

Corporate Governance, Board Diversity and Bank Efficiency: The Case of Commercial Banks in Malaysia

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Abstract

The subprime crisis in the mid-2008 has resulted in failure of major financial institutions in many countries. Kirkpatrick (2009) pointed out that such problems were primarily due to information asymmetry in the banking industry where information about the banks' exposure failed to reach the board and senior management. Therefore, good corporate governance practices are crucial for long-term survival of banking industry. The study examines the effect of board size and board composition on cost and profit efficiency of the commercial banks in Malaysia from 2000 to 2009 by employing Data Envelopment Analysis (DEA). Next, the Tobit regression is utilized to determine the effect of board composition and board size on cost and profit efficiency by controlling for liquidity risk, bank size, non-performing loans ratio, return to equity, and ratio of equity to total assets. Results found that independent director is positively related to cost efficiency. This implies that independent directors provide an effective monitoring role in oversighting and evaluating the performance of management in the banking industry. The results of the present study suggested that board size does not influence cost and profit efficiency of the commercial banks in Malaysia. This is consistent with the studies by Adams and Mehran (2008) and Zulkafli and Samad (2007). Gender diversity is also found to have no significant effect on cost and profit efficiency of the commercial banks in Malaysia. This is likely due to the relatively lower percentage of female in the corporate boardroom.

JEL classification: G21, D21, G30

1.0 Introduction

The subprime crisis in the mid-2008 has resulted in failure of major financial institutions in many countries. This was mainly due to poor risk management process as a result of weak corporate governance practices. Kirkpatrick (2009) pointed out that such problems were primarily due to information asymmetry in the banking industry where information about the banks' exposure failed to reach the board and senior management. Therefore, good corporate governance practices are needed to ensure long-term survival of commercial banking industry.

Corporate governance is a set of processes and customs that govern the relationship between the stakeholders of a company which includes corporate management, the board of directors, and shareholders. It aims to provide the route for easier performance management within the organization. Besides, it has been recognized by the Basel Committee (2006) as an essential tool in enhancing investors' protection and confidence by contributing to a more proper functioning of the market economy and hence leads to further improvement in economic growth.

In addition, corporate governance practices received considerable attention in Malaysia with the implementation of the Malaysian Code on Corporate Governance (MCCG) in March 2000. Special emphasis had been given on the role of independent non-executive directors to oversight and evaluates management performance (Fama and Jensen 1983; Bhojraj and Sengupta 2003; Ashbaugh-Skaife, Collins and LaFond 2006). In 2001, the Bursa Malaysia Revamped Listing Requirement (2001) states that at least one third of their board of directors must comprise of independent non-executive directors as part of the listing requirement. Continuous improvement in the corporate governance practices is witnessed with the revision of MCCG code in 2007. Besides, board composition in terms of qualification of directors and the role of independent directors in the audit committee being reviewed following the Budget 2008 announced by the Malaysian Prime Minister. This highlights the importance of corporate governance practices in ensuring continuous improvement in firms' performance.

Corporate governance in the banking industry is far more complex and differs from the non-banking firms because the banking industry is highly regulated (Macey and O'hara 2003; Spong and Sullivan 2007; Andres and Vallelado 2008; Agoraki, Delis and Panagiotis 2009). The management and board of directors of the banks are not only accountable for it owners but also to depositors, borrowers, shareholders, clients, bank and also regulators (Ciancanelli and Reyes-Gonzalez 2000; Pathan, Skully and Wickramanayake 2007). According to Andres and Vallelado (2008) heavy regulations in the banking industry created an additional mechanism of corporate governance. This greatly reduced the effectiveness of the corporate governance in the banking industry and thus affects the bank's performance.

In addition, the role of the banking industry is essentially important in ensuring the smoothness of monetary policy transmission in the developing countries because it provides the main source of financing to businesses. In this context, banks act as the assets transformer in transforming the short-term liabilities in the form of deposits into long-term loans. Therefore, the banking industry is highly leveraged and the mismatch resulted from the assets transformations may contribute to failure of banks as well as distort the creation of sound financial system in the country.

