

# An Exploratory Study on Workforce Development Strategies by Taiwan-Invested OEMs in China

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Received: November 9, 2013 Accepted: November 29, 2013 Online Published: January 26, 2014

doi:10.5539/ass.v10n4p233

URL: <http://dx.doi.org/10.5539/ass.v10n4p233>

## Abstract

This study employs the perspective of global value chain (GVC) to address the workforce development (WFD) strategies conducted by Taiwanese OEMs in China for supporting their GVC upgrading. According to the case-based empirical analysis, five major characteristics of their WFD strategies are identified: 1) Consideration of the imbalance between skills supply and demand for GVC upgrading in China; 2) Inclusion of training industry-specific skills as per international standards, 3) Emphasis on developing “soft skills”; 4) Specific training for key bottleneck positions required by GVC upgrading; 5) Establishment of innovative corporate career development initiatives. This paper contributes to the literature by promoting better understanding of the WFD strategies by Taiwanese OEMs in China as well as examining the critical role of these strategies in facilitating GVC upgrading. Further, since a variety of enterprises interviews were conducted, it answers to a recent call for using first-hand information to analyze relevant issues, providing constructive implications for other Taiwanese OEMs to overcome the critical skilled labor shortage that may hinder their GVC upgrading.

**Keywords:** workforce, upgrading, global value chain, OEM, Taiwan, China

## 1. Introduction

Taiwanese original equipments manufacturers (OEMs), in order to achieve low-cost production, have been investing heavily in China, thus playing an important role in promoting China's fast economic growth and maintaining its international status as the world's factory for the past three decades (Lin & Hou, 2010; Lau & Bruton, 2008).

However, the RMB appreciation, rising costs, and inflation pressures have weakened China's cost advantages and largely squeezed OEM's profit margins recently. According to China's 12th Five-Year Plan (2011-2015), a goal was set to raise the national minimum wage by an average of at least 13 percent a year (The State Council, 2011). The current average manufacturing wage, as a matter of fact, has risen to about 2.25 Euro/hour, which is comparable of that of certain Eastern European countries. (Note 1) Considering direct labor cost accounts for the majority of the cost components across an OEM's supply chain operations, a growing number of foreign-invested manufacturers in China, of course including those Taiwan-invested OEMs (Herrigel, Wittke, & Voskamp, 2013; Chin, 2013a) have decided to conduct upgrading strategies to upgrade their positions within the global value chain (GVC) for obtaining higher economic returns.

Given the labor-intensive nature, human capital is seen as an essential element for OEMs to support GVC upgrading. Nevertheless, research discovered that most OEMs in emerging economies or developing countries didn't prepare their workforce well to adapt to the challenges in the process of upgrading (Fernandez-Stark, Bamber, & Gereffi, 2012; Chin, 2013b). Workforce development appeared to be an under-researched topic in the past, as Taiwanese OEMs' operations in China typically employed low-skilled workers with a minimum level of education. To fill this research gap, the purpose of this study is to probe into the workforce-focused issues, especially about the role and dynamics of the workforce development initiatives/strategies by Taiwanese OEMs implementing upgrading in China. More specifically, this paper seeks to understand the effectiveness of the investment by Taiwanese OEMs on enhancing human assets, shedding light on the importance of linking the

labor skills development to firm competitiveness by OEMs. As a result, this current research, as an initial step, aims to explore *what the workforce development strategies employed by Taiwan-invested OEMs in China are in terms of facilitating their GVC upgrading?*

This study makes three main contributions. Theoretically, it contributes to the literature by promoting better understanding of the workforce development strategies by Taiwanese OEMs in China as well as examining the critical role of these strategies in facilitating GVC upgrading. Further, since a variety of enterprises interviews were conducted, it answers to a recent appeal for using first-hand information to analyze relevant issues (Lau & Bruton, 2008; Chin, 2013a). Practically, this paper could offer constructive implications for other Taiwanese OEMs in China to overcome the critical skilled labor shortage that may hinder their GVC upgrading.

