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OWNERSHIP STRUCTURE AND RISK TAKING OF MALAYSIAN BANKING INSTITUTIONS

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ABSTRACT

Firstly, this research aims to investigate the direct impact of the three ownership structure (government, institutional and family) on bank risk takings measured by Z-Score. The Z-Score formulation that is used is based the context that fit for Malaysia as one of the emerging markets. Besides, this research investigates the impact of the ownership structure with capital adequacy ratio as the moderating element towards bank risk taking as measured by Z-Score, along with the five control variables. The eight Large Domestically-owned Commercial Banks in Malaysia of period 2000-2012 are used in this research which contribute to balance panel of 104 observations. For this research, multiple regression and hierarchical moderated multiple regression are applied for both of the models. The results suggest that the three ownership structures are not significant towards Z-Score for the direct relationship which is between the three ownership structures and Z-Score. However, the result showed significant findings of capital adequacy as the moderating factor between ownership structure and Z-Score. Besides, the interaction between the family ownership and capital adequacy are found to be significant towards Z-Score. The implication and discussion of the regression results towards the eight Large Domestically-owned Commercial Banks in Malaysia also are analysed accordingly.

Keywords: Ownership structure, risk taking, banking, Z-Score, capital adequacy ratio

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INTRODUCTION

Two clear messages from the corporate governance literature shows that ownership is important and that it is helpful to view the issue in the context of the principal-agent framework and public choice theory (Altunbas et al. 2001). However, while that literature has provided considerable understanding of the effects of ownership, its primary focus is basically on non-financial firms. The separation of owners (financial provider) from decision maker (manager) creates agency problem between these two entities in the firm. Agency problem arises when shareholders yearn for capital return while the decision maker may misappropriate the shareholders' investment. Agency problem is a source of inefficiency because it explains why environmental pressures, which influence the responses and effort of management, may fail to coerce maximal effort from managers.

According to Levine (2004), principal-agent problems in banks may raise the issues attributable to what is the most appropriate governance structure for banks. The complicated issues of bank governance is caused by several factors such as the quality of bank regulations and supervision, the opaqueness of bank assets, the level of market development, and the institutional environment which conditions the overall effectiveness of financial markets. Iannotta et al (2007) argues that a firm's ownership structure can be defined along two main dimensions. First, the degree of ownership concentration; firms may differ because their ownership is more or less dispersed. Next, the nature of the owners; given the same degree of concentration, two firms may differ if the government holds a majority stake in one of them, which is similarly a stock firm with dispersed ownership is different from a mutual firm.

Bank stability has been yet again the topmost agenda for the policy makers' agenda across advanced developing countries. This has been a concern since the beginning of the 1997-1998 Asian financial crisis, and for the past few years there has been numerous debates around the world on to the stability of banks of different sizes and ownership (Beck et al 2009). For the past two decades, Malaysia has experienced two financial crisis namely; Asian Financial Crisis in 1997-1998 and the Global Financial Crisis in 2008-2009. The 1997/1998 Asian Financial Crisis has been found to be more severe and have left a bigger impact to Malaysia banking industry as compared to the 2008-2009 Global Financial Crisis. As per Beck et al. (2003) the occurrence of the banking crisis is due to the banking fragility, whereby crises are less likely in economies with more concentrated banking systems. This is because the profits enhanced by the concentrated banking systems do resulted lower bank fragility. The same issue also has been discussed in (Beck et. al 2006).

The aim of this research is to investigate the ownership structure as a mechanism for analysing the determinants of Malaysian bank risk taking. The main motivating factor of this study is the effect of the 1997/1998 economic crisis. In addition, prior to the situation, the poor bank governance are more severe than that of non-bank firms and their failures have even more significant costs. This is due to banks are considered unique economic units because their distinguishing roles in financial intermediation, in payment system, liquidity, information and maturity and denomination transformation. In line to this, banks are also important as they provide critical monitoring role in the governance of their borrowers such as reducing borrowers' earnings management behaviour as suggested by Ahn & Choi (2009).

Pathan (2009) points the importance of studying bank risk-taking today is far more important than ever before due to the constant attempt of legislation revision. All the attempts by the policy makers is to facilitate a better monitoring of the bank activities which includes the bank risk taking behaviour. Besides, the financial shocks in the US such as the sub-prime mortgage crisis in August 2007 due to the irresponsible risk-taking by the financial institutions, do initiate the economy at risk. As the result, it is crucial to study on bank risk taking.

