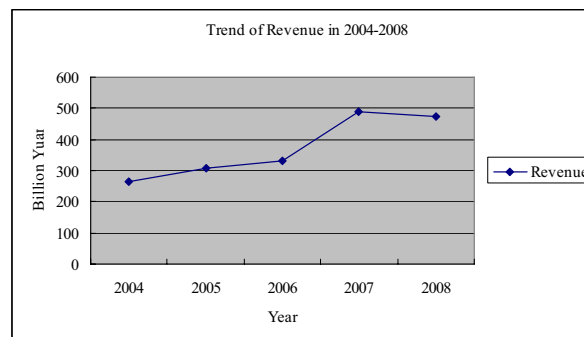


Figure 2. Trend of Revenue in 2004-2008 of CIMC Group

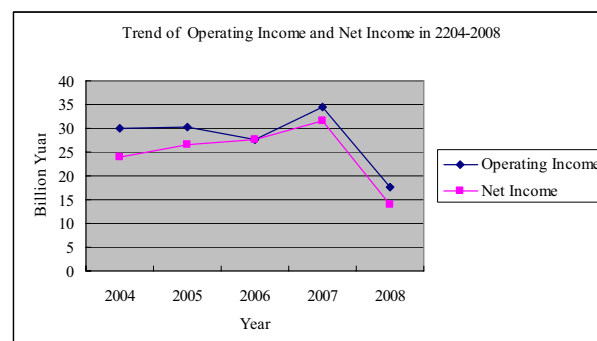


Figure 3. Trend of Operating Income and Net Income in 2004-2008 of CIMC Group



## A Study of Hong Kong Tax Compliance Ethics

Daniel Ho

Department of Accountancy & Law, School of Business, Hong Kong Baptist University

Kowloon Tong, Hong Kong

Tel: 852-3411-7539 E-mail: [danielho@hkbu.edu.hk](mailto:danielho@hkbu.edu.hk)

Brossa Wong (Corresponding author)

Accounting Department, Hang Seng School of Commerce

Shatin, Hong Kong

Tel: 852-2636-7173 E-mail: [brossawong@hssc.edu.hk](mailto:brossawong@hssc.edu.hk)

### Abstract

This paper extends our previous study by discussing in more details the composition and functions of the Board of Review in Hong Kong. We conduct a trend analysis on the Board's decisions by examining three recent informal tax cases relating to compliance behavior for individual taxpayers in Hong Kong. We find that the more recent Board's decisions are quite consistent with our previous findings. The level of penalty tax levied increases with the intention of the taxpayers to avoid tax, the magnitude of tax undercharged and the poor attitude of taxpayers. Despite the regular changes in the composition of the Board members, consistency in the Board's decisions may be explained by the following reasons: there is no change in principle or in spirit in making decisions, there is no new development in the penalty policy and the Board has been adopting the decisions of precedent Board cases in similar situations.

**Keywords:** Ethics, Tax compliance, Tax cases, Individual taxpayers, Hong Kong

### 1. Introduction

When faced with tax moral dilemmas, it is generally believed that ethics can serve as guidelines for taxpayers on how to act rightly and justly. To better understand the inter-relationship between ethics and tax compliance, we have conducted a study to perform an extensive literature review on them and to examine three informal tax cases relating to compliance behavior for individual taxpayers in Hong Kong. We noted that ethical beliefs could be an effective means to improve tax compliance, particularly for taxpayers with lower levels of moral development. In addition, tax compliance rate may be higher when taxpayer has a stronger moral belief that tax evasion is not ethical. More importantly, a stronger enforcement effort might have a positive overall effect on tax compliance. We therefore suggested the introduction of general ethics education for all citizens in Hong Kong in order to enhance level of moral development which in turn could improve tax compliance at large (Ho & Wong, 2008).

An examination of the actions of taxpayers provides insightful information on tax compliance and ethics issues as "morality (*ethics*) ultimately lies in action and that the study of moral (*ethical*) development should use action as final criterion" (Blasi, 1980, p.1, *italics words added*). Since our last study, there are new penalty tax cases. We are motivated to explore into whether the decisions of the Board of Review (the Board), which is an independent statutory body to determine tax appeals, will be affected by different composition of members and / or if there is any change in principle or in spirit because of the passage of time. The purpose of this paper is to extend our previous study by discussing in more details the composition and functions of the Board in Hong Kong. In addition, we conduct a trend analysis on the Board's decisions by examining another three recent informal tax cases relating to compliance behavior for individual taxpayers in Hong Kong.

The remainder of this paper is organized as follows. The next section describes and discusses the composition and functions of the Board in Hong Kong. This is followed by a section which critically examines three informal tax cases related to compliance behavior of individual taxpayers in Hong Kong. The last section concludes this paper.

### 2. Board of Review in Hong Kong

#### 2.1 Introduction

The Board of Review (Inland Revenue Ordinance) is an independent statutory body constituted under section 65 of the Inland Revenue Ordinance (the IRO) to determine tax appeals. The jurisdiction of the Board is stipulated in sections 66 to 69A and section 82B of the IRO. The Board consists of a chairman and ten deputy chairmen, who are persons with

legal training and experience, and not more than 150 other members, all of whom are appointed by the Chief Executive of Hong Kong. The second author of this paper was appointed by the Chief Executive of the Hong Kong government as a member to the Board for a period of three years up to 31 December 2007.

## *2.2 Functions and Procedures*

The Board is an independent tribunal and informal tax court in Hong Kong to determine tax appeals. Any taxpayer may lodge an appeal by giving notice of appeal in writing to the clerk to the Board (the clerk) under the following circumstances:

- a. If a taxpayer has validly objected to an assessment but the Commissioner of Inland Revenue (the Commissioner) considered the objection has failed, the taxpayer may lodge an appeal to the Board within one month after the transmission of the Commissioner's written determination.
- b. The IRO empowers the Commissioner to institute prosecution, to compound or to assess additional penalty tax if taxpayers fail to comply with the requirements under the IRO. For less serious cases, i.e. offences that do not involve any willful intent to evade tax, they are generally dealt with administratively by the imposition of additional penalty tax under section 82A of the IRO. A taxpayer who has been assessed an additional penalty tax can appeal to the Board under section 82B of the IRO within one month after the date of issue of the notice of assessment.

## *2.3 Composition and Functions of the Hearing Panel*

On receipt of a notice of appeal, the clerk will fix a time for the hearing of the appeal. A hearing panel with at least three members, one of whom is either the chairman or a deputy chairman, is formed to determine the tax appeal. The chairman or the deputy chairman will serve as the panel chair and two other members will serve as panel members. All members to the Board are provided with a schedule of hearings on a monthly basis and it is voluntary for members to sign up as a panel member for the hearing. The second author has heard two hearings as a panel member during her term. Decision is made on the basis of a majority of votes, and in the case of an equality of votes the chairman or deputy chairman, i.e. the panel chair, will have a second or casting vote.

## *2.4 Attending Board of Review Hearing*

A taxpayer should attend the hearing of an appeal either in person or by an authorized representative. The Board may proceed to hear the appeal in the absence of the taxpayer and his authorized representative under special circumstances. In such case, the Board may consider the written submissions of the taxpayer.

All appeals are heard *in camera*. The onus of proving that the assessment appealed against is excessive or incorrect is on the taxpayer. The taxpayer should therefore call upon all witnesses and place all documents, no less than 14 days before the hearing, to support his appeal. The taxpayer is given a choice at the hearing of either making an unsworn statement or giving evidence on oath in support of the appeal. The taxpayer will be cross examined by representative of the Commissioner if he chooses the latter option and greater weight will be attached to evidence tested by such process.

After hearing the appeal, the Board will confirm, reduce, increase or annul the assessment appealed against or may remit the case to the Commissioner for re-assessment. The Board may also order the taxpayer to pay as costs of the Board an additional sum not exceeding HK\$5 000, if the proceeding has been conducted frivolously, vexatiously or an abuse of process.

## *2.5 Delivery of Board of Review Decisions*

The decision of the Board is final; however either the taxpayer or the Commissioner may make an application requiring the Board to state a case on a question of law for the opinion of the Court of First Instance, within one month of the date of the Board's decision. After hearing an appeal, the panel chairman will deliver the decision of the Board which is normally in written form. The panel chairman is responsible to report the case which is endorsed by panel members. The Board of Review Decisions, available on-line and in printed version, is a publication of the Board which contains selected decisions on tax appeals written by the presiding chairmen (and endorsed by panel members) of hearings. In accordance with section 68(5) of the IRO, the identity of the taxpayer is not disclosed.