Furthermore, it is always a concern of the bank's regulators to prevent the effect of systematic risk in the banking industry. This is because failure of one bank creates a spillover effect to other banks and resulted in destabilization of the country's economic system (Calomiris 2007). The effort to reduce systematic risk had resulted in conflict between the shareholders in wealth

maximization and leads to new agency problem (Andres and Vallelado 2008). Consequently, corporate governance practices through board size, board composition, board diversity and leadership structure of the board may help to mitigate the problems of information asymmetry (Jensen 1993). Therefore, board structure and board composition are critical in corporate governance analysis because it enhances investors' protection and confidence which in turn help to improve firms' performance. This is supported by Barth, Caprio and Nolle (2004).

This study primarily examines the effect of board structure and board size on bank performances in Malaysia in terms of cost and profit efficiency for the period 2000 to 2009 using Data Envelopment Analysis (DEA). In the second stage of the analysis, Tobit regression is conducted to determine the effect of board composition and board size on cost and profit efficiency of these commercial banks. Gender diversity in the corporate boardroom is also included in the analysis of the commercial banks in Malaysia.

This study complements the study of corporate governance and banks' performance because most of the studies of bank performance are based on accounting ratio, namely return on assets and return on equity as well as Tobin's Q (Simpson and Gleason 1999; Griffith, Fogelberg and Weeks 2002; Belkhir 2004; Adams and Mehran 2005; Sierra, Talmor and Wallace 2006; Pathan et al. 2007; Zulkafli and Samad 2007; Adams and Mehran 2008; Andres and Vallelado 2008; Tanna, Pasioura and Nnadi 2008; Agoraki et al. 2009). According to Agoraki et al. (2009) bank efficiency as a measure of bank performance is relatively superior as compared to the financial ratio because it enables to take into account of the shortcoming associated with the evaluation of inventories and depreciation. Besides, the frontier analysis allows one to determine the efficient use of banks' resources at a given level of outputs while achieving the corporate objectives of cost minimization and profit maximization.

Section 2 discusses on the study of corporate governance on bank performance. Next, Section 3 presents the methods in estimating the cost and profit efficiency and discusses on the Tobit regression used to examine the relationship between corporate governance and bank efficiency level. This is followed by the discussion of results in Section 4. Section 5 concludes and highlights suggestions for future studies.

2.0 Literature Review

Section 2 outlines the review of literatures pertaining to the objective of the study. It is centered on the following board characteristics that may have impacts on the bank efficiency: (i) gender diversity; (ii) board size; and (ii) independent directors.

2.1 Gender Diversity

The issues of women in the corporate boardroom have been an area of interest of various researchers in recent years as women in present day play a critical role in corporation in view of their contribution towards knowledge, creativity and problem solving skills. According to Westphal and Milton (2000), and Carter, Simkins and Simpson (2003) women are important for corporations as they offered a fresh and various perspectives in problem solving. Besides, they are able to correct informational biases in strategy formulation. Another researcher, Kramer, Konrad, and Erkut (2006) also highlighted that female directors did put forward the interest of employees and firms' stakeholders and such an input has significantly affected the firms' performance. Similarly, Catalyst (2004) claimed that companies experience a better financial performance when there are high representations of women in top management teams. Erhardt,

Werbel and Shrader (2003) and Catalyst (2004) explained that this is because heterogeneous group made a better innovative and creative business decision-making than homogenous group.

The strengths of women are also brought up by Desvaux, Devillard-Hoellinger and Baumgarten (2007) who opined that gender diversity is an asset for corporate image because it helps to foster relationship between the company, its employees, its shareholders, and its customers. Likewise, Adams and Ferreira (2004) argued that diverse board is more effective as female directors tend to have lesser attendance problems in board meeting than male directors. Nishii, Gotte and Raver (2007) are also of the opinion that diversity in senior management could lead to adoption of diversity practices which in turn improve company's effectiveness and performance.

