Board Structure and Corporate Performance in Malaysia

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Abstract

This study examines the association between board structure and corporate performance, where performance is defined as the value added (VA) efficiency of the firm's physical and intellectual resources rather than the more commonly used financial terms or profitability ratios. It is argued that the inclusion of intellectual elements into the measurement provides a long-term measurement of corporate performance. The VA efficiency of the firm's total resources is calculated using the Value Added Intellectual Coefficient (VAIC) methodology developed by an Austrian, Ante Pulic. The four board characteristics that are of interest in this study are board composition, directors' ownership, CEO duality and board size. Based on a randomly selected sample of 75 companies listed on Bursa Malaysia, it is found that board composition and board size have a positive impact on firm performance, while the effects of directors' ownership and CEO duality on the VA efficiency of firm's total resources are not established. The outcome of the study shows that the emphasis on the importance of outside directors on the board by The Malaysian Code on Corporate Governance and by the requirements of Bursa Malaysia is deemed pertinent to the long-term corporate performance.

Keywords: Intellectual capital, Board structure, Corporate governance, Value-Added efficiency

1. Introduction

The board of directors have been largely criticised for the decline in shareholders' wealth and corporate failure.   They have been in the spotlight for the fraud cases that had resulted in the failure of major corporations, for example, Enron, WorldCom and Global Crossing. Some of the reasons stated for these corporate failures are the lack of vigilant oversight functions by the board of directors, the board relinquishing control to corporate managers who pursue their own self-interests and the board being remiss in its accountability to stakeholders. As a result, various corporate governance reforms have specifically emphasised on appropriate changes to be made to the board of directors in terms of its composition, structure and ownership configuration.   The Malaysian Code on Corporate Governance (MCCG) of 2000 proposes that the board should include a balance of executive directors and non-executive directors in order to ensure that the board's decision making is not dominated by a certain party. The best practices of the code also recommend that the responsibilities of the chairman and the chief operating officer should not be held by the same person to ensure that there is a balance of power and authority. The appointments to the board should be made by a nomination committee and the directors should undergo an orientation and education programme (training). Other mechanisms of corporate governance include audit committees and a sound internal control structure.

The underlying objective for these regulations and recommendations is to create an effective board that can perform its stewardship responsibilities and protect the interests of the shareholders.   This implies that certain board characteristics may lead to better corporate performance.   In addition, corporate performance needs to be measured using a long-term indicator, instead of the more commonly used short-term financial ratios.   This is to determine the impact of the board

structure on the sustainable performance of the company. Hence, the measurement of corporate performance needs to include the firm's total (physical and intellectual) resources. The board characteristics that are of particular interest in this study are board composition, directors' share ownership, Chief Executive Officer (CEO) duality and board size. Hence, the impact of each of these characteristics on corporate performance needs to be determined to substantiate the desirable board structure which would produce favourable outcome on the value-added efficiency of the resources of Malaysian companies. Intellectual capital is of particular interest in this study due to the increasing importance of this resource to companies, especially in this era of knowledge economy and due to the increasing prevalence of knowledge-intensive industries. According to Baron (2003), about 75% of market value relies on intangible assets, most notably human capital, which is one of the components of intellectual capital. Yet there is very little account taken of the contribution people make to the success of the organisation. The impact of intellectual capital on markets is huge as it is concerned with value creation for the long-term development of capabilities and competencies. Baron (2003) also argued that in advanced economies, intellectual capital is the only distinctive asset which cannot be imitated easily (especially human capital which includes skills, talent, motivation, and know how of people). According to Bontis et al. (2000), the estimates in 1999 show that 37.5% of the workforce in Malaysia is in the service sector, which is a knowledge-intensive sector. These demonstrate that intellectual capital and its management is gaining importance in the country. Due to the rise in the number of knowledge-intensive organisations and the increasing awareness of the importance of intellectual capital to firms, it is doubtful that traditional measures are adequate to represent the true picture of corporate performance. A more comprehensive measure is needed to incorporate intellectual capital resources of a firm.

Corporate performance can be measured using long-term market performance measures and other performance measures that are non market-oriented measures or short-term measures. Some examples of these measures include market value added (MVA), economic value added (EVA), cash flow growth, earnings per share (EPS) growth, asset growth, dividend growth, and sales growth (Coles et al., 2001, Abdullah, S.N., 2004). Dehaene et al. (2001) used return on equity (ROE) and return on assets (ROA) as proxies for corporate performance in Belgian companies and Chen et al. (2005) utilised the market-to-book ratio in their research on firms in Hong Kong. Judge et al. (2003) used a series of indicators including financial profitability, customer satisfaction, product/service quality, capacity utilisation and process improvements to assess firm performance. In their article, Roos and Roos (1997) defined intellectual capital as the "…sum of the 'hidden' assets of the company not fully captured on the balance sheet", and this includes the tacit knowledge of the members of the organisation, and what is left in the company when they leave. Intellectual capital is argued to be the most important source of sustainable competitive advantage and it comprises both human capital and structural capital. Human capital represents the knowledge, skills, motivation and capability of the individual employee to provide solutions to the customers. On the other hand, structural capital represents the organisational capability to meet market requirements. A significant part of structural capital is customer capital, which basically is the relationship developed with the customers, suppliers, network partners and investors of the company. Another part of structural capital is organisational capital, and this includes business processes, strategic processes, productions processes and business development capital (Roos and Roos, 1997).

Realising the importance of intellectual capital to a firm's performance, there have been numerous attempts and approaches to intellectual capital reporting. According to Mouritsen et al. (2001), attempts made by companies to report on intellectual capital include the preparation of intellectual capital statements that combine numbering, visualisation and narration to account for organisational value creation. The emphasis here is on creating value, and Cooper (2000), in his paper, likened intellectual capital to the conversion of knowledge into something valuable. In other words, intellectual capital is defined as intellectual material that has been formalised and leveraged to produce higher valued asset. Value creation is presented as an effect of the connections between human, structural and customer capital. One of the approaches to "valuing" suggests that the object of "valuing" is to create (more) value and to generate value via the transformation or improvement of corporate routines and practices. So, 'value added' in this study is defined as the wealth created (or contributed) by the firm through the utilisation of its key productive resources (Ho & Williams, 2003).