## **3. Trend Analysis on Real-life Perspectives**

In our previous study (Ho & Wong, 2008), we have examined three informal tax cases relating to compliance behavior for individual taxpayers in Hong Kong. All the taxpayers in these cases have committed behavior of understating or omission of income. Since our last analysis, there are new penalty tax cases. As the term of each appointed member to the Board is three years, there is a consistent change in the composition of the Board. Moreover, the panel of each hearing is randomly formed by voluntary members. We are therefore motivated to explore into whether the decision of the Board will be affected by different composition of members and / or if there is any change in principle or in spirit because of the passage of time. As such, we extend our previous study to examine another three recent informal tax cases relating to compliance behavior for individual taxpayers in Hong Kong and to conduct a trend analysis on the

Board's decisions.

### 3.1 The Cases

#### 3.1.1 Case One

Case *D4/06* (2006-07, Volume 21) was heard on 25 February 2006 and the decision was delivered on 10 April 2006. The hearing panel composed of Mr. Kenneth Kwok Hing Wai SC (chairman), Mr. David Li Ka Fai and Mr. Horace Wong Ho Ming.

The taxpayer was a computer systems specialist and she applied for business registration as sole proprietress of a business (the Firm) on 23 June 2000. On the same date, she signed a 'Professional Services Contract General Agreement' in the name of the Firm with a bank (the Bank) under which the Firm would provide services in the capacity of a Systems Specialist for around one year for a fee of HK\$547 560. The agreement also provided that the Firm would assign the taxpayer to provide the services. The business registration records of the Firm were changed on 4 October 2000 and the taxpayer's father, who was unemployed, was added as a partner of the Firm with effect from 1 September 2000.

The taxpayer did not report the fees paid by the Bank as her salary income but reported income as a partner of the Firm with a 10% share of the profits, while her father was said to have a share of the remaining profits. The Revenue conducted an audit on the taxpayer's affairs on 21 January 2005 and the taxpayer reached compromise with the Revenue on 26 February 2005. She agreed to the amounts of understated income for the years of assessment 2000/01 and 2001/02 and the understated income was computed on the basis that the fees paid by the Bank were the taxpayer's salary income. Two additional assessments were then issued in accordance with the compromise document and the taxpayer did not object to the assessments. The document also provided that penal actions may be considered by the Revenue.

The Deputy Commissioner subsequently issued two penalty assessments to assess the taxpayer to additional tax under section 82A of the IRO. The additional tax imposed averaged 68% of the tax undercharged. The taxpayer appealed to the Board on the grounds that she was not liable to additional tax and that the amount of additional tax was excessive. The taxpayer contended that she was compelled by the Bank to contract as a contractor instead of an employee. She had reported the fees paid by the Bank under profits tax because she did not know that she should report the fees as her salary. She also stated that there were about 30 persons in her team and that about seven to eight of them had contracts similar to her case.

The Board found that since more than two thirds of the persons in her team were employees, the taxpayer had failed to prove that she was compelled by the Bank to contract as a contractor instead of an employee. In the absence of compulsion by the Bank, the Board held that the taxpayer had no reasonable excuse to understate her salary income. The taxpayer had understated 81% and 38% of the correct amount of income for the years of assessment 2000/01 and 2001/02 respectively. The understatement, although involving two years of assessment, was in respect of the fees from the Bank over a one-year period. The Board was impressed by the co-operation of the taxpayer and adopted the same approach as in case *D90/01* (2001, Volume 16, Third Supplement) to reduce the additional tax imposed by half.

#### 3.1.2 Case Two

Case *D80/06* (2007-08, Volume 22) was heard on 24 November 2006 and the decision was delivered on 6 February 2007. The hearing panel composed of Mr. Kenneth Kwok Hing Wai SC (chairman), Mr. Ip Tak Keung and Ms. Susanna W Y Lee.

The taxpayer had understated his salary income by 29.04% in his tax return for the year of assessment 2004/05. The assessor assessed the taxpayer to salaries tax based on the total amounts of income reported in the employers' returns and the taxpayer did not appeal against the assessment. The Deputy Commissioner subsequently issued a penalty assessment to assess the taxpayer to additional tax under section 82A of the IRO. The additional tax imposed was HK\$4 400, being 19.77% of the amount of tax undercharged.

The taxpayer appealed against the penalty assessment and claimed that he had understated his income because his employer failed to give correct notification to him regarding his remuneration. The Board was of the view that a taxpayer had the duty to report the correct amount of income. Receipt and accrual of income and the total amount thereof were factual matters within the personal knowledge of the taxpayer. One should have knowledge of his own total income and should not be spoon-fed by the employer.

The Board considered that the taxpayer should be able to verify the correctness of his income even though his emoluments were paid into his bank account by auto-pay. The Board held that the taxpayer was in reckless disregard of his duty to report the correct amount of his income and carelessness was not an excuse for submitting an incorrect return. The taxpayer held senior positions and the understatement of income was significant, both in amount and percentage. The Board held that payment of tax on time, lack of intention to evade tax and frequent change of jobs were



not mitigating factors.

The taxpayer had also understated his income three years ago in his 2001/02 tax return but no additional tax had been imposed in that occasion. The Board was of the view that taxpayers should take their duty seriously and heavier penalty should be imposed for subsequent contraventions. The Board held that the additional tax for the year of assessment 2004/05 was not excessive and was much inclined to increase the additional tax. Instead of increasing the additional tax, a costs order of HK\$2 500 was made and the appeal was dismissed.

### 3.1.3 Case Three

Case *D22/07* (2007-08, Volume 22, First Supplement) was heard on 16 August 2007 and the decision was delivered on 11 September 2007. The hearing panel composed of Mr. Kenneth Kwok Hing Wai SC (chairman), Mr. Donald Choi Wun Hing and Mr. David Kwok Sek Chi.

The taxpayer was employed by his former employer as the chief executive officer from 1 April 2005 to 31 October 2005 with a total salary income of HK\$1 225 002 and his former employer reported the taxpayer's income to the Revenue. The taxpayer was also employed by another company in a part-time capacity with a salary income of HK\$857 500 for the period between 1 April 2005 and 31 March 2006. However, the taxpayer only reported his salary income from his part-time job in his tax return and omitted the income from his former employer. The assessor assessed the taxpayer to salaries tax based on the total amounts of income reported in the employers' returns and the taxpayer did not appeal against the salaries tax assessment. After considering representations made on behalf of the taxpayer, the Deputy Commissioner assessed the taxpayer to additional tax under section 82A of the IRO which is equivalent to 8.16% of the tax undercharged.

The taxpayer appealed against the penalty assessment and contended that he accepted that it was his error and his fault. He impressed the Board that he had no intention to, and did not, deceive the Revenue. He left it to his wife to handle tax reporting but he had forgotten to provide his wife with his former employer's return and did not check the information on his tax return.

The Board, having considered all the matters urged by on behalf of the taxpayer, did not think that the assessment was excessive and the appeal was dismissed. The Board also decided not to increase the assessment for the following reasons. The taxpayer had taken and was taking steps to ensure further compliance. It was a mitigating factor for a taxpayer to put in place an effective system or mechanism to prevent any further contravention. The taxpayer had learnt a lesson and was sincere in his promise to comply with his reporting duties in future.

### 3.2 The Analysis

An interesting finding is that Mr. Kenneth Kwok Hing Wai SC served as panel chair for all the three recent cases and he is in fact the existing Chairman of the Board. In general, the decision of a taxpayer to behave unethically may be explained by the following factors: expected gain in tax savings from behaving unethically; low individual perception of the likelihood; low individual attitude to risk; and low individual ethical reasoning levels. Fischer *et al.* (1992) proposed a model of taxpayer compliance with four dimensions, namely demographic; non-compliance opportunity; attitude and perceptions; and tax system or structure. The Fisher model has been empirically tested by Chan *et al.* (2000). The taxpayers in these three cases have similar education level, income level and income source. They are all educated and occupy senior positions in their employment. All taxpayers in these cases have committed the same offence of understating or omission of income despite that their moral development, attitudes towards fairness of tax system, levels of non-compliance, and their attitude towards their tax affairs and tax authorities are quite different.

In case *D22/07* (2007-08, Volume 22, First Supplement), the taxpayer had understated his salary income by 59% due to his carelessness and the penalty tax imposed was only 8% of the tax undercharged. Carelessness was not an excuse for submitting an incorrect return. The Board did not think that the penalty tax assessment was excessive or insufficient. It was because the taxpayer has showed a good attitude and was sincere in his promise to comply with his reporting duties in future. It was a mitigating factor for a taxpayer to put in place an effective system or mechanism to prevent any further contravention.

In case *D80/06* (2007-08, Volume 22), the taxpayer had understated his salary income by 29% but the penalty tax imposed was 19% of the tax undercharged. The Board held that the taxpayer was in reckless disregard of his duty to report the correct amount of his income and carelessness was not an excuse for submitting an incorrect return. His attitude did not convince the Board that he was serious with his tax affairs. The Board also held that payment of tax on time, lack of intention to evade tax and frequent change of jobs were not mitigating factors. The taxpayer had also understated his income three years ago and the Board was of the view that heavier penalty should be imposed for subsequent contraventions. Instead of increasing the additional tax, a costs order of HK\$2,500 was thus made.

