

Hassan, Rohail; Marimuthu, Maran

## Article

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## Article

# Does Corporate Diversity Really Matter in the Plantation Sector? Empirical Evidence from a World Islamic Leading Country and Market Reaction

Rohail Hassan \* and Maran Marimuthu

Department of Management and Humanities, Universiti Teknologi PETRONAS (UTP), Malaysia, 3261 Seri Iskandar, Perak Darul Ridzuan, Malaysia; maran.marimuthu@utp.edu.my

\* Correspondence: rohail\_g02549@utp.edu.my; Tel.: +60-11-1641-6168

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**Abstract:** The paper examines demographic and cognitive diversity at top-level management and its impact on the performance of Malaysian-listed companies (Plantation and Energy Sectors). Although many organisations aspire to be socially diverse, diversity's consequences for organisational performance remain unclear. Do profitable firms tend to enhance board diversity or other attributes of the firm that contribute towards the firm's financial performance? This study specifies the whole distinct mechanism and measures it independently; bridging as the demographic and cognitive diversity among the board of directors (BODs) and bonding as the firm's financial performance. To maintain the homogeneity factor, empirical analysis is confined to two fully-fledged sectors and 125 Malaysian listed firms out of 798 firms selected on the basis of judgmental sampling during the period of 2009 to 2013. The paper applies econometrics methodology on panel data analysis and the correlation matrix to justify this phenomenon. The paper attempts to fill the gap in the existing literature, discuss the empirically diverse corporate boards with the interaction approach and its impact on firm performance (a) gender diversity and foreign participation (b) gender diversity and ethnic diversity. The empirical findings suggest that both demographic and cognitive diversity are significant predictors of a firm's financial performance. Hence, the companies specifically belonging to plantation and energy sectors are more responsible for promoting diversity among top-level management.

**Keywords:** demographic diversity; gender diversity; ethnic diversity; age profile; cognitive diversity; board of directors (BODs); education diversity; Tobin's Q; market performance

**JEL Classification:** M; M1; M14; G3; G34

## 1. Introduction

One of the vital issues for corporate boards of listed firms is its board composition. The corporate board is considered to be balanced if its board members come from various backgrounds, which allows it to perform more efficiently. Developing societal, political, and cultural views at top-level management is a part of demographic diversity. In addition, the global desire of firms is to have better corporate governance (Monks and Minow 2004). In the past, the corporate world has faced a number of high-profile scandals like Worldcom, Enron, and Adelphia, which caused the firms involved heavy losses. After this, many major firms were shut down, and many policy makers started to investigate the issues of corporate governance (OECD 2004). In 1997, the Malaysian economy was badly affected by financial crisis. The reason behind this corporate failure was the poor practices of corporate governance among the companies (Mitton 2002). Diversity and corporate governance have a

strong relationship in the context of top-level management. Boards of directors (BODs) are leaders in the firms and responsible for making strategic decisions and setting strategic goals. Diverse boards may monitor managers and top management teams in a better way. Board diversity increases board independence (Carter et al. 2003).