Carter et al. (2003) conducted a study on 638 public traded firms in Fortune 1,000 found that firms are having favorable financial ratios when there are high percentages of women involvement in corporations. Carter et al. (2003)'s findings are in line with the later study of Erhardt et al. (2003) on 127 US large companies. Besides, in a more recent study, Smith, Smith and Verner (2005) found a positive relationship on firm performance when women are added in top management. Likewise, the study of Bernardi, Bosco and Vassill (2006) found companies that appeared on "100 Best Companies to Work For" are generally consisted of high proportion of female directors. Such a finding of Bernardi, et al. (2006) is likely to imply the positive contribution of women in corporations. Similarly, the results of Francoeur, Labelle and Sinclair-Desgagne (2008) showed that firms with high level representation of women do generate positive stock-market returns.

On contrary, Bøhren and Strøm (2007) and Adams and Ferreira (2008) found firms perform poorer when the boards are more gender diversified. Such a finding could be explained by Jianakoplos and Bernasek (1998) who found that women are relatively more risk-averse in financial decision-making as compared to men. Besides, the study of Earley and Mosakowski (2000) revealed that heterogeneous group is not well performed. This is because group with diverse background have difficulties to work together in order to achieve a common understanding. Besides, Hambrick, Cho and Chen (1996) also found that diverse groups are slower in taking action, making decisions and responding to the competitors' initiatives.

On the other hand, some studies for example Zahra and Stanton (1988), Shrader, Blackburn and Iles (1997) and Campbell and Miguez-Vera (2007) found no relationship between the presence of women on the corporate boardroom and the firm value. Likewise, Marimuthu and Kolandaisamy (2009) showed that diversity seems irrelevant to financial performance in Top Management Teams (TMTs) of Top 100 listed companies.

The review of literature generally shows inconsistent results on the impacts of gender diversity and firms' performance. All in all further research is needed to gain deeper insight into this area in view of the different opinions expressed by various researchers.

2.2 Board size

The review of literature shows inconclusive findings on the impacts of board size and firms' performance. According to Coles, Daniel and Naveen (2008), larger board size is suitable for complex firms that need greater advising requirements. Kyereboah-Coleman and Biekpe (2006) argued that larger board size is effective and better for corporate performance as it consists of wide range of skillful and knowledgeable expertise that could improve board's decision. Kyereboah-Coleman and Biekpe (2006) further explained that with larger board size, it could lessen the CEO domination which in turn improves corporate performance.

The empirical research conducted by Eilon (1986) on 42 boards of US retailing firms found that non-failed firms tend to have larger boards as compared to failed firm. This implies that larger board tends to have longer corporate survival. In addition, the study of Kiel and Nicholson (2003) revealed a positive result when they explored the relationship between board size and corporate performance of those largest public listed companies in Australia. Similarly, using a sample of 174 banks and savings-and-loan holding companies, the study of Belkhir (2008) revealed that board size is positively related to Tobin's Q and return on assets.

Adam and Mehran (2008) conducted their research using 35 large publicly traded BHCs banks over a period of 1959-1999. Their study found that there is no relationship between firm performance and board size. Likewise, Zulkafli and Samad (2007) found no relationship between board size and bank performance when they conducted a research on 107 listed banks from nine Asian countries. However, many studies in the literature also found a negative relationship between board size and measures of firm performance. These studies include: Jensen (1993), Yermack (1996), Huther (1997), Conyon and Peck (1998), Eisenberg, Sundgren and Wells (1998), Mak and Kusnadi (2005), Pathan et al. (2007), Bennedsen, Kongsted and Nielsen (2008), Guest (2009) and O'Connell and Cramer (2010). In particular, a study conducted by Mak and Kusnadi (2005) in Malaysia and Singapore on board size and firm performance found that board size and firm value in the two countries are inversely correlated. Similar results are also found in European countries, namely the UK, France, Netherlands, Denmark and Italy (Conyon and Peck 1998), Finland (Eisenberg et al. 1998) and Ireland (O'Connell and Cramer 2010). Besides, the study of Yermack (1996) found that smaller boards produce favorable financial ratios in United States Public Corporations. Yermack (1996) argued that such a result can be interpreted as either smaller size of board brings positive corporate performance, or adjustment on board size is made in response to the past corporate performance.