In case *D4/06* (2006-07, Volume 21), the taxpayer had adopted a tax evasion plan and was found to have understated her income as a result of tax investigation conducted by the Revenue. The taxpayer had understated 81% and 38% of

the correct amount of income for two years of assessment. The understatement, although involving two years of assessment, was in respect of the fees from the Bank over a one-year period. The additional tax imposed averaged 68% of the tax undercharged. The Board was impressed by the co-operation of the taxpayer and adopted the same approach in a precedent case *D90/01* (Volume 16, Third Supplement) to reduce the additional tax imposed by half.

In order to provide a comparison of the Board's decisions over time, the following summary of discussion of three cases *D21/05*, *D48/05* and *D59/05* are extracted from our previous paper (Ho & Wong, 2008). The taxpayers in *D21/05* (2005-06, Volume 20, First Supplement) are successful businessmen with low education level and they have understated substantial amount of income (nearly HK\$20M) for long duration of seven years. However, they were co-operative during the time of investigation and the final level of penalty was reduced from 150% to 120% and 140% of the respective tax undercharged. The taxpayer in *D48/05* (2005-06, Volume 20, Second Supplement) is a practicing solicitor with high education level and he has omitted quite substantial amount of income (nearly HK\$2M) for four years. However, he is not serious with his tax affairs and as such has committed the offence and even missed the deadline for a valid appeal. The penalty level remains at about 50% of tax undercharged. The taxpayer in *D59/05* (2005-06, Volume 20, Third Supplement) is a research manager with reasonable education level and has committed an error in understating his income. However, his attitude is very bad when being imposed of penalty tax at 7.86% of tax undercharged and the Board ordered him to pay an additional sum of HK\$5 000 given that the appeal is frivolous and vexatious.

It can be seen that the more recent Board's decisions are quite consistent with our previous findings. The level of penalty tax levied increases with the intention of the taxpayers to avoid tax, the magnitude of tax undercharged and the poor attitude of taxpayers. The decisions of the Board are consistent over the time framework we have studied despite the regular changes in the composition of the Board members. Consistency in the decisions demonstrates that there is no change in principle or in spirit in making decisions. In fact, there is no new development in the penalty policy adopted by the Revenue despite the passage of time. The consistency can be further explained by the fact that the Board has been adopting the decisions of precedent Board cases in similar situations.

#### 4. Conclusion

The Board of Review is an independent statutory body constituted under the IRO to determine tax appeals in Hong Kong. Any taxpayer may lodge an appeal by giving notice of appeal in writing to the clerk to the Board if he disagrees with the determination of the Commissioner under an objection or with the level of penalty tax being imposed. A hearing panel with at least three members, one of whom is either the chairman or a deputy chairman, is formed to determine the tax appeal. Decision is made on the basis of a majority of votes. A taxpayer should attend the hearing of an appeal either in person or by an authorized representative. The onus of proving that the assessment appealed against is excessive or incorrect is on the taxpayer. After hearing the appeal, the Board will confirm, reduce, increase or annul the assessment appealed against or may remit the case to the Commissioner for re-assessment. The decision of the Board is final; however either the taxpayer or the Commissioner may make an application requiring the Board to state a case on a question of law for the opinion of the Court of First Instance, within one month of the date of the Board's decision.

As the term of each appointed member to the Board is three years, there is a consistent change in the composition of the Board. Moreover, the panel of each hearing is randomly formed by voluntary members. As an extension of our previous study, we conduct a trend analysis on the Board's decisions by examining another three recent informal tax cases relating to compliance behavior for individual taxpayers in Hong Kong. The more recent Board's decisions are quite consistent with our previous findings. The level of penalty tax levied increases with the intention of the taxpayers to avoid tax, the magnitude of tax undercharged and the poor attitude of taxpayers. Despite the regular changes in the composition of the Board members, consistency in the Board's decisions may be explained by the following reasons: there is no change in principle or in spirit in making decisions; there is no new development in the penalty policy; and the Board has been adopting the decisions of precedent Board cases in similar situations.

#### References

- (2001). Case No. D90/01, *Hong Kong Inland Revenue Board of Review Decisions*, Volume 16, Third Supplement.
- (2005-06). Case No. D21/05, *Hong Kong Inland Revenue Board of Review Decisions*, Volume 20, First Supplement, 346-357.
- (2005-06). Case No. D48/05, *Hong Kong Inland Revenue Board of Review Decisions*, Volume 20, Second Supplement, 638-647.
- (2005-06). Case No. D59/05, *Hong Kong Inland Revenue Board of Review Decisions*, Volume 20, Third Supplement, 821-827.
- (2006-07). Case No. D04/06, *Hong Kong Inland Revenue Board of Review Decisions*, Volume 21, 139-146.

- (2007-08). Case No. D80/06, *Hong Kong Inland Revenue Board of Review Decisions*, Volume 22, 61-70.
- (2007-08). Case No. D22/07, *Hong Kong Inland Revenue Board of Review Decisions*, Volume 22, First Supplement, 555-558
- Blasi, A. (1980). Bridging Moral Cognition and Moral Action: A Critical Review of the Literature. *Psychological Bulletin*, 88(1), July, 1-45.
- Chan, C. W., Troutman, C. S., & O'Bryan D. (2000). An Expanded Model of Taxpayer Compliance: Empirical Evidence from the United States and Hong Kong. *Journal of International Accounting, Auditing & Taxation*, 9 (2), 83-103.
- Fischer, C. M., Wartick, M., & Mark M. M. (1992). Detection Probability and Taxpayer Compliance: A Review of the Literature. *Journal of Accounting Literature*, 11, 1-46.
- Ho, D., & Wong, B. (2008). Issues on Compliance and Ethics in Taxation: What Do We Know? *Journal of Financial Crime*, 15 (4), 369-382.



## Research on the Sino-us Trade Conflict and Countermeasures

Qige Wu

School of economics, Tianjin polytechnic university

E-mail:jinzairan888@163.com

### Abstract

With the development of information and science & technology, the pace of globalization is accelerating, which has more and more great influences on international trade. The development of economic globalization not only deepens mutual interdependence among countries, but also raises their conflicts and frictions. Trade conflicts will affect the development of bilateral trade and regional economy, which may result in worldwide economic crisis. Because of the development of foreign trade and rise of Chinese economy, there are more and more conflicts between China and its trade partners, especially Sino-US trade conflicts. In today's increasingly competitive world economy, international competition is no longer just the capital and technology competition. Law has been involved in the game. China should learn to use the weapon of law and other ways to protect themselves.

**Keywords:** Sino-US trade, Trade conflicts, Trade imbalance, Influence on China's economy and trade, Countermeasures research

### 1. The status of Sino-US trade friction

Since China implemented the policy of reform and opening-up in the 1970s, economic cooperation and trade relations between China and the United States have made considerable progress. China and The United States, as the largest developing country and the most developed country, have been important trade partners in trade and investment, which play a decisive role in promoting the process of economic globalization and trade liberalization. Due to the rapid growth of Sino-US trade and worsening of trade imbalance, bilateral trade conflicts become more and more intense.

#### *1.1 Trade friction has been involved in every field*

Since China's accession to WTO, Sino-US trade conflicts have gradually risen from micro-economic to macro-economic field. The number of China's exports has reached more than 4000. These products transferred from the original agricultural products, including chemical raw materials, textiles to the steel, color television, telecommunications which are capital-intensive and technology-intensive manufactured goods. With the opening of goods and service market as well as the upgrading of industrial structure, New industries and products become the subject of trade friction. For the reason that Sino-US trade conflicts will take on the features of continuance, frequency and complication.

#### *1.2 China faces the main form of trade friction which contains Anti-dumping, special safeguard measures.*

As we all known, Since 2007, As Chinese economic has been developed more and more quickly, the United States began to use different ways and means to cause an even greater pressure on China to achieve its own economic and political purposes, because the United States worried about China's economy growth, including Anti-dumping, the appreciation of RMB and so on. To Chinese Products, U.S. has been taking more and more measures such as anti-dumping, anti-subsidy, and peculiar safeguard measures, which is a serious distortion of free trade. According to the traditional international economical theory, any distortion of free trade will do harm to trade-country's social welfare level, and cause "deadweight loss" to the whole world, and is also not in accordance with the "symptomatic rules". There is no doubt that the growing trade conflicts is putting increasingly negative impacts on the smooth development of Sino-US economic and trade relations. This phenomenon has aroused interests of many people, and so how to view this and how to deal with it become the major issue of common concern for China's government, business and academia. In face of the increasingly fierce trend of Sino-US trade conflicts, how to resolve Sino-US trade conflicts has been a major issue in China's economic development and foreign trade, which is also of great value to dealing with trade conflicts between developed countries and developing countries.