Even though there is an increasing number of study and research on bank risk taking, it is found that most of the studies were done in developed countries and very few studies done in developing countries. There is a need of the bank risk taking studies in developing countries such as Malaysia because there is a concern whether or not the approaches and results of the studies conducted in developed countries could be generalized and whether it is applicable to the developing countries context such as Malaysia.

Bank risk taking is measured by Z-Score that is commonly employed as risk measure in empirical banking literature. This measure reflects the probability of insolvency of the sample banks. In addition, this study also attempts to investigate the importance of capital adequacy ratio (CAR) as a moderating factor between the ownership structures with the bank risk takings. Capital adequacy ratio (CAR) is the ratio of a bank's capital to its risk.

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The first proposed problem statement for this research is as such:

1. Does the bank ownership structure affect the bank risk taking in Malaysia?

Since capital adequacy ratio (CAR) is the moderating variable used in this research, the second research problem is as below:

2. Is there any impact on ownership structure with bank risk taking with capital adequacy ratio as the moderating factor?

Based on the former research problem statement, with the research objectives are as follows:

i. To investigate the effect of ownership structure and bank risk taking.
ii. To investigate the interaction of CAR on ownership structure with bank risk taking.

The importance of conducting this research are as such:

Firstly, most of the previous studies have not investigated on how ownership structures interact in shaping the risk taking of banks (Laeven & Levine 2009). This study will focus on the effect of the five types of ownership structure (bank, financial company, industrial company, mutual fund and government) towards bank risk takings. In addition, this study will also investigate the interaction effect of capital adequacy ratio as the moderating variable.

Secondly, standard agency theories suggest that ownership structure influences corporate risk taking (Jensen & Meckling 1976 ; John et al. 2008). Although, this issue is important and crucial in creating awareness among corporate policy makers, literature and discussion, however, are still lacking. Hence, there is a need to study the influence of ownership structure towards risk taking and in this research context will be the bank risk taking. This gap is believed to have a serious potential from a policy maker perspective.

Finally, this study will also add in the body of bank literature since there is the need and not much of bank risk taking study in developing countries. Most of the studies and measurement on bank risk takings focused to the developed countries (Rahman et al. 2012) . This study also contributes to the measurement of bank risk taking behaviour that is applicable to the developing countries such as Malaysia.

This paper is organized as follow. The next section discusses the literature related to agency theory with special emphasis on bank risk taking. The hypotheses of this research are developed at the end of the section. The two following section discusses the methodology and the data employed in this study and presents the results of this study. Finally, the last section concludes the main findings of the study.

LITERATURE REVIEW

The banking system is the primary mobiliser of funds and also the main source of financing that supports the economic activities in Malaysia. It comprises of commercial banks, investment banks and Islamic banks. In this study, the focus is on the eight Domestically-owned Commercial Banks in Malaysia. This is due to their importance as the largest group of commercial banks and most significant providers of funds in the banking system. Furthermore, commercial banks have the largest share of the market. The classifications of the eight commercial banks are as provide in Table 1.

Table 1: The classification of the three main group of commercial banks

Family Owned Banks	Government Owned Banks	Corporate Owned Banks
AMMB HLB Public Bank RHB	Affin CIMB Maybank	Alliance Bank Berhad

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The worsening situation that have been prompted in some of the banking institutions in the early 1998 has initiate the Malaysia government for a sudden decision for a bank merger programme in 1999 in order to consolidate the banking industry as some banking institutions faced difficulties due to their substantial losses and the increase of NPL ratios (Lum & Koh 2007).

A robust bank merger programme was initiated by the government in July 1999 in order to restructure all domestic banking institutions into six banking groups (Lum & Koh 2007). Referring to the Bank Negara Malaysia annual report 2001, there are ten lead anchor banks namely; Affin Bank Group, Alliance Bank Group, Arab Malaysia Bank Group, Bumiputra-Commerce Bank Group, EON Bank Group, Hong Leong Bank Group, Malaysian Banking Group, Public Bank Group, RHB Bank Group and Southern Bank Group. The composition of the ownership structure in the merged banking groups and the market structure of the banking industry usually changes due to the consolidation of the banking industry. The Malaysian government's strategy in the post-crisis years is to consolidate the banking industry (Lum & Koh 2007).

The proper management of risk is through good corporate governance mechanisms which provide a framework of disclosure that allows the market to discern the risk choices of the banking institutions. It must entail greater transparency and market discipline in order to be effective (Lum & Koh 2007). As for the Malaysian banking sector, the changes in the ownership structure has been an important feature of the evolution. In Malaysia, the bank ownership structure implies a high concentration of shareholding by ownership types. The BAFIA was a clear and robust regulatory response to the crisis of the mid-1980s, which came into force on October 1, 1989.