Diversified Corporate boards have a very significant impact on firm performance and firm value creation. As a result of this, wealth is maximised and this enhances stakeholder's confidence. Demographic diversity has a positive impact on firm performance (Hassan and Marimuthu 2014, 2016). In contrast, researchers found that gender diversity among board members could result in a bad firm performance (Adams and Ferreira 2009). Women's participation at the board level has a positive relationship with organisational performance. However, female board representation does not have any significant impact on firm performance as measured by Tobin's Q, according to previous studies (Adams and Ferreira 2009; Nguyen et al. 2015; Hassan et al. 2016; Rose 2007; Hassan et al. 2017; Smith et al. 2006). Ethnic diversity among the board of directors means that they can perform their responsibilities more effectively and efficiently (Marimuthu and Kolandaisamy 2009a). There is ambiguity among previous research regarding diversity issues at the board level (Hassan and Marimuthu 2016; Hassan et al. 2015c, 2017). There is less debate on the cognitive diversity of BODs, i.e., educational, experience diversity (Hassan et al. 2015c). However, past studies used simple statistical tools and techniques to investigate the diversity issue. There is a need to investigate the diversity issue in a more holistic way by using different sample sizes and sampling techniques (Hassan et al. 2015a). Empirical studies showed that there is a strong correlation between demographic and cognitive diversity and firm performance (Hassan et al. 2016). It is a keen interest for many researchers to explore demographic and cognitive diversity with regards to firm performance. This paper focuses on investigating diversity at the top level of management of large companies with regards to their firms' value (Tobin's Q). This study tries to fill the gaps in diversity literature related to board directors as, to the best of our knowledge, this is the first study which investigates demographic and cognitive diversity simultaneously with a variety of diversity dimensions. Hence, the purpose of this study is twofold. First, this study aims to examine diversity among board members and firm performance. Second, this paper discusses empirically diverse corporate boards with the interaction approach and its impact on the firm performance. This study focuses only on Malaysian listed companies maintaining a homogeneity factor because Malaysia is a highly rich diverse country. This research contributes to the literature in several ways. First, this study shows the cognitive diversity among board members and its impact on firm performance. Second, we used the interaction approach to investigate the diversity issue more holistically. Third, this study employed a combination of different hypotheses that are not well explored in the literature. Fourth, we extend previous research, mainly focused on cognitive context. Finally, this study, as far as we know, is the first study with detailed diversity constructs and using market performance (Tobin's Q). The findings from the diversity at the board level with regards to firm performance have significantly positive and negative results. The interaction approach is very positively significant with firm performance. Foreign participation diversity with gender diversity has a positive and significant impact on firm performance. Hence, foreign participation at the board level can enhance the profits and perhaps improve the internal operations of their companies. Women can perform better on corporate boards if they work with the foreigners on board. The more diversified a board is, the higher the firm performance will be.

The remainder of the paper is organized as follows; Section 2 covers theoretical background and the construct identification. In Sections 3–5, the hypotheses and model development, empirical design and methodology and empirical results are put forth. Discussions and findings of the study are explained in Section 6. Finally, this paper is concluded in the last section.

## 2. Theoretical Background and Construct Identification

### *Demographic and Cognitive Diversity and Firm Performance*

In this dynamic environment, it is essential for organisations to see the impact of top-level management and firm value. In the context of board diversity, boards consist of different members with different characteristics and backgrounds, e.g., gender, majority groups, minority groups, and ethnicity, which can be an advantage for the success of firms. There is a strong relationship between diversity and firm performance. Diversity could lead to a company's competitive advantage (Abdullah 2014; Lückerath-Rovers 2013). No specific theory predicts the nature of the relationship between corporate board diversity and financial performance (Harrison and Klein 2007). In this study, different social theories from various aspects are discussed. Agency theory explains the board functions of monitoring and controlling managers. It is based on the "agency problem" that arises when two parties have differing goals. The relationship between the principal and agent is defined as a contract where the principal engages the agent in his/her duties to the principal. Agency relationship plays a paramount role in firm performance, and it is based on the composition of the board (Jensen and Meckling 1976). The upper echelons theory relies on behavioural decision-making theories as well as concepts of organisational demography. Corporate boards are relevant and can be used for organisational outcomes, such as firm performance and strategic achievements. This theory explains the impact of demographic and cognitive diversity in the context of firm performance. Researchers have argued that diversified boards can make more efficient decisions as compared to homogenous boards (Hambrick and Mason 1984). Organisations can attract, retain, and take the competitive edge from diverse talent, beginning with increasing the diversity among the top management teams (Gelfand et al. 2004). This study is based on the upper echelon theory because it is related to top-level management characteristics and their effect on firm performance. Diverse boards may better monitor managers and top management teams because board diversity increases board independence. However, the agency theory does not predict a clear overview of the relationship between board diversity and financial performance (Carter et al. 2003).

