The Value of Diversification, Managerial Ability and Corporate Governance: Evidence from Malaysian Firms

Chyn-Hwa Lee and Swee-Sim Foong*

ABSTRACT

Manuscript type: Research paper

Research aims: This paper examines the moderating effect of managerial ability on the relationship between diversification and firm value.

Design/Methodology/Approach: The analysis is based on all KLSE-listed firms across nine sectors over the period of 2009 to 2017 using panel regression.

Research findings: High-ability managers increase Tobin's q. Managerial ability changes the diversification-firm value relationship from negative to significantly positive. Managerial ability, in terms of governance mechanism, CEO age, and education background, has a positive moderating effect on the value outcome of diversification.

Theoretical contribution/Originality: This study is one of the first to link resource-based perspective and outcome of diversification, and find a moderating relationship between diversification and firm value. It contributes to resource-based theory, highlighting that accumulated human capital is a valuable strategic resource for a firm. The results also contribute to the corporate governance literature and provide support for upper echelons theory.

Practitioner/Policy implication: The findings are valuable to diversified firms in understanding the effect of managerial ability on the outcome of diversification. Diversified firms that hire older CEOs with better education, practise separate leadership structures, and have a mostly independent board are more likely to benefit from diversification.

Research limitation/Implications: This study uses only one proxy for managerial ability. Second, firms are grouped by industry to compare efficiency. However, firms in the same industry can have quite varied inputs and outputs depending on their asset and operation mix.

Chyn-Hwa Lee is a Ph.D. student at the Management Section, School of Distance Education, Universiti Sains Malaysia. Email: chynhwa@yahoo.com

* Swee-Sim Foong is a Senior Lecturer at the Management Section, School of Distance Education, Universiti Sains Malaysia. Email: foongss@usm.my

https://doi.org/10.22452/ajba.vol16no1.2

Keywords: Diversification, Firm value, Managerial ability, Corporate governance
JEL Classification: G3, L25

1. Introduction

The widespread adoption of corporate diversification as part of firm growth strategies has necessitated research on the topic, especially its economic ramifications. Existing literature on diversification focuses on the relationship between diversification and financial performance and valuation (see, e.g., Lins & Servaes, 2002). After three decades of research, a consensus has been established that diversification lowers firm value and performance (Lee, Ooi & Hooy, 2019). Despite negative findings, Malaysian CEOs have been aggressive in diversifying across industries. Lins and Servaes (2002) report that 47% of Malaysian firms are diversified, and that it was the most diversified among the seven Asian countries in their study. More importantly, Lee (2022) finds an increasing Herfindahl index from 2010 to 2016, implying that Malaysian firms have expanded into more sectors in recent years.

Why do Malaysian firms keep diversifying? The plausible answer to this is often the institutional environment of emerging nations. Under the assumption that emerging market firms operate in less established and inefficient capital markets, firms would be more motivated to diversify into other industries to create internal capital markets to support their weaker external financial markets. Diversification is a natural response to "institutional voids" in emerging economies (Khanna & Palepu, 2000). Given that there is no clear answer, a better understanding of the cross-sectional variance of corporate diversification and firm value is required.

Diversification is not inherently good or bad. The value outcome of diversification is contingent on other factors. Identifying the factors that lead to diversification success for some firms but not others help managers maximise firm value through diversification. This study suggests that managerial ability is one of these factors. The impetus comes from prior evidence that establishes a positive relationship between managerial ability and firm performance (Bamber et al., 2010; Demerjian et al., 2012; Andreou et al., 2016).

Our ability-based explanations focus on the difficulty of managing a diversified firm. This study follows the argument made by Erdoft et al. (2013) that corporate diversification alone does not determine the discount or premium. Firms diversify when

the benefits outweigh the costs. Diversification usually benefits firms through synergy or spillover. However, some managers of diversified firms may have been overwhelmed by the volume and complexity of decision-making, resulting in poor firm performance. It is logical to predict that high-ability managers will exercise superior judgement and make better decisions, contributing significantly to firm performance. To the best of our knowledge, most existing literature does not consider managerial ability as a conditional factor. Therefore, this study contributes to a significant body of research (Sautner & Villalonga, 2010; among others) by showing that the value outcome of diversification varies with managerial ability.

The key findings of our study are as follows. Our sample showed a diversification discount. We then adopt the methodology of Demejian et al. (2012) and incorporate managerial ability as a moderating factor. We observed that the diversification discount reduces and sometimes turns into a premium when firms appoint high-ability managers.

Upper echelons theory suggests hiring a CEO with personal traits that fit the firm's strategies. Empirical evidence reveals that CEO attributes such as age, education background, and tenure affect firm performance (see, e.g., Altuwaijri & Kalyanaraman, 2020; Naseem et al., 2019; Urquhart & Zhang, 2022). However, according to Bulent et al. (2013), most studies focus on developed countries, such as the United States, leaving a research gap on the effect of CEO characteristics on firm performance in emerging economies. This study investigates whether age and education play a role in influencing the value outcome of diversification. Our results show that the positive coefficient between diversification and firm value (when high-ability managers are on board) will be further magnified when firms are operated by older CEOs and/or CEOs with higher education.

Many studies cite the agency cost associated with diversification. Campbell, Coff, and Kryscynski (2012) theorise that high-ability managers are hard to replace and may misuse their power. Examples of rent-seeking behaviours cited in prior literature include suboptimal investments, falsified financial reporting, empire building, and increased firm size for higher compensation (Wang, 2019). Therefore, a proper analysis of the effect of diversification on company value should account for agency costs, which may lower the benefits of diversification. According to the study, high-ability managers are likely to make the right decisions to improve their firms' performance when monitored closely. Our results suggest that effective corporate

governance magnifies the positive correlation between diversification and firm value (where high-ability managers are on board).

This study contributes to the literature in multiple ways. First, we show that diversified firms can benefit from exceptional managers. Second, managerial ability has a positive effect on the relationship between diversification and firm value, which are magnified by highly-educated older CEOs and effective corporate governance. Our findings have several economic implications for individual managers and firms. The study is structured as follows: Section 2 provides the literature reviews and arguments of our tested hypotheses. Section 3 contains the descriptions of data collection, sample firms, and regression models. Section 4 reports the results and findings, and some policy suggestions are provided in Section 5.

2. Literature Review and Hypothesis Development

2.1 Managerial Ability and the Effect of Diversification on Firm Value

Following Demerjian et al. (2012), this study defines managerial ability as the ability of managers to convert company resources into revenue. More capable managers are expected to generate more revenue for a given level of resources, or utilise fewer resources for a given level of revenue. Since corporate policies are subject to a manager's decision-making, and the outcome of corporate diversification strategies could depend on a manager's ability, this approach, which assesses a manager's ability based on the efficiency with which his or her firm generates revenue, is in line with the objective of this study.

Various benefits of diversification have been cited in previous literature. These include an internal capital market that opens more opportunities, debt coinsurance, synergies from sharing capabilities applicable to multiple lines of business, economies of scope, and market power enhancement (Martin & Sayrak, 2003; Wang, 2019). However, potential gains may be outweighed by increased demand for managerial resources. Diversification is likely to increase the demand for CEO-level managerial input (Rose & Shepard, 1997) and complicate resource allocation decisions (Finkelstein & Hambrick, 1989). Operating in several industries requires the CEO to master multiple, potentially distinct product markets and develop competitive strategies for each product line. Moreover, exploiting synergies demands firm-wide collaboration between business units. All these factors suggest that:

H_1: Managerial ability positively affects the relationship between diversification and firm value.

2.2 *CEO Personal Attributes and the Effect of Diversification on Firm Value*

Agency problems and horizon problems negatively impact firm performance (Lim & Lee, 2019). As a CEO nears retirement, a lack of career concern may tempt him or her to manipulate the firm's performance for personal gain, known as horizon concerns. Yim (2013) claims that horizon issue arises when CEOs near the age of 65, the average retirement age. Therefore, firms with an older CEO may face greater agency problems. On the other hand, younger CEOs have more career concerns, which prevents agency and horizon problems. However, other researchers have highlighted that CEO age-related physiological and psychosocial issues affect firm performance (Hambrick & Mason, 1984; Heaton, 2002; Roberts & Rosenberg, 2006). Roberts and Rosenberg argue that as managers age, they become less motivated and have less energy due to changes in their energy metabolism. Younger CEOs are more dynamic, open to new ideas, and willing to face changes and problems. However, they also tend to be overconfident, which can lead to overinvesting and value-destroying ventures (Malmendier & Tate, 2008). Younger CEOs also rarely correct their cognitive bias since they have fewer negative experiences (Forbes, 2005).

This study argues that both aspects will affect firm performance. Therefore, whether younger CEOs do better than older CEOs or vice versa is highly dependent on which aspects predominate. But, considering the current highly dynamic business environment and the challenges in different business segments, the knowledge and experiences gained should enable older CEOs to make better decisions, be more effective in resource utilisation, and have an advantage over their younger counterparts. Thus, we hypothesise that:

H_{2A}: The positive effects of managerial ability on the relationship between diversification will vary by CEO age. The positive effects will be further enhanced for firms that are operated by older CEOs.

Higher education is often a CEO's last formal education before entering the workforce, therefore, it affects their personality and skills. Higher CEO education is associated with cognitive complexity, creativity, sustained business investment, and the ability to form productive coalitions (Urquhart & Zhang, 2022). All these outcomes

can increase firm performance.

Education can affect a CEO's ability in two ways. First, more capable students achieve well in school and attend a top university. In this sense, schooling has minimal effect on the individual, although it is an indicator of cognitive ability. Universities offer undergraduate and graduate degrees. These degrees have different emphases and attributes; therefore, they transmit diverse knowledge and skills. The other channel is that students learn skills and knowledge that strengthen their decision-making capacity. This is especially significant for postgraduates. By finishing a postgraduate degree, people will develop capabilities they would not have with an undergraduate degree. Altuwaijri and Kalyanaraman (2020) posit that better-educated managers have higher cognitive abilities, are more capable of processing information, and therefore can accept and comprehend new ideas faster and better. Yang et al. (2022) find that better-educated managers invest more in R&D and are associated with implementing technical innovations. As such, we hypothesise that:

$H2_B$: The positive effects of managerial ability on the relationship between diversification will vary by CEO education. The positive effects will be further enhanced for firms that are operated by CEOs with higher education.