As per Section 46 of BAFIA 1989, all banks are required to institutionalize their shareholding structure by restricting ownership in a bank by restrictive the limit of equity ownership by individual companies in bank to no more than 20 per cent as per the Banking act of 1973. On the other hand, the equity owned by family-owned company or an individual is restricted up to 10 per cent. However, it does seems to have any significant effect on the composition of ownership structure in the banking industry even though the consolidated programme have resulted in larger and better capitalized domestic banking institutions.

Referring to the theoretical and empirical literature, the nature of the shareholders does influence the different of agency problems and the risk-taking behaviour. The identified issue raised by Jensen and Meckling (1976) is the conflict of interest between managers and shareholders. In line to this, the theory indicates that shareholders with a diversified portfolio are motivated to take more risk for a higher expected return whereas managers take less risk to protect their position and personal benefits and to preserve their acquired human capital Galai and Masulis (1976), Jensen and Meckling (1976), Demsetz and Lehn (1985), Esty (1998).

Referring to Galai and Masulis (1976), Esty (1998), Jensen and Meckling (1976), Demsetz and Lehn (1985), the agency theory indicates that shareholders with a diversified portfolio are motivated to take more risk for a higher expected return whereas managers take less risk to protect their position and personal benefit, and preserve their acquired human capital. The first to test empirically and relationship between banks' ownership structure and their risk taking incentives is by (Saunders, Strock, & Travlos, 1990). Moreover, from the findings also reveal that the banks controlled by shareholders tend to take more risk compare to banks controlled by managers. Based on these findings it motivates to undergo for this research.

Based on theory of risk taking it predicts that banks with large dominating shareholders, in other words, with easy control over management, tend to take more aggressive risks than managers who dominated banks with small disperse shareholdings. Prior studies, in the case of banking found that the existence of large shareholders increases bank risk taking (Ciancanelli and Gonzalez, 2000; Iannota et al., 2007; John et al., 2008).

The level of risks in banks which refer to bank risk taking, is measured by insolvency risk (Barry et al. 2011). Bank insolvency problem reveal the degree of exposure to losses or failures which will reduce bank capital reserves that could be used to offset adverse shocks. Bank insolvency risk indicates the banks' distance from failure and is measure using Z-Score. A lower (negative) Z-Score indicates a riskier bank, whereas a higher (positive) Z-Score implies a more stable or the bank is safer. The predictions by Saunders et al. (1990) and Laeven and Levine (2006) that banks with large dominating shareholders take larger risks than manager-dominated banks with small shareholdings.

Empirical studies on the effect of ownership on bank risk takings provide mixed results. Ownership concentration positively affects bank's risk taking (Laeven & Levine 2009). Besides, banks with concentration

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ownership tend to have better loan quality, lower asset risk and lower insolvency risk (Ianotta et al 2007). Referring to Laeven and Levine (2009), the ownership stakes to consider consists of ten per cent and twenty per cent with the Z-Score as the bank risks. However, Shehzad, de Haan, and Scholtens (2010) on the other hand, suggest that in order for the result to be different, is by a higher levels of ownership concentration with capital adequacy ratio as the proxies for risk. As the result, the effect of ownership concentration is positive and in a better risk-weighted capitalization with the capital adequacy ratio as the proxy of the bank risk.

The Capital Adequacy refers to a bank's capital or equity whereby it is the margin by which creditors are covered if the bank has to liquidate its assets. Capital to asset ratio, is a good measure of a bank's health, which by law, is required to be above a prescribed minimum.

Both hypotheses formation are as follow:

The relationship between bank ownership and Z-Score

According to Garcia-Marco and Robles-Fernandez (2008) that high concentration ownership in small Commercial bank tends to lead to a greater increase in risk-taking The situation implicitly is due to higher shareholder concentration that appear linked to a stricter control over managers. This is appearing to be clear evidence for the moral hazard problem which is the increase in risk taking in this kind of institutions. Referring to Laeven and Levine (2009), the diversified owners have stronger incentives to increase risk than non-shareholding managers. As the result, for banks with powerful and yet diversified owners tend to be riskier than widely held banks.