"Diversity" describes the distribution of differences among the members of a unit with respect to a common attribute, X, such as tenure, ethnicity, conscientiousness, task attitude, or pay. Diversity is a unit-level, compositional construct. Thus, in describing the diversity of a given attribute within a unit (e.g., a group or organisation) (Harrison and Klein 2007). Gender is a status, which is constructed through "social", "cultural", and "psychological" means; it is not based on personal traits (West and Zimmerman 1987). Gender diversity is an integral part of board diversity. Board diversity claims that boards should reflect the society and represent gender, ethnicity, professional experience and background (Milliken and Martins 1996). Diversity among corporate boards always brings a better understanding of the marketplace and innovation and increases creativity, leadership, better decision-making, and effective global relationships (Robinson and Dechant 1997). In the corporate world, female participation on boards is very low. According to Catalyst census, women's participation in boards is only 12.4 percent in the US and 6.4 in the UK. A developed country, Norway, has required at least 40 percent women's participation on boards since 2008 (Monbiot 2006). Currently, Malaysia has laws and regulations that encourage women's participation quotas on boards in the private sector and requires companies to engage at least 30 percent females at the board level (MCCG, 2012). In June 2011, the Malaysian government established a goal of 30 percent females on the holding of senior positions in the public sector by 2016 (SCM, 2011).

In contrast to the cognitive diversity perspective among BODs, the decision-making perspective on diversity mainly focuses on education, work experience and tenure among members (Hülsheger et al. 2009; Van Knippenberg and Schippers 2007). There are two solid sources to studying cognitive diversity, i.e., educational diversity and functional diversity (Jackson et al. 2003). Cognitive diversity provides a broader set of knowledge, skills and expertise to handle the complex situation that adds value to firm performance (Dahlin et al. 2005). However, the interaction approach among different

variables may affect firm performance. We designed two interactive variables: (gender diversity)  $\times$  (ethnic diversity) and (gender diversity)  $\times$  (foreign participation diversity). These variables were used because Malaysia is a multi-ethnic country and more than 45% of the population is non-Muslim. It is good to investigate a combination of diverse boards with regards to race, nationality, and religion. Earlier studies in this field have used measurements such as a firm's ROA and a company's ROE to measure a company's performance (Smith et al. 2006; Marimuthu and Kolandaisamy 2009b; Khan et al. 2017). The ROA and ROE can be used because they show, in a simple way, how well a firm is performing financially when it comes to profitability. A firm's ROA is operationalized as income before tax plus financial expenses divided by total assets, and it is presented as a percentage. The ROE is operationalised as income before tax plus financial expenses divided by shareholder equity, and it is presented as a percentage (Collin et al. 2008). However, this study used Tobin's Q to measure the firm performance. In the context of control variables, Booth, et al. (Booth et al. 2002) argued that companies could choose appropriate governance options based on what is best for them and internal governance structure is substitutable for firms. For example, in this dynamic environment, board size may increase as the number of substantial problems increases. In the case of large companies, it seeks for the strategic role to be more active due to complex operations and the size of the firm. Dalton et al. (2003) found that board size in small firms has a better impact as compared to large firms. Similarly, Patro et al. (2009) found that firm size is positively linked with board size, but it has a negative relation with growth opportunity.

Furthermore, firm size changes at the same time as board characteristics change. Hence, to examine the effect of board characteristics on firm performance, "firm size" is included as a control variable. Board size is essential; it is a clear indication of both the advisory role and monitoring function. As a firm's age and size increase, the board size will positively change as well (Coles et al. 2008). To operationalize the board size, various studies measured the total number of directors on the board of directors of a firm (Coles et al. 2008; Hassan et al. 2015b). We used the total number of members on the corporate board as a measure of "board size". For detailed findings and studies related to this diversity issue, please refer to a tabular review of previous research (see Appendix A).