Other studies, for example, Pathan et al. (2007) also revealed a negative relationship between board size and banks' performances in the Thai banking industry. In a similar vein, Huther (1997) asserted that larger board is correlated with higher cost which is one of the contributions towards ineffectiveness corporate performance. Eisenberg, et al. (1998) and Guest (2009) argued that when the board size becomes larger, it will increase communication and coordination problems among the board members, and consequently it will affect board's management control. As oppose to Kyereboah-Coleman and Biekpe (2006) and Jensen (1993) argued that large board could lead to greater CEO control which reduces the board effectiveness. This is because when board size is large, board members are less likely to participate, communicate and commit in the board discussion.

Overall, it can be seen that the number of directors (board size) that sit on the board should be appropriate in order to achieve company's goal (good performance). The appropriateness is highly depending on the firm size. Pfeffer (1972) remarked that large company that require more external contracting relationship should keep the board large, so that the board consists of members that can deal with various sectors of external environment. Therefore, some researchers suggested that the number of board members should be optimal.

2.3 Independent director

The presence of independent non-executive directors on the corporate boardroom is likely to reduce agency problems as outline in Fama and Jensen (1983) as they enhance monitoring management's decision, protecting interests of shareholders and other stakeholders, and safeguarding firms' reputation. Likewise, according to Staikouras, Staikouras and Agoraki (2007)

non-executive directors add value to firm by providing their expert knowledge and monitoring services. Similarly, the empirical evidence of Barnhart, Marr and Rosenstein (1994) showed that board composition is essential when independent directors ratify decisions that have a direct effect on managerial well-being and overall firm performance. In the case of banking industry, Brickley and James (1987) found that the presence of independent director tend to reduce managerial consumption of perquisites which in turn improve bank performance. In line with the above, many studies (e.g. Baysinger and Butler 1985; Shivdasani 1993; Cotter, Shivdasani, and Zenner 1997; Pathan et al. 2007; Tanna et al. 2008; and Chuan, Hsiao and Chun 2009) also confirm the contribution of independent directors in enhancing firms' value.

Positive relationship between the proportion of independent directors on the bank board and performance is also found in Pathan et al. (2007). Likewise, Tanna et al. (2008) found that independent directors have been effective in monitoring and controlling managers. Such an action may lead to a positive impact on performance, stock return, credit ratings, and auditing. Besides, the study of Chuan et al. (2009) revealed that board independence plays a positive role on firms' investment behavior and performance.

On the other hand, citing three of the largest bankruptcies in the history of corporate America, namely, Enron Corp., WorldCom, Inc., and Global Crossing Ltd, Petra (2005) argued that the presence of outside directors alone fail to resolve the problems of deficiencies exposed in the corporate boardrooms as these companies also utilized outside directors on their boards. The remark of Petra (2005) is consistent with the earlier study conducted by Hermalin and Weisbach (1991) who found that there is no relationship between the percentage of outside directors and firm performance. Similarly Pi and Timme (1993) found that cost efficiency and return on assets are not associated significantly with the proportion of independent directors in commercial banks in the US.

According to Petra (2005), the inclusion of outside directors may jeopardize the efficient operation of a board of director. This is because outside directors do not have sufficient exposure on daily activities of the firm because of their limited involvement with corporate activities. Other studies, as discussed in Haniffa and Hudaib (2006, p.1039) for example, Baysinger and Butler (1985), Demb and Neubauer (1992) and Goodstein, Gautum and Boeker (1994), also highlighted the weaknesses of high proportion of independent non-executive directors which include excessive monitoring and jeopardize companies as they may stifle strategic actions. In addition, the non-executive directors are accused for not being truly independence and may lack of the business knowledge and this may defeat the purpose of independent non-executive directors.

Overall, the review of literature indicates that the presence of independent directors tends to safeguard the efficacy of supervision and advice in the operation of firm. Therefore, Andres and Vallelado (2008) pointed out that the independent directors should endow with knowledge, incentives, and abilities to mitigate the conflicts of interest between shareholders and insiders. However, Andres and Vallelado (2008) also stressed that an excessive proportion of independent directors may damage the advisory role of boards. This is because it may cause problems on coordinating, controlling and flexibility in decision making. Therefore, a negative relationship between presence of independent directors and firm performance could be observed (Bhagat and Black 2001).