As per Barry, Lepetit, and Tarazi (2009), the different ownership structure do imply different levels of risk and profitability. The ownership structure discuss by Barry et al. (2009) consists of government, bank, Financial Company, Mutual and Pension Fund, Nominees, Trust or Trustees, Insurance Company, Individuals and Families. In addition, according to Barry et al. (2009), banks with different ownership structures tends to have different attitude toward risk taking behaviour. This situation is subject to the different ownership structure in the bank, the levels of the risk taking behaviour are varies whether are more or less risky. As per Iannotta et al. (2007), a higher ownership concentration is associated with lower insolvency risk. Thus, this study proposes the ownership structure to be positively associated with Z-Score.

H1 : There is positive relationship between ownership structure and Z-Score

The impact of ownership structure on Z-Score with CAR

According to Naceur and Kandil (2009), since the response of choice by a non-risk averse will be towards a riskier asset, the distribution of risk aversion across banks is due to the effect of capital requirements on the overall banking system. The potency of more capital at risk through capital requirement enables to internalize the efficiency of investing in high risk assets. In addition, the situation will also reduce the capitalized value of expected future profits which is referring to the reduction of the banks' franchise values.

According to Naceur and Kandil (2009), the banks' capital ratio decisions are significantly affected by the capital requirements. Besides, the regulatory pressure did positively affect their chosen risk levels, although did not induce banks to increase their capital requirement. As per Shehzad et al. (2010), the capital adequacy ratio positively affected by ownership concentration, and as the result ownership concentration reduces the bank riskiness and this can be measure by Z-Score. On the other hand, referring to Dolde and Knopf (2006), ownership structure is associated with higher risk is also associated with higher returns.

The argument raised by Ciancanelli and Reyes-Gonzalez (2000) that capital requirements avoid expropriation problems between shareholders and bank creditors. Referring to La Porta, Lopez-De-Silanes, and Shleifer (1999) and Rime (2001), capital requirement reduce incentives for high risk taking in banking as shareholders are forced to absorb a larger part of the losses. In supporting the findings, Konishi and Yasuda (2004) found that the implementation of high capital requirement reduced bank risk. This indicates and suggests a negative significant relationship between high capital requirement and bank risk taking. In addition, this suggests that the implementation of high capital requirement is important in reducing bank risk.

Referring to Laeven and Levine (2009) , the ownership stakes to consider consists of ten per cent and twenty per cent with the Z-Score as the bank risks. However, Shehzad et al. (2010) on the other hand, suggest that

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in order for the result to be different, is by a higher levels of ownership concentration with capital adequacy ratio as the proxies for risk. As the result, the effect of ownership concentration is positive and in a better risk-weighted capitalization with the capital adequacy ratio as the proxy of the bank risk. Based on prior studies, the current study predicts positive moderation association by capital adequacy ratio between ownership structure and Z-Score.

H2 : CAR positively intervene the relationship between ownership structure and Z-Score.

METHODOLOGY

The data used in this study consist of annual ownership and financial data for the eight listed commercial banks in Malaysia during the years 2000-2012. The banks included in the sample are AMMB, HLB, Public Bank RHB, Affin, CIMB, Maybank and Alliance Bank. The data have been gathered from annual reports of the banks, Thomson Financial Datastream data services and Bureau Van Dijk Bankscope. The focus of this research is on commercial banks only.

The ownership data are collected from annual reports of the banks and typically includes the top thirty shareholders. The classification of the ownership structure was gathered from Bureau Van Dijk Bankscope. Usable data for analysis begins from 2000-2012 due to the Bank merger and acquisition process completed by 2001. Thus, in order to test both of the models in this research; a balanced panel of data is constructed by collecting yearly data from 2000 until 2012 of eight Large Domestically-owned Commercial Banks in Malaysia which consists of 104 observations.

Below are the discussion of the main categories of variables for this research namely indicators of bank risk takings and ownership structure variables. As such, the model has Z-Score as dependent variables and three ownership structure variables namely *(*government ownership, institutional ownership and family ownership) as independent variables. In addition, bank size, leverage, loan quality, deviation from traditional banking activities and management efficiency are employed as control variables, and Capital Adequacy Ratio (CAR) as the moderating variable.

In this research, in order to meet the context of emerging market and as proposed by Bank Negara Malaysia regarding the more appropriate measurement of Z-Score, the calculation of this variable is based on the measurement as introduced by(Altman, 2005), and it is as presented below:

Z-SCORE = 3.25 + 6.56 (Working Capital / Total Asset) + 3.26 (Retained Earnings / Total Asset) + 6.72 (Operating Income / Total Asset) + 1.05 (Equity/ Total Asset)

The findings by Demsetz and Lehn (2005) do agree of the norm of including variable such as firm size as one of the variable in the regression equation. The formula of the firm size in this research is measured by the natural logarithm of the total assets of the banks. As for this research, bank size is represented by the natural logarithm of bank total assets. Following Lee et al. (2008) , bank's financial leverage is measured by capital to asset ratio, and leverage value is represented by the ratio of total debt to common equity. Capital adequacy requirements set by central banks are intended to reduce bank insolvency risk. As for this research, Capital Adequacy Ratio value is calculated as the ratio of total capital to risk weighted assets of banks.