#### *1.3 Technical Barriers have badly affected our exports.*

China is the world's largest developing country, the level of economic development is not high and the overall quality of export products is lower. The export market for our products mainly concentrated in the developed countries and some newly industrializing countries, trade volume reached more than 90%, but now these countries become more and more strictly with import products, Export products made in China will inevitably face a growing number of technical barriers.

*1.4 Balance of trade, the RMB exchange rate, intellectual property protection and labor standards cause trade frictions.*

## **2. The original causes of Sino-US trade friction**

### *2.1 The external background of Sino-US trade friction*

Economic globalization is an irreversible trend in the development of modern economic. Under the impetus of globalization, it deepens the economic links between countries and strengthens the interdependence. At the same time, the opportunity of the economic friction between countries has been greatly increased. Production of global and unified world market requires the convergence of the system, rules and even the culture and customs. However, domestic regulation has seriously affected the development of the economic and trade among nations. And some countries existed differences in social systems, historical backgrounds, consumer preferences, can not achieve full integration in a short period of time. As long as these differences exist, trade friction between countries is inevitable. Sino-US trade has a highly complementary. In theory, China's exports to the United States should have a comparative advantage in labor-intensive products, U.S. export the capital and technology-intensive products, but in the reality, for the purpose of containing China, The United States did not export capital and technology-intensive products, and it restrict exports on high-tech. therefore it result continuing large trade deficit. The United States that is on grounds of serious trade imbalance launch trade friction to China.,Increasing the Sino-US trade friction has been generated.

### *2.2 Internal root causes of Sino-US trade friction*

China and the United States are very important trade partners, the two countries have highly complementary in the market, resources, technology, capital and other areas. At present, China is America's fourth largest trading partner, while the United States is China's second largest trading partner.

#### *2.2.1 From the Chinese point of view*

Firstly, the rising of Chinese economic. Since the policy of reform and opening up, Chinese economic development is remarkable. China has become the second largest economic power in the world, If the current trend developed, in the 21st century before the end of the first 10 years is likely to catch up with Germany, during the second 10 years, China may be second to the United States, Japan, the European economic power. China's status as a world trading power has also increased rapidly, for example, China's trade volume to the United States reached 211.6 billion U.S. dollars. Trade surplus volume is up to 114 billion U.S. dollars and China became the largest exporting country to the US. The United States economy has been declined in this years, while China's economy has maintained a sustained high growth, it result to Sino-US trade friction. Secondly, Dependence on trade with the United States is too large. Since reform and opening up, foreign trade in China's national economic play an important role in development process of national economics. Thirdly, the structure of export is lower, Labor-intensive products exports occupy a dominant position in the structure of Chinese export products, these products include textiles, clothing, shoes, toys, bags, etc. These industries are often at a low level, low technology, less innovation capability, alternative products, easily to reduce the market share of Chinese products. Once Chinese exports to the United States increased dramatically, causing the U.S. trade deficit, the United States will take various measures to restrict imports of our country, the occurrence of trade friction is inevitable. Last but not the least important, Enterprises Lack self-discipline and export disordered. In recent years, the quantity of export products increased dramatically, but the volume of trade isn't increasing. This is mainly because the domestic enterprises which have to compete for the market shares have an image of "small profits but quick turnover". In addition, foreign trade enterprises are subsidized by our own country at a long-term. As a result, many foreign trade enterprises complete the export targets and compete for market fixed lower price, Thus they often have been accused by dumping. Some enterprises which in order to obtain export subsidies and export tax rebate sale products without profits, the results for the United States has accused China and launched a trade war against China, finally it would hurt China's enterprises.

#### *2.2.2 From the united states point of view:*

In the first place, In order to achieve the so-called "fair trade", U.S. foreign trade policy has obvious characteristics of the two sides, one is that the US promote the liberalization of export trade, the other is the United States insists on import trade protectionism. Under the guidance of this policy, As long as the economic is in deep recession or the United States enhance domestic trade protectionism, it will lead to trade friction between United States and other countries. In the second place, US adopt the policy of restrict export, Sino-US trade imbalance is one important reason for the trade friction, The United States does not only seek nothing of its own reasons, but also attribute a large number of trade deficit to the exports from China to the US. Actually, there are many factors constraint Sino-US trade, for instance, Differences in trade statistics, Restrictions on exports to the United States and so on, Restrictions on U.S. exports is an most important factor that other factors can not be compared with .In the third place, the US restrict commodities which are made in China, because America worried about the Chinese sustained and rapid economic development, The United States does not want to see such a country whose economic is growing better and better. Therefore, anti-China forces in the United States regarded China as a potential enemy. The current Sino-US trade

friction is not accidental, it is not only tactical, but also inevitable and strategic. China's rising is so quick that U.S. government is bound to take a series of measures to try to contain this development. Sino-US trade friction will occur frequently. Last but not the least important, for the needs of U.S. domestic politics, Politic and economic are closely and inseparable, although the trade frictions performed in the economic field, but in fact there is a profound political reasons. In order to win election victory every four years, U.S. politicians have to yield to special interest groups. They always make a fuss about policy to China, only in this way can they obtain valuable votes, because the political survival rules of the United States is that candidates must get more votes.

### **3. How to deal with the Sino-US trade friction**

Faced with the increasing competition in the Sino-US trade friction, we need to face up to it in ideology and value in strategic as well as look down up in tactic.

#### *3.1 Consideration from the government level*

The Government should treat Sino-US trade friction calmly and take appropriate diplomatically strategy and tactics. So it is safe to say that China's rise is a peaceful rise, the rise of China will more vigorously promote world peace and development; it emphasized trade is mutually beneficial, "win-win". Flexible diplomatic strategy can greatly increase the ability to resolve trade friction. What's more, The Chinese government should be familiar with US deeply and exhaustively in every aspect, such as political, economic, social and cultural. In order to protect their own interests, China must learn to recognize and think problems which happened between China and the United States by standing on the point of view of our partners, put forward trade policy and operational skills. China should follow the economical mode of major countries, regard domestic demand as the main engine of the development and adjust the proportion of domestic demand and foreign demand. Our government also should Change the growth mode of foreign trade, only in this way, we may keep the macroeconomic develop rapidly. In addition to the above, on the one hand, In order to solve Sino-US trade friction, Chinese Government should strengthen communication with the United States Government and gradually establish regular bilateral consultations and coordinate mechanisms, discuss economical cooperation regularly, eliminate the differences which is happening between US and China in international economic policies, maintain the stable development of Sino-US bilateral economical and trade relations. On the other hand, WTO dispute settlement mechanism that is used by all over the world especially developing countries is an effective ways to resolve trade conflicts and protect their own legitimate rights.

#### *3.2 consideration from the enterprise and industry level*

Enterprises at all levels must develop products by competing procedure of manufacture which is high-tech and high-value, do a good job for the development of major export products, convert the business mechanism for enterprise, establish a modern enterprise system, attract excellent person, implement strategy which is priority of quality, learn how to use trademarks, packaging, public relations, advertisement and other means of non-price competition, explore actively new overseas markets, bring up the advantage of competition. Finally, as a non-market economy country, we should learn to deal with anti-dumping from other countries especially developed countries. What's more, high-tech products are increasingly becoming the major kinds of world trade and coupled with a serious oversupply of labor-intensive products in international market, so competition gradually decreased. Our enterprise wouldn't rely on the labor-intensive products to obtain profits, we should changed from labor-intense to tech-intense, realized diversity of export products, we should also adjust regional structure of export, expand from traditional Asia and North American to Latin America, the Middle East and African markets, so we can reduce the risk of trade friction. It is safe to say, our government should also promote enterprises to go abroad actively, the corresponding volume of exports is bound to decrease, this will certainly alleviate trade friction. In additionally, with the change of functions, the government will not resolve trade dispute, while the strength of individual enterprise is limited, therefore, industry association have a unique advantage for prevention and settlement of trade disputes. Industry associations should join the government and enterprises to build trade early warning mechanism.

#### *3.3 Resolving trade friction by means of interest relation.*

In modern times, A universally truth is to be said as following: There is no permanent enemies and friends, nothing is more important than eternal interests for the business company. In recent years, Many US multinational companies have substantial operations in China, so that they can take advantage of Chinese cheaper labor resources. The US companies have always attached importance to the great trade interests with China, So China has the opportunity to make use of these economic resources and political resources.

### **4. Concluding remarks**

China has emphasized for several times not to politicize economic problems but this is only its own wishful thinking. Trade collisions are the products of foreign trade at a certain period of time and it is restricted by political factors. If we can address the mutual benefits and the collisions of Sino American trade properly, it is not possible for the collisions to become trade wars in the international trade where benefit is the name of the game. The comparative advantage of

benefit over collision determines that the mutual trade relationship of the two countries will continue to develop.