In their study, Barsky and Marchant (2000) stated that due to the nature of knowledge-based organisations and their dependence on intellectual capital, the way they view the value creation process has also changed. Traditional financial measures such as return on capital and earnings per share (measures that constitute most corporate performance management systems) tell investors and management little about the true performance of the company. Since accounting practices have failed to keep pace with the growing importance of intellectual capital, many of these assets remain unaccounted for and unmonitored. Without tools to capture and measure intellectual capital, many firms wind up mismanaging their intellectual assets or, worse, destroying knowledge value simply because managers misunderstand the nature of the company's resources.

Shareholders (principals) hire managers (agents) to make decisions that are in the best interest of the shareholders. The separation of ownership from control implies that the principal (shareholders) cannot exercise full control over

managerial actions.   Opportunistic behaviour is assumed in agency theory, and there exists information asymmetry between the principals and agents (managers).   Information asymmetry occurs where management have the competitive advantage of information within the company over that of the owners.   These lead to two important conflicts between management and shareholders.   One of the conflicts is in terms of differing objectives.   In his paper, Grinyer (1995) argued that the main objective of the shareholders is to maximise personal wealth.   Meanwhile, managers may have a wider range of economic and psychological needs such as power, reputation and higher salaries. This means some decisions of managers are motivated by self-interest, which reduces the welfare of the principal.   In other words, given their ability to run the company with little check on their activities by shareholders, managers may be tempted to place less emphasis on maximising shareholder returns (profitability, share price and dividend payouts) and more on expanding the asset base, increasing turnover at the expense of profitability and paying themselves higher salaries.   Another source of conflict is differing time horizons, where the agent may be eager to take actions which have relatively short-run pay-offs in order to demonstrate success, whereas shareholder interests may be better served by longer-term actions (Evans & Weir, 1995).

Board composition refers to the number of independent non-executive directors on the board relative to the total number of directors.   An independent non-executive director is defined as independent directors who have no affiliation with the firm except for their directorship (Clifford and Evans, 1997).   There is an apparent presumption that boards with significant outside directors will make different and perhaps better decisions than boards dominated by insiders.   The Malaysian Code on Corporate Governance (2000) recommends, as a best practice, that there needs to be balance on the board of directors with at least one third of the board members should be independent directors.   This is to ensure the effectiveness of the independent directors in maintaining the objectivity in board decisions. The argument for the need of independent non-executive directors on the board substantiated from the agency theory which states that due to the separation between ownership and control, managers (given the opportunity) would tend to pursue their own goals at the expense of the shareholders (Jensen and Meckling, 1976).   Hence, by having independent non-executive directors on the board, these directors would help to monitor and control the opportunistic behaviour of management, and assist in evaluating the management more objectively.   Furthermore, Brickley and James (1987) argued that outside directors also contribute to reduce management consumption of perquisites.   In the absence of such monitoring by outside directors, managers might have the incentive to manage earnings in order to project better performance results and hence increase their compensation.   Empirically, studies on the association between independent non-executive directors and firm performance have shown mixed results.   In their study among Belgian companies, Dehaene et al. (2001) found a significant positive relationship between the number of external directors and return on equity, which lends support to the notion that outside directors provide superior benefits to the firm as a result of their independence from firm management and this is taken into account by investors in making investment decisions.   This is also supported by Dahya and McConnell (2003) who found evidence in the UK that investors appear to view appointments of outside CEOs as good news, and this is reflected in the announcement period stock returns.   On top of that, in their study, Lee et al. (1999) found that the appointment of a financial outside director to the board of a public corporation is associated with positive abnormal returns among medium-size firms.   These firms, which may have limited access to financial markets and less financial expertise, benefit substantially from these appointments.

On the contrary, there were also studies that found negative association between independent non-executive directors and firm performance.   One such study is by Agrawal and Knoeber (1996), who discovered a significant negative relationship between board outsider and firm performance.   This is also supported by the findings of Bhagat and Black (1999) who established that firms with majority outside directors perform worse than other firms.   These studies show that independent non-executive directors do not necessarily have positive impact on firm performance, implying that in these cases perhaps the independent non-executive directors do not play their roles effectively. Apart from their role in firm performance, independent non-executive directors may also have an effect on the comprehensiveness of financial disclosures by firms. A study by Chen and Jaggi (2000) discovered that there is a significant positive relationship between the ratio of independent non-executive directors on corporate board and the comprehensiveness of financial disclosures.   This implies that the inclusion of such directors on boards improves the firm's compliance with the disclosure requirements, which in turn enhances the comprehensiveness and quality of disclosures. So, independent non-executive directors are useful for monitoring board activities and improving the transparency of corporate boards.

A potentially important factor that may reduce manager–shareholder conflicts is stock ownership by board members (both executive and non-executive).   To the extent that board members own part of the firm, they develop shareholder-like interests and are less likely to engage in behaviour that is detrimental to shareholders. In other words, managerial shareholdings help align the interests of shareholders and managers since as the company's performance increases, the managers benefit via their equity interests in the company (Jensen and Meckling, 1976).   Therefore, managerial ownership is argued to be inversely related to agency conflicts between managers and shareholders, and to be positively related to corporate performance. However, Morck et al. (1988) argued that higher levels of managerial equity ownership may decrease financial performance since managers with significant ownership stakes may gain such

power that they neglect or become less considerate of the interests of other shareholders. This is because they are in the position where they have considerable voting rights and they are also the ones who make the judgement on how to run the company. This may lead them to make decisions that confer benefits to themselves to the detriment of other stakeholders. One of the key monitoring mechanisms advocated by the agency perspective is the separation of the roles of CEO from chairperson. If the two roles are not separated, this means that the CEO also chairs the group of people in charge of monitoring and evaluating the CEO's performance, and hence duality exists. This situation also gives rise to possible conflict of interest and may impair the independence of the monitoring group. This is because in such situation, the ability of the CEO/Chairperson to exercise independent self-evaluation is questionable (Rechner and Dalton, 1989). Fosberg and Nelson (1999) discovered that firms that switch to the dual leadership structure (separated roles between the CEO and the chairman) to control agency problems experienced a significant improvement in performance which is measured by the operating income before depreciation, interest and taxes to total assets ratio. Dehaene et al. (2001) found evidence that where the functions of chairman and chief executive are combined, the return on assets is significantly higher than otherwise, which suggests a positive relationship between duality and firm performance. They argued that when the chairman is also active as the CEO in the daily activities of the firm, he will try to invest as much as possible to increase the size of the firm or to boost his personal status.