2.3 Corporate Governance and the Effect of Diversification on Firm Value

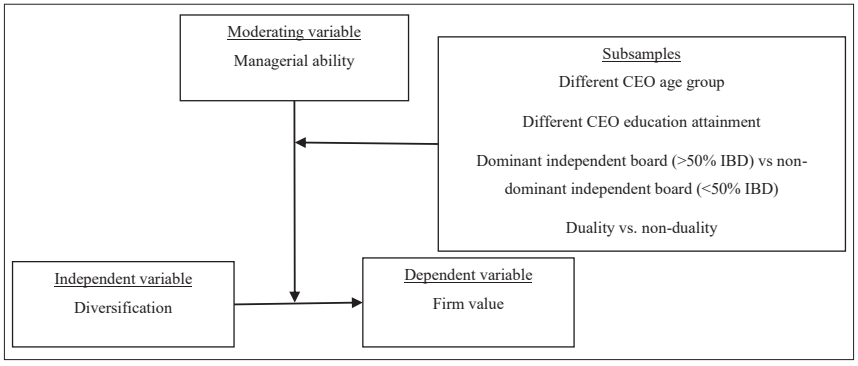
According to Fama (1980), CEO career worries largely offset agency difficulty. In a competitive market, a manager who does not perform well can be replaced or paid less. Career concerns may mitigate agency problems, but not completely. In this paper, we argue that it is crucial to have good corporate governance, especially when a firm diversifies. As indicated earlier, several studies hypothesise that the diversification discount originates from an agency problem. According to Al-Maskati et al. (2014), corporate governance explains 15% to 21% of the diversification discount. Lins and Servaes (2002) empirical findings further support the argument for agency problems. Doubtless, every CEO knows it is morally wrong to act against the interests of shareholders. However, according to Heaton (2002), some CEOs are overconfident and take greater risks. Therefore, when a CEO is fully confident in his or her own abilities, he or she may think entrenchment actions are 'invisible' to others. As such, we hypothesise that:

H_{3A}: The positive effects of managerial ability on the relationship between diversification and firm value will be further enhanced when the firm's majority of the board members are independent directors.

H_{3B}: The positive effects of managerial ability on the relationship between diversification and firm value will be further enhanced when the positions of CEO and chairman are held by different individuals.

Figure 1 depicts our theoretical model. The contingent approach directs us to include a new aspect in the diversification puzzle, namely managerial ability, which may influence the relationship between corporate diversification and firm value. First, our study asserts that diversification has a direct relationship with firm value. Second, our hypothesis shows that a portion of the influence of diversification on firm value may be moderated by managerial ability, with a company's CEO ability influencing the final value outcomes of the firm diversification effort.

Figure 1: Theoretical framework



3. Methodology and Data

3.1. Data and Sample Construction

To test the study hypotheses, we adopted unbalanced firm-level panel data for the period of 2009 to 2017. Our study begins in 2009 because it is the first fiscal year after the subprime mortgage crisis ended. Data collection ends in 2017 due to the availability of several data sets. The sample data includes all Kuala Lumpur Stock Exchange (KLSE)-listed firms across nine sectors: consumer products, construction, industrial products, technology, IPC, hotel, plantation, properties,

and trading and services. Nine years of firm annual data, information on CEO attributes, and corporate governance were collected from the Datastream/Worldscope database. All variables are winsorised at the 5th and 95th percentiles.

3.2. Measurement of Variables

3.2.1. Managerial Ability

Following Demerjian et al. (2012), a two-step approach is used to estimate managerial ability.[1] Using data envelope analysis (DEA), an initial estimate of each firm's efficiency relative to its 'best-practice' industry peers is generated by taking into consideration the amount and combination of resources utilised by each firm. The range of efficiency scores ranges from 0 to 1. The efficiency score of a firm on the efficient frontier is one. If a company's efficiency score is less than one, it either utiliaes more resources to create the same amount of output or produces less output with the same amount of input compared to its 'best-practice' industry peers. The relative efficiency of firms in the same industry and year is measured using the following DEA model:

$$\max \theta = (\text{Sales}) \,.\, (v_1\text{CoGS} + v_2\text{SG\&A} + v_3\text{PPE} + v_4\text{OpsLease})^{-1} \quad (1)$$

where:

Variable	Definition
Sales	Firm revenues
CoGS	Cost of goods sold
SG&A	Selling, general, and administrative expenses (OpsLease or operating lease expense is a component of SG&A expense)
PPE	Purchased fixed assets
OpsLease	The discounted present value of the next five years of required operating lease payments

[1] DEA evaluates individual entities' efficiency relative to their peers. These "decision-making units" (DMUs) convert inputs (labour, material, service, investment capital) into one or more outputs (eg, revenue, income, rate of returns and customer satisfaction). Charnes, Cooper, and Rhodes (1978) first employed DEA to estimate a production technology frontier. Although DEA was traditionally viewed as a strictly non-parametric methodology, research has shown that it can be interpreted as a maximum likelihood procedure (Banker, 1993).

However, firm efficiency is not just determined by management characteristics. It is also affected by firm-specific factors like size, cash availability, life cycle, and operational complexity. For example, CEOs with large firms benefit from the advantages of having a larger market share, which enables them to be more efficient when bargaining with vendors and customers. When comparing two CEOs with identical abilities, the larger firm's CEO is likely to be associated with higher total firm efficiency.

Therefore, Demerjian et al. (2012) modify DEA-generated firm efficiency using Tobit regression. By regressing firm efficiency on firm characteristics (total assets, market share, free cash flow, firm age, industry, and foreign operation indicator), firm-specific influences would be removed. Demerjian et al. assume that managers' abilities explain the remaining unexplained firm efficiency. Equation 2 below describes the regression model. Tobit regression by sector, which includes year-fixed effects, is carried out for Equation 2. The residual of this estimation is the measure of managerial ability.

$$\begin{aligned}\text{Firm efficiency}_i &= \alpha + \beta_1 \ln(\text{Total Assets})_i + \beta_2 \text{Market Share}_i \\ &+ \beta_3 \text{Free Cash Flow Indicator}_i + \beta_4 \ln(\text{Age})_i + \beta_5 \text{ Herfindahl index}_i \\ &+ \beta_6 \text{Foreign Currency Indicator}_i + \text{Year}_i + \varepsilon_i\end{aligned} \tag{2}$$

where:

Variable	Definition
Total assets	Total assets of the firm in year *t*
Market share	The percentage of revenues earned by the firm within its sector in year *t*
Firm age	The number of years the firm has been listed at the end of year *t*
Free cash flow indicator	Coded 1 when a firm has non-negative free cash flow (defined as earnings before depreciation and amortisation less the change in working capital and less the capital expenditure) in year *t*
Herfindahl index	Total sum of the squared of individual business segment sales divided by the squared of total sales for year *t*. If the firm is not in the segment file, it is assigned a concentration of one
Foreign currency indicator	Coded 1 when a firm reports a nonzero value for foreign currency adjustment (FCA) in year *t*

3.3 *Corporate Diversification Measurements*

This study uses the number of related segments to measure the level of diversification of sample firms. This measure was used in the studies by Denis et al. (1997) and Zuaini and Napier (2006). The higher the number of segments (two-digit SIC codes), the higher the level of diversification.

3.4 *Firm Value Measures: Tobin's q*

Tobin's q and excess value were previously utilised as firm value proxies. Without consensus, it is hard to determine the best firm value measure. This study uses Tobin's q as a firm value measure in the Malaysian context, after taking into account data limitations. Lang and Stulz (1994) popularised Tobin's q. Many studies have utilised Tobin's q in studies of diversification and firm value (e.g., Khanna & Palepu, 2000; Lins & Servaes, 2002; Lee & Hooy, 2018). Tobin's q is a firm's market value divided by its replacement value (Chung & Pruitt, 1994). Tobin's q is a market-based forward-looking measurement, which means that it represents what management will accomplish.

$$\text{Tobin's q} = \frac{\text{MVE} + \text{PS} + \text{DEBT}}{\text{TA}} \tag{3}$$

where,

Variable	Definition
MVE	Market value of the equity calculated by a firm's share price multiplied by the total number of common stock outstanding
PS	The book value of the firm's preferred stocks
DEBT	The value of the firm's short-term liabilities net of its short-term assets, plus the book value of the firm's long-term debt
TA	The book value of the total assets of the firm

3.5 *Panel Regression*

Previous studies that used Tobin's q as a measure of firm value (e.g., Stowe & Xing, 2006) indicated that firm growth opportunities, size, dividend payout, free cash flow, and financial leverage influence Tobin's q (firm value) regardless of diversification. Therefore, these five variables (growth opportunities, firm size, free cash flow, dividend payout, and financial leverage) are included in the panel

regression model as control variables. The firm's size is included to account for scale and scope economies. The dividend payout reflects the availability of additional credit that firms may use for diversification. According to the discounted cash flow model (DCF), higher dividends increase firm value.

Jensen's (1986) free cash flow hypothesis stipulates that high gearing reduces agency costs. However, too much debt may increase the risk of financial distress. Extra interest and principal repayment might hinder diversification and affect firm value. According to Jensen, too much free cash flow may lead to overinvestment, thus increasing agency costs. However, some researchers claim that free cash flow opens the door for firms to have various investment opportunities that add more value to the firm. Sales growth reflects higher capacity usage. The firm would be able to spread fixed-cost over a larger volume of products, benefiting from the increasing economic of scale effect. To study the impact of managerial ability on the relationship between diversification and firm value, we utilise Equation 4 as a baseline model. Year and industry dummies were included.

$$\begin{aligned}\text{Tobin's } q_{it} = {} & \beta_0 + \beta_1 \text{GROWTH}_{it} + \beta_2 \text{SIZE}_{it} + \beta 3\ \text{LEVERAGE}_{it} + \beta_4\ D^{\text{PayDividend}}{}_{it} \\ & + \beta_5\ D^{\text{PositiveCash}}{}_{it} + \beta_6\ N^{\text{Sector}}{}_{,it} + \beta_7 \text{ABILITY}_{it} \\ & + \beta_8\ N^{\text{Sector}}{}_{,it}(\text{ABILITY}_{it}) + \eta_i + \xi_t + \varepsilon_{it}\end{aligned} \tag{4}$$

where:

Variable	Definition
Tobin's q_{it}	Ratio of market value of assets and replacement value of assets
GROWTH_{it}	Percentage change in sales to represent growth opportunities
SIZE_{it}	Log of total asset used to represent the firm size
LEVERAGE_{it}	Ratio of debt to common share equity proxies for firm leverage status
$D^{\text{PayDividend}}{}_{it}$	Dividend dummy. Equal to 1 if the firm declares a cash dividend
$D^{\text{PositiveCash}}{}_{it}$	Free cash flow dummy. Equal to 1 if the firm reports positive free cash flow
$N^{\text{Sector}}{}_{it}$	Number of segments (one to nine)
ABILITY_{it}	Managerial ability of CEOs in generating revenues
η_i	Industry dummy. Equal to a 1 if a firm belongs to particular industry.
ξ_t	Year dummy

To ensure that our results are robust, Tobin's q is replaced with return on asset (ROA) and return on equity (ROE) to form Equations 5 and 6, respectively.

$$\begin{aligned} ROA_{it} = {} & \beta_0 + \beta_1 GROWTH_{it} + \beta_2 SIZE_{it} + \beta 3\ LEVERAGE_{it} + \beta_4\ D^{PayDividend}{}_{it} \\ & + \beta_5\ D^{PositiveCash}{}_{it} + \beta_6\ N^{Sector}{}_{,it} + \beta_7 ABILITY_{it} \\ & + \beta_8\ N^{Sector}{}_{,it}(ABILITY_{it}) + \eta_i + \xi_t + \varepsilon_{it} \end{aligned} \quad (5)$$

$$\begin{aligned} ROE_{it} = {} & \beta_0 + \beta_1 GROWTH_{it} + \beta_2 SIZE_{it} + \beta 3\ LEVERAGE_{it} + \beta_4\ D^{PayDividend}{}_{it} \\ & + \beta_5\ D^{PositiveCash}{}_{it} + \beta_6\ N^{Sector}{}_{,it} + \beta_7 ABILITY_{it} \\ & + \beta_8\ N^{Sector}{}_{,it}(ABILITY_{it}) + \eta_i + \xi_t + \varepsilon_{it} \end{aligned} \quad (6)$$

To study the effects of age, this study focuses on the horizon issues related to CEO retirement age. CEOs usually retire at 65 (Brickley et al., 1999), whereas Malaysia's official retirement age is 60. Therefore, this study considers 60 and 65 as important CEO career milestones. To examine the horizon issue, subsamples of firms with CEOs older than 60 and 65 years were created. But it will be interesting to see if the younger CEOs outperform their elders. Subsample 1 includes companies with CEOs aged 50 to 59. Subsample 2 consists of 60 to 64-year-olds. Subsample 3 has CEOs aged 65 or older. Age is categorical, not a series. Studies suggest that CEO education affects firm performance. This study used the above method to determine if the positive effect of managerial ability on diversification and firm value differs by CEO education level. Education subsample 1 consists of firms with CEOs that have at least an undergraduate degree. Subsample 2 includes firms with postgraduate-educated CEOs. Equations 4, 5, 6 will then be estimated for the two subsamples.