## 2. Theoretical Foundation

### 2.1 The GVC Framework

The concept of global value chains (GVC) refers to a new breed of global production network system fuelled by the globalization of production and trade, generally consisting of developed country lead firms and-often operating in developing and emerging economies-suppliers and service providers (Ivarsson & Alvstam, 2011; Gereffi, Humphrey, & Sturgeon, 2005). For instance, many of the adidas footwear products are designed in Europe or USA and manufactured in China, Vietnam or Cambodia. The emergence of GVCs during the past three decades has enabled numerous large multinational corporations (MNCs) in advanced economies to specialize in specific aspects of manufacturing, rather than complete industrial sector. More specifically, these MNCs can outsource “non-core” functions such as generic services and mass production to low-cost regions of the world, but focus on building core competencies on technological innovation, marketing and other high value-added activities (Gereffi et al., 2005). Following this GVC approach, many developing and emerging economy OEMs have arisen to be important new players in the global trade regime, notably firms from East Asia (Mathews, 2006). Moreover, some giant economies such as China even offered seemingly inexhaustible pool of cheap labor force with large domestic markets. Therefore, a large number of Taiwanese OEMs, due to the unique geographic advantage of neighbor distance as well as deep historical and cultural bonds with China, grabbed the opportunities driven by the prevalence of GVCs to invest heavily in the mainland, making good use of their abundant supply of low-wage workers to produce components or finished products for exporting to international markets (Hornig & Chen, 2010; Morrison et al., 2008).

A review of China’s economic statistics shows that these Taiwan-invested OEMs have made great contributions to China’s export and gross domestic product (GDP) growth (China, 2013a; Lau & Bruton, 2008). However, given the low-cost advantages for China’s manufacturing are disappearing, Taiwanese OEMs having plants in China nowadays can’t but seek to conduct upgrading strategies for making better profits, such as engaging in more cost-efficient production or shifting to higher value-added activities in GVCs (Lin & Hou, 2010; Hornig & Chen, 2008).

According to the GVC literature, four typical upgrading trajectories by OEMs have been identified: *process upgrading* about transforming inputs into outputs more efficiently by mastering advanced technologies; *product upgrading* about moving into more sophisticated product lines; *functional upgrading* about engaging in more value-added functions; and *inter-sectoral upgrading* about moving into new but often related industries (Gereffi et al., 2011; Ivarsson & Alvstam, 2011). Hence, all four types of upgrading require OEMs to enhance the overall skills content of production as well as relevant activities, and perform different levels of pragmatism-based organizational leaning from their mature market clients (Herrigel et al., 2013). Also, it highlights the vital needs to upgrading the labor force to possess new knowledge and skills that fit, or are even co-specialized to the unique criteria for upgrading within the specific industrial value chains.

However, traditional workforce development systems in developing or emerging countries often do not provide skills training and education required by OEMs to carrying out upgrading (Fernandez-Stark et al., 2012). As a result, it seems to be imperative for the Taiwanese OEMs mentioned above to identify what professional skills are in demand in the process of transition to higher-value activities within GVCs, and based on which, these OEMs can make corresponding workforce development plans to develop highly-skilled and professional workers for enhancing the possibility of successful upgrading (Fernandez-Stark et al., 2012; Chin, 2013b).

### 2.2 Workforce Development: The Skills Challenges in GVC Upgrading

According to Tang, Lee, Valerio, and McGough (2011), *workforce development* is about “building and upgrading job-relevant skills” and serves a dual function: 1) Vocational or professional training, education and the like that enables individuals to acquire necessary knowledge, skills and attitudes for remunerative

employment or better performance; 2) An effective means or arrangements that meet employers' demands for specific technical or practical skills at both strategic and operational levels. Referring to this viewpoint, GVC scholars define *workforce development* as "the process by which a territory's initial endowment of human capital is converted into a source of competitive advantage for firms and industries in the territory (Fernandez-Stark, 2012; Gereffi et al., 2011). Taken together, workforce development initiatives/strategies should cover a broad range of activities, including education, training (both formal and informal) and access to relevant services such labor market information, intermediation and exchange.

Despite its critical role in upgrading as discussed earlier, so far there has been limited literature discussing *workforce development* strategies by OEMs and no widely accepted methodology for investigating relevant issues (Gereffi et al., 2011; Kaplinsky et al., 2009; Morrison et al., 2008). First, it may be due to the complexity of the nature of upgrading patterns, considering the different input-output structures of individual value chains and the institutional context in which the chain is embedded may diversify the upgrading trajectories by OEMs in different industries. In other word, better knowledge on forecasting job creation and the corresponding skills requirement in a specific value chain may only be obtained through sufficient up-close, in-depth investigations and analysis on the upgrading trajectories of the specific value chain (Gereffi et al., 2011; Tang et al., 2011).