The level of loan loss provisioning, ideally according to Dugan (2009) should be able to reflect the beliefs of banks management on the quality on the loan portfolio that they have. loan quality is calculated as the ratio of provision of loan loss to total asset adopted by (Hassan, 1993):Referring to DeYoung (2012), traditional fee income had neither a positive or negative effect on the bank failure. Deviation from traditional banking activities is calculated the ratio of non-interest income to total asset as per prior research by (Madura, Martin, & Taylor, 1994). The bank is said to be using its assets more effectively, as the greater a bank's earnings in proportion to its assets. As for this research, management efficiency is calculated as the ratio of total earning asset to total asset as prior research by Angbazo (1997)

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The relationship between bank ownership and Z-Score

In Hypothesis 1, the ownership structure is expected to positively affect towards Z-Score. In order to investigate this hypothesis, the multiple regressions in Equation (1) is used to determine the relationship between ownership structure and Z-Score.

Model 1

$$\text{Z-Score} = \beta_0 + \beta_1 GOVOWN_{it} + \beta_2 INSTOWN_{it} + \beta_3 FAMOWN_{it} + \sum_{j=1}^{7} \gamma_j DB_j + e_{it} \quad (1)$$

Where, GOVOWN, INSTOWN and FAMOWN are ownership structure variables, Z-Score is the Z-Score formula used in developing countries. DB_j is a bank dummy variable which is equal to 1 if the bank is Affin Bank and 0 otherwise, 1 if the bank is Alliance Bank and 0 otherwise, and so forth. Besides, Maybank is taken as the reference bank which is selected based on its high total asset for the sample period and e_{it} is the error term. This model is tested as benchmark for other two models in order to find the relative improvement in model's explanation power. The framework for Model 1 is depicted in Figure 1.

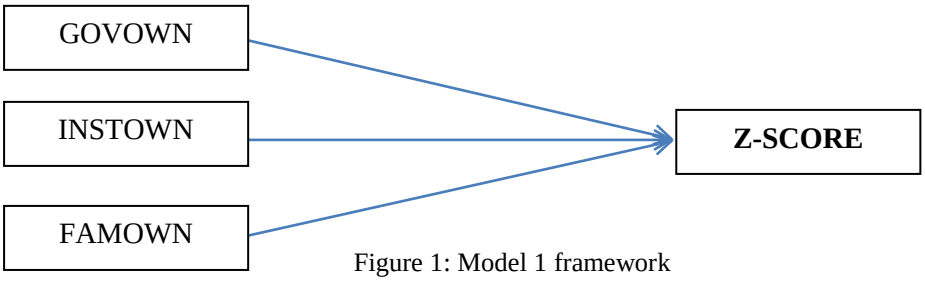

Figure 1: Model 1 framework

Hierarchical moderated multiple regression is used to access the effects of a moderating variable which in this research is the capital adequacy ratio (CAR). As for the hierarchical moderated multiple regression, it is required to enter the three ownership structure variables, the control variables and the moderating variable on the first step and then the interaction terms along with the former variables in the second step. The framework for Model 2 is depicted in Figure 2.

The impact of ownership structure on Z-Score with CAR

Model 2

$$\text{Z-Score} = \beta_0 + \beta_1 GOVOWN_{it} + \beta_2 INSTOWN_{it} + \beta_3 FAMOWN_{it} + \beta_4 CAR_{it} + \beta_5 BNKSIZE_{it} + \beta_6 LVRG_{it} + \beta_7 LOANQ_{it} + \beta_8 DEVTBA_{it} + \beta_9 MGMTEFF_{it} + \sum_{j=1}^{7} \gamma_j DB_j + e_{it} \quad (2)$$

Model 3

$$\text{Z-Score} = \beta_0 + \beta_1 GOVOWN_{it} + \beta_2 INSTOWN_{it} + \beta_3 FAMOWN_{it} + \beta_4 GOVOWN*CAR_{it} + \beta_5 INSTOWN*CAR_{it} + \beta_6 FAMOWN*CAR_{it} + \beta_7 CAR_{it} + \beta_8 BNKSIZE_{it} + \beta_9 LVRG_{it} + \beta_{10} LOANQ_{it} + \beta_{11} DEVTBA_{it} + \beta_{12} MGMTEFF_{it} + \sum_{j=1}^{7} \gamma_j DB_j + e_{it} \quad (3)$$