On the contrary, Rechner and Dalton (1989) found no significant difference between shareholders returns of companies with CEO duality and those that separate the two roles. The study consists of companies from the Fortune 500 group, and the data was collected from the year 1978 to 1983. They concluded that there is little justification to infer that it is an unprofitable move for a company to have CEO duality. There are also studies that examine the relationship between CEO duality and corporate voluntary disclosures. Voluntary disclosure is seen as an act of accountability and transparency on the firm's behalf and poor disclosure has also been blamed for the recent financial crisis in the Asian region. So, more demands have been made of the board to disclose more corporate information. Gul and Leung (2004) found that in Hong Kong, when the roles of the CEO and the chairman are combined, the levels of voluntary corporate disclosures are lower. This also supports the notion for the two roles to be separated. However, they added that the negative relationship is weaker for firms with higher proportion of independent non-executive directors. This suggests that the expertise of independent non-executive directors moderates the negative CEO duality and corporate disclosure relationship. The MCCG does not specify a desirable board size; instead it proposes that every board examines its size while keeping in mind the impact of the number upon its effectiveness. The findings of previous studies have shown mixed results with regard to the relationship between this board characteristic and performance. A study involving a sample of large U.S. industrial corporations between 1984 and 1991 by Yermack (1996) presents evidence consistent with theories that small boards of directors are more effective, as he found an inverse association between board size and firm value. In that study, the effect of board size on two variables, namely investors' valuation of the company and profitability ratios, are tested. It is found that when the board consists of between four to ten members, the investors' valuation of the company and the profitability ratios decrease steadily. When the board size is more than ten, there is no significant relationship between the board size and investors' valuation, but the profitability ratios decrease less rapidly. The result of his study is robust to numerous controls for company size, industry membership, inside stock ownership, growth opportunities, and alternative corporate governance structures.

The main purpose of this study is to examine the relationship between board structure and the VA efficiency of physical and intellectual resources within the Malaysian business context. This study is a replication of the study conducted by Ho and Williams (2003) who investigated the link between corporate board features and corporate performance for a sample of publicly traded firms in South Africa, Sweden and the UK. In contrast to most prior literature, performance in their study is defined as the value added (VA) efficiency of the firm's resources rather than the more commonly used financial terms or profitability ratios. The VA efficiency of the firm's total resources is calculated using the Value Added Intellectual Coefficient (VAIC) methodology developed by Ante Pulic (1998).

2. Methods

2.1 Theoretical framework

Based on the extensive literature, four board characteristics (board composition, directors' ownership, CEO duality and board size) have been identified as possibly having an impact on corporate performance and these characteristics are set as the independent variables in the framework.

2.2 Control Variables

Drawing from a review of related corporate disclosure researches (for example, Vafeas and Theodorou (1998)), five control factors (profitability, leverage, dividend yield, R&D sensitivity and firm size) are included in the theoretical model designed for this study. These factors have been known to have an impact on corporate performance, and hence need to be controlled in the study. According to Wahab et al. (2004), the inclusion of the control factors also reduces the risk of model misspecification due to missing variables. The inclusion of the control factors in the theoretical model is depicted in **Figure 1**:

The dependent variable is the VA efficiency of total resources, which is used as a measure of corporate performance. The relationship between each of the independent variable and corporate performance is hypothesised as follows:

H_1: There is a positive relationship between the percentage of independent non-executive directors and the VA efficiency of firm's total resources.

H_2: There is a positive relationship between directors' ownership and the VA efficiency of firm's total resources.

H_3: There is a negative relationship between CEO duality and the VA efficiency of firm's total resources.

H_4: There is a negative relationship between board size and the VA efficiency of firm's total resources.

2.3 sampling, Instrumentation and Variable Measurement

2.3.1 Sample

All companies listed on the main board of Bursa Malaysia constitute the population of this study. However, firms belonging to the financial services industry and regulated utility companies are excluded from the population. This is due to the special regulatory environment in which they operate. This follows from the argument that regulation masks the efficiency differences across firms, potentially rendering governance mechanisms less important (Vafeas & Theorodou, 1998, Singh & Davidson, 2003).

From this set of population, 75 companies have been randomly selected using the random case selection function of the SPSS software. These 75 companies are selected without discriminating between the different industries included in the study. Besides that, the convenient sampling technique is also applied in this research, where the availability of the annual reports of the chosen companies on the Bursa Malaysia website also plays a determining role in the inclusion of the company in the final list. In other words, companies that have been chosen by the random sampling function but do not have annual reports readily available on the Bursa Malaysia website are eliminated from the sample list and the random sampling technique is repeated to replace these companies.

The sample size of 75 is about 13% of the population and is deemed sufficient for the purpose of the statistical analyses that are planned to be performed to study the relationship between board structure and VA efficiency of total resources of the firms. It should also be noted that the small sample size may not render the results of the study to be generalisable.

2.3.2 Content analysis

This study is based on content analysis of the annual reports of the sample companies in order to obtain data to measure the dependent and independent variables. According to Guthrie et al. (2004), content analysis is one of the more widely used research method applied in investigating the frequency and type of intellectual capital reporting. A technique for gathering data, content analysis involves codifying qualitative and quantified information into pre-defined categories in order to derive patterns in the presentation and reporting of information (Guthrie and Petty, 2000).

The data required for the purpose of this study is collected from 2003 fiscal year annual reports of the chosen publicly traded firms listed on Bursa Malaysia. The data collection technique used is mainly content analysis of these annual reports and database searches using the Datastream facilities. In the case of unavailability of data on the database, manual search on the annual reports of the companies are conducted. The manual search also applies to the information required from other parts of the annual reports, such as from the Directors' Profile and the Statement on Corporate Governance. In this study, content analysis involves reading the annual reports of each company in the sample and coding the information contained therein.

2.3.3 Variable measurement

According to the VAIC concept, human capital is not part of input (costs) but a resource equal to capital employed. Hence, firms should strive to achieve a maximum result (increase the efficiency of its resources in adding value) by utilising its resources as well as possible. Also known as the Austrian Approach, the VAIC methodology is used in this study to measure the value added efficiency of the companies' physical and intellectual capital. The methodology is considered a universal indicator and it shows the abilities of a company in value creation and representing a measure for business efficiency in a knowledge-based economy (Pulic, 1998). It also enables the collection of intellectual capital leverage to key success processes and is easy to calculate using information already accounted and reported in annual reports (thus minimises the costs to preparers and stakeholders).