The results of regression in all subsamples will then be compared to those of the full sample, with the focus on the interaction term, $N^{Sector}{}_{it} \times ABILITY_{it}$. For example, if the magnitude of the interaction term of the subsample (IBD more than 50%) is greater than that of the full sample and the sign is positive for both the full and subsamples, it shows that better governance increases the positive impact of managerial ability on the outcome value of diversification. The same method of interpretation applies to all others.

This study examines the impact of two mechanisms, the ratio of independent directors on the board (IBD) and CEO duality, to answer the third research question of whether the positive effect of managerial ability on the relationship between diversification and

firm value is magnified by a good corporate governance mechanism. The same subsampling method was used. To analyse IBD, equations 4, 5, and 6 will be estimated for firms with the majority of their board members being independent directors. Duality will be studied using the same method. All three equations will be estimated for firms without duality.

3.6 The Issue of Endogeneity

Studies such as Villalonga (2004), Santarelli and Tran (2016) suggest that after controlling endogeneity or self-selection bias, the diversification discount disappears or turns into a premium. Unobserved omitted variables, such as CEO personality, may be correlated with the independent variables in this study. Of course, each firm and its manager have individual characteristics that may or may not influence the independent variables and bias the estimated firm performance measures. However, if these variables have an effect, they need to be controlled. We assume that the effects of the omitted variables at one moment will be the same at another. The effects are 'fixed'. However, the omitted variables must have time-invariant values and effects for this assumption to hold. Many of the CEO attributes (e.g., education, race, and other socioeconomic background) that may influence firm performance measures fall into this category. The fixed-effects model implies that because each firm has its own characteristics and personnel, its time-invariant characteristics are unique and should not be correlated with those of other firms. Though less likely, there may be no omitted variable, or the omitted variables are uncorrelated with independent variables in the regression model. In this case, it is probably best to use the random-effects model. Random-effects models offer unbiased coefficient estimates, utilise all data, and have smallest standard errors (Allison, 2009).

However, the firm and year fixed effects in standard regression specifications do not account for dynamic endogeneity that develops when past performance influences the diversification-firm performance relationship (Babajide Wintoki et al., 2012). Therefore, following Ullah et al. (2018), this study also uses a dynamic panel generalised method of moments (GMM) estimator. The GMM model, which is used for panel data, delivers consistent results in the presence of "unobserved heterogeneity, simultaneity, and dynamic endogeneity" (Babajide Wintoki et al., 2012).

4. Results and Discussion

Table 1 provides descriptive statistics for all the variables used in the main regression model. The mean managerial ability score (MA) of 0.0000 for our sample firms is consistent with Demerjian et al. (2012), who report a mean of -0.004 for their sample. However, the MA value ranges from -0.7891 to 0.4995, which is much wider than that of Demerjian et al., -0.0415 to 0.557. The wider range may indicate a larger difference in CEO abilities in Malaysian firms compared to US firms.

Table 1: Descriptive statistics

Variable	Obs.	Mean	Std. dev.	Min.	Max.
Tobin's q	6,254	1.0261	0.465	0.5003	2.3193
ROA	6,259	4.0502	6.2862	-10.07	16.48
ROE	6,182	5.0675	11.5684	-23.7400	25.57
ABILITY	5,996	0.0000	0.1931	-0.7891	0.4995
N^{Sector}	6,331	2.5573	1.4367	1	9
GROWTH	6,261	0.0442	0.2524	-0.4143	0.6502
SIZE	6,324	12.9579	1.4811	3.2581	18.7868
LEVERAGE	5,969	0.4393	2.4314	0	132.5
$D^{PositiveCash}$	6,138	0.7022	0.4573	0	1
$D^{PayDividend}$	6,261	0.5924	0.4914	0	1

Note: Tobin's q = (market value of equity + book value of total liability) / book value of assets; ROA = return on assets; ROE = return on equity; ABILITY = managerial ability, a variable derived from the method developed by Demerjian et al. (2012); N^{Sector} = number of sectors a firm diversified into in the particular year; SIZE = firm size (log of current and long-term assets); LEVERAGE = ratio of debt to common share equity; GROWTH = sales growth; $D^{PositiveCash}$ and $D^{PayDividend}$ = dummy variables, 1 if the firm has positive free cash flow and pay dividend respectively in the particular year; 0 otherwise.

Table 2 presents the relationship between diversification and firm performance. We found a negative and highly significant coefficient in diversification measures (p-value < 0.01) across all three performance measures, implying that diversification leads to lower firm performance, which is consistent with the results of many previous studies.

Table 2: Estimation with diversification measure, NSector

	With diversification measure		
	Tobin's q	**ROA**	**ROE**
Growth	0.1037***	2.6282***	5.3784***
	(0.0147)	(0.2243)	(0.4317)
Size	0.0375***	0.2363***	0.7679***
	(0.0051)	(0.0523)	(0.0983)
Leverage	0.2825***	-0.0400**	-0.1249
	(0.0309)	(0.0163)	(0.0904)
$D^{PositiveCash}$	0.0771***	5.5327***	10.0660***
	(0.0119)	(0.1537)	(0.3050)
$D^{PayDividend}$	0.1849***	4.6146***	8.2464***
	(0.0122)	(0.1451)	(0.2811)
N^{Sector}	-0.0454***	-0.3035***	-0.4835***
	(0.0041)	(0.0453)	(0.0846)
Constant	0.6474***	-3.4114***	-12.7573***
	(0.0974)	(1.0126)	(1.9132)
N	5744	5790	5737
R^2	17.13%	43.51%	43.59%

Note: The dependent variables are Tobin's q = (market value of equity + book value of total liability) / book value of assets; ROA = return on assets; ROE = return on equity; N = total firm year observation. The asterisks ***, **, * denote statistical significance at 1%, 5%, and 10%, respectively.

Table 3 presents the results of the test of hypothesis 1, which is to investigate the moderating effect of managerial ability on the relationship between diversification and firm performance by introducing the interaction term, $N^{Sector} \times$ ABILITY, into the fixed-effects (FE) and random-effects (RE) regression models. This study found a diversification discount. However, the positive value of the interactive term between managerial ability and the diversification measure implies that diversified firms associated with high-ability managers are expected to mitigate its discounted firm value.

To demonstrate the effect, take, for example, the regression that used Tobin's q as an independent variable. When a diversified firm is associated with a high-ability manager, the value of 0.0475 for the interactive term between managerial ability and diversification measure ($N^{Sector} \times$ ABILITY) shows that the firm value is enhanced by 0.0475 units. More crucially, the figure of 0.0475 denotes the

additional firm value that can be subtracted from the discounted firm value. When high-ability managers are at the helm of diversified firms, the discounted value of diversified firms is drastically reduced from -0.0123, and turns into a diversification premium of 0.0352 (based on the calculation of -0.0123 + 0.0475).

Table 3: Estimation with managerial ability and interaction term based on fixed and random effects

Panel A	With FE			With RE		
	Tobin's q	**ROA**	**ROE**	**Tobin's q**	**ROA**	**ROE**
Growth	0.0466***	1.9291***	3.7323***	0.0428***	2.1248***	4.2959***
	(0.0113)	(0.2066)	(0.4152)	(0.0114)	(0.2049)	(0.4093)
Size	-0.0591**	0.5564**	1.4690***	-0.0056	0.3999***	1.0222***
	(0.0238)	(0.2774)	(0.5564)	(0.0126)	(0.0935)	(0.1703)
Leverage	0.2809***	-0.0860**	-0.1385*	0.3029***	-0.1011**	-0.1680**
	(0.0618)	(0.0342)	(0.0730)	(0.0551)	(0.0427)	(0.0791)
$D^{PositiveCash}$	0.0322***	4.2726***	8.0384***	0.0386***	4.8204***	9.0675***
	(0.0092)	(0.1823)	(0.3603)	(0.0090)	(0.1750)	(0.3489)
$D^{PayDividend}$	0.1060***	1.7720***	3.2669***	0.1165***	3.1721***	6.0363***
	(0.0154)	(0.2532)	(0.5138)	(0.0145)	(0.2034)	(0.4069)
N^{Sector}	-0.0123**	-0.0564	-0.0693	-0.0198***	-0.2264***	-0.3903***
	(0.0059)	(0.0910)	(0.1776)	(0.0053)	(0.0674)	(0.1229)
ABILITY	0.0116	2.6627***	3.8523**	0.0209	2.8421***	4.1480***
	(0.0589)	(0.9118)	(1.7777)	(0.0570)	(0.8301)	(1.5935)
N^{Sector} × ABILITY	0.0475*	0.6991*	1.7548**	0.0609**	0.7643**	1.8515***
	(0.0251)	(0.3879)	(0.7372)	(0.0246)	(0.3681)	(0.6890)
Constant	1.7428***	-8.0689**	-23.1967***	1.1387***	-6.4278***	-17.8748***
	(0.3076)	(3.6656)	(7.3676)	(0.1679)	(1.3283)	(2.3829)
N	5717	5750	5701	5717	5750	5701
R^2	3.07%	40.83%	40.62%	15.99%	44.65%	44.63%
Hausman Test				105.04***	172.89***	167.46***
				(0.0000)	(0.0000)	(0.0000)
N^{Sector} + (N^{Sector} × ABILITY)	**0.0352**	**0.6427**	**1.6855**	**0.0411**	**0.5379**	**1.4612**

Note: N^{Sector} × ABILITY = interaction term. Hausman's (1978) specification test. Ho: The random-effects model is consistent. H1: The FE model is consistent. The p-value < 0.05 implies rejecting Ho where the FE model is preferred. Figures in parentheses are standard errors.