Where, Z-Score is Z-Score formula used in developing countries, GOVOWN, INSTOWN and FAMOWN are ownership structure variables and (CAR) is the capital adequacy ratio. BNKSIZE, LVRG, LOANQ, DEVTBA and MGMTEFF are the control variables. DB_j is a bank dummy variable which is equal to 1 if the bank is Affin Bank and 0 otherwise, 1 if the bank is Alliance Bank and 0 otherwise, and so forth. Besides, Maybank is taken as the reference bank which is selected based on its high total asset for the period and e_{it} is the error term. Finally, as for the second step of the hierarchical regression, represented by Model 3e, the interaction variables between the three independent variables and the moderating variable (CAR) are included in the regression. This model assumes that capital adequacy ratio (CAR) as moderating variable has effect on the dependent variable; Z-Score, through its interaction with the independent variables.

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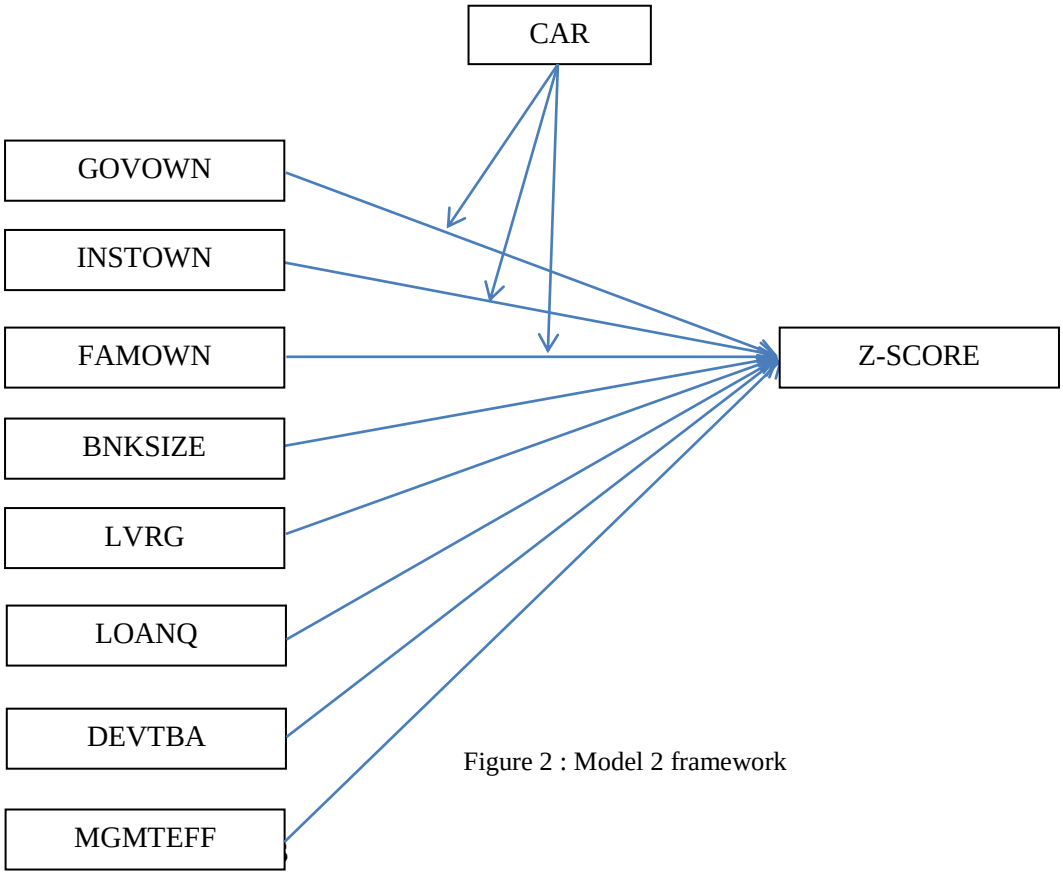

Figure 2 : Model 2 framework

Summary of the sample descriptive statistics of ownership structure variables, risk measure; Z-Score, moderating variable, and control variables for the overall sample for the eight commercial banks are presented in Table 2. Total number of observations in this study for each variable is 104, which came in the form of a panel data of eight cross sections (i.e. commercial banks) and time series of thirteen years. Panels of data are all balanced with no missing data. From the descriptive statistics results, for government ownership with mean value 13.69 per cent is the second largest ownership structure for the eight commercial banks. The largest ownership type with the mean value 51.85 per cent is INSTOWN which referring to institutional ownership structure. On the other hand, FAMOWN or family ownership, on average the shareholdings of the overall banks are 7.67 per cent. Family ownership structure is considered to have low shareholdings among the three ownership structure.