Second, as mentioned above, all GVC models and their corresponding workforce development strategies incorporate a wide range of actors and stakeholders, ranging from public institutions (e.g., local and national governments), quasi-public institutions (e.g., higher education), private firms, international associations, non-government organizations (NGOs), and the like (Fernandez-Stark et al., 2012; Gereffi et al., 2011). Research indicates that from a GVC perspective, the implications and concerns about skills development arise from five major factors: globalization, technology, the role of knowledge and innovation in the GVCs, political change, and demographic shifts (Jacobs & Hawley, 2008). As a result, when OEMs put forward workforce development strategies to facilitate GVC upgrading, they may need to simultaneously face a variety of challenges involving national, regional, provincial or industrial systems at the individual, organizational and societal levels.

In view of the forgoing, it is clear that although enhancing the capabilities of labor force is of great importance to GVC upgrading by OEMs, the dynamic nature of GVCs and the complex interventions from a broad range of stakeholders both within and beyond GVCs result in critical skills challenges for OEMs.

### 2.3 Taiwanese OEMs in China

Some research points out, the cost to manufacture in China could soar twofold or even threefold by 2020 on the assumption that China's currency will be continuously rising about 5% annually and wages may be going up by 30% a year. For instance, the prevailing manufacturing wages in Pearl River Delta are expected to rise 9.2 percent in 2013, faster than the estimated GDP growth rate of 7.6 percent in this region. Evidence shows that the impact of volatility in labor costs on OEMs' profit margins is likely to influence global MNC's manufacturing strategies (Herrigel et al., 2013; Chin, 2013a, 2013b; Jiang, Baker, & Frazier, 2009). Hence, as noted previously, wage increases in China have intensified the problems of high employee turnover rate and relevant workforce issues, particularly in labor-intensive OEM industries. In addition to the wage inflation threatening China's competitive position as a low-cost investment destination, foreign OEMs in China also need to face another severe problem, that is, the Chinese government has decided to reduce the country's dependence on exports, in order to achieve sustainable economic development rather than export-driven growth as what happened in the past (Cheung, 2012).

Taking Foxconn, a Taiwanese listed as well as the biggest OEM of computer components in the world, for example, monthly turnover rate of this company's Shenzhen plant had soared to about 15 percent in 2009 and there were 12 factory workers committing suicide in just two months in the middle of 2010 (Enderle & Niu, 2012). In response, Foxconn has kept raising the minimum monthly salary level for frontline workers, from RMB 900 in 2009 to RMB 1,800 in 2012, more than the mandated monthly wage requirement of RMB 1,500 in Shenzhen.

Under this kind of tough circumstances, many Taiwanese OEMs, particularly those possessing advanced information and communication technologies (ICT), have conducted upgrading strategies to ascend to higher, more value-added positions along the GVCs, such as the notable own-brand computer manufacturers Asus and Acer, as well as the well-known mobile phone manufacturer HTC (Lin & Hou, 2010; Horng & Chen, 2008; Morrison et al., 2008). These successful examples have highlighted the significance of workforce development strategies and accompanying human capital investment to facilitate upgrading, given competent engineers and skilled workers were critically needed to uphold the best practices (Herrigel et al., 2013; Chen & Miller, 2011;

Lin & Hou, 2010).

It's worth noting that workforce education and training for supporting GVC upgrading can't only focus on hard skills in manufacturing but should also cover "soft" skills such as leadership, teamwork, communication, ethical management and conflict management that may not be gained simply through on-the-job or in-house training (Fernandez-Stark et al., 2012). In fact, as noted before, the strategic investments in workforce development were usually made by both public institutions and private firms in developing and emerging economies for promoting industrial international competitiveness at national and organizational levels. However, compared with Europe and U.S., current workforce development systems in China may not provide sufficient skills training and education required by OEMs to carrying out upgrading (Jiang et al., 2009). In this vein, Taiwanese OEMs in China have mostly relied on their own capabilities to establish their respective workforce development strategies that can fit their actual labor demands in upgrading. Given growing evidence points out the problems on labor shortages and mismatches between skills demand and supply facing foreign OEMs in China (Davies & Liang, 2011), equipping the workforce with job-relevant skills for ascending the GVCs grows to be a continuing challenge for Taiwanese OEMs.