Formally, VAIC is a composite sum of three indicators formally termed: (1) Capital Employed Efficiency (CEE) – indicator of VA efficiency of capital employed; (2) Human Capital Efficiency (HCE) – indicator of VA efficiency of human capital; and (3) Structural Capital Efficiency (SCE) – indicator of VA efficiency of structural capital. This is represented by Formula 3.1:

$$\textbf{VAIC = CEE + HCE + SCE} \tag{3.1}$$

Where   VAIC = value added intellectual coefficient

CEE = capital employed efficiency coefficient

HCE = human capital efficiency coefficient

SCE = structural capital efficiency coefficient

It is important to note here that even though the term VAIC stands for value added intellectual coefficient, it actually represents the value-added efficiency of the firm's total resources, and not just the intellectual resources.   It is used as an alternate measure of firm performance in this study, as opposed to the more commonly used profitability and other financial ratios in previous studies.

The CEE, HCE and SCE are indicators of the efficiency of each of these elements in creating (or adding) new value. For example, if HCE is 2.8, this means that each RM1 invested in human capital has added value of RM1.80 to the firm. CEE represents the efficiency of VA of physical resources, while the total of HCE and SCE represents the efficiency of VA of intellectual capital   A higher VAIC coefficient indicates a better management of physical (CE) and intellectual (HC and SC) resources.

The first step of calculating the three indicators is to calculate the firm's total VA:

$$VA = I + DP + D + T + M + R \qquad (3.2)$$

Where:

I   = Interest expense

DP   = Depreciation expense

D   = Dividends

T   = Corporate taxes

M   = Equity of minority shareholders in net income of subsidiaries

R   = Retained profits

All the above information is obtained from the financial statements of the companies.   After obtaining the VA, the three indicators in the VAIC methodology (CEE, HCE and SCE) are calculated using the following formulas:

$$CEE = VA/CE \qquad (3.3)$$

$$HCE = VA/HC \qquad (3.4)$$

$$SCE = SC/VA \qquad (3.5)$$

Each of the above indicators and its formulas are described in Table 1:

The regression results of the VAIC against the independent and control factors will form the evidence supporting or rejecting hypotheses H_1, H_2, H_3 and H_4.

For each of the independent variables, the variable name and measurement technique is shown in Table 2 below. The proxy measures for the control factors are described in Table 3.

2.4 Statistical analyses

For the purpose of empirical analysis, this study uses descriptive analysis, Pearson correlation analysis and linear multiple regression as the underlying statistical tests.   A descriptive analysis of the data obtained is conducted to obtain sample characteristics.   The Pearson correlation analysis is executed to check for multicollinearity problem among the variables.

The multiple regression analysis is performed on the dependent variable, VAIC, to test the relationship between the independent variables (board structure features) with VA efficiency of firms' total resources.   The regression model utilised to test the relationship between the board characteristics and VAIC is as follows:

$$VAIC = \beta_0 + \beta_1 OutDir + \beta_2 InsOwn + \beta_3 Duality + \beta_4 BrdSize + Control\ Variables + \varepsilon_i$$

Where:

β_0 = Intercept coefficient

β_i = Coefficient for each of the independent variables

Control Variables = Represents the control factors included in the regression analysis, which are profitability (ROA), leverage (Leverage), dividend yield (DivYield), R&D sensitivity (R&D) and firm size (FrmSize).

ε_i = Error term

3. Results and Discussion

3.1 Board characteristics and ownership

Consistent with expectation, the mean for directors' ownership suggests that directors of publicly listed firms in Malaysia generally have sizeable ownership stakes in the company compared to their counterparts in Western developed economies such as the Sweden and the United Kingdom (see, Ho and Williams, 2003). This is perhaps due to the higher number of family-owned and managed companies in Malaysia. The descriptive statistics for the independent variables indicate that the average number of directors on the board in the selected companies is about 8 persons. On average, the VA efficiency coefficient for the total resources (VAIC) of the firms in this study is 5.020, and the mean VA efficiency coefficients for each intellectual and physical resource are 4.829 and 0.191 respectively. The noticeable difference between the mean and median of the VA efficiency of physical resources indicates the presence of extremely low values for that variable that brings down the mean figure to 0.191 even though 50% of the sample obtained a coefficient of more than 0.311. This is also evident from the high standard deviation for the variable, which is 16.99. The average VAIC of the firms in this study is quite high compared to the findings by Ho and Williams (2003) in their study. They found that UK firms have the highest average VAIC of 5.317, followed by South African firms with 4.270 (Table 4).

In Table 5, it can be seen that 70.7% of the companies comply with the recommendations of the MCCG by separating the roles of the chairman and the CEO of the company. Relative to the study of Swedish, British and South African firms by Ho and Williams (2003), the level of duality of 29.3% of the sample data in this study is fairly low. However, this is higher than a previous finding in the Malaysian setting by Abdul Rahman and Mohd Haniffa (2002). They found that only 11.8% of their sample practises CEO duality, based on the pooled data over a period of five years from 1996 to 2000.

3.2 Regression analysis

A Pearson correlation analysis is performed on the independent variables to check for the degree of multicollinearity among the variables. The results are shown in Table 6, and it can be seen that directors' ownership is significantly correlated to dividend yield (at $p = 5\%$), while profitability is significantly correlated to leverage and dividend yield (both at 1% level). There is also a significantly positive association between dividend yield and R&D sensitivity (at $p = 1\%$) and firm size (at $p = 5\%$). The results also indicate a positive correlation between R&D sensitivity and firm size, at the 5% significance level. The highlighted correlations in the box represent the correlation coefficients between the independent variables and the control factors.

Even though there are significant correlations among some of the independent variables and also between some of the independent variables and the control factors, none of the coefficients exceeds 0.8, which is used as an indicator of serious multicollinearity (Gujarati, 1992). Hence, it may be concluded that multicollinearity is not a serious problem in this case.

By setting the VAIC coefficient as the dependant variable, and the board characteristics and control factors as independent variables, a regression analysis is performed. This aims to address the first research objective of testing the relationship between board characteristics and the VA efficiency of firms' total resources. The results of this analysis are shown in Table 7.

From the output of the analysis in Table 7, the analysis of variance (ANOVA) test returns a significant p-value of 0.000 which means there is sufficient evidence to infer that at least one of the explanatory variables is linearly related to VAIC, and the model seems to have some validity. The regression results which indicate that many of the independent and control variables are significant also supports the prior conclusion that there is no indication of the existence of serious multicollinearity in these models (Gujarati, 1992).

The R^2 value, which indicates the explanatory power of the independent variables, is 0.825. This means that 82.5% of the variation in the VA efficiency coefficient of firms' total resources is explained by the variation in the independent and control variables. According to Keller and Warrack (2003), the R^2 value does not have a critical value that enables a conclusion to be drawn. However, in general, the higher the R^2 value, the better the model fits the data. In this study, the R^2 value is quite high since only about 20% of the variation in the dependent variable is unexplained by the model, denoting a strong relationship between the explanatory variables and the VAIC.