The mean for the moderating variable is 14.65 per cent, with maximum of 23.8 per cent and minimum of 11.55 per cent which all above the requirement of banking regulation of the capital requirement of 8 per cent. On the other hand, Z-Score with the mean value of 4.11 and maximum of 4.69 indicate that the sample of the banks are stable in term of insolvency risk and are in the range of a safe zone. On the other hand, the minimum Z-Score of 2.68 indicates that the effected banks are in a range of grey zone. None of the banks in the sample in the distress zone Altman (1968). As for the sample commercial banks have the means value of RM18.17 million for the bank size and 2.152660 for the ratio of total debt to total equity which is denoting to the financial leverage. As for the mean for LOANQ, DEVTBA and MGMTEFF are 0.69, 0.97 and 0.86 respectively.

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Table 2: Descriptive statistics for the variables of the research

	Mean	Median	Max	Min	Std.Dev.	Observ.
GOVOWN	0.1369	0.0881	0.8166	0.0000	0.1517	104
INSTOWN	0.5185	0.5467	0.8838	0.0891	0.2137	104
FAMOWN	0.0767	0.0054	0.3364	0.0000	0.1022	104
BNKSIZE	18.1713	18.166	20.0171	13.969	0.8958	104
LVRG	2.1329	1.7477	8.7467	0.2541	1.4942	104
LOANQ	0.0069	0.0065	0.0307	-0.0009	0.0053	104
DEVTBA	0.0097	0.0089	0.0443	0.0011	0.0049	104
MGMTEFF	0.0086	0.0095	0.0162	-0.0211	0.0052	104
CAR	0.1465	0.1449	0.2380	0.1155	0.0207	104
ZSCORE	4.1099	4.137	4.6848	2.6792	0.3066	104

The relationship between bank ownership and Z-Score

Model 1

Result of the regression analysis conducted on Model 1 is presented in Table 3. In this model, the result shows that different type of ownership structure has a different impact on the performance of banks which is measured by Z-Score. The F-statistic (5.094298) suggests that the model is statistically significant. The result shows that none of the ownership structure; government ownership (GOVOWN), institutional ownership (INSTOWN) and family ownership (FAMOWN) have significant impact even at 10 per cent level towards Z-Score for the eight Large Domestically-owned Commercial Banks. Besides, the results also show that Maybank, as the reference bank based on its high total asset for the period, has a positive effect and is significant towards Z-Score. In addition, the results also shows that AMMB and HLB are both significant towards Z-Score at 10 and 1 per cent level respectively. Besides, the Z-Score for AMMB is higher than the Z-Score of Maybank by 0.215357, meanwhile the Z-Score for HLB is lower than the Z-Score of Maybank by 0.446100. The remaining five banks; Affin, Alliance, CIMB, PBB and RHB are also not significant towards Z-Score. Based on Model 1, variation in ownership structure can explain 35.3911 per cent of variation in Z-Score. Table 3 presents the regression results on the relationship between ownership structure and Z-Score of the banks.

The impact of ownership structure on Z-Score with CAR

Model 2

Result of regression analysis conducted on Model 2 is presented in Table 3. The F-statistics (7.063976) suggest that the model is statistically significant. The model is to indicate whether capital adequacy ratio (CAR) has a significant effect as the moderating variable. From Model 2 shows a significant result of capital adequacy ratio (CAR), as a moderating variable. Referring to the results show that capital adequacy ratio (CAR) has a significant effect as the moderating variable for Maybank as the reference bank, as well as Affin, AMMB and RHB on the relationship between ownership structure and Z-Score. Besides, bank size (BNKSIZE) and leverage (LVRG) are the two control variable that are found to be significant in this model. BNKSIZE is found to be in positive direction effect towards Z-Score, meanwhile (LVRG) is found to be in negative direction effect towards Z-Score. The R-square of the regression model is 0.565051. Based on Model 2e, variation in ownership structures can explain 56.5051 per cent of variation in Z-Score.