### References

- Ludema, Rodney D. Wooten. (2001). June, 355 – 376. Good Optimal international trade agreements and dispute settlement procedures European, *Journal of Political Economy* Volume: 17, Issue:2.
- Rowbotham, E. (1995). July,291.*The changing nature of dispute settlement under the GATT and the WTO Fuel and Energy Abstracts* Volume: 36, Issue: 4.
- Bown, Chad P. March. (2004). 263 - 294. Trade disputes and the implementation of protection under the GATT: an empirical assessment *Journal of International Economics* Volume: 62, Issue: 2.
- Jim Perlow. “Trade Deficit with China Puts US at Disadvantage”.  
<http://Phoenix.bizjournal.com/Phoenix/stories/2002/10/140editorial4.html>.
- (2005). Report to Congress of the U.S. China Economic and Security Review commission,  
<http://www.usee.gov/researchPaPers/annual-rePorts.htm>/<http://www.sei.sn.cn>.
- Bown, Chadp. Rachel McCulloch. (2005). U.S. *Trade police Toward China; Discrimination and Its Implication*.



## Causal Relationship between Foreign Direct Investment and Growth:

### Evidence from BRICS Countries

Sridharan. P

Selection Grade Lecturer, Department of International Business

(School of Management), Pondicherry University

Puducherry- 605 014. India

Tel: 91-989-402-3571 E-mail: psdn@rediffmail.com

Vijayakumar. N (Corresponding Author)

Lecturer, Department of Banking Technology

(School of Management), Pondicherry University

Puducherry- 605 014. India

Tel: 91-944-338-2134 E-mail: nvkvijay@gmail.com, nvkvijay@rediffmail.com

Chandra Sekhara Rao. K

Professor, Department of Banking Technology

(School of Management), Pondicherry University

Puducherry- 605 014. India

Tel: 91-989-425-5526 E-mail: kcsrao.btm@pondiuni.edu.in

#### Abstract

In this paper we examine the causal relationship between Foreign Direct Investment (FDI) and Growth of the BRICS countries. We employed Industrial Production Index (IPI) as a measure of Economic Growth. The stationarity of the data series are checked using Augmented Dickey Fuller (ADF) Test and tested for the existence of co-integration. Johansen Co-integration model found that the Brazil alone co-integrated among the selected countries at levels. The Vector Error Correction Model (VECM) employed to trace the existence of long run relationship. The results of VECM found that Growth leads FDI bi-directionally for Brazil, Russia and South Africa and FDI leads Growth uni-directionally for India and China respectively.

**Keywords:** Foreign Direct Investment, Growth, Stationarity, Vector Error Correction.

**JEL Classification Code:** F21, O57

#### 1. Introduction

The growth of international production is driven by economic and technological factors. Liberalization of Trade Policies and FDI facilitate this growth. In this context, Globalization offers an unprecedented opportunity for developing countries to achieve faster Economic Growth through Trade and Investment. During the 1970s, International Trade grew more rapidly than FDI, and thus International Trade was the most important International Economic activity. This situation changed dramatically during 1980s, when world FDI flow started to increase sharply. In this period, the world FDI has increased its importance by transferring technologies and establishing marketing and procuring networks for efficient production and sales, internationally (Shujiro Urata, 1998). While, foreign investors benefit by utilizing their assets and resources efficiently through FDI, the recipients benefit by acquiring technologies and by getting involved in international production and trade networks.

There are several studies which examine the channels of transmission between FDI and Growth. Econometric models of endogenous growth were combined with studies of Diffusion of Technology in an attempt to show the effect of FDI on the Economic Growth of several economies (Lucas, 1988; Barro, 1990). In these models, Technology plays an important role in Economic Development. The factors contributing to the mobility of capital and technology have been the single most reason for low income countries to grow at a higher rate. The volatility of FDI and requirement for macroeconomic and financial adjustments has been identified as a contributing factor for Economic Growth of



developing nations. De Gregrio and Guidotti (1995) indicated that financial liberalization and stabilization must be undertaken in the host countries before any increases in FDI become feasible. FDI has been seen as an effective channel to transfer technology and foster growth in developing countries, within the framework of the neoclassical models (Solow, 1956).

This study is organized into five sections including the present one. The empirical relationships exist between FDI and Economic Growth is described in section 2. The data and their sources are given section 3. The methodological issues and the empirical result are discussed in section 4. Summary and concluding remarks are given in section 5.

## **2. Relationship between FDI and Economic Growth**

The notion of 'Investment led Economic Development' has put forward the idea that the outward and inward FDI position of a country is related to its Economic Development relative to the rest of the world. It suggests that the countries changes through five different stages of development. These stages are being classified according to the propensity of the countries to the outward and/or inward investors (Dunning and Narula, 1994). This propensity, in turn, depends on the extent and pattern of the ownership-specific advantages of domestic firms, its location advantages and the degree of utilization of the ownership-specific advantages by the domestic and foreign firms in the internationalization of markets.

The impact of FDI on growth rate of output was constrained by the existence of diminishing returns of physical capital. Therefore FDI could only exert an effect on the level of output per capita, but not on the growth rate. In other words, it was unable to alter the growth of output in the long run. In the context of the new theory of Economic Growth, FDI is considered as an engine of growth of mainstream economies. As noted by the World Bank (2002), several recent studies concluded that FDI can promote the Economic Development of the Host Country by promoting productivity growth and export. However, the exact relationship between Foreign Multinational Corporations and their host countries varies considerably between countries and among industries. The characteristics of the Host Country and the policy environment are important determinants of net benefit of FDI.

The role of FDI in the growth process has been a topic of discussion in several countries. These discussions have provided rich insights into the relationship between FDI and Growth. Although several studies on FDI and Growth in Developing Economies exist, however, few studies on this subject have been done on BRICS (Brazil, Russia, India, China and South Africa) countries. Moreover, most of the studies provide a descriptive discussion of FDI and Economic Growth. The available studies have employed cross section regression methodologies but recent time series studies do not support the FDI led Economic Growth hypotheses. A large body of literature explores the direct and indirect relationship between Foreign Direct Investment (FDI) and Growth, with substantial number of evidences that highlight the apparent relationship between Foreign Direct Investment and Trade. Recent empirical evidences are rather mixed. Some found no causality between FDI and Economic Growth (Jung and Marshall, 1985) others found unidirectional relationship. Chow (1995) reported bidirectional relationship between FDI and Economic Growth. The heterogeneity that observed in the previous study results may be due to adoption of different testing procedures, different lag structure specifications and the different filtering techniques used in the methodologies. Thus, the general objective of this study is to examine the causal relationship between FDI and Economic Growth in BRICS. Specifically, this study examines whether:

- i) Economic Growth of a country drives the FDI inflow
- ii) FDI-leads the Economic Growth of a country
- iii) The two way causal link between them

The most interesting economic scenario suggests a two-way causal link between FDI and Host Country's Economic Growth. Countries with fast Economic Growth generate more demand for FDI and offer opportunities for making profits. On the other hand, inward FDI flows may enhance growth through positive direct and indirect effects on variables that affect growth. Thus, the study expects a bi-directional causality between FDI and Growth.

## **3. Data**

This study analyses the causal nexus between FDI inflows and the growth of selected countries Brazil, Russia, India, China and South Africa (BRICS). The growth of any economy can be substituted by Gross Domestic Product (GDP), Per-capita Income and Industrial Production Index (IPI). However, this study employs IPI as the measure of growth in the analysis using available quarterly data set from 1996 to 2007 for Brazil, 1994 to 2007 for Russia, 1992 to 2007 for India, 1999 to 2007 for China and 1990 to 2007 for South Africa. Similarly, FDI flows are also used in-terms of US\$ for above matching period for the selected countries. The quarterly data set is obtained from IMF International Financial Statistics Year Books.