3.3 The Impact of Board Composition on VAIC

Table 7 shows that the coefficient for percentage of independent non-executive directors on the board ($t = 2.92$) is significant at the 1% level. In addition, the coefficient is positive at 1.31. This means that for each additional increase in the percentage of independent non-executive directors to total board size, the VAIC increases on average by 0.131%, holding other explanatory variables constant. Hence, it can be inferred that hypothesis H_1 is supported. In other words, as the percentage of independent non-executive directors on the board increases, the VA efficiency of the

firms' total resources also increases.   This is consistent with Ho and Williams' (2003) findings with respect to Swedish sample firms in their study. This finding also supports the notion that independent non-executive directors contribute to corporate performance as a whole.

3.4 The Impact of Directors' Ownership on VAIC

Table 7 depicts that the coefficient for directors' ownership is insignificant even at the 10% level.   This reveals that there is insufficient evidence to infer that there is a linear relationship between directors' share ownership in the company and the VA efficiency of the company's total resources.   Hence, hypothesis **H₂** is rejected.   Nevertheless, it is interesting to observe that the coefficient is negative, which is contrary to the expectation in the theoretical model. In their study, Ho and Williams (2003) found that the coefficient for directors' ownership is significantly positive for their sample of Swedish firms, but not significant for South African and British samples.   The insignificant coefficient in this study may mean that directors in Malaysia are not motivated by equity interests in the company.   This is perhaps because they are more highly rewarded in the form of perquisites and allowances.

3.5 The Impact of CEO Duality on VAIC

It is important to note here that the CEO duality variable is a dummy variable, since it constitutes the value of either 0 or 1.   Table 7 demonstrates that the coefficient for CEO duality (t = 0.156) is insignificant even at the 10% level.   The insignificant t value for this variable means that there is no significant difference in the VA efficiency of total resources between firms that separate the roles of the CEO and the chairman and those that practice CEO duality.   However, an interesting point to note here is that the coefficient is positive while the theoretical model predicts a negative relationship between this variable and the dependent variable (VAIC).   Thus, hypothesis H₃ is rejected and it can be concluded that there is no evidence to support the notion that there is a relationship between CEO duality and VAIC.

The findings contradict the results of a prior research on firms in Malaysia by Abdul Rahman and Mohd Haniffa (2002). In their study, CEO duality is found to reduce the effectiveness of the board, resulting in poor company performance. However, their study uses accounting measures (ROA and ROE) as proxies for corporate performance, which may account for the difference in the outcomes.   Furthermore, as argued by Judge et al. (2003), even with the existence of a formal law that separates the roles of CEO and the chairperson, informal activities may still undermine the law and firm performance.   So, even though most of the firms in this study separate the two roles, it may just be a case of form over substance, and hence the company fails to reap the actual benefits of such practice.

3.6 The Impact of Board Size on VAIC

The results of the regression analysis in Table 7 show that the coefficient for total number of directors (board size) is significant at the 10% level.   However, the coefficient is positive, suggesting that there is a moderately significant positive relationship between board size and VAIC.   This is contrary to the theoretical model and the stated hypothesis, which predicts a negative relationship between board size and company performance.   Hence **H₄** is rejected.   This finding indicates that a larger board size contributes more towards firm performance as a whole.   This suggests that a larger board size means that there are more ideas and skills that can be shared among board members.   It presents evidence against the argument by Eisenberg et al. (1998) who suggested that a large board size is more vulnerable to being overpowered by the CEO.

It also proposes that the board of directors in Malaysian firms perform more effectively in a larger group.   This is opposite to the findings by Ho and Williams (2003), where they concluded that board size is statistically insignificant against VAIC in their regression for all three countries (South Africa, Sweden and the UK).   This implies that board size plays a more imperative role in Malaysia compared to these countries.

3.7 Control Factors

The regression results also show that for the control factors included in the analysis, four of them (ROA, Leverage, R&D Sensitivity and Firm Size) are significant at the 1% level.   The coefficient for dividend yield is found to be insignificant, even at the 10% level.   As expected, all relationships between the control factors and VA efficiency coefficient are positive, except for R&D Sensitivity which is negatively related to the dependent variable.   This is perhaps due to the lack of awareness of the importance of R&D disclosure in the financial statements, and such disclosure may viewed negatively by the users.

One of the limitations of this study is its small sample size, which consists of only 75 companies.   Most studies involving corporate governance structure and firm performance had used all non-financial companies listed on the board in its sample (see, for example, Abdul Rahman and Mohd Haniffa, 2002).   Ho and Williams (2003) used about 84 to 108 companies for each of the countries included in their study, and Judge et al.'s (2003) study comprises of 113 firms.   Due to the numerous variables and items that need to be collected, the choice of 75 companies in this study is more manageable, and is still valid for statistical analysis.   However, an extension of the study to include all the companies listed on Bursa Malaysia would further enhance the generalisability of the findings

4. Conclusion

The purpose of this research is to examine the importance of one of corporate governance aspects, namely board structure. Compared to previous literature on board structure-performance relationship, this study uses the VAIC methodology to measure corporate performance, which includes the physical and intellectual resource bases of the firm. In general, the results of this study provide evidence that a higher proportion of independent non-executive directors on the board has a positive impact on firm performance based on the VAIC measurement. Meanwhile, at a higher significance level (10%), the board size is found to have a positive impact on the VA efficiency of firms' total resources. However, the effects of directors' ownership in the company and CEO duality on the VA efficiency of firms' total resources are not established. The above findings are also similar for the relationships between each of the board characteristics and the VA efficiency of the intellectual resources of the firms.

The results imply that the requests for a minimum number (one-third of the board) of independent non-executive directors on the board by the Bursa Malaysia Listing Requirements and the MCCG are deemed very important. This is because independent non-executive directors possess a diverse background, attributes, characteristics and expertise, which may improve board processes and decision-making, and consequently firm performance. Independent non-executive directors also play a vital role in the long-term performance of the company, as they contribute significantly to the performance of intellectual resources of the firm. There is also evidence to suggest that a large board size performs effectively and there seems to be no communication and coordination problem among the board members. This is contrary to most US studies which found that a small board size is more effective and performs better. This is perhaps due to the differences in the culture and nature of the firms, as this particular study is conducted in a developing Asian country. Regardless of the board composition and structure adopted by the company, it is important that they make adequate disclosure on this matter in the annual reports so that users can decide for themselves.