Considering the aforementioned, this research, based on the premise that OEMs must invest to develop competitive labor force to ensure success of the GVC upgrading, seeks to conduct case studies to identify what the workforce development strategies by Taiwan-invested OEMs in China are and whether the strategies can foster, or conversely, hinder the upgrading process or potential of these firms. In other words, this current study would be ground in a GVC framework to investigate how Taiwanese OEMs lay out effective HR strategies to improve the quality of labor force in China via multiple channels in practice.

### 3. Methodology

Given *workforce development in GVC upgrading* as a research topic has been underestimated in the past and is exploratory in nature (Gereffi et al., 2011), the use of case study methodology seems to be particularly appropriate. This research thus complies with case research design using in-depth archival and field data to generate results.

According to qualitative methodologists (Yin, 2003), a multiple case-based study may serve as a solid basis for either empirically examining existing theories or providing reasonable theoretical explanations of new phenomenon being observed. Further, sample selection is one of the most difficult and critical procedure because the sample firms must be specific and representative of all cases (Eisenhardt & Graebner, 2007; Chin, 2013a). As a result, to enhance the explanatory power, this paper employs a multi-case research method investigating two Taiwanese OEMs in golf club manufacturing in China.

The reason to choose golf club manufacturing industry is mainly because most notable, world-class golf club brands including Taylor Made, Callaway, Ping, and Nike have outsourced their manufacturing to several large Taiwanese OEM suppliers in China. Given golf club manufacturing has experienced many years of evolution, the materials have changed dramatically and design and manufacturing techniques have been developed and refined for the last 20 years. The golf club manufacturing requires a certain level of technological capabilities and is characterized by a high degree of asset specificity. Therefore, Taiwanese OEMs, with their worldwide reputations of advance technology and good quality, play a major role in serving these international golf club brands.

In order to collect accurate data, researchers were assisted by the managers of the social environmental affairs (SEA) division at the adidas Sourcing Guangzhou office. With their participation, two cases were judgmentally-not randomly-selected from the adidas currently active suppliers list: Company A (listed on due to the Taiwan stock exchange) headquartered in Taiwan, the world's biggest golf club OEMs accounting for about 35% of the global market share (case #1), and Company B headquartered in Taiwan, the world's third biggest golf club OEMs accounting for about 18 % of the global market share (case #1).

#### 3.1 Data Collection

Given the selected OEM suppliers have established close collaborative relationships with the adidas group, the adidas SEA managers thus helped the research team to arrange site visits to the two Taiwanese companies' factories in China. The research team spent three days at each factory, using semi-structured and open-ended interviews with the suppliers' general managers/CEO, HR directors/department heads, two-four production managers, relevant key staffs, the labor union representative, and 15-20 randomly chosen frontline workers, who were explicitly requested to identify the workforce development strategies conducted in their respective factories for supporting GVC upgrading as well as the effectiveness of the practices of these HR strategies. Sample

questions include the following:

- 1) Please illustrate the main workforce/skill requirements of your clients, i.e., the global golf brand firms, for their OEM suppliers to fulfill best practices in GVCs;
- 2) What are the most critical skill challenges for supporting GVC upgrading facing your firm in China?
- 3) How do international industry standards, e.g., product and process standards in terms of quality and product safety, impact labor skill requirements?
- 4) As far as facilitating GVC upgrading, what were the most effective workforce development initiatives used by your firm?

To obtain robust data and capture the real conditions of target cases to a maximum extent, the triangulation approach of qualitative research was employed to ensure multi-source information being gathered in each firm, including interview records, archival materials, internal reports, literature, etc. (Eisenhardt & Craebner, 2007). Moreover, in addition to being tape-recorded, the face-to-face interviews were conducted by at least three person teams where one researcher handles interview questions and the other two are responsible for taking notes and observations. Each interview lasted from 30 to 90 minutes and the recorded data were dealt with and organized on the same day they were taped. However, some follow-up interviews might also be executed if there were any queries needing to be further addressed.

#### 4. Empirical Findings and Discussions

Main findings of our case study are shown as follows. As mentioned earlier, both case firms are headquartered in Taiwan and operating their largest factories in China. Company A, founded in 1953, is currently the world's biggest golf club contract manufacturer, producing golf clubs for most top global golf brands including Taylor Made, Callaway, Ping, and Nike under OEM and original design manufacture (ODM) arrangements while Company B, established in 1987, is the number one golf club OEM/ODM supplier of the adidas group with more than 70% proportion of its total sales to Taylor Made. The core mission of Company A is "pursuing excellence, enriching life" while the latest mission statement of Company B is "creating a dynamic environment driven by enthusiasm while pursuing excellence; organizing an effective supply chain to achieve customer satisfaction and to enrich quality of life". The detailed business profiles of the two Taiwanese OEMs are presented in Table 1.