3.0 Methodology

This study employs Data Envelopment Analysis (DEA) to estimate the bank efficiency in Malaysia from year 2000 to 2009. This is a linear programming methods based on the concept of Pareto efficiency where the production frontier is used to estimate the efficiency of a particular firm (Casu and Molyneux 2003). This technique compares each bank's studied with the "best practice" banks and each bank is known as the Decision Making Unit (DMU). The most efficient DMUs lie on the cost or production frontier and assigned with a score of "1". Banks (DMUs) below the frontier are considered to be relatively inefficient as compared to the benchmark banks and will be given an efficiency score in between "1" and "0".

As compared to the econometric models of frontier analysis, DEA is relatively flexible because it does not require a priori functional specification of the unknown technology (Fukuyama 1993; Favero and Papi 1995). Therefore, the estimation of efficiency will not be subjected to possible misspecification of the production function (Bauer, Berger, Ferrier and Humphrey 1998; Jemric and Vujcic 2002; Okuda and Hashimoto 2004). Besides, DEA is superior as compared to econometrics models because it is best used for small samples estimations. The cost efficiency for bank j can be expressed as follows:

$$\begin{aligned} \text{Min } CE_j &= \sum_{m=1}^M w_{jm} X_{jm} \\ \text{s.t. } \sum_{r=1}^R \lambda_r X_{rm} &\leq X_{jm} \\ \sum_{r=1}^R \lambda_r Y_{rm} &\geq Y_{jn} \\ \sum_{r=1}^R \lambda_r &= 1, \lambda_r \geq 0, r = 1, 2, \dots, j, \dots, R \end{aligned} \quad (1)$$

where:

CE_j = cost efficiency of the j th DMU

Y_{jn} = n th output of the j th DMU

Z_{kn} = n th undesirable output of the k th DMU

w_{jm} = m th input price of the j th DMU

X_{jm} = m th input of the j th DMU

The cost efficiency for the j th bank is given by the ratio of minimum costs to actual costs can be estimated using Equation 2 below.

$$0 < CE_j = \frac{\sum_{m=1}^M w_{jm} X_{jm}^*}{\sum_{m=1}^M w_{jm} \theta_j^* X_{jm}} < 1 \quad (2)$$

where:

θ_j^* = technical efficiency of j th DMU

X_{jm}^* = m th input of the j th DMU (calculated by linear programming)

In this context, the banks are said to use m th unit of input in their production of n th unit of output.

Next, the alternative profit function with the assumption that banks to have certain control over their output prices in the imperfect competitive environment is employed in this study. Profit efficiency represents a better concept of the firm's objectives because it takes into account of both cost of production and revenues generated by the banks. The alternative profit efficiency for bank j can be expressed as follows:

$$\begin{aligned} \text{Max } PE_j &= R_j - \sum_{m=1}^M w_{jm} X_{jm} \\ \text{UnV} & \\ \text{s.t.} & \\ \sum_{r=1}^R \lambda_r R_r &\geq R_j \\ \sum_{r=1}^R \lambda_r X_{rm} &\leq X_{jm} \\ \sum_{r=1}^R \lambda_r Y_{rn} &\geq Y_{jn} \\ \sum_{r=1}^R \lambda_r &= 1, \lambda_r \geq 0, r = 1, 2, \dots, j, \dots, R \end{aligned} \quad (3)$$

where:

PE_j = cost efficiency of the j th DMU

R_j = Revenue efficiency for j th DMU

Y_{jn} = n th output of the j th DMU

w_{jm} = m th input price of the j th DMU

X_{jm} = m th input of the j th DMU

The alternative profit for bank j th is given by:

$$APE_j = \frac{\sum_{m=1}^M R_j - \sum_{m=1}^M w_{jm} X_{jm}}{\sum_{m=1}^M R_j^* - \sum_{m=1}^M w_{jm} X_{jm}^i} < 1 \quad (4)$$

The above equations follow constant return to scale (CRS) that assumes the production takes place in the linearly scale the inputs and outputs without changing the efficiency level. Nevertheless, in the real economic situation firms may not be able to scale their factors of productions and outputs linearly. Therefore the approach of variable return to scale (VRS) estimation by setting $\sum_s \lambda_s = 1$ provides a better representation for both cost and profit function.