The interaction terms N^{Sector} × ABILITY consistently produced significant results in all three models. The results confirm the first hypothesis that the influence of diversification on firm value may be dependent on other factors, and that management ability affects the relationship between diversification and firm value. In other words, for a firm that employs a diversification strategy, the firm has a higher chance of reaping the positive benefits if it has a capable CEO. Next, we used Hausman's (1978) specification test to identify the model. In this study, the null hypothesis is that random effects are preferred, and the alternate hypothesis stated that the preferred model is FE. The result of Hausman's test, presented in the last row of Table 3, with p-value < 0.05, rejects the null hypothesis and favours the FE model. The results of the two-step system GMM presented in Table 4 show that the core findings remain intact. All three interaction terms are statistically significant with expected signs and consistent with previous panel regression findings. The passage of standard diagnostic tests for dynamic panels in the model gives further credence to the conclusion that the baseline results are not affected by endogeneity concerns. Our initial findings are robust. As such, this study's subsample analysis will only use FE and RE models.

Table 4: Robustness check with two-step system GMM

	Tobin's q	**ROA**	**ROE**
Growth	0.1162***	4.4113***	9.4068***
	(0.041)	(0.7599)	(1.5635)
Size	-0.0438***	0.1322	0.4274
	(0.009)	(0.1578)	(0.3572)
Leverage	0.1679***	0.1524*	0.5209
	(0.0403)	(0.0796)	(0.8733)
$D^{PositiveCash}$	0.0461*	4.9025***	9.2496***
	(0.0275)	(0.5649)	(1.1593)
$D^{PayDividend}$	0.0325	2.7570***	4.2660***
	(0.0262)	(0.4711)	(0.9425)
ABILITY	-0.1068	-0.1441	-7.9552
	(0.1771)	(2.7588)	(5.6487)
N^{Sector}	-0.0044	0.1164	0.1475
	(0.0086)	(0.1430)	(0.2483)
N^{Sector} × ABILITY	0.1411*	2.4378**	5.2711**
	(0.0721)	(1.1433)	(2.4563)

	Tobin's q	ROA	ROE
AR(1) test statistic	-7.4409	-12.2011	-10.2878
	[0.0000]	[0.0000]	[0.0000]
AR(2) test statistic	-0.4427	2.1028	1.2505
	[0.658]	[0.0355]	[0.2111]
Hansen test	117.7917	108.3707	116.2423
	[0.2884]	[0.5261]	[0.3235]
N	**4226**	**4216**	**4168**

Notes: The descriptions for all the variables listed above are given in Tables 1, 2 and 3. This table rewrites the baseline model in Equation 4 as a dynamic panel by including lagged value of Tobin's q as a regressor and estimate with two-step system GMM. Year dummies are included in the regressions (not reported to conserve space). Figures in parentheses are standard errors, while *p*-values are reported in square brackets. *AR*(1) and *AR*(2) tests are under the null of no first-order and second-order serial correlation, respectively, in the first-differenced residuals. The Sargan and Hansen tests of over-identification are under the null that all instruments are valid.

Recent empirical research reveals that CEO age, education, and tenure affect firm performance (see, e.g., Altuwaijri & Kalyanaraman, 2020; Naseem et al., 2019). In Panel A of Table 5, comparing Models 2 and 1, the coefficient increased from 0.0475 to 0.0805 (FE model). The results can be interpreted as high-ability managers reducing the discounted value of diversified firms from -0.0123, and turning into diversification premium of 0.0352 (based on -0.0123 + 0.0475). For firms that employ CEOs aged 50 and above, the effect of managerial ability on diversification value is much more pronounced, with the discounted value of -0.008 becoming a premium of 0.0725 (based on -0.008 + 0.805).

Table 5: Further issue: Who are the high-ability CEOs? (CEO personal traits: age)

Panel A	**FE**				**RE**			
	FULL (1)	**Age ≥ 50 (2)**	**Age ≥ 60 (3)**	**Age ≥ 65 (4)**	**FULL (5)**	**Age ≥ 50 (6)**	**Age ≥ 60 (7)**	**Age ≥ 65 (8)**
Growth	0.0466***	0.0490***	0.013	0.0299	0.0428***	0.0443***	0.0217	0.0398
	(0.0113)	(0.0116)	(0.0198)	(0.0311)	(0.0114)	(0.0115)	(0.0193)	(0.0299)
Size	-0.0591**	-0.0700***	-0.0671***	-0.0452	-0.0056	-0.0005	0.0034	0.0191
	(0.0238)	(0.0132)	(0.0251)	(0.0434)	(0.0126)	(0.0086)	(0.0132)	(0.0183)
Leverage	0.2809***	0.3627***	0.3997***	0.4956***	0.3029***	0.3600***	0.3763***	0.4470***
	(0.0618)	(0.0302)	(0.0650)	(0.1126)	(0.0551)	(0.0270)	(0.0515)	(0.0686)

Panel A	FE				RE			
	FULL (1)	**Age ≥ 50 (2)**	**Age ≥ 60 (3)**	**Age ≥ 65 (4)**	**FULL (5)**	**Age ≥ 50 (6)**	**Age ≥ 60 (7)**	**Age ≥ 65 (8)**
$D^{PositiveCash}$	0.0322***	0.0234**	0.0207	0.032	0.0386***	0.0305***	0.0242*	0.0355*
	(0.0092)	(0.0095)	(0.0146)	(0.0212)	(0.0090)	(0.0094)	(0.0143)	(0.0204)
$D^{PayDividend}$	0.1060***	0.0990***	0.0752***	0.0900***	0.1165***	0.1114***	0.1023***	0.1237***
	(0.0154)	(0.0137)	(0.0227)	(0.0345)	(0.0145)	(0.0130)	(0.0209)	(0.0305)
N^{Sector}	-0.0123**	-0.008	-0.0059	-0.0318**	-0.0198***	-0.0172***	-0.0143*	-0.0254**
	(0.0059)	(0.0058)	(0.0090)	(0.0135)	(0.0053)	(0.0052)	(0.0078)	(0.0114)
ABILITY	0.0116	-0.1034*	-0.0434	0.1809	0.0209	-0.0809	-0.0531	0.0884
	(0.0589)	(0.0561)	(0.0917)	(0.1299)	(0.0570)	(0.0546)	(0.0871)	(0.1201)
$N^{Sector} \times$ ABILITY	0.0475*	0.0805***	0.0447	0.0343	0.0609**	0.0943***	0.0571	0.051
	(0.0251)	(0.0248)	(0.0407)	(0.0611)	(0.0246)	(0.0243)	(0.0389)	(0.0567)
Constant	1.7428***	1.8425***	1.7714***	1.4796***	1.1387***	1.0166***	0.8949***	0.6518***
	(0.3076)	(0.1749)	(0.3281)	(0.5643)	(0.1679)	(0.1185)	(0.1789)	(0.2484)
N	5717	4241	1778	873	5717	4241	1778	873
R2	3.07%	0.95%	0.21%	3.24%	15.99%	13.89%	12.84%	20.16%
Hausman Test					105.04***	98.36***	38.27***	23.37
					(0.0000)	(0.0000)	(0.0014)	(0.1041)
Panel B: Summary of the net effect of N^{Sector} + ($N^{Sector} \times$ ABILITY)								
N^{Sector} + ($N^{Sector} \times$ ABILITY)	**0.0352**	**0.0725**	0.0388	0.0025	**0.0411**	**0.0771**	0.0428	0.0256

For the robustness check, this study repeats the results by replacing Tobin's q by ROA and ROE. Table 6 and Table 7 present the robustness test results using ROA and ROE as DV, respectively. The results are consistent with those of Table 5. The data in panel B of Tables 5, 6, and 7 imply that the effect of managerial ability on diversification value increases with CEO age. In other words, in terms of the moderating effect of managerial ability, the data reveal that managerial ability significantly and positively affects the value outcome of diversification. The positive moderating effect is greatest for firms hiring CEOs over 65, followed by those over 60 years old. The full sample has the lowest moderating effect.

Table 6: Robustness test with ROA on common traits of high-ability CEOs (CEO personal traits: age)

	Panel A: FE				Panel B: RE			
	FULL (1)	**Age ≥ 50 (2)**	**Age ≥ 60 (3)**	**Age ≥ 65 (4)**	**FULL (5)**	**Age ≥ 50 (6)**	**Age ≥ 60 (7)**	**Age ≥ 65 (8)**
Growth	1.9291***	1.8290***	1.7782***	0.834	2.1248***	2.0527***	2.0665***	1.3572***
	(0.2066)	(0.1871)	(0.3204)	(0.5147)	(0.2049)	(0.1838)	(0.3024)	(0.4756)
Size	0.5564**	0.2712	1.4118***	1.4628**	0.3999***	0.4037***	0.7181***	0.8168***
	(0.2774)	(0.2115)	(0.4055)	(0.7171)	(0.0935)	(0.0884)	(0.1389)	(0.2016)
Leverage	-0.0860**	-0.0923**	-9.5219***	-10.9765***	-0.1011**	-0.0837**	-6.2971***	-5.7222***
	(0.0342)	(0.0394)	(1.0445)	(1.8164)	(0.0427)	(0.0350)	(0.6396)	(0.8156)
$D^{PositiveCash}$	4.2726***	3.9640***	3.4547***	3.7124***	4.8204***	4.5596***	3.8680***	4.3198***
	(0.1823)	(0.1513)	(0.2364)	(0.3495)	(0.1750)	(0.1475)	(0.2233)	(0.3230)
$D^{PayDividend}$	1.7720***	1.5506***	1.1693***	0.6789	3.1721***	3.1068***	2.5808***	2.5350***
	(0.2532)	(0.2202)	(0.3685)	(0.5739)	(0.2034)	(0.1856)	(0.2957)	(0.4378)
N^{Sector}	-0.0564	0.0908	0.0962	0.2992	-0.2264***	-0.1192*	-0.0732	0.0046
	(0.0910)	(0.0925)	(0.1448)	(0.2239)	(0.0674)	(0.0691)	(0.1034)	(0.1550)
ABILITY	2.6627***	1.2635	0.3524	-0.0563	2.8421***	1.6363**	0.9536	-0.0292
	(0.9118)	(0.8997)	(1.4846)	(2.1502)	(0.8301)	(0.8292)	(1.2943)	(1.8020)
N^{Sector} × ABILITY	0.6991*	0.7886**	1.8487***	2.4673**	0.7643**	0.8624**	1.2144**	1.9685**
	(0.3879)	(0.3979)	(0.6571)	(1.0083)	(0.3681)	(0.3693)	(0.5787)	(0.8511)
Constant	-8.0689**	-4.4819	-16.1308***	-16.7477*	-6.4278***	-6.9256***	-8.3663***	-10.9061***
	(3.6656)	(2.7976)	(5.3091)	(9.3325)	(1.3283)	(1.2014)	(1.8275)	(2.6513)
N	5750	4273	1804	896	5750	4273	1804	896
R^2	40.83%	38.74%	34.09%	32.85%	44.65%	42.92%	43.52%	46.69%
Hausman test					172.89***	269.55***	100.02***	57.27***
					(0.0000)	(0.0000)	(0.0000)	(0.0000)
Panel B: Summary of the net effect of N^{Sector} + (N^{Sector} × ABILITY)								
N^{Sector} + (N^{Sector} × ABILITY)	**0.6427**	**0.8794**	**1.9449**	**2.7665**	**0.5379**	**0.7432**	**1.1412**	**1.9731**

Table 7: Robustness test with ROE on common traits of high-ability CEOs (CEO personal traits: age)