Table 1. Basic business profiles of the two case companies

	Company A	Company B
Constitution Year	1953	1987
Listed Year	1997 listed on Taiwan Stock Exchange	non-listed
Parent /Subsidiaries	Co. The group is headquartered in Taiwan, comprising about 18 companies located in the mainland, Taiwan, Vietnam, U.S.A and Germany	The group is headquartered in Taiwan, with about 9 strategic manufacturing locations in the mainland, Vietnam and Taiwan.
Current Business & Products	Core Main The group provides a full range of golf club and electronic components manufacturing services, including OEM and ODM for major global brands, while it has upgraded to engage in OBM business in compressor manufacturing industry since 2005.	The group specializes in manufacturing golf clubs, composite and fiber components as well as bike components under OEM arrangement for global brands.
Main Clients in golf club manufacturing	TaylorMade, Callaway, Ping, and Nike	Taylor Made
Revenue in 2012	About 3 billion RMB in golf club manufacturing	About 640 million RMB in golf manufacturing
Employees	14,000 worldwide	5,000 worldwide

#### 4.1 Workforce Development Strategies (WFD) by Both Firms Have Taken into Account the Imbalance between Skills Supply and Demand Needed for GVC Upgrading in China

When OEMs ascend the GVCs to engage in more value-added and high-skilled activities such as design functions of ODM service, they demand "upgradeable workers" who can be trained in a rapid and effective manner (Fernandez-Stark et al., 2012). However, as indicated above, compared with western developed countries, the existing formal workforce development institutions in China are not adequately prepared to provide

corresponding skills training, education, and most importantly, occupational standards with related training assessments required by OEMs to establish feasible measurements for new jobs created in the process of upgrading (Jiang et al., 2009).

In other words, although a skilled workforce is fundamental for increasing manufacturing efficiency, mastering advanced technologies and enhancing process optimization needed for GVC upgrading, the current labor force supply-demand system in China is still not sound enough to sustain workforce in this way. Evidence has also indicated the tough issues on labor shortages and mismatches between skills demand and supply facing foreign OEMs in China recently (Sheldom & Li, 2013; Davies & Liang, 2011). Fortunately, most world brands, such as Taylor Made, Ping, and Nike, consider the upgrading of key OEM suppliers as a deliberate part of their sourcing strategy (Kang, Mahoney, & Tan, 2009; Ivarsson & Alvstam, 2011). As a result, the two case firms, like most other foreign OEMs in China, have been heavily assisted and supported by their developed country clients to identify core workforce skills needed for GVC upgrading, proposing corresponding workforce development strategies to establish new training protocols in line with international standards. More specifically, the two Taiwanese OEMs have been providing education and training for their workforce that goes beyond the expected on-the-job training pertaining to specific golf club manufacturing procedures, to cover a wider range of basic education and skill needs.

#### *4.2 Inclusion of Training Industry-Specific Skills in Compliance with International Standards for Total Quality Management (TQM) and Ethical Codes*

Given promoting people-oriented and environmental sustainability has become a business imperative for enterprises operating worldwide, the WFD strategies by both firms have included the codes of conduct for international TQM standards such as ISO 9000, ISO 14000 Six Sigma Methodology and the like. Both OEMs have been investing heavily in employee external training, regularly conducting the third-party audit to ensure the results and get the certifications through the third party that enable the firms to have legal advantages in international business communities and markets.

Additionally, considering some ethically problematic labor/HR management practices in China were reported in recent years, such as Foxconn's exploitative working conditions and Gucci's inhumane labor treatment, both firms have highlighted the imperativeness of implementing industry-wide and worldwide codes of ethics and establishing socially responsible management systems in their respective WFD strategies.

#### *4.3 Emphasis on Developing "Soft Skills", Especially for Training Qualified Production Frontline Supervisors to Facilitate GVC Upgrading*

As far as OEMs, equipping low-end production workers with some crucial "soft skills" such as problem solving, conflict resolving, and teamwork are of great importance to facilitating and supporting their GVC upgrading (Gereffi et al., 2011). Company A claimed that to increase the utilization of modernized information technologies in the production process, they have put a premium on hiring and developing workers with open mindset and good, non-technical skills such as teamwork, communication, coordination, and leadership. Company B also indicated that according to their experience in ascending to ODM status, enhancing interpersonal skills among production workers must be prioritized for GVC upgrading because poor communication and inability to work in teams may significantly impede the collaboration and knowledge transfer between different functional areas, thus hindering the building of new set of capabilities for upgrading.