## **4. Empirical Models and Results**

The methodology involves constructing an econometric estimation model to investigate the impact of FDI on the

growth of BRICS countries. In the first step of the estimation process, the study examines the stationarity properties of the data series. In stationarity time series, shocks will be temporary and over the time their effects will be eliminated as the series revert to their long run mean values. On the other hand, non-stationarity series will contain permanent components (Asteriou, 2006). In fact, most of the economic variables show a trend and therefore most cases are non-stationary. These non-stationary time series can easily lead the Ordinary Least Square (OLS) regression to incorrect or spurious conclusions. Thus, a key way to test for non-stationarity is to test for the existence of unit root. The present study employs the Augmented Dickey–Fuller (ADF) Test for unit roots. The ADF Test includes extra lagged terms of the dependent variables in order to eliminate autocorrelation. The lag length on these extract term is determined by the Akaike Information Criterion (AIC) and Schwartz Criterion (SC). The ADF Test is given in the following regression equation.

$$\Delta Y_{t-1} = \alpha_0 + \gamma Y_{t-1} + \alpha_2 t + \sum_{i=1}^p \beta_i \Delta Y_{t-i} + \varepsilon_t \quad (1)$$

The ADF regression test for the existence of unit root of  $Y_t$  is in the logarithm format for the variables FDI and IPI at time  $t$ . The variable  $\Delta Y_{t-1}$  expresses the first differences with  $p$  lags and the  $\varepsilon_t$  is the variable that adjusts the errors of autocorrelations. The coefficients and  $\alpha_i$  are being estimated. The null and the alternative hypothesis for the existence of unit root in variable  $Y_t$  is:

$$H_0 : \delta_2 = 0 \quad H_e : \delta_2 < 0$$

The results of the ADF Test for the variables FDI and IPI for the alternative models of constant and constant with trend for their logarithmic levels and their differences are presented in the Table 1. The results for the selected countries indicate that the series is non-stationary when the variables are defined at levels with constant, except IPI series of China. Where, the FDI and IPI series of India and China for the constant and constant with trend is stationary at levels. While, the first differencing of series removes the non-stationary components in all cases (constant and constant with trend) and the null hypothesis of non-stationarity is clearly rejected at the 5% significance level and it confirms that the FDI and IPI are integrated in order one. Thus, the robustness of the result allows this study to treat the variables as  $I(1)$  to proceed with Co-integration analysis.

#### 4.1. Co-integration and Johansen Test

The study confirms that the variables under examination are integrated in order one. However, the co-integration test is performed to determine the nature of the long run relationship. The testing of hypothesis is null for non co-integration against the alternative hypothesis, which mean the existence of co-integration. The pioneering work on co-integration analysis was done by Engle and Granger (1987). After this, the researchers like Stock and Watson (1988) and Johansen (1988) tried to extend the work. This study tests the presence of co-integrating relationship between FDI and IPI using the Johansen (1988) Maximum Likelihood Method within a Vector Auto Regressive (VAR) framework. This procedure has superior properties to other methods of testing co-integration (Gonzalo, (1994). A brief outline of the Johansen (1988) procedure is given below:

The notation  $Z_t$  denote a  $p \times 1$  vector of variables which are not integrated in order higher than one, then  $Z_t$  can be formulated as a VAR model of order  $k$ :

$$Z_t = \Pi_1 Z_{t-1} + \Pi_2 Z_{t-2} + \Lambda + \Pi_k Z_{t-k} + \text{deterministic components} + \varepsilon_{1t}$$

Where  $\varepsilon_{1t}$  is independently and normally distributed and  $\Pi_1, \Pi_2, \Lambda, \Pi_{t-k}$  are coefficient matrices. The model can be reparameterized to yield a Vector Correction Model in the form of  $\Delta Z_t = \Gamma_1 \Delta Z_{t-1} + \Lambda + \Gamma_{k-1} \Delta Z_{t-(k-1)} + \Gamma Z_{t-1} + \text{deterministic components} + \varepsilon_{2t}$

Where  $\varepsilon_{2t}$  is independently and normally distributed and  $\Gamma_1, \Gamma_2, \Lambda, \Gamma_{1-(k-1)}$  and  $\Gamma$  are coefficient matrices. Let  $r = \text{rank}(\Gamma)$ , then if  $0 < r < p$  the matrix  $\Gamma$  can be portioned into  $p \times r$  matrices  $\alpha$  and  $\beta$  such that  $\Pi = \Gamma\beta'$  and  $\beta'$  is  $I(0)$  (Johansen and Juselius, 1990).  $r$  is the number of co-integrating relationships and  $\beta$  in each column is the co-integrating vector. In this study we used Johansen (1995) Trace Tests to determine the number of co-integrating relationships between the variables in the bi-variate model.

The results of Co-integration Test based on Johansen's approach are presented in table 2. The results of the Trace Test rejects the null hypothesis at 0.95 critical value level for the selected countries under our study, expect for Brazil, where no co-integration exist and fails to reject the hypothesis at the stationarity level on linear combination.

#### 4.2. Error Correction Model

The study confirms that the variables under examination are co-integrated and estimate the VAR model, in which the study includes Vector Error Correction Model. The Error Correction Model detects the Long run co-integration relationship in the following form:

$$\Delta y_t = \alpha_0 + \beta_1 \Delta x_t - \pi \hat{e}_{t-1} + \varepsilon_t \quad (2)$$

This model will include both long run and short run information where  $\beta_1$  is the impact multiplier (the short run effect) and  $\pi$  is the feed back effect (adjustment effect and shows number of disequilibrium being corrected). The  $\beta_2$  in the equation  $\hat{e}_{t-1} = y_{t-1} - \hat{\beta}_1 - \hat{\beta}_2 x_{t-1}$  however includes the long run response.

The coefficient of Error Correction Model includes information about whether the past values of variables affect the current value of the variables under study. The size and statistical significance of the co-efficients of the Error Correction Model measures the tendencies of each variable to return to equilibrium. For example  $\pi$  in equation (2) is statistically significant means that  $y_t$  responds to disequilibrium in its relation with exogenous variables. According to Choudry (1995), even if the co-efficients of the lagged changes of the independent variables are not statistically significant, Granger Causality can still exist as long as  $\pi$  is significantly different from zero. The short run dynamics are captured through individual co-efficients of the different terms. We carefully chose the appropriate lag length of each regressor based on Schwartz criterion. The results of the Error Correction Model for FDI and IPI are presented as panel A and panel B respectively in Table 3. The Error Correction term for FDI shows a negative sign for BRICS countries and it significantly explores the existence of long run relationship for Brazil, Russia and South Africa. In the short run, growth leads FDI, for India and South Africa which exhibits bidirectional relationship. The same result was also confirmed for India by Bhatt, Sundari and Durairaj (2005). The Error Correction Model results for IPI does not explain the existence of long run relationship with FDI for BRICS countries, whereas in the short run it exhibits unidirectional relationship for India and China explaining that FDI leads Growth at lag length of one.

## 5. Summary and Conclusion

Our study examined the causal nexus between FDI and Economic Growth of the BRICS countries using quarterly data set for Brazil from 1996 to 2007, Russia from 1994 to 2007, India from 1992 to 2007, China from 1999 to 2007 and South Africa from 1999 to 2007 respectively. The study employed Industrial Production Index (IPI) as a measure of Economic Growth. The data series are checked for the stationarity using Augmented Dickey Fuller (ADF) Test and employed the Johansen Co-integration to find out the level of consistence of co-integration, where Brazil alone was co-integrated among the selected countries. However, using Vector Error Correction Model, the existence of long run relationship was traced and the test result revealed that the growth leads FDI bi-directionally for Brazil, Russia and South Africa and FDI leads growth uni-directionally for India and China respectively.

## References

- Akaike, H. (1973). Information theory and an extension of the maximum likelihood principle. In *International Symposium on Information Theory, 2nd, Tsahkadsor, Armenian SSR* (1973), pp. 267-281.
- Asterious, D. (2006). *Applied econometrics: A modern approach using eviews and microfit*, England: Palgrave Macmillan.
- Barro, R. (1990). Government spending in a small model of endogenous growth. *Journal of Political Economy*, 98, 103-25.
- Bhatt, K.S., Sundari, T. & Durairaj, K. (2005). The Nexus between FDI and Economic Growth. In Kehal.H.S (Eds.), *Foreign Investment in Rapidly growing countries*, (pp. 168-179). Palgrave Publishers.
- Boswijk, H.P. & Frances, H. (1992). Dynamic specification and cointegration. *Oxford Bulletin of Economics and Statistics*, 54, 369-81.
- Choudry, T. (1995). Long-run money demand function in argentina during 1935-1962: Evidence from cointegration and error correction models. *Applied Economics*, 27, 661-67.
- Chow, P.C.Y. (1987). Causality between export and industrial development. *Journal of Developmental Economics*, 26, 55-63.
- De Gregrio & Guidotti, P. (1995). Financial development and economic growth. *World Development*, 3, 443-448.
- Dickey, D.A. & Fuller, W.A. (1979). Distribution of the estimators for autoregressive time series with unit root. *Journal of American Statistical Association*, 74, 427-431.
- Dunning, H.J. & Rajeneesh, N. (1999). Foreign direct investment and governments" A catalysts for economic restructuring. *Routledge*, London.
- Engle, R.F. & Granger, C.W.J. (1987). Cointegration and error correction: representation, estimation and testing. *Econometrica*, 55, 251-76.
- Johansen, S. & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with application to the demand of money. *Oxford Bulletin of Economics and Statistics*, 52, 169-210.