	FE				RE			
	FULL (1)	**Age ≥ 50 (2)**	**Age ≥ 60 (3)**	**Age ≥ 65 (4)**	**FULL (5)**	**Age ≥ 50 (6)**	**Age ≥ 60 (7)**	**Age ≥ 65 (8)**
Growth	3.7323***	3.8179***	4.2263***	3.4638***	4.2959***	4.4885***	4.8117***	4.6191***
	(0.4152)	(0.3669)	(0.6228)	(1.0039)	(0.4093)	(0.3583)	(0.5886)	(0.9270)
Size	1.4690***	0.9185**	4.3820***	4.4816***	1.0222***	0.9815***	1.6862***	1.6862***
	(0.5564)	(0.4236)	(0.8238)	(1.4443)	(0.1703)	(0.1584)	(0.2692)	(0.3958)
Leverage	-0.1385*	-0.1479*	-28.2898***	-26.1803***	-0.1680**	-0.1406**	-16.5374***	-16.5732***
	(0.0730)	(0.0766)	(2.4224)	(3.7959)	(0.0791)	(0.0674)	(1.5685)	(2.2845)
$D^{PositiveCash}$	8.0384***	7.4317***	6.3303***	6.9062***	9.0675***	8.6161***	7.2329***	7.8778***
	(0.3603)	(0.2951)	(0.4612)	(0.6881)	(0.3489)	(0.2856)	(0.4343)	(0.6292)
$D^{PayDividend}$	3.2669***	2.8651***	2.3653***	2.8096**	6.0363***	6.1181***	5.1411***	5.9174***
	(0.5138)	(0.4280)	(0.7202)	(1.1203)	(0.4069)	(0.3486)	(0.5731)	(0.8439)
N^{Sector}	-0.0693	0.1324	0.3293	1.0134**	-0.3903***	-0.2767**	-0.077	0.1734
	(0.1776)	(0.1799)	(0.2814)	(0.4373)	(0.1229)	(0.1275)	(0.1966)	(0.2944)
ABILITY	3.8523**	0.2013	0.3484	-3.6957	4.1480***	1.1224	1.8752	-0.4878
	(1.7777)	(1.7737)	(2.9301)	(4.2138)	(1.5935)	(1.6020)	(2.5357)	(3.5352)
N^{Sector} × ABILITY	1.7548**	2.4898***	3.3681***	4.8255**	1.8515***	2.4615***	2.0475*	3.1221*
	(0.7372)	(0.7785)	(1.2847)	(1.9814)	(0.6890)	(0.7086)	(1.1236)	(1.6530)
Constant	-23.1967***	-16.0030***	-52.8831***	-57.3920***	-17.8748***	-17.9377***	-20.8629***	-23.9322***
	(7.3676)	(5.6102)	(10.6870)	(18.7276)	(2.3829)	(2.1523)	(3.4642)	(5.0707)
N	5701	4237	1788	882	5701	4237	1788	882
R^2	40.62%	39.20%	30.17%	28.98%	44.63%	43.34%	43.04%	45.39%
Hausman test					167.46***	293.25***	125.41***	55.52***
					(0.0000)	(0.0000)	(0.0000)	(0.0000)
Panel B: Summary of the net effect of N^{Sector} + (N^{Sector} × ABILITY)								
N^{Sector} + (N^{Sector} × ABILITY)	**1.6855**	**2.6222**	**3.6974**	**5.8389**	**1.4612**	**2.1848**	**1.9705**	**3.2955**

The results in this section refute agency and physiological perspectives. In addition, Carlsson and Karlsson (1970) assert that senior executives have well-established social networks, spending habits, and expectations for future income. As a result, senior executives dislike risks, fearful that it would disturb their current and future lives. This psychosocial factor, combined with recent changes in corporate governance, inhibits the agency problem. Furthermore, healthcare and nutrition have improved globally in recent decades. People in almost every country in the world live longer and healthier than before. According to the World Health Organization Life

Expectancy and Healthy Life Expectancy data, Malaysian men and women who reach the age of 60 in 2019 are expected to have an additional 14 years and 15.3 years of healthy life, respectively (WHO, 2019). Therefore, the findings in this section, where senior CEOs, especially those nearing retirement age, outperform their younger counterparts, come as no surprise.

Tables 5, 6 and 7 offer numerous indications. First, management ability is the information, abilities, and experience a manager can utilise (Hitt et al., 2001). It takes time to gain knowledge, abilities, and experience. Therefore, older CEOs should be able to make better decisions, and be more efficient with their resource allocation. Thus, it is not unexpected that older CEO had a greater impact on firm success. Second, according to Heaton (2002), younger CEOs are overconfident and eager to prove themselves, which can lead to value-destroying projects. This could be one of the explanations for our findings. Third, our findings refute the near-retirement agency problem (Yim, 2013) and support the idea that near-retirement CEOs will continue to perform well as they could be elected as board members after their retirement. Fourth, by setting the official retirement age at 60, our society risks losing the brightest brains in top-level corporate positions, which is detrimental to a nation that aspires to be economically advanced.

Table 8: Further issue: Who are the high-ability CEOs? (CEO personal traits: education)

	FE			RE		
	FULL	**Degree (1)**	**Postgrad (2)**	**FULL**	**Degree (1)**	**Postgrad (2)**
Growth	0.0466***	0.0477***	0.0242	0.0428***	0.0419***	0.0183
	(0.0113)	(0.0113)	(0.0179)	(0.0114)	(0.0113)	(0.0178)
Size	-0.0591**	-0.1174***	-0.1226***	-0.0056	-0.0238***	-0.0055
	(0.0238)	(0.0136)	(0.0251)	(0.0126)	(0.0088)	(0.0153)
Leverage	0.2809***	0.3608***	0.3469***	0.3029***	0.3836***	0.3709***
	(0.0618)	(0.0303)	(0.0412)	(0.0551)	(0.0274)	(0.0378)
$D^{PositiveCash}$	0.0322***	0.0316***	0.014	0.0386***	0.0408***	0.0207
	(0.0092)	(0.0099)	(0.0166)	(0.0090)	(0.0100)	(0.0165)
$D^{PayDividend}$	0.1060***	0.1191***	0.0586**	0.1165***	0.1286***	0.0749***
	(0.0154)	(0.0144)	(0.0246)	(0.0145)	(0.0138)	(0.0233)
N^{Sector}	-0.0123**	-0.0127**	-0.0262***	-0.0198***	-0.0196***	-0.0311***
	(0.0059)	(0.0059)	(0.0099)	(0.0053)	(0.0054)	(0.0090)

	FE			RE		
	FULL	**Degree (1)**	**Postgrad (2)**	**FULL**	**Degree (1)**	**Postgrad (2)**
	(0.0589)	(0.0553)	(0.0837)	(0.0570)	(0.0543)	(0.0809)
N^{Sector} × ABILITY	0.0475*	0.0479**	0.0732*	0.0609**	0.0664***	0.0976***
	(0.0251)	(0.0244)	(0.0376)	(0.0246)	(0.0241)	(0.0368)
Constant	1.7428***	2.5088***	2.6333***	1.1387***	1.3568***	1.1322***
	(0.3076)	(0.1820)	(0.3377)	(0.1679)	(0.1230)	(0.2111)
N	5717	3778	1422	5717	3778	1422
R^2	10.44%	12.15%	14.70%	15.99%	17.83%	19.01%
Hausman test					124.77***	49.73***
N^{Sector} + (N^{Sector} × ABILITY)	**0.0352**	**0.0352**	**0.0470**	**0.0411**	**0.0468**	**0.0665**

Warren Buffett, one of the world's most successful investors, once remarked, "I don't care where someone went to school, and that never influenced me to hire somebody or buy a business" (Hymowitz, 2006). Does that mean education background has no impact on firm performance? Theoretically, better educated CEOs should be more intelligent, able to discern valuable information, and make superior decisions (Hambrick & Mason, 1984). The results in Table 8 demonstrate that the coefficient of the interactive term of subsample 1, 0.0479, is greater than that of full sample, 0.0475 (FE model). The results are even more prominent with subsample 2. A similar trend was found with the RE model.

The positive impact of CEO education on the moderating effect of managerial ability is further supported by Tables 9 and 10, where we replace Tobin's q with ROA and ROE. Our findings coincide with those of King et al. (2016), who find that CEOs with MBAs achieve higher profitability for their banks than those without. Also, Urquhart and Zhang (2022) demonstrate that firms with PhD-holding CEOs outperform their peers. They discover that CEOs with PhDs improve firm performance by 3.03%, but CEOs with PhDs from highly ranked universities improve firm performance by 4.65%.

Table 9: Robustness test with ROA on CEO personal traits (education)

Panel A	**FE**			**RE**		
	FULL	**Degree**	**Postgrad**	**FULL**	**Degree**	**Postgrad**
Growth	3.73 23***	3.7892***	3.6693***	4.2959***	4.2908***	4.2087***
	(0.4152)	(0.3586)	(0.5840)	(0.4093)	(0.3514)	(0.5609)
Size	1.4690***	2.3828***	3.3345***	1.0222***	1.5598***	1.9411***
	(0.5564)	(0.4507)	(0.8917)	(0.1703)	(0.1747)	(0.2987)
Leverage	-0.1385*	-15.3758***	-18.8693***	-0.1680**	-11.1753***	-12.8043***
	(0.0730)	(1.3997)	(2.4825)	(0.0791)	(0.9816)	(1.5715)
$D^{PositiveCash}$	8.0384***	7.0685***	6.5352***	9.0675***	8.1957***	7.9332***
	(0.3603)	(0.3176)	(0.5504)	(0.3489)	(0.3071)	(0.5119)
$D^{PayDividend}$	3.2669***	2.6162***	2.8876***	6.0363***	4.9805***	4.9208***
	(0.5138)	(0.4575)	(0.8133)	(0.4069)	(0.3906)	(0.6495)
N^{Sector}	-0.0693	-0.0139	-0.0956	-0.3903***	-0.4952***	-0.5203**
	(0.1776)	(0.1872)	(0.3233)	(0.1229)	(0.1362)	(0.2283)
ABILITY	3.8523**	2.6409	1.6063	4.1480***	2.7816*	2.0311
	(1.7777)	(1.7618)	(2.7456)	(1.5935)	(1.6108)	(2.4018)
N^{Sector} ×	1.7548**	1.9055**	2.4281**	1.8515***	2.2328***	2.5507**
ABILITY	(0.7372)	(0.7737)	(1.2277)	(0.6890)	(0.7146)	(1.1033)
Constant	-23.1967***	-29.5388***	-40.4497***	-17.8748***	-19.7338***	-23.8739***
	(7.3676)	(5.9346)	(11.7017)	(2.3829)	(2.3077)	(3.8697)
N	5701	3779	1435	5701	3779	1435
R^2	40.62%	36.09%	36.07%	44.63%	43.48%	45.55%
Hausman test					205.25***	78.69***
					(0.0000)	(0.0000)
N^{Sector} + (N^{Sector} × ABILITY)	**0.6427**	**0.7235**	0.5325	**0.5379**	**0.7226**	0.4589

Table 10: Robustness test with ROE on CEO personal traits (education)