In terms of the upgrading of manufacturing sector, production frontline supervisors who directly manage frontline operators play a critical role in enhancing productivity, efficiency and process optimization; however, there is often a shortage of qualified, skilled frontline managers/floor supervisors in the Chinese context (Sheldom & Li, 2013; Jiang et al., 2009). It is because these floor supervisors were, in general, migrant workers from rural areas with little or no formal education in the past. To compensate for this labor force weakness, two case firms viewed in-house formal training program for supervisor-level positions that includes multi-facet managerial skills such organizing, planning and commanding, and advanced knowledge regarding industrial relations, health and safety in the workplace.

#### *4.4 Specific Training for Key Bottleneck Positions Required by GVC Upgrading*

The technical specifications of golf clubs are constantly evolving in response to the fast changes in the rules of the Professional Golfers' Association (PGA). Hence, the higher stage of the value chain in golf club manufacturing, the more highly specialized professionals are required to take on some critical bottleneck positions. However, given the public educational institutions in China have not been able to fill these skills gaps (Sheldom & Li, 2013; Davies & Liang, 2011), both case firms have been depending mostly on themselves to

prepare qualified labor force for the bottleneck positions created in the process of upgrading.

Company A claimed that they plan to build their own in-house tertiary college, teaching employees the specific skills required for GVC upgrading as well as catering to their clients' manifold needs whereas Company B indicated that the financial burden of additional training has increased the comparative cost of labor and may affect their competitiveness in China.

#### 4.5 Establishment of Innovative Corporate Career Development Initiatives

Career development for OEM workers today is not what it was in the past. Due to mergers, outsourcings, consolidations, and more or less endless downsizings among OEMs in China, the ground rules, at least for most low-skilled factory workers, have changed to a certain extent. More often many production workers in China find themselves having to re-invent themselves, e.g., shifting careers from manufacturing to service industry in the face of the inevitable growth slowdown of export-oriented manufacturers in China.

Under such circumstances, both case firms have laid out innovative career development initiatives for plant floor workers, providing a variety of career paths, career-oriented performance feedback and most importantly, the career planning workshops that introduce the projected future demand for different types of new jobs/positions created by the need to support GVC upgrading.

### 5. Conclusions

According to the foregoing case-based empirical analysis, five major characteristics of the workforce development strategies by Taiwanese OEMs in China are identified: 1) Consideration of the imbalance between skills supply and demand for GVC upgrading in China; 2) Inclusion of training industry-specific skills as per international standards, 3) Emphasis on developing "soft skills"; 4) Specific training for key bottleneck positions required by GVC upgrading; 5) Establishment of innovative corporate career development initiatives.

In sum, despite being exploratory in nature, this paper makes several contributions as follows. First, it theoretically provides a holistic framework that demonstrates five distinguishing features of the WFD strategies by Taiwan-invested OEMs in China, underscoring the significance of developing effective HR-related strategies to supporting GVC upgrading. Second, this study conducted in-depth surveys of two case firms, ranging from literature retrieval, archival research, a variety of personal interviews to field investigation, thus responding to a recent call for collecting first-hand timely data to discuss relevant issues (Lau & Bruton, 2008; Chin, 2013a). Third, given over 80 percent of Taiwanese OEMs have invested in the Chinese mainland, this paper therefore provides constructive and insightful implications for other Taiwanese OEMs, in terms of developing high-quality human capital in China as their competitive advantages to facilitate GVC upgrading.

The increasing evidence of OEMs in China moving up the GVCs to compete with western MNCs for high-tech products internationally has drawn the attention of global political leaders and policy makers to re-evaluating related economic challenges (Fernandez-Stark et al., 2012; Gereffi et al., 2011). Viewed from this point, in addition to explicitly revealing the upgrading efforts of Taiwan-invested OEMs, our findings also implicitly shed light on the imperatives for the Chinese education systems to help these private OEMs better prepare "upgradable" individuals able to learn and accommodate to today's rapidly evolving labor requirements in GVCs.

### Acknowledgement

We acknowledge the support of the research team of the Strategic HRM upgrade project for adidas OEM suppliers in China.

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## Note

Note 1. <http://nanjingconnect.com/392/>

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