- Jung, W.S. & Marshall, P.J. (1985). Exports growth and causality in developing countries. *Journal of Developmental Economics*, 18, 1-12.
- Liu, X., Wang, C. & Wei Y. (2001). Causal links between foreign direct investment and trade in China. *China Economic Review*, 12, 190-202.
- Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22, 3-42.
- PachecoLópez, P. (2005). Foreign direct investment, exports and imports in Mexico. *World Economy*, 28 (8), 1157-1172.
- Phillips, P.C.B. & Perron, P. (1988). Testing for unit root in time series regression. *Biometrika*, 75, 335-346.
- Schwarz, R. (1978). Estimating the dimension of a model. *Annals of Statistics*, 6, 461-464.
- Solow, R.M. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics*, 70, 65-94.
- Stock, H James. & Watson W Mark. (1988). Variable trends in economic time-series. *Journal of Economic Perspectives*, 2 (3), 147-174.
- Shujiro Urata. (1998). *Japanese foreign direct investment in Asia: Its impact on export expansion and technology acquisition of the host economies*. Waseda University and Japan Center for Economic Research.
- World Investment Report. (2002). Transnational Corporation and Export Competitiveness. *UNTACD*: New York and Geneva.

Table 1. Unit Root Test

Augmented Dickey Fuller Test Results				
Foreign Direct Investment				
Country	Level		Difference	
	C	C&T	C	C&T
Brazil	-0.491 <sup>*</sup> (-4.000)	-0.491 <sup>*</sup> (-3.960)	-1.771 <sup>*</sup> (-7.079)	-1.768 <sup>*</sup> (6.998)
Russia	-0.133 (-1.288)	-0.528 (-2.706)	-2.313 <sup>*</sup> (-6.421)	-2.315 <sup>*</sup> (-6.361)
India	-0.102 (-3.058)	-0.257 <sup>*</sup> (-4.114)	-1.230 <sup>*</sup> (-6.217)	-1.297 <sup>*</sup> (-6.353)
China	0.282 (-1.540)	-0.338 (-1.761)	-1.843 <sup>*</sup> (-5.567)	-1.855 <sup>*</sup> (-5.540)
South Africa	-0.224 (-1.840)	-0.567 (-3.332)	-1.879 <sup>*</sup> (-6.017)	-1.883 <sup>*</sup> (-5.988)
Industrial Production Index				
Brazil	-0.0251 (-0.489)	-0.161 (-1.445)	-0.960 <sup>*</sup> (-6.387)	-0.966 <sup>*</sup> (-6.377)
Russia	-0.128 (-1.753)	-0.275 (-2.988)	-1.086 <sup>*</sup> (-7.907)	-1.092 <sup>*</sup> (-7.863)
India	-0.237 (-2.721)	-0.309 (-3.446)	-1.101 <sup>*</sup> (-8.262)	-1.122 <sup>*</sup> (-8.381)
China	-0.848 <sup>*</sup> (-4.952)	-0.892 <sup>*</sup> (-5.089)	-1.190 <sup>*</sup> (7.020)	-1.190 <sup>*</sup> (-6.920)
South Africa	-0.019 (-0.458)	-0.134 (-2.3270)	-1.184 <sup>*</sup> (-9.878)	-1.226 <sup>*</sup> (-10.308)

Notes: a. FDI is the foreign direct investment and  
 b. IPI is the industrial production index  
 c. C is the constant C & T is the C constant and trend  
 d. Figures in the parenthesis are t-statistics and \*denotes significant at 5% level which is the rejection of the null hypothesis of non- stationary. A critical value at 5% level of significance for constant is -2.90 and constant and trend is -3.47.

Table 2. Co-integration Test Results Based on Johansen Approach

Country	H <sub>0</sub>	H <sub>a</sub>	$\lambda_{\max}$ rank Value (0.95)	$\lambda_{\max}$ CV Value(0.95)	$\lambda_{\text{Trace}}$ rank	$\lambda_{\text{Trace}}$ CV
Brazil	r=0	r=1	6.387	14.26	6.513	15.49
	r≤1	r=2	0.126	3.84	0.126	3.84
Russia	r=0	r=1	28.970*	14.26	31.019*	15.49
	r≤1	r=2	2.049	3.84	2.049	3.84
India	r=0	r=1	22.999*	14.26	23.673*	15.49
	r≤1	r=2	0.674	3.84	0.674	3.84
China	r=0	r=1	34.853*	14.26	37.052*	15.49
	r≤1	r=2	2.199	3.84	2.199	3.84
South Africa	r=0	r=1	37.322*	14.26	55.685*	15.49
	r≤1	r=2	18.362*	3.84	18.632*	3.84

Note: r is the co-integrating vector, CV is the critical value at 5% level  
 \* denotes rejection of the null hypothesis at 5% level of significant

Table 3. Vector Error Correction Model

Panel – A: Foreign Direction Investment

Variables	Countries				
	Brazil	Russia	India	China	South Africa
CointEq1	-0.348* (-2.291)	-0.436* (-2.356)	-0.020 (0.490)	-0.348 (-1.806)	-0.487* (-2.886)
FDI[-1]	-0.289 (-1.628)	-0.359* (-2.061)	-0.917* (-6.960)	-0.466* (-2.033)	-0.228 (-1.438)
FDI[-2]	-0.143 (-0.918)	-0.242 (-1.702)	-0.441* (-3.264)	-0.033 (-0.177)	-0.169 (-1.380)
IPI[-1]	-2.66 (0.962)	-1.951 (-0.853)	-0.512 (0.555)	-2.426 (-1.304)	12.155* (2.149)
IPI[-2]	-1.198 (-0.434)	-0.684 (-0.329)	1.240 (1.960)**	-1.826 (-1.252)	4.342 (0.738)
C	0.015 (0.509)	0.065 (1.355)	0.009 (0.468)	0.024 (0.558)	0.011 (0.179)
R <sup>2</sup>	0.335	0.309	0.557	0.490	0.404
Adj R <sup>2</sup>	0.250	0.325	0.513	0.396	0.357
S.E.equation	0.186	0.343	0.152	0.243	0.512
F-statistic	3.932	6.017	12.576	5.191	8.560
Log likelihood	15.129	-15.315	29.322	3.128	-49.628

Note: FDI is the Foreign Direct Investment, Figures in paranthesis are t-Statistic,  
 \* and \*\* denotes the rejection of null hypothesis at 5% and 10% level of significance

Panel – B: Industrial Production Index

Variables	Countries			
	Russia	India	China	South Africa
CointEq1	0.032 (2.548)	0.042 (5.157)	0.121 (4.791)	0.009 (2.512)
FDI[-1]	-0.010 (-0.863)	-0.079* (-3.027)	-0.063* (-2.106)	-0.003 (-0.782)
FDI[-2]	-0.006 (-0.597)	-0.043 (-1.606)	-0.016 (-0.639)	0.002 (0.661)
IPI[-1]	0.073 (0.466)	0.141 (0.769)	0.715 (2.930)	-0.206 (-1.764)
IPI[-2]	0.046 (0.321)	0.125 (0.989)	0.189 (0.988)	-0.113 (-0.932)
C	0.002 (0.704)	0.002 (0.620)	0.000 (0.044)	0.001 (1.063)
R <sup>2</sup>	0.157	0.635	0.642	0.187
Adj R <sup>2</sup>	0.067	0.599	0.575	0.122
S.E.equation	0.024	0.030	0.032	0.010
F-statistic	1.750	17.443	9.680	2.904
Log likelihood	126.430	119.519	70.157	218.029

Note: IPI is the Industrial Production Index, Figures in parenthesis are t-Statistic  
 \* denotes the rejection of null hypothesis at 5% level of significance



## The Enterprise Organizational Structure Change Strategy in Internet Times

Zitian Xu

School of Business, Linyi Normal University

Linyi 276000, China

Tel: 86-539-206-0713 E-mail: chixzt@163.com

### Abstract

As the most dynamic business model in the 21st century, Electronic commerce has brought enormous opportunities and challenges for the enterprise development and growth. This article has analyzed the traditional enterprise organizational structure limitations and the requirements of enterprise organizational structure by e-commerce, proposed enterprise organizational structure strategic orientation in Internet times.

**Keywords:** Internet, E-commerce, Organizational structure, Networks

The development of the Internet has changed the laws of economic development and market mechanism. Electronic commerce causes competitive space of enterprises to shift gradually from the traditional marketplace to the network marketplace, the marketing way also changes from traditional marketing towards online marketing. The customers can search more comprehensive and perfect product and price information through the Internet. Compared to the past, now they have the bigger market power. In Internet era, companies are faced with a more volatile environment, increased fierce market competition, more discerning and nitpicking customers. In order to adapt to changes in the external environment, businesses need to change the traditional organizational structure to deal with the impact and challenges which e-commerce brings.