Next, Tobit regression is employed to determine the effect of board structure and board size on cost and profit efficiency of the commercial banks. The bank size, liquidity risk, ratio of non-performing loans to gross loans, return on average assets, return on average equity, and equity to capital ratio are employed as the control variables for cost and profit efficiency in this present study. The Tobit regression estimation is shown in Equation (5).

$$Eff_{it} = f(BS, ID, GD, LR, NPL, \text{profitability}, \text{equity capital}) \quad (5)$$

$$Eff_{it} = \alpha_{it} + \beta_1 BS_{it} + \beta_2 ID_{it} + \beta_3 GD_{it} + \beta_4 LR_{it} + \beta_5 size_{it} + \beta_6 NPL_{it} + \beta_7 ROE_{it} + \beta_8 ETA_{it} + \varepsilon_{it}$$

Where Eff_{it} refers to average cost and profit efficiency scores of commercial bank i at time period t .

BS_{it} = board size (natural logarithm of total number of directors) for bank i at time t

ID_{ij} = independent director/ total number of directors for bank i at time t

GD_{ij} = total of women directors/ total number of directors for bank i at time t

LRe_{it} = liquidity risk for bank i at time t

$Size_{it}$ = bank size (natural logarithm of total assets) for bank i at time t

NPL_{it} = non-performing loan to total assets for bank i at time t

ROE_{jt} = return on equity for bank i at time t

ETA_{jt} = equity to total assets for bank i at time t

ε_{it} = error-terms for bank i in at time t

3.1 Data and Variables:

The sample of this study consists of selected 19 commercial banks operating in Malaysia which includes both domestic and foreign commercial banks from period 2000 to 2009. The variables used in this study are extracted from various issues of report of commercial bank. The unbalanced panel data approach is used to estimate the relationship between board size and board composition with the commercial banks in Malaysia. The intermediation approach where the banks function as intermediary in collecting deposits from the savers and provides excess of funds to the investors is employed.

The inputs vector employed in this study consists of labour, capital, and loanable funds. The price of labour is calculated by dividing total personnel expenses (employees' salaries and benefit expenses) with total assets of the bank. The price of physical capital is calculated by dividing total depreciation by total fixed assets. The price of loanable funds is calculated by dividing total interest expenses on deposits and non-deposit funds with total loanable funds. The inputs are used to produce financial outputs such as loans, investments, and off-balance sheet products. Hence, these three served as the output vectors for the traditional banking products of banks. Next, the price of outputs employed consists of price of loans, price of investments and the price of off-balance sheet activities. The price of loans is computed using interest income from loans to total loans whereas price of investments is the ratio of investment income to total investment. The price of off-balance sheet activities is taken as the ratio of non-interest income to total off-balance sheet activities of the banks. The total costs consist of operating and financial costs and the net income before taxes is used as the proxy for banks' profit. All outputs, costs and profits values are in RM million.

In the second stage estimation of corporate governance practices on cost and profit efficiency, the independent variables employed are board size, number of independent directors, gender diversity while controlling for liquidity risk, bank size, non-performing loans ratio, return to assets, return to equity, and ratio of equity to total assets. The expected results are stated in Table 1.

[Insert Table 1]

4.0 Results and Discussion

The results of cost and profit efficiency scores of the commercial banks in Malaysia from year 2000 to 2009 are summarized in Table 2.

[Insert Table 2]

The summary statistics of the efficiency scores reveal that the commercial banks in Malaysia is relatively cost efficient with an average efficiency scores of 81.8% as compared to profit efficient with the reported efficiency score of 68%. The results indicate that the commercial banks on average could reduce their input mix by 18.2% given the same output level in order to be cost efficient. On the other hand, the input wasted on profit efficiency is greater and amounted to an average of 32%.

Next, the estimated results of the relationship between board size and board composition with the cost and profit efficiency of the commercial banks in Malaysia is presented in Table 3.

[Insert Table 3]

From Table 3, the results show that the board size does not influence the cost and profit efficiency of the commercial banks in Malaysia. This is supported by Adams and Mehran (2008) which found that banking firms' performance in the U.S. does not significantly influenced by the board size. Similar results were found by Zulkafli and Samad (2007) on 107 listed banks in the Asian emerging markets.