Model 3

Result of regression analysis conducted on Model 3 is presented in Table 3. The F-statistics (6.220175) suggest that the model is statistically significant. The regression is to indicate on the interaction effects of capital adequacy ratio on the relationship between ownership structures towards Z-Score. Even though capital adequacy ratio (CAR) is found to be significant as a moderating variable as in Model 2e, the results from Model 3e shows that capital adequacy ratio (CAR) is found has effect in affecting the Z-Score of family ownership only and the remaining two interaction variables ; government and institutional ownership are found to be not significant. Besides, bank size (BNKSIZE) and leverage (LVRG) are the two control variable that are found to be significant in this model.

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BNKSIZE is found to be in positive direction affect towards Z-Score, meanwhile (LVRG) is found to be in negative direction effect towards Z-Score.

Besides, the results also show that Maybank, as the reference, has a positive effect, but is not significant towards Z-Score. In addition, in this model Affin, AMMB and RHB are found to be significant towards the performance of Z-Score with the higher Z-Score than Maybank by 0.513295, 0.4755960 and 0.212568 respectively. The R-square of the regression model is 0.584535. Based on Model 3e, variation in ownership structures can explain 58.4535 per cent of variation in Z-Score. Comparing the R-square of Model 3 to R-Square of Model 2e, one can conclude that R-square has been improved. In other word, Model 3 has more explanation power compared to Model 2.

Table 3: Regression results for the models

Variables	Model 1	Model 2	Model 3
Intercept	3.810888 (9.300222)***	0.819497 (0.598115)	3.015788 (1.515243)
GOVOWN	0.314390 (0.592411)	-0.193856 (-0.364779)	-2.232549 (-1.055344)
INSTOWN	0.495012 (0.942776)	-0.223298 (-0.410195)	-2.344772 (-1.601819)
FAMOWN	-0.438921 (-0.468405)	-0.749845 (-0.744466)	-8.504461 (-2.076707)**
CAR		5.421393 (4.110912)***	-7.362728 (-0.953074)
BNKSIZE		0.136964 (2.091497)**	0.135293 (1.952590)*
LVRG		-0.044935 (-1.997190)**	-0.055547 (-2.401371)**
LOANQ		1.288104 (0.157981)	0.618301 (0.075927)
DEVTBA		6.462066 (0.835985)	0.247951 (0.029862)
MGMTEFF		7.545945 (0.937240)	9.472418 (1.172491)
GOVOWN*CAR			11.66694 (0.754808)
INSTOWN*CAR			12.75250 (1.432511)
FAMOWN*CAR			49.21807 (1.923510)*
Affin	0.144374 (0.649763)	0.448319 (1.834804)*	0.513295 (2.042521)**
Alliance	-0.118628 (-0.740881)	0.160893 (0.786286)	0.170613 (0.794371)
AMMB	0.215357 (1.857185)*	0.520683 (4.463354)***	0.475960 (3.907025)***
CIMB	0.152514 (1.323862)	0.145787 (1.451236)	0.141106 (1.411793)
HLB	-0.446100 (-3.689661)***	-0.224562 (-1.401309)	-0.234849 (-1.390363)
PBB	0.396122 (1.602263)	0.050746 (0.218273)	-0.041611 (-0.168018)
RHB	-0.079496 (-0.747794)	0.222102 (1.802268)*	0.212568 (1.692703)*

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R^2	0.353911	0.565051	0.584535
F-Statistics	5.094298	7.063976	6.220175
N	104	104	104

Figures in parenthesis are t-statistic. ***,**,*, Statistically significance at 1%,5% and 10% levels.

CONCLUSION

Ownership structure is found not to be significant of direct relationship towards Z-Score. However, capital adequacy ratio (CAR) is found to be significant as a moderating variable towards Z-Score. This is consistent with the findings by Shehzad et al. (2010). Besides, FAMOWN*CAR is found significant and consistent with the hypothesis prediction whereby CAR positively intervene the relationship between ownership structure and bank risk taking. (BNKSIZE) is found to be significant in both models, but is found to be positively affect towards Z-Score. This is not consistent with the finding by Srairi (2013), whereby bank size and bank risk taking is expected to be negatively related. In addition, leverage is found to be significant towards Z-Score. However, the result is not supporting the findings by Papanikolaou and Wolff (2010), whereby the findings found a significant positive relationship between leverage and bank risk taking. Management efficiency (MGMTEFF) is found to be in positive direction in the hierarchical models. However, MGMTEFF are found not significant towards Z-Score As for the deviation from traditional banking activities (DEVTBA), and loan quality (LOANQ) are found not significant for bank risk taking in both the models. The results also show that the preferences for risk taking in the commercial banks in Malaysia are affected not only due to the different type of ownership but also due to the moderating factor of capital adequacy ratio regardless of the directions of the relationship.

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