### 1. The limitations of the traditional enterprise organizational structure

The traditional enterprise organizational structure pattern, the pyramid-shaped, top-down control model, appears in the industry economy times. It is the management organization pattern which based on the tradition organizational structure theory, has the features like well-structured, clear hierarchical division of labor, easy to monitor, etc. But along with the Information networking, economic globalization advancing, market competition aggravating, the drawbacks of the traditional organizational structure has become increasingly exposed:

#### 1.1 Many management agencies and large personnel

The traditional organization mainly increases the management levels to solve the enterprise size expansion. But along with increasing levels of management, organization will inevitably become bloated and overstaffed, which resulting the rise of the business management cost, causing the wrangle of the different departments responsibilities and obligations, lowering management efficiency. So the enterprise will finally lack the prompt adaptiveness to the fast-changing market environment.

#### 1.2 Difficult Inter-sectoral linkages and coordinations

The division of labor results in the ego idea between various functional departments which obtain the limited resources from the common higher authority. There is a kind of competitive relationships between them. They will meticulously plan their own action, which often causes the department goal to dominate above the enterprise general objective. Due to the existence of internal conflicts and contradictions, crosswise exchange between the various departments is also very limited; coordination has become increasingly difficult with the expansion of size.

#### 1.3 Poor transmission and exchange of information

The traditional enterprise information channel is unitary. The information flowing is mainly longitudinal and passive. The information communication channel extension causes the information transmission time increase as well as the information distortion and management vacuum possibility. The enterprise high-level decision-making usually takes a number of intermediate links to implement it, resulting in the high decision information cost and bad information accuracy. So the policy-makers will be unable to make the rapid reaction.

#### 1.4 Inhibiting the creative staff.

As a result of the concentration of power in the upper deck, the subordinate independency is small and the participation

in decision-makings is limited. The stern organization and the strict division of labor caused the staff to turn into the “robot”, unable to display its enthusiasm and the creativity freely, restricting the realization of “humanist” management idea in business.

## **2. The requirements of enterprise organizational structure in Internet era**

Internet causes enterprise's competition to enter non-boundary competition times; the traditional enterprise organization pattern is very difficult to adapt the e-commerce businesses. E-commerce sets new requests to the enterprise organizational structure:

### *2.1 Rapid organization responsion*

In Internet era, enterprises are faced with the consumers who pursuit diversified and personalized demands as well as the ever-changing market. Therefore, the enterprise must have the nimble organization and the decision system to adapt such fast change. The contemporary enterprise should make full use of network resources, remove away traditional enterprise middle link parts by using the modern network technogy, change traditional policy-making management pattern, simplify administrations, streamline business processes, to create a learning-oriented organizational structure and enhance decision-making ability and rapid responsive capability.

### *2.2 Timely and accurate information communication*

In the traditional organization, the information layer-to layer delivery delays fast decision-making and rapid responsiveness. The age of electronic commerce, management communication capacity and management span grew doubled and re-doubled with the aid of information technology. Enterprises can reduce the management levels to achieve a flat organization and networking which accelerating the speed of information transmission and power decentralization. Therefore, we must establish and improve internal and external organizational communication networks, enable businesses to freely access to accurate, timely, multi-channel information of decision-making.

### *2.3 Conducive to the integration of internal resources*

Under electronic commerce condition, enterprises carrying out activities in an effective way should fully use and integrate internal personnel, financial, physical, technical, time, information and other types of resources. With the personalized and diversified consumer demands, business competition focuses on innovation, responsive speed, customized products, customized services and so on. Enterprises should use flexible organizational structure which based on the goal or project.

### *2.4 Effective use of external resources*

Any enterprise's resources is limited, enterprise's development need to use external resources. Therefore, enterprises should perfect enterprise external resources networks such as customers, technical, project, human, production factors by developing electronic commerce fully, establish a win-win cooperation organizational system based on responsibility, rights and benefits which is flexible and virtual.

### *2.5 Promoting staff's learning and innovation*

Learning and innovation capacity of enterprises is a measure of enterprise's core competitiveness. Therefore, the organizational structure should be conducive to staff learning and growing needs, enhance employee participation and collaboration between them, and create a kind of independent, innovative, collaborative working atmosphere. So enterprises should implement the decentralization of decision-making, turn the highly centralized decision-making model into the decentralized multi-center decision-making model, and promote the staff and enterprise's common growth.

## **3. Enterprise organizational structure strategic orientation in Internet times**

The information revolution is changing the human society, also changing the enterprise's organization and mechanism. The development of Internet will further changes of organizational structure.

### *3.1 Set up the brand-new business strategic thinking based on the Internet*

E-commerce is a kind of new competitive strategy based on the Internet and information technology and increasingly become a source of competitive advantage. With the development of e-commerce, complete traditional organizational model lose the reasons which continue to exist. Therefore, companies must break through the original strategy ideology mode, clearly locate their role in e-commerce environment, and guide the development of enterprises with new business strategies. In order to achieve the flexibility of organization, many of today's enterprises are re-adjusting the enterprise and market boundary through the implementation of the Internet strategy. The organizational structure be adjusted accordingly, so that the enterprise can concentrate on developing the core business and reduce the size, enhance the adaptability and resilience. For example, General Electric Company, through reforming borderless operations, reduces the bureaucratism and hierarchical system which harm management greatly, and gain new competitive advantage.

### 3.2 Integrate enterprise business processes by using the information technology

Businesses can use network and information technology, starting from the development strategy, implement the core business process reengineering to break the traditional boundaries of functional departments, establish a rational system of business processes and operations, turn gradually enterprise management focus from the functional operation of the production, marketing, financial management, human resources management to of customer relationship management, supply chain management, strategic partnership management. Businesses should create higher value for current and potential enterprise customers, establish a more coordinated and effective relationship among the whole value chain of customers, suppliers, distributors, and partners, to lead the entire chain's value growth. For example, Wal-Mart has pioneered the use of computer networks and e-commerce activities to cooperate with Procter & Gamble. So two companies work closely together, which lower two company's stock levels and the logistics cost greatly, has molded the new competitive advantage.

### 3.3 Carry out networking strategy, establish the enterprise strategy networks

Enterprise may realize competitive edge by cultivating and applying networks. Enterprise needs to know the network category is going beyond the general scope of the network. The network is not technical terms. It not only includes business IT application activities, but also includes the hybrid forms of business organizations operation.

Enterprises can build dynamic, networked, virtual organization from internal and external. In-house, establish flat organizational structure through reducing or eliminating intermediate-levels and regrouping resources portfolio, apply various teams which adjust rapidly to changes in the external environment, and try to meet external diversified customers; Outside the enterprise, build a "virtual" "solid" combined network organization by using the Internet, supply chain and capital markets. "Virtual" means to form the business relationships with others through production outsourcing, sales outsourcing, R & D outsourcing, strategic alliances, and network marketing and so on. "Actual" refers to form an ego-centered, time-space crossing, customer-oriented virtual enterprise under the help of strong corporate brand and operation capacity, advanced management capabilities, efficient management information system, etc.

### 3.4 Introduce and use work groups and teams in organization

In order to enhance the ability adapting changes in the external environment and the organization competitiveness, enterprises should form stable or ad-hoc "process" or "network" teams. Team organization eliminate the shortcomings of the pyramid, which is difficult in inter-departmental communication, meticulous division of labor, slow decision-making, inferior flexibility, and create a kind of independent, innovative, flexible, cooperative working atmosphere. At present, team has become, in many large companies (especially high-tech enterprises), the preferred form of internal organization. The cross-functional team members from different backgrounds and with different skills often have a sense of equality, involvement and responsibility, which can greatly glow the worker's innovative spirit. Through team-building, it is not only conducive to train talented persons, but also create learning organization through the knowledge transferring or sharing in the enterprises.

## References

- Liu, Yezheng. (2007). *Introduction to E-Commerce*. Beijing: Higher Education Press. (Chapter 1).
- Stephen , P , Robbins. (2004). *Management*, (7th ed.). Beijing: Renmin University Press. (Chapter 10).
- Zhang, Shumei, & Fen, Hua. (2004). Study about the e-commerce impacts on organizational structure and management style innovation. *Journal of Shandong Economy*, 7, 71-74.
- Zhou, Sanduo. (2005). *Management*, (4th ed.). Shanghai: Fudan University Press. (Chapter 13).



A journal archived in Library and Archives Canada  
A journal indexed in Canadiana (The National Bibliography)  
A journal indexed in AMICUS  
A journal indexed in the EconLit databases  
A journal listed in Ulrich's  
A journal listed in DOAJ  
A journal listed in Journalseek  
A journal included in Google Scholar  
A journal included in LOCKSS  
A journal included in PKP Open Archives Harvester  
A peer-reviewed journal in business and management

## International Business Research

Quarterly

Publisher Canadian Center of Science and Education  
Address 4915 Bathurst St. Unit #209-309, Toronto, ON. M2R 1X9  
Telephone 1-416-208-4027  
Fax 1-416-208-4028  
E-mail [ibr@ccsenet.org](mailto:ibr@ccsenet.org)  
Website [www.ccsenet.org](http://www.ccsenet.org)  
Printer William Printing Inc.  
Price CAD.\$ 20.00

ISSN 1913-9004