Panel A	**FE**			**RE**		
	FULL	**Degree**	**Postgrad**	**FULL**	**Degree**	**Postgrad**
Growth	3.73 23***	3.7892***	3.6693***	4.2959***	4.2908***	4.2087***
	(0.4152)	(0.3586)	(0.5840)	(0.4093)	(0.3514)	(0.5609)
Size	1.4690***	2.3828***	3.3345***	1.0222***	1.5598***	1.9411***
	(0.5564)	(0.4507)	(0.8917)	(0.1703)	(0.1747)	(0.2987)
Leverage	-0.1385*	-15.3758***	-18.8693***	-0.1680**	-11.1753***	-12.8043***
	(0.0730)	(1.3997)	(2.4825)	(0.0791)	(0.9816)	(1.5715)
$D^{PositiveCash}$	8.0384***	7.0685***	6.5352***	9.0675***	8.1957***	7.9332***
	(0.3603)	(0.3176)	(0.5504)	(0.3489)	(0.3071)	(0.5119)
$D^{PayDividend}$	3.2669***	2.6162***	2.8876***	6.0363***	4.9805***	4.9208***
	(0.5138)	(0.4575)	(0.8133)	(0.4069)	(0.3906)	(0.6495)
N^{Sector}	-0.0693	-0.0139	-0.0956	-0.3903***	-0.4952***	-0.5203**
	(0.1776)	(0.1872)	(0.3233)	(0.1229)	(0.1362)	(0.2283)
ABILITY	3.8523**	2.6409	1.6063	4.1480***	2.7816*	2.0311
	(1.7777)	(1.7618)	(2.7456)	(1.5935)	(1.6108)	(2.4018)
N^{Sector} ×	1.7548**	1.9055**	2.4281**	1.8515***	2.2328***	2.5507**
ABILITY	(0.7372)	(0.7737)	(1.2277)	(0.6890)	(0.7146)	(1.1033)
Constant	-23.1967***	-29.5388***	-40.4497***	-17.8748***	-19.7338***	-23.8739***
	(7.3676)	(5.9346)	(11.7017)	(2.3829)	(2.3077)	(3.8697)
N	5701	3779	1435	5701	3779	1435
R^2	40.62%	36.09%	36.07%	44.63%	43.48%	45.55%
Hausman test					205.25***	78.69***
					(0.0000)	(0.0000)
N^{Sector} + (N^{Sector} × ABILITY)	**1.6855**	**1.8916**	2.3325	**1.4612**	**1.7376**	2.0304

The results of the following section support our second hypothesis that good corporate governance will enhance the positive effects of managerial ability. In Malaysia, Principle A of the Malaysian Code of Corporate Governance (MCCG) 2019 stipulates that a board determines the strategic direction and monitors management (SC, 2019). Paragraph 15.02 of Bursa Malaysia's Listing Requirements specifies that a listed company must have at least two directors, or one-third of the board of directors, whichever is higher, as independent directors (Bursa Malaysia, 2022). Nevertheless, the MCCG goes beyond the Bursa listing requirements by mandating firms to have at least 50% independent directors.

Following the direction of MCCG, a subsample of firms with more than 50% independent directors on the board was constructed.

Comparing the full sample regression and the subsample regression (IBD > 50%) in Panel A of Table 11, we discovered that the result remained significant, and the interaction term of the FE models' coefficient increased from 0.0475 to 0.0608. The results in Panel B of Table 11 indicate that when high-ability CEOs manage diversified firms, the discounted value of the diversified firms decreases significantly from -0.0123 and turns into a premium of 0.0352 (based on the calculation of -0.0123 + 0.0475). The result suggests that each unit increase in the diversification measure of firms affiliated with high-ability managers results in an approximately 0.0352% improvement in the firms' Tobin's q. However, for firms with at least half independent directors, managerial ability has a substantially greater impact on value outcome of diversification. Tobin's q increases by 0.0489% for each unit increase in the diversification measure (based on -0.0119 + 0.0608).

Table 11: Further issue on CG: Firms with IBD > 50%. Tobin's q as firm performance measure

Panel A	**FE**		**RE**	
	FULL	**IBD > 50%**	**FULL**	**IBD > 50%**
Growth	0.0466***	0.0506***	0.0428***	0.0446***
	(0.0113)	(0.0130)	(0.0114)	(0.0129)
Size	-0.0591**	-0.0986***	-0.0056	-0.0174*
	(0.0238)	(0.0153)	(0.0126)	(0.0095)
Leverage	0.2809***	0.2379***	0.3029***	0.2829***
	(0.0618)	(0.0258)	(0.0551)	(0.0230)
$D^{PositiveCash}$	0.0322***	0.0127	0.0386***	0.0226**
	(0.0092)	(0.0116)	(0.0090)	(0.0115)
$D^{PayDividend}$	0.1060***	0.0749***	0.1165***	0.0968***
	(0.0154)	(0.0172)	(0.0145)	(0.0161)
N^{Sector}	-0.0123**	-0.0119*	-0.0198***	-0.0196***
	(0.0059)	(0.0069)	(0.0053)	(0.0061)
ABILITY	0.0116	-0.0464	0.0209	-0.0151
	(0.0589)	(0.0639)	(0.0570)	(0.0620)
N^{Sector} × ABILITY	0.0475*	0.0608**	0.0609**	0.0707**
	(0.0251)	(0.0288)	(0.0246)	(0.0281)
Constant	1.7428***	2.2763***	1.1387***	1.3010***
	(0.3076)	(0.2018)	(0.1679)	(0.1307)
N	5717	2858	5717	2858
R^2	3.07%	0.70%	15.99%	14.33%
Hausman test				105.04***
				(0.0000)
Panel B: Summary of the net effect of N^{Sector} + (N^{Sector} × ABILITY)				
N^{Sector} + (N^{Sector} × ABILITY)	**0.0352**	**0.0489**	**0.0411**	**0.0511**

Table 12 shows the results of the robustness test, with Tobin's q replaced by ROA and ROE as an independent variable. However, no significant results were found with the FE models. While the RE model demonstrates that the coefficient of the interaction term decreases when ROE was used, the Hausman Test subsequently rejected the RE model. The difference in results could be attributable to different performance measures. ROA and ROE are accounting-based performance measures, whereas Tobin's q is a market-based performance measure. Tobin's q is affected by market performance and investor expectations of firms.

Table 12: Robustness test with ROA and ROE on the CG Issue: Firm with more than 50% independent director on the board

Panel A	**FE**				**RE**			
	ROA		**ROE**		**ROA**		**ROE**	
	FULL (1)	**IBD >50% (2)**	**FULL (3)**	**IBD >50% (4)**	**FULL (5)**	**IBD >50% (6)**	**FULL (7)**	**IBD >50% (8)**
Growth	1.9291***	1.9223***	3.7323***	4.0265***	2.1248***	2.1420***	4.2959***	4.6344***
	(0.2066)	(0.2205)	(0.4152)	(0.4350)	(0.2049)	(0.2152)	(0.4093)	(0.4207)
Size	0.5564**	0.3461	1.4690***	1.3493**	0.3999***	0.4407***	1.0222***	1.0199***
	(0.2774)	(0.2579)	(0.5564)	(0.5252)	(0.0935)	(0.1007)	(0.1703)	(0.1848)
Leverage	-0.0860**	-0.0898**	-0.1385*	-0.1186	-0.1011**	-0.0746**	-0.1680**	-0.1269*
	(0.0342)	(0.0426)	(0.0730)	(0.0834)	(0.0427)	(0.0366)	(0.0791)	(0.0711)
$D^{PositiveCash}$	4.2726***	4.2971***	8.0384***	8.2829***	4.8204***	5.0065***	9.0675***	9.6132***
	(0.1823)	(0.1978)	(0.3603)	(0.3880)	(0.1750)	(0.1877)	(0.3489)	(0.3639)
$D^{PayDividend}$	1.7720***	1.5886***	3.2669***	3.0730***	3.1721***	3.3200***	6.0363***	6.4105***
	(0.2532)	(0.2952)	(0.5138)	(0.5765)	(0.2034)	(0.2324)	(0.4069)	(0.4383)
N^{Sector}	-0.0564	0.0429	-0.0693	0.1344	-0.2264***	-0.2231***	-0.3903***	-0.3840**
	(0.0910)	(0.1173)	(0.1776)	(0.2292)	(0.0674)	(0.0828)	(0.1229)	(0.1547)
ABILITY	2.6627***	3.1824***	3.8523**	4.5637**	2.8421***	3.3167***	4.1480***	4.9721***
	(0.9118)	(1.0855)	(1.7777)	(2.1492)	(0.8301)	(0.9738)	(1.5935)	(1.8884)
N^{Sector} × ABILITY	0.6991*	0.4757	1.7548**	1.4318	0.7643**	0.4669	1.8515***	1.4513*
	(0.3879)	(0.4898)	(0.7372)	(0.9677)	(0.3681)	(0.4445)	(0.6890)	(0.8588)
Constant	-8.0689**	-6.1262*	-23.1967***	-23.3124***	-6.4278***	-7.5053***	-17.8748***	-18.8176***
	(3.6656)	(3.3892)	(7.3676)	(6.9144)	(1.3283)	(1.3521)	(2.3829)	(2.4826)
N	5750	2891	5701	2853	5750	2891	5701	2853
R^2	40.83%	41.19%	40.62%	41.35%	44.65%	45.66%	44.63%	45.89%
Hausman test					172.89***	161.09***	167.46***	155.77***
					(0.0000)	(0.0000)	(0.0000)	(0.0000)
N^{Sector} + (N^{Sector} × ABILITY)	**0.6427**	0.5186	**1.6855**	1.5662	**0.5379**	0.2438	**1.4612**	**1.0673**

The second hypothesis of this study was subsequently examined using CEO duality. MCCG 2012 originally allowed duality. However, the statement on CEO duality was revised in MCCG 2017. According to Practice 1.3, "the posts of Chairman and CEO are held by different individuals" (SC, 2017), effectively removing CEO duality. Table 13 reveals that while the interaction term remained significant, the coefficient of the RE model declined from 0.0609 (full sample) to 0.0449 (subsample, no duality), demonstrating that firms that adopt separate leadership underperform those in the full sample. While the model failed the Hausman test, might this mean CEO duality is not detrimental for firm performance? To answer the doubts, we proceed to the robustness test with ROA and ROE.