It would also be more meaningful to perform a comparative analysis between Malaysia and other countries. This comparative analysis could serve to gauge Malaysia's VAIC performance and also its intellectual capital performance against countries with similar or opposite settings. A comparative analysis could be performed between Malaysia and another developing nation, or with a developed nation. Other corporate governance variables may also be included in the model, such as cross-directorship and family ownership.

References

Abdullah, S.N. (2004). Board Composition, CEO Duality and Performance among Malaysian Listed Companies, *Corporate Governance*, 4, 4, pp 47-61.

Abdul Rahman, R. and Abdul Hamid, N. (2003). The Role of Board Characteristics as a Response to Agency Problem among Acquiring Firms in Malaysia, presented at the Asian Accounting Association Conference, Seoul, Korea, 20-21 October.

Abdul Rahman, R. and Haniffa, R. (2003). Internal Control Mechanisms and Performance of Malaysian Listed Firms, presented at the ANZAM 2003 Conference, Perth, Australia, 2-4 December.

Abdul Rahman, R. and Mohd Haniffa, R. (2002). CEO Duality and Corporate Performance: Evidence in Malaysia, presented at the International Conference on Corporate Governance: Trends and Challenges in the Millennium, Kuala Lumpur, Malaysia, 29-30 October.

Agrawal, A. and Knoeber, C.R. (1996). Firm Performance and Mechanisms to Control Agency Problems Between Manager and Shareholders, *Journal of Financial and Quantitative Analysis*, 31, pp. 377-389.

Baron, A. (2003). Measuring Human Capital: The Key to Organizational Success?, *Development and Learning in Organizations*, 17, 3, pp 7-9.

Barsky, N.P. and Marchant, G. (2000). The Most Valuable Resource Measuring and Managing Intellectual Capital, *Strategic Finance*, 81, 8.

Bhagat, S. and Black, B. (1999). The Uncertain Relationship between Board Composition and Firm Performance, *Business Lawyer*, 54, pp. 921-963.

Bontis, N., Chua, W.C.K. and Richardson, S. (2000). Intellectual Capital and Business Performance in Malaysian Industries, *Journal of Intellectual Capital*, 1, 1, pp 85-100.

Bontis, N., Dragonetti, N.C., Jacobsen, K. and Roos, G. (1999). The Knowledge Toolbox: A Review of the Tools Available to Measure and Manage Intangible Resources, *European Management Journal*, 17, 4, pp 391-402.

Brennan, N. (2001). Reporting Intellectual Capital in Annual Reports: Evidence from Ireland, *Accounting, Auditing & Accountability Journal*, 14, 4, pp 423-436.

Brickley, J.A., Coles, J.L. and Jarrell, G. (1997). Leadership Structure: Separating the CEO and Chairman of the Board, *Journal of Corporate Finance*, 3, pp 189-220.

Brickley, J.A. and James, C.M. (1987). The Takeover Market, Corporate Board Composition and Ownership Structure: The Case of Banking, *Journal of Law and Economics*, 30, pp. 161-180.

Byrd, J.W. and Hickman, K.A. (1992). Do Outside Directors Monitor Managers? Evidence from Tender Offer Bids, *Journal of Financial Economics*, 32, pp 195-221.

Chen, C.J.P. and Jaggi, B. (2000). Association between Independent Non-Executive Directors, Family Control and Financial Disclosures in Hong Kong, *Journal of Accounting and Public Policy*, 19, 4-5, pp. 285-310.

Chen, Z., Cheung, Y.L., Stouraitis, A. and Wong, A.W.S. (2005). Ownership Concentration, Firm Performance, and Dividend Policy in Hong Kong, *Pacific-Basin Finance Journal*, Article in Press – Corrected Proof, available online 23 March.

Clifford, P. and Evans, R. (1997). Non-Executive Directors: A Question of Independence, *Research and Theory Papers*, 5, 4.

Coles, J.W., McWilliams, V.B. and Sen, N. (2001). An Examination of the Relationship of Governance Mechanisms to Performance, 27, 1, pp 23-50.

Cooper, J. (2000). Turning Knowledge into Value (Against a Backdrop of Tangibles, the Intangible Reality of Intellectual Capital Flows Throughout the Realm of Biotechnology Firms across Canada), *CMA Management*, 74, 8, p22-25.

Cutting, B. and Kouzmin, A. (2000). The Emerging Patterns of Power in Corporate Governance - Back to the Future in Improving Corporate Decision Making, *Journal of Managerial Psychology*, 15, 5, pp. 477-507.

Dahya, J. and McConnell, J.J. (2003). Outside Directors and Corporate Board Decisions, *Journal of Corporate Finance*, Article in Press, Corrected Proof.

Dehaene, A., De Vuyst, V. and Ooghe, H. (2001).   Corporate Performance and Board Structure in Belgian Companies, *Long Range Planning*, 34, 3, pp 383-398.

Demb, A. and Neubauer, F.F. (1992). *The Corporate Board*, Oxford University Press, New York.

Eisenberg, T., Sundgren, S. and Wells, M. (1998). Larger Board Size and Decreasing Firm Value in Small Firms, *Journal of Financial Economics*, 48, pp 35–54.

Evans, J. and Weir, C. (1995). Decision Processes, Monitoring, Incentives and Large Firm Performance in the UK, *Management Decision*, 33, 6, pp 32-38.

Fosberg, R.H. and Nelson, M.R. (1999). Leadership Structure and Firm Performance, *International Review of Financial Analysis*, 8, 1 pp 83-96.

Ghosh, A. (1998). Does Accounting Based Performance Really Improve Following Corporate Acquisitions?, Working Paper, Zickling School of Business, Baruch College (CUNY), New York, USA.

Goodstein, J., Gautum, K. and Boeker, W. (1994). The Effect of Board Size and Diversity on Strategic Change, *Strategic Management Journal*, 15, pp. 241-250.

Grace, M., Ireland, A. and Dunstan, K. (1995). Board Composition, Non-Executive Directors' Characteristics and Corporate Financial Performance, *Asia-Pacific Journal of Accounting*, pp. 121-137.

Grinyer, J.R. (1995). A New Concept for Amortising Goodwill, University of Dundee.

Gujarati, D. (1992). Essentials of Econometrics, Singapore: McGraw-Hill.

Gul, F.A. and Leung, S. (2004). Board Leadership, Outside Directors' Expertise and Voluntary Corporate Disclosures, *Journal of Accounting and Public Policy*, 23, 5, pp. 351-379.