Next, results suggest that the percentage of independent director in the board is positively related to cost efficiency of the commercial banks in Malaysia and it is statistically significant at 5% significance level. This indicates that the role of independent director is successful in mitigating moral hazard behavior of managers to act in accordance with their own self interest. This contributes to higher banks' performance in cost efficiency. Andres and Vallelado (2008) suggested that independent director in the board is useful because it resulted in fewer conflicts of interest with the managerial level and reduced cost incurred to manage the bank. Nevertheless, the percentage of independent director is not significant to influence the profit efficiency level of the commercial banks.

On the other hand, gender diversity does not significantly affect the cost and profit efficiency of the commercial banks in Malaysia. This might due to relatively lower percentage of women in the board. The result is consistent with the earlier study done by Marimuthu and Kolandaisamy (2009) on the Top 100 listed companies in Malaysia that shows gender diversity is not relevant in determining the firm performance.

Liquidity risk is found to be negatively related to cost and profit efficiency at 1% significance level. This indicates that the higher the liquidity risks the lower the cost and profit efficiency of the banks. As pointed out by Rao (2005) lower liquidity risk will result in higher cost and profit efficiency because it is less costly for the banks to handle liquid assets which are relatively lower in interest costs, transaction costs as well as lower storage and protection costs.

Finally, the equity to capital asset ratio is found to be positively related to cost and profit efficiency level of the commercial banks in Malaysia. A higher equity to capital ratio indicates that banks resort to equity capital in financing the banking activities instead of using debt-financing. This resulted in lower risk-taking propensity and lower cost of borrowing and leads to higher and profit efficiency. The study is inline with Demsetz, Saindenberg and Strahan (1996), Salas and Saurina (2003), Rao (2005) and Chang and Chiu (2006).

5.0 Conclusion

This study examined the effect of board size and board composition on cost and profit efficiency of the commercial banks in Malaysia from 2000 to 2009. The DEA is employed to estimate cost

and profit efficiency scores of commercial banks in Malaysia. Next, the Tobit regression is utilized to determine the effect of board composition and board size on cost and profit efficiency of these commercial banks by controlling for liquidity risk, bank size, non-performing loans ratio, return to equity, and ratio of equity to total assets.

The results of the present study suggested that board size does not influence cost and profit efficiency of the commercial banks in Malaysia. This is consistent with the studies by Adams and Mehran (2008) and Zulkafli and Samad (2007). Next, results found that independent director is positively related to cost efficiency. This implies that independent directors provide an effective monitoring role in over sighting and evaluating the performance of management in the banking industry. This is in line with the requirement of the MCCG on the role of independent directors to further improve the banking performances. Besides, the regulator should also continuously improve on the MCCG and provides more transparent rules and regulation in developing the role of independent directors to boost the efficiency level of the banking industry. Overall, the results of the present study on the effects of board independent on firms' performance are consistent with the findings by Baysinger and Butler (1985), Shivdasani (1993), Cotter et al. (1997), Pathan et al. (2007) Tanna et al. (2008) and Chuan et al. (2009) on firms' performance. However, it contradicts the findings of prior studies in Malaysia conducted by Abdullah and Nasir (2004), Rahman and Ali (2006), and Haniffa and Hudaib (2006) which showed that independence non-executive directors have not been performed the monitoring functions effectively.

Nevertheless, gender diversity does not significantly influence the cost and profit efficiency of the commercial banks in Malaysia. This is likely due to the relatively lower percentage of female in the corporate boardroom. Furthermore, women may have also played a less critical role as compared to man in the male dominated corporate boardroom in the commercial bank in Malaysia. Hence, their contribution in terms of knowledge, creativity and problem solving skills may not have critically affected the efficiency of the banks. Generally, such a result in this study is consistent with the studies by Marimuthu and Kolandaisamy (2009), Zahra and Stanton (1988) and Shrader et al. (1997) who found that the involvement of women in corporations does not affect firms' performance. Even though the involvement of women in corporate boardroom does not affect firms' performance, Malaysian government should encourage women to participate actively in corporations in order to promote better gender equality in the country. As remarked by Koshal, Gupta and Koshal (1998, p. 18) "women represent a special talent pool; it is not only a matter of morality to treat women equal to male, it also makes good business sense to use this talented resources effectively".