Table 13: Further issue on CG: Firms with no CEO duality

Panel A	**FE**		**RE**	
	FULL	**No Duality**	**FULL**	**No Duality**
Growth	0.0466***	0.0495***	0.0428***	0.0455***
	(0.0113)	(0.0112)	(0.0114)	(0.0111)
Size	-0.0591**	-0.0555***	-0.0056	-0.0044
	(0.0238)	(0.0129)	(0.0126)	(0.0085)
Leverage	0.2809***	0.3301***	0.3029***	0.3413***
	(0.0618)	(0.0309)	(0.0551)	(0.0277)
$D^{PositiveCash}$	0.0322***	0.0307***	0.0386***	0.0373***
	(0.0092)	(0.0093)	(0.0090)	(0.0093)
$D^{PayDividend}$	0.1060***	0.1174***	0.1165***	0.1277***
	(0.0154)	(0.0132)	(0.0145)	(0.0126)
N^{Sector}	-0.0123**	-0.0137**	-0.0198***	-0.0218***
	(0.0059)	(0.0055)	(0.0053)	(0.0050)
ABILITY	0.0116	0.0512	0.0209	0.0586
	(0.0589)	(0.0534)	(0.0570)	(0.0524)
$N^{Sector} \times$ ABILITY	0.0475*	0.0291	0.0609**	0.0449*
	(0.0251)	(0.0235)	(0.0246)	(0.0231)
Constant	1.7428***	1.6863***	1.1387***	1.1446***
	(0.3076)	(0.1698)	(0.1679)	(0.1181)
N	5717	4433	5717	4433
R^2	3.07%	3.15%	15.99%	16.45%
Hausman test				85.03***
				(0.0000)
Panel B: Summary of the net effect of N^{Sector} + ($N^{Sector} \times$ ABILITY)				
N^{Sector} + ($N^{Sector} \times$ ABILITY)	**0.0352**	**0.0154**	**0.0411**	**0.0231**

Table 14 demonstrates a decrease in the coefficient for the FE model with ROE as the dependent variable, consistent with Table 7. Comparing the other three subsample regressions with full samples, the coefficient increased from 0.6991 to 0.7897 (ROA, FE model). Also, the coefficient increased from 0.7643 to 0.9567 and from 1.8515 to 2.1657 when ROA and ROE were used in the RE model.

Multiple theories support or reject duality. Finkelstein and D'Aveni (1994) assert that duality gives firms a strategic advantage since it gives the CEO more latitude to react swiftly to market shifts and secure crucial resources. Alexander, Fennell, and Halpern (1993) suggest that duality reduces agency costs by eliminating information asymmetry, thereby increasing firm value. Another perspective emphasises board oversight and duality. Duality raises the CEO's power base and influence on the board, impairs independence, and reduces the board's monitoring role (Fama & Jensen, 1983), which hurts firm performance. In general, the results in Tables 13 and 14 show that Hypothesis 3B is partly supported. The positive moderating effects of managerial ability on the relationship between diversification and firm value will be further enhanced for firms that practice separate leadership structures.

Table 14: Robustness test with ROA and ROE on CG issue: Firms with no CEO duality issue

Panel A	**FE**				**RE**			
	ROA		**ROE**		**ROA**		**ROE**	
	FULL	**No Duality**	**FULL**	**No Duality**	**FULL**	**No Duality**	**FULL**	**No Duality**
Growth	1.9291***	1.9423***	3.7323***	3.9002***	2.1248***	2.0876***	4.2959***	4.2764***
	(0.2066)	(0.1781)	(0.4152)	(0.3427)	(0.2049)	(0.1760)	(0.4093)	(0.3353)
Size	0.5564**	0.5521***	1.4690***	2.3528***	0.3999***	0.4258***	1.0222***	1.5435***
	(0.2774)	(0.2055)	(0.5564)	(0.4175)	(0.0935)	(0.0893)	(0.1703)	(0.1672)
Leverage	-0.0860**	-3.8623***	-0.1385*	-14.2688***	-0.1011**	-1.8237***	-0.1680**	-11.2245***
	(0.0342)	(0.4517)	(0.0730)	(1.3066)	(0.0427)	(0.2528)	(0.0791)	(0.9314)
$D^{PositiveCash}$	4.2726***	3.9948***	8.0384***	7.3319***	4.8204***	4.5827***	9.0675***	8.3217***
	(0.1823)	(0.1483)	(0.3603)	(0.2848)	(0.1750)	(0.1452)	(0.3489)	(0.2758)
$D^{PayDividend}$	1.7720***	1.6132***	3.2669***	2.5182***	3.1721***	2.9465***	6.0363***	4.7738***
	(0.2532)	(0.2103)	(0.5138)	(0.4046)	(0.2034)	(0.1829)	(0.4069)	(0.3473)
N^{Sector}	-0.0564	-0.0631	-0.0693	-0.0273	-0.2264***	-0.2534***	-0.3903***	-0.4073***
	(0.0910)	(0.0878)	(0.1776)	(0.1674)	(0.0674)	(0.0676)	(0.1229)	(0.1243)
ABILITY	2.6627***	2.5677***	3.8523**	5.2113***	2.8421***	2.8079***	4.1480***	4.4419***
	(0.9118)	(0.8523)	(1.7777)	(1.6391)	(0.8301)	(0.7994)	(1.5935)	(1.5102)

Panel A	FE				RE			
	ROA		ROE		ROA		ROE	
	FULL	No Duality	FULL	No Duality	FULL	No Duality	FULL	No Duality
	(0.3879)	(0.3744)	(0.7372)	(0.7168)	(0.3681)	(0.3533)	(0.6890)	(0.6645)
Constant	-8.0689**	-6.2700**	-23.1967***	-29.0206***	-6.4278***	-5.5129***	-17.8748***	-18.9643***
	(3.6656)	(2.7105)	(7.3676)	(5.4002)	(1.3283)	(1.2090)	(2.3829)	(2.1907)
N	5750	4431	5701	4402	5750	4431	5701	4402
R^2	40.83%	39.05%	40.62%	38.71%	44.65%	45.25%	44.63%	44.89%
Hausman test						259.03***		221.67***
						(0.0000)		(0.0000)
N^{Sector} + (N^{Sector} × ABILITY)	**0.6427**	**0.7266**	**1.6855**	**1.4999**	**0.5379**	**0.7033**	**1.4612**	**1.7584**

5. Conclusion

We hand-collected nine years of firm annual data (2009 to 2017) to explore various related hypotheses on the moderating effect of managerial ability on the relationship between diversification and firm value. Our data comprise all the listed firms in Bursa Malaysia except one firm in the mining sector. These firms are selected from nine sectors, which include consumer products, construction, industrial products, technology, IPC, hotel, plantation, properties, and trading and services. Table 15 summarises the findings of this study.

Table 15: The summary of the main findings

Hypothesis	Results with Tobin's q	Results with ROA	Results with ROE	Key findings
H1: Managerial ability positively affects the relationship between diversification and firm value.	Positive relationship and statistically significant	Positive relationship and statistically significant	Positive relationship and statistically significant	Supported. There is a significant moderating effect of managerial ability on the relationship between diversification and firm value
H2A: The positive effects of managerial ability on the relationship between diversification and firm value will vary by CEO age. The positive effects will be further enhanced for firms that are operated by older CEOs.	Positive relationship and statistically significant for subsample > 50 years old. Positive relationship but non-statistically significant for the other subsamples	Positive relationship and statistically significant all four subsamples	Positive relationship and statistically significant all four subsamples	Generally supported. The positive moderating effects of managerial ability on the relationship between diversification and firm value will be further enhanced for firms that are operated by older CEOs. The strongest beneficial moderating effect occurs when firms hire CEOs over the age of 65, followed by firms with CEOs over the age of 60 and then firms with CEOs over the age of 50. The full sample had the least favourable moderating effect compared to all three subsamples.

Hypothesis	Results with Tobin's q	Results with ROA	Results with ROE	Key findings
H2B: The positive effects of managerial ability on the relationship between diversification and firm value will be further enhanced for firms operated by highly educated CEOs.	Positive relationship and statistically significant all four subsamples	Positive relationship and statistically significant for undergraduate degree subsample. Positive relationship and statistically non-significant for postgraduate degree subsample	Positive relationship and statistically significant all four subsamples	Generally supported. The positive moderating effects of managerial ability on the relationship between diversification and firm value will be further enhanced for firms operated by CEOs with higher education. The strongest beneficial moderating effect occurs when firms hire CEOs with a postgraduate degree, followed by firms with CEOs with at least an undergraduate degree.
H3A: The positive effects of managerial ability on the relationship between diversification and firm value will be further enhanced when the majority of the board of firm are independent board of directors.	Positive relationship and statistically significant	Positive relationship and non-statistically significant	Positive relationship and statistically significant for the RE model. Positive relationship and non-statistically Significant for the FE model	Partly supported. The positive moderating effects of managerial ability on the relationship between diversification and firm value (Tobin's q) will be further enhanced for firms with majority of board members are independent.
H3B: The positive effects of managerial ability on the relationship between diversification and firm value will be further enhanced when the positions of CEO and chairman are held by different individuals.	Positive relationship and statistically significant for the RE model. Positive relationship and non-statistically significant for FE model	Positive relationship and statistically significant	Positive relationship and statistically significant	Partly supported. The positive moderating effects of managerial ability on the relationship between diversification and firm value will be further enhanced for firms that practice separate leadership structures (no duality).

The findings are threefold. Managers differ with respect to their ability to manage, combine, and use resources. High-ability managers can create more value with less resources by combining and using them effectively. Second, this study reveals that managerial ability positively affects the relationship between diversification and firm performance. Third, the positive effects of managerial ability are reinforced when firms adopt effective internal corporate governance (majority of the board consisting of independent directors), employing older CEOs with a better education background.

Our study contributes empirically to recent contingent-based perspectives on the value outcome of diversification. This study has crucial implications for resource-based theory, showing that a firm's

most valuable strategic resource is accumulated human capital. The results also contributed to the corporate governance literature. Managerial ability becomes an increasingly important factor in determining the outcome of a diversification strategy in firms with good corporate governance. Agency theory suggests that due to information asymmetry and separation of control and ownership, rational managers are unlikely to work for shareholder interests. A confident high-ability CEO may think entrenchment behaviours can be concealed from others. Our finding extends this view by suggesting that the positive influence of capable managers on the outcome of the diversification strategy depends on the quality of the corporate governance mechanism. Last, we provide support for the upper echelons theory. The findings show that age and education background have a significant impact on the positive influence of managerial ability on the value outcome of diversification. Using Tobin's q, ROA, and ROE as firm value measures yields robust results.

Our findings have academic/theoretical and managerial/policy implications. Given the prevalence of diversification strategies among Malaysian firms, understanding the value outcome of diversification has become an essential research topic. This study links the resource-based perspective and the outcome of diversification to find a moderating relationship between diversification and firm value. According to the upper echelons theory, a manager's ability directly links to the firm business strategy (Hambrick & Mason, 1984) because high-ability managers can make better organisational and strategic decisions and leads to higher firm performance (Nielsen 2010).

Concerning managerial implications, we recommend that firms must not only focus on their resource endowment, but also hire managers who can devise correct diversification strategies from those resources. This is especially true in large firms, such conglomerates, where resources must be deployed efficiently across business segments. Managers must know that the ability to optimise their firm's resources is a crucial skill that transcends organisational borders (Cheng et al., 2020). Managers should therefore take conscious steps to enhance their own managerial ability, making them more valuable as their careers develop. When appointing CEOs, the board should evaluate managerial abilities. Diversified firms have a higher likelihood of benefiting from diversification if they employ older CEOs with higher education, practices separate leadership structure, and have a majority independent board.

5.1 Limitations of the Study and Suggestions for Future Research

This study has several limitations. First, management ability measures. This study utilises one proxy for managerial ability. Future studies could employ the General Ability Index (GAI), CEO pay, and manager fixed-effect, CEO reputation to explore the moderating effect of management ability on the value outcome of diversification. However, Demerjian et al. (2012) compared different proxies and found that theirs has a more significant manager-specific component and less noise.