Guthrie, J. and Petty, R. (2000). Intellectual Capital: Australian Annual Reporting Practices, *Journal of Intellectual Capital*, 1, 3, pp 241-251.

Guthrie, J., Petty, R., Yongvanich, K. and Ricceri, F. (2004). Using Content Analysis as a Research Method to Inquire into Intellectual Capital Reporting, *Journal of Intellectual Capital*, 5, 2, pp 282-293.

Hampel Report, The (1998). www.legal500.com, 15/10/2004.

Herremans, I.M. and Isaac, R.G. (2004). The Intellectual Capital Realization Process (ICRP): An Application of the Resource-based View of the Firm, *Journal of Managerial Issues*, 16, 2, pp 217-231.

Ho, C.A. and Williams, S.M. (2003). International Comparative Analysis of the Association between Board Structure and the efficiency of Value Added by a Firm from its Physical Capital and Intellectual Capital Resources, *The International Journal of Accounting*, 38, 4, pp 465-491.

Huang, C.C. (2004). Intellectual Capital Reporting, *Accountants Today*, August, pp 22-24.

Ingley, C.B. and van der Walt, N.T. (2003). Board Composition: Building Better Boards, *Corporate Governance*, 3, 4, pp 5-17.

Jensen, M.C. and Meckling, W.H. (1976). Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure, *Journal of Financial Economics*, 3, pp. 305-360.

Judge, W.Q., Naoumova, I. and Koutzevoi, N. (2003). Corporate Governance and Firm Performance in Russia: An Empirical Study, *Journal of World Business*, 38, 4, pp 385-396.

Keller, G. and Warrack, B. (2003). Statistics for Management and Economics, United States: Thomson Brooks/Cole.

Klapper, L.F. and Love, I. (2004). Corporate Governance, Investor Protection, and Performance in Emerging Markets, *Journal of Corporate Finance*, 10, 5, pp 703-728.

Kuala Lumpur Stock Exchange Listing Requirements, (1994).

Laing, D. and Weir, C.M. (1999). Governance Structures, Size and Corporate Performance in UK Firms, *Management Decision*, 37, 5, pp 457-464.

Lee, Y.S., Rosenstein, S. and Wyatt, J.G. (1999). The Value of Financial Outside Directors on Corporate Boards, *International Review of Economics and Finance*, 8, 4, pp. 421-431.

Malaysian Code of Corporate Governance, The (2000).

Mohamed Abdullah, M.R. (2003). Functions of an Independent Director, in *Independent Directors: Perceptions, Roles and Responsibilities*, Malaysian Institute of Corporate Governance, Percetakan Sempana Score Sdn Bhd, Kuala Lumpur.

Morck, R., Shleifer, A. and Vishny, R.W. (1988). Management Ownership and Market Valuation: An Empirical Analysis, *Journal of Financial Economics*, 20, pp 293-315.

Mouritsen, J., Larsen, H.T. and Bukh, P.N. (2001). Valuing the Future: Intellectual Capital Supplements at Skandia, *Accounting, Auditing & Accountability Journal*, 14, 4, pp 399-422.

Pass, C., Robinson, A. and Ward, D. (2000). Performance Criteria of Corporate Option and Long-Term Incentive Plans: A Survey of 150 UK Companies 1994-1998, *Management Decision*, 38, 2, pp 130-137.

Patton, A. and Baker, J.C. (1987). Why Won't Directors Rock the Boat?, *Harvard Business Review*, 65, pp. 10-18.

Pearce, J.H. and Zahra, S.A. (1992). Board Composition form a Strategic Contingency Perspective, *Journal of Management Studies*, 29, pp. 411-438.

Peng, M.W., Buck, T. and Filatotchev, I. (2003). Do Outside Directors and New Managers Help Improve Firm Performance? An Exploratory Study in Russia Privatization, *Journal of World Business*, 38, 4, pp. 348-360.

Pettigrew, A.M. and McNulty, T. (1995). Power and Influence in and around the Boardroom, *Human Relations*, 48, pp. 845-873.

Pulic, A. (1998). Measuring the Performance of Intellectual Potential in Knowledge Economy, http://www.vaic-on.net, 2 August 2004.

Rechner, P.L. and Dalton, D.R. (1989). The Impact of CEO as Board Chairperson on Corporate Performance: Evidence vs. Rhetoric, *The Academy of Management Executives*, 111, 2, pp 141-143.

Randoy, T. and Goel, S. (2003). Ownership Structure, Founder Leadership, and Performance in Norwegian SMEs: Implications for Financing Entrepreneurial Opportunities, *Journal of Business Venturing*, 18, 5, pp 619-637.

Roos, G. and Roos, J. (1997). Measuring your Company's Intellectual Performance, *Long Range Planning*, 30, 3, pp 413-426.

Ryan Jr., H. E.., and Wiggins, R. A. (2004). Who is in Whose Pocket? Director Compensation, Board Independence, and Barriers to Effective Monitoring, *Journal of Financial Economics*, pp 497–524.

Sarbanes-Oxley Act, The (2002).

Short, H. (1996). Non-Executive Directors, Corporate Governance and the Cadbury Report: A Review of the Issues and Evidence, *Research Papers*, 4, 2.

Singh, M. and Davidson, W.N. (2003). Agency Costs, Ownership Structure and Corporate Governance Mechanisms, *Journal of Banking & Finance*, 27, 5, pp 793-816.

Srinivasan, N. (2003). Enhancing the Contributions of Independent Directors in *Independent Directors: Perceptions, Roles and Responsibilities*, Malaysian Institute of Corporate Governance, Percetakan Sempana Score Sdn Bhd. Kuala Lumpur.

Vafeas, N. Theodorou, E. (1998). The Relationship between Board Structure and Performance in the UK, *British Accounting Review*, 30, pp 383-407.

Wahab, E.A.A., How, J.C.Y. and Verhoeven, P. (2004). Institutional Investors and Firm Performance in Malaysia, Working Paper, Curtin Business School, Curtin University of Technology, Bentley, Australia.

Weisbach, M.S. (1988). Outside Directors and CEO Turnover, *Journal of Financial Economics*, 20, pp. 431-460.

Williams, S.M. (2000). Relationship Between Board Structure and a Firm's Intellectual   Capital Performance in an Emerging Economy, Working Paper, University of Calgary, Alberta, Canada.

Yermack, D. (1996). Higher Market Valuation of Companies with a Small Board of Directors, *Journal of Financial Economics*, 40, pp 185-211.