It is acknowledged that the present study only covers the limited aspect of corporate governance such as board size and board independence on bank efficiency. To gain deeper insights, future studies may investigate other corporate governance mechanisms such as board competency, non-duality role of CEO, independence of audit committee and competency of audit committee on their impacts of bank efficiency. It is also suggested the study to be replicated in other emerging markets as to observe their cross cultural effects and to examine whether the same general relationship holds.

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Table 1: Expected results of variables employed in the regression models

Variable	Expected result
board size = $\text{Log}(\text{total number of directors})$	<p>Positively related to bank efficiency if large board resulted in better monitoring and advising the management as well as facilitate the manager supervision.</p> <p>Negatively related to bank efficiency if large board resulted in coordination problems, control and flexibility in decision-making.</p>
Percentage independent directors = $\frac{\text{total number of independent directors}}{\text{total number of board of directors}}$	<p>Positively related to bank efficiency because it helps to mitigate agency problem and moral hazard by overseeing the executive and managing directors as well as act as a monitoring role to the banks management.</p> <p>Negatively related if large number of independent directors damage the advisory role of the boards.</p>
gender diversity = $\frac{\text{Total of female directors}}{\text{total number of board of directors}}$	<p>Positive relationship is expected if greater gender diversity contributed a fresh perspective in the corporate boardroom for their knowledge, creativity and problem solving skills.</p> <p>Negative relationship is expected when the gender diversity resulted in more complex management of the firms.</p>
liquidity risk	Negative relationship is expected because greater risk reduces the banks to operate efficiently.
bank size = $\log(\text{total assets})$	Capture the possible cost advantages associated with size. Expected to have positive effect with bank efficiency level.
non-performing loans ratio = $\frac{\text{total of non-performing loans}}{\text{total loans}}$	<p>Control for assets quality.</p> <p>Negative relationship between non-performing loans to total loans and bank efficiency scores since lower asset quality causes banks to incur additional cost in managing the assets and hence reduction in profit.</p>
Return to equity = $\frac{\text{Net income}}{\text{total equity}}$	The profitability ratio should be a positively related to bank efficiency because more efficient banks are said to generate greater profit earnings (Mester, 1993).
equity to total assets	<p>Control for the regulatory conditions.</p> <p>A negative relationship is expected when a lower ratio results from higher risk-taking propensity and leverage and thus, higher borrowing costs.</p> <p>A positive relationship is expected when regulators view a higher level of equity to reduce of future losses.</p>

Table 2: Descriptive statistics of average cost and profit efficiency score of commercial banks in Malaysia from 2000 to 2009

Cost efficiency		Profit efficiency	
Mean	0.818	Mean	0.680
Median	0.835	Median	0.831
Mode	1.000	Mode	1.000
Standard Deviation	0.148	Standard Deviation	0.899
Count	167	Count	167

Table 3: Cost and profit efficiency estimation and its determinants

Variable	Cost efficiency	Profit efficiency
Constant	0.452 (0.118) [3.819]***	-0.094 (0.586) [-0.161]
Board size	0.066 (0.046) [1.418]	0.007 (0.229) [0.032]
Independent director	0.174 (0.069) [2.534]**	-0.188 (0.339) [-0.554]
Gender diversity	-0.000 (0.132) [0.001]	-0.439 (0.650) [-0.676]
ROE	0.053 (0.082) [0.654]	0.456 (0.406) [1.122]
Liquidity risk	-0.212 (0.082) [2.586]***	-1.269 (0.417) [-3.044]***
Bank size	0.008 (0.009) [0.869]	0.053 (0.044) [1.217]
Non-performing loans	0.180 (0.142) [1.265]	-0.103 (0.699) [-0.148]
Equity to capital	0.337 (0.130) [2.596]***	2.011 (0.659) [3.050]***
Sigma	0.137 (0.007) [18.276]***	0.668 (0.039) [17.291]***
Log Likelihood	95.310	-169.541

Notes: ***, **, * denote significance at 1, 5, and 10 % level respectively. Standard errors in parentheses and z-statistics in [].