Second, firms are grouped by Bursa Malaysia sector categorisation to compare efficiency. Depending on asset and operation mix, firms in the same industry can have quite diverse inputs and outputs (Demerjian et al., 2012). Future studies may consider using other industry groupings, such as the GICS, Bloomberg Industry Classification Standard, or Datastream Industry Classification.

Acknowledgements

The authors acknowledge the financial support of Universiti Sains Malaysia (USM) Research University Grant (1001/PJJAUH/816292). The usual disclaimer applies.

References

Alexander, J. A., Fennell, M. L., and Halpern, M. T. (1993). Leadership instability in hospitals: The influence of board-CEO relations and organizational growth and decline. *Administrative Science Quarterly*, 74-99. https://doi.org/10.2307/2393255

Allison, P. D. (2009). *Fixed effects regression models*. New York: SAGE Publications.

Al-Maskati, N., Bate, A. J., and Bhabra, G. S. (2015). Diversification, corporate governance and firm value in small markets: Evidence from New Zealand. *Accounting and Finance*, *55*(3), 627-657. https://doi.org/10.1111/acfi.12069

Altuwaijri, B. M., and Kalyanaraman, L. (2020). CEO education-performance relationship: Evidence from Saudi Arabia. *Journal of Asian Finance, Economics and Business*, *7*(8), 259-268. https://doi.org/10.13106/jafeb.2020.vol7.no8.259

Andreou, P. C., Philip, D., and Robejsek, P. (2016). Bank liquidity creation and risk-taking: Does managerial ability matter? *Journal*

of Business Finance and Accounting, *43*(1-2), 226-259. https://doi.org/10.1111/jbfa.12169

Babajide Wintoki, M., Linck, J. S., and Netter, J. M. (2012). Endogeneity and the dynamics of internal corporate governance. *Journal of Financial Economics*, *105*(3), 581-606. https://doi.org/10.1016/j.jfineco.2012.03.005

Bamber, L. S., Jiang, J., and Wang, I. Y. (2010). What's my style? The influence of top managers on voluntary corporate financial disclosure. *The Accounting Review*, *85*(4), 1131-1162. https://doi.org/10.2308/accr.2010.85.4.1131

Bülent, K., Cüneyt, O., and Arif, O. (2013). Determinants of capital structure: Evidence from a major emerging market economy. *MPRA Paper 48415*. http://mpra.ub.uni-muenchen.de/48415/

Bursa Malaysia (2022). *Listing requirements*. https://www.bursamalaysia.com/regulation/listing_requirements/main_market/listing_requirements

Campbell, B. A., Coff, R., and Kryscynski, D. (2012). Rethinking sustained competitive advantage from human capital. *Academy of Management Review*, *37*(3), 376-395. https://doi.org/10.5465/amr.2010.0276

Carlsson, G., and Karlsson, K. (1970). Age, cohorts and the generation of generations. *American Sociological Review*, *35*(4), 710-718. https://doi.org/10.2307/2093946

Cheng, T. Y., Li, Y. Q., Lin, Y. E., and Chih, H. H. (2020). Does the fit of managerial ability with firm strategy matters on firm performance? *Journal of Asian Finance, Economics and Business*, *7*(4), 9-19. https://doi.org/10.13106/jafeb.2020.vol7.no4.9

Demerjian, P., Lev, B., and McVay, S. (2012). Quantifying managerial ability: A new measure and validity tests. *Management Science*, *58*(7), 1229-1248. https://doi.org/10.2139/ssrn.1266974

Denis, D. J., Denis, D. K., and Sarin, A. (1997). Agency problems, equity ownership, and corporate diversification. *Journal of Finance*, *52*(1), 135-160. https://doi.org/10.2307/2329559

Erdorf, S., Hartmann-Wendels, T., Heinrichs, N., and Matz, M. (2013). Corporate diversification and firm value: A survey of recent literature. *Financial Markets and Portfolio Management*, *27*(2), 187-215. https://doi.org/10.1007/s11408-013-0209-6

Fama, E. F. (1980). Agency problems and the theory of the firm. *Journal of Political Economy*, *88*(2), 288-307. https://doi.org/10.1086/260866

Fama, E. F., and Jensen, M. C. (1983). Separation of ownership and control. *Journal of Law and Economics*, *26*(2), 301-325. https://doi.org/10.2139/ssrn.94034

Finkelstein, S., and D'aveni, R. A. (1994). CEO duality as a double-edged sword: How boards of directors balance entrenchment avoidance and unity of command. *Academy of Management Journal*, *37*(5), 1079-1108. https://doi.org/10.2307/256667

Finkelstein, S., and Hambrick, D. C. (1989). Chief executive compensation: A study of the intersection of markets and political processes. *Strategic Management Journal*, *10*(2), 121-134. https://doi.org/10.1002/smj.4250100203

Forbes, D. P. (2005). Are some entrepreneurs more overconfident than others? *Journal of Business Venturing*, *20*(5), 623-640. https://doi.org/10.1016/j.jbusvent.2004.05.001

Hambrick, D. C., and Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, *9*(2), 193-206. https://doi.org/10.2307/258434

Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica: Journal of the Econometric Society*, 1251-1271. https://doi.org/10.2307/1913827

Heaton, J. B. (2002). Managerial optimism and corporate finance. *Financial Management*, 33-45. https://doi.org/10.2307/3666221

Hitt, M. A., Ireland, R. D., Camp, S. M., and Sexton, D. L. (2001). Strategic entrepreneurship: Entrepreneurial strategies for wealth creation. *Strategic Management Journal*, *22*(6-7), 479-491. https://doi.org/10.1002/smj.196

Ishak, Z., and Napier, C. (2006). Expropriation of minority interests and corporate diversification in Malaysia. *Asian Academy of Management Journal of Accounting and Finance*, *2*, 85-113. https://ideas.repec.org/a/usm/journl/aamjaf00201_85-113.html

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review*, *76*(2), 323-329. https://doi.org/10.2139/ssrn.99580

Khanna, T., and Palepu, K. (2000). Is group affiliation profitable in emerging markets? An analysis of diversified Indian

business groups. *Journal of Finance*, *55*(2), 867-891. https://doi.org/10.1111/0022-1082.00229

King, T., Srivastav, A., and Williams, J. (2016). What's in an education? Implications of CEO education for bank performance. *Journal of Corporate Finance*, *37*, 287-308. https://doi.org/10.1016/j.jcorpfin.2016.01.003

Lang, L. H., and Stulz, R. M. (1994). Tobin's q, corporate diversification, and firm performance. *Journal of Political Economy*, *102*(6), 1248-1280. https://doi.org/10.1086/261970

Lee, K. T., and Hooy, C. W. (2018). Can informal corporate governance mechanisms mitigate diversification discount? Evidence from Malaysia. *International Journal of Managerial Finance*. https://doi.org/10.1108/IJMF-02-2018-0040

Lee, K. T., Ooi, C. A., and Hooy, C. W. (2019). Corporate diversification, board diversity and stock-price crash risk: Evidence from publicly listed firms in Malaysia. *International Journal of Economics and Management*, *13*(2). https://doi.org/10.21315/aamjaf2022.18.1.4

Lee, K. T. (2022). Corporate diversification and stock price crash risk: Do female directors matter? Evidence from Malaysia. *Asian Academy of Management Journal of Accounting and Finance*, *18*(1), 75-100. https://doi.org/10.21315/aamjaf2022.18.1.4

Lim, J., and Lee, S. C. (2019). Relationship between the characteristics of CEOs and excess cash holdings of firms. *Emerging Markets Finance and Trade*, *55*(5), 1069-1090. https://doi.org/10.1080/1540496X.2018.1518778

Lins, K. V., and Servaes, H. (2002). Is corporate diversification beneficial in emerging markets? *Financial Management*, 5-31. https://doi.org/10.2307/3666220

Malmendier, U., and Tate, G. (2008). Who makes acquisitions? CEO overconfidence and the market's reaction. *Journal of Financial Economics*, *89*(1), 20-43. https://doi.org/10.1016/j.jfineco.2007.07.002

Martin, J. D., and Sayrak, A. (2003). Corporate diversification and shareholder value: A survey of recent literature. *Journal of Corporate Finance*, *9*(1), 37-57. https://doi.org/10.1016/S0929-1199(01)00053-0

Naseem, M. A., Lin, J., ur Rehman, R., Ahmad, M. I., and Ali, R. (2019). Does capital structure mediate the link between CEO characteristics and firm performance? *Management Decision*, *58*(1), 164-181. http://doi.org/10.1108/MD-05-2018-0594

Roberts, S. B., and Rosenberg, I. (2006). Nutrition and aging: changes in the regulation of energy metabolism with aging. *Physiological Reviews*, *86*(2), 651-667.

Rose, N. L., and Shepard, A. (1997). Firm diversification and CEO compensation: Managerial ability or executive entrenchment? *RAND Journal of Economics*, *28*(3), 489-514. https://doi.org/10.2307/2556026

Santarelli, E., and Tran, H. T. (2016). Diversification strategies and firm performance in Vietnam: Evidence from parametric and semi-parametric approaches. *Economics of Transition*, *24*(1), 31-68. https://doi.org/10.1111/ecot.12082

Sautner, Z., and Villalonga, B. (2010). Corporate governance and internal capital markets. *Harvard Business School Finance Working Paper 1530565*. http://doi.org/10.2139/ssrn.1530565

Securities Commission (SC) (2012). *Malaysian code on corporate governance 2012*. http://micg.org.my/upload/file/articles/11/CODE-CG-2012.pdf

Securities Commission (SC) (2017). *Malaysian code on corporate governance 2017*. https://www.sc.com.my/api/documentms/download.ashx?id=4d1f5610-cf41-455c-9c20-21fa4c310f46

Securities Commission (SC) (2019). *Malaysian code on corporate governance 2021*. https://www.sc.com.my/api/documentms/download.ashx?id=ff69ce0d-a35e-44d4-996a-c591529c56c7

Stowe, J. D., and Xing, X. (2006). Can growth opportunities explain the diversification discount? *Journal of Corporate Finance*, *12*(4), 783-796. https://doi.org/10.1016/j.jcorpfin.2005.05.001

Urquhart, A., and Zhang, H. (2022). PhD CEOs and firm performance. *European Financial Management*, *28*(2), 433-481. https://doi.org/10.1111/eufm.12316

Villalonga, B. (2004). Does diversification cause the 'diversification discount'? *Financial Management*, *33*(2), 5-27. https://dx.doi.org/10.2139/ssrn.227828

Wang, Y. Y. (2019). *Time-varying efficiency of internal capital markets*. PhD Thesis, University of Melbourne. http://hdl.handle.net/11343/221441

World Health Organization (WHO) (2019). *Malaysia: Health data overview for Malaysia*. https://data.who.int/countries/458

Yang, X., Mao, S., Sun, L., Feng, C., and Xia, Y. (2022). The effect of economic policy uncertainty on green technology innovation: Evidence from China's enterprises. *Sustainability*, *14*(18), 11522. https://doi.org/10.1016/j.econmod.2022.106104

Yim, S. (2013). The acquisitiveness of youth: CEO age and acquisition behavior. *Journal of Financial Economics*, *108*(1), 250-273. https://doi.org/10.1016/j.jfineco.2012.11.003