Table 1. Definition and Calculation of the Three Indicators of the VAIC Methodology

Indicator	Definition	Formula
CEE (Capital Employed Efficiency)	Represents the efficiency of VA of physical resources	$\dfrac{VA}{CE}$ Where: CE = Capital employed = Book value of net assets
HCE (Human Capital Efficiency)	Represents the efficiency of VA of intellectual (human) resources	$\dfrac{VA}{HC}$ Where: HC = Total salary and wages of the firm. This represents the salary and benefit expenses to the employees and officers of the firm.
SCE (Structural Capital Efficiency)	Represents the efficiency of VA of intellectual (structural) resources	$\dfrac{SC}{VA}$ Where: SC = VA – HC

Table 2. Variable Name, Description, Type and Measurement for Independent Variables

Variable Name	Description	Type	Measurement
OutDir	Percentage of independent non-executive directors on the board	Ratio	$\dfrac{\text{No. of outside directors}}{\text{Total No. of Director}} \times 100\%$
InsOwn	Percentage of outstanding shares owned by directors	Ratio	$\dfrac{\text{No. of Ordinary Shares Owned}}{\text{Total No. of Ordinary Shares}} \times 100\%$
Duality	CEO Duality	Nominal	(1=Yes, 0=No)
BrdSize	Board size	Ratio	Number of directors on the board

Table 3. Control Factors, Type and Their Proxy Measures

Control Factor	Type	Measurement
Profitability (ROA)	Ratio	Profitability is measured by using the return on assets ratio, which is the net income plus after-tax interest expense, and divided by total assets: $$\frac{\text{Net income + Interest expense (1 – Tax rate*)}}{\text{Total assets}}$$ * The company tax rate in 2003 was 28%
Leverage (Leverage)	Ratio	Leverage is measured by dividing the total debt with the total shareholders' equity as reported in 2003 annual report: $$\frac{\text{Total Debt}}{\text{Total Shareholders Equity}}$$
Dividend Yield (DivYield)	Ratio	Measured by the cash dividends paid as a percentage of total shareholder equity: $$\frac{\text{Cash Dividends Paid}}{\text{Total Shareholder Equity}} \times 100\%$$
R&D Sensitivity (R&D)	Nominal	Firm is defined as R&D sensitive if a separate disclosure on the amount of R&D expense is made in its annual report: (1=R&D sensitive, 0=Otherwise)
Firm Size (FrmSize)	Ratio	Natural log of annual sales, i.e. ln (annual sales). Similar to most board structure-firm performance literature (for example, Brickley et al., 1997, Vafeas and Theodorou, 1998), the annual sales figures is transformed using the logarithmic transformation to address non-normality concerns with residuals.

Table 4. Samples by Efficiency Indicators, Percentage of Independent non-executive directors, Directors' Share Ownership and Total Number of Directors

	N	Mean	Median	Std. Deviation	Minimum	Maximum
Efficiency Indicators:						
VA efficiency of total resources (VAIC)	75	5.019576	5.178239	8.7481525	-53.5755	19.9552
VA efficiency of intellectual resources (HCE + SCE)	75	4.828975	4.912069	7.9582582	-46.3405	19.2838
VA efficiency of physical resources (CEE)	75	0.190601	0.311429	0.9086316	-7.235	0.8939
Independent Variables:						
Percentage of independent non-executive directors	75	38.5853	37.5	11.24894	10	87.5
Director's ownership	75	11.6925	4.03	16.98664	0	65.21
Total number of directors	75	7.84	8	1.661	5	13

Table 5. Samples by CEO Duality

		Frequency	Percent	Valid Percent
Valid	Separate roles between chairman and CEO	53	70.7	70.7
	Duality exists	22	29.3	29.3
	Total	**75**	**100.0**	**100.0**

Table 6. Pearson Correlation Analysis Results (n = 75)

	Percentage of independent non-executive directors	Directors' ownership	CEO duality	Board size	Profitability	Leverage	Dividend yield	R&D sensitivity	Firm size
Percentage of independent non-executive directors	1								
Directors' ownership	-.148	1							
CEO duality	.055	.095	1						
Board size	-.209	-.112	-.133	1					
Profitability	**-.147**	**.201**	**.018**	**.070**	1				
Leverage	**.134**	**.069**	**.111**	**.073**	.503(*)	1			
Dividend Yield	**.030**	**-.236(**)**	**.054**	**-.016**	.341(*)	.042	1		
R&D Sensitivity	**.088**	**-.169**	**.157**	**.112**	.108	.019	.463(*)	1	
Firm size	**.170**	**-.107**	**.067**	**.077**	.176	.003	.232(**)	.279(**)	1

*   Correlation is significant at the 0.01 level (2-tailed).

**   Correlation is significant at the 0.05 level (2-tailed).

Table 7. Regression of Independent Variables and Control Factors on VA Efficiency of Firms' Total Resources (VAIC)

Model Summary				
R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Durbin-Watson**
.908	.825	.801	3.9015317	1.834
ANOVA				
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Regression	4673.806	9	519.312	34.116	.000**
Residual	989.427	65	15.222		
Total	5663.233	74			

Coefficients					
	Unstandardised Coefficients		**Standardised Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	-30.720	7.738		-3.970	.000**
Percentage of independent non-executive directors	.131	.045	.169	2.920	.005**
Director's ownership	-.047	.030	-.091	-1.570	.121
CEO = Chairman	.161	1.033	.008	.156	.877
Total number of directors	.516	.293	.098	1.763	.083*
Profitability	.403	.056	.518	7.178	.000**
Leverage	1.027	.144	.461	7.128	.000**
Dividend Yield	.034	.168	.013	.201	.842
R&D Sensitivity	-5.138	1.727	-.183	-2.974	.004**
Firm size (Sales)	1.390	.401	.196	3.464	.001**

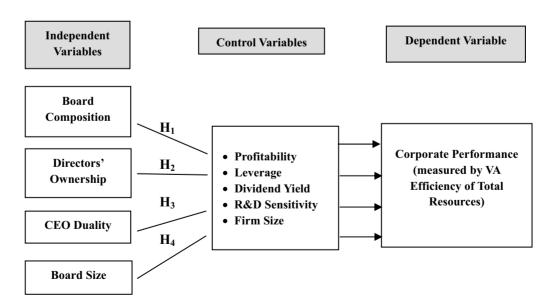* Significant at 10% level

** Significant at 1% level

Figure 1. The Framework for the Relationship between Board Features and the Efficiency of VA by Firm's Total Physical and Intellectual Resources