### 3. Hypotheses and Model Development

The Upper Echelon Theory argues that board characteristics (top-level management) have an impact on firm performance (Hambrick and Mason 1984). Based on Figure 1, possible hypotheses were made on the basis of previous studies and theories. Consequently, the literature shows the actual relationship between demographic diversity in the boardroom and its impact on firm performance (Hassan and Marimuthu 2014; Hassan et al. 2015a, 2016; Al-Musali and Ismail 2015). As gender participation is an issue in the corporate world and literature, the debate is ongoing whether gender participation matters or not. In addition, ethnic diversity is also a problem. Hence, the proposed hypotheses for this study are as below.

Hassan et al. (2016) and Adams and Ferreira (2009) suggested that the greater the gender diversity on boards, the higher the firm performance. In other words, having women's participation at the board level may improve firm performance (Adams and Ferreira 2009; Nguyen et al. 2015; Hassan et al. 2016). Ismail et al. (2013) found a positive and significant relationship between the presence of women on the board and the firms' performance as measured by ROA. Women have distinctive managerial styles. Lückerath-Rovers and Bos (2011) found that companies in the Netherlands with women on the board performed better in terms of ROE than firms without women on their boards. Based on the discussion, the following hypothesis was developed:

**H1:** Gender diversity (Muslim and Non-Muslim women) among the board members (BODs) has a positive impact on firm performance (Tobin's Q).

According to Yusoff (2010), having board diversity can improve the decision-making process, policies and procedures, and networking. Previous studies related to ethnic diversity and firm

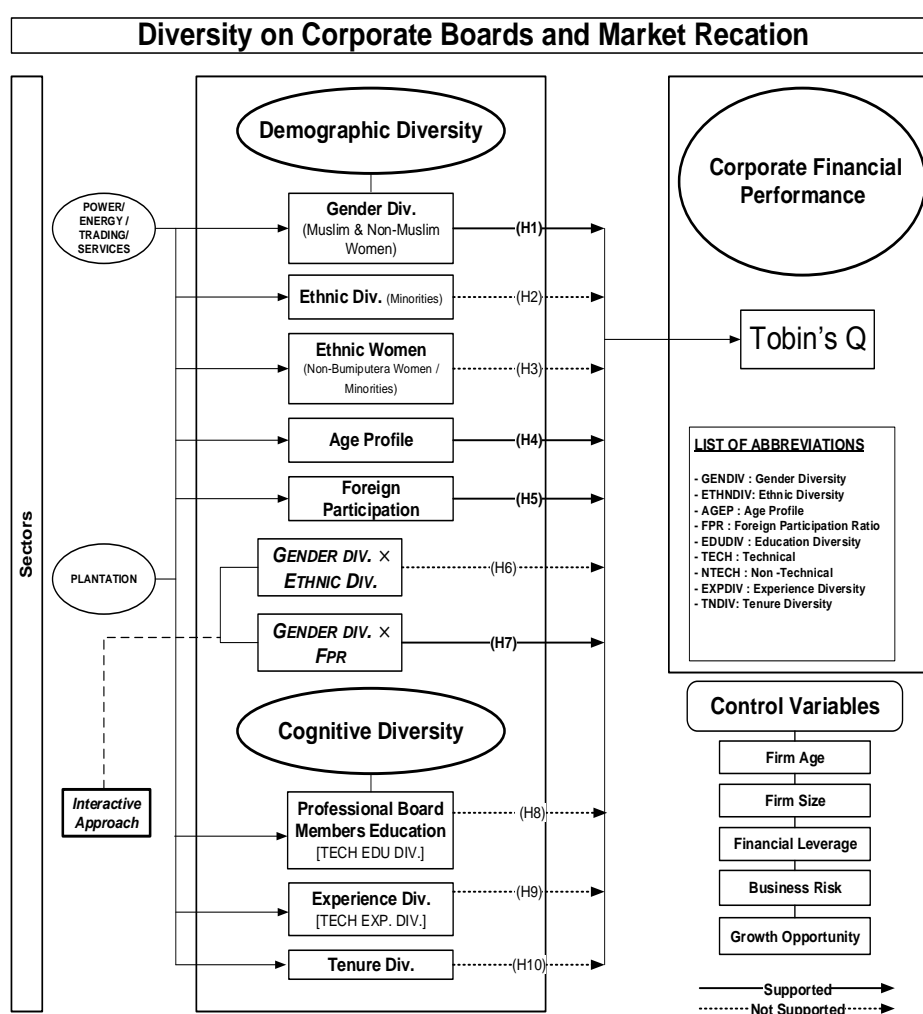
performance in Malaysia have found a positive and significant relationship (Marimuthu and Kolandaisamy 2009b; Shukeri et al. 2012). To maintain a positive relationship with the stakeholders, ethnic boards have to act creatively and innovatively (Marimuthu and Kolandaisamy 2009b). According to Hambrick and Mason (1984), the younger board of directors are more passionate to promote the change and growth in firms. Zainal et al. (2013) found that having foreign director participation over a five-year period tended to reflect slower progress in firms and decreased overall performance. However, in the Malaysian context, ethnic diversity has no impact on firm performance (Ismail et al. 2013; Shukeri et al. 2012). Based on the discussion, the following hypotheses were developed:

**H2:** Ethnic diversity among the board members (BODs) has a positive impact on firm performance (Tobin's Q).

**H3:** Ethnic women participation among the board of directors has a positive impact on firm performance (Tobin's Q).

**H4:** The age profile of the board of directors has a positive impact on firm performance (Tobin's Q).

**H5:** Foreign participation among the board of directors has a positive impact on firm performance (Tobin's Q).



**Figure 1.** Research model (board diversity at board level and firm performance).

In recent literature on strategic management and corporate governance, it is possible that we can use the interaction effect of gender diversity with ethnic diversity and gender diversity with foreign



participation. This study incorporated the interactive variables for further investigation. The presence of gender diversity enhances firm performance as well the interaction between two groups (men and women). With the interaction effect, it may have produced better results and improved firm performance (Erkut et al. 2008). Based on the discussion, the following hypotheses were developed:

**H6:** *Gender diversity with ethnic diversity (Gender Diversity  $\times$  Ethnic Diversity) among board members (BODs) has a positive impact on firm performance (Tobin's Q).*

**H7:** *Gender diversity with foreign participation (Gender Diversity  $\times$  Foreign Participation) among board members (BODs) has a positive impact on firm performance (Tobin's Q).*

In recent literature, educational diversity is defined by the level of educational qualification within different disciplines. According to the upper-echelon theory, a higher education level is considered a good proxy for higher levels of the knowledge base and intellectual competence (Hambrick and Mason 1984). A number of previous empirical studies provide evidence that the educational level of upper echelons is positively associated with financial performance, such as (Darmadi 2013; Hambrick et al. 1996). In addition, functional background and its effect on firm performance have received extensive attention in management research. Researchers have tried to establish whether decision-makers' exhibit biases in decision-making that reflect their functional backgrounds (Tarus and Aime 2014; Tihanyi et al. 2000). According to Hambrick and Mason (1984), the previous research on CEO and top management has shown that board of directors with accumulated knowledge in a particular functional area develop unique skills in that discipline of strategic value to the firm. Experience is an important indicator of knowledge base and skills that decision-makers bring to their jobs. There are rare studies which linked experience diversity with firm performance (Hassan et al. 2015c). Similarly, the board of directors' tenure has received significant attention in the literature with regard to firm performance. Past studies have focused the tenure of CEO or top management and its impact on firm financial performance (Tihanyi et al. 2000). This study addresses the effect of tenure diversity and its impact on firm's financial performance. According to Hambrick and Mason (1984), corporate board members use experiences to shape the lenses that help to address organisational problems and identify strategic opportunities. Short tenure always enhances board independence and reduces manipulation of managers which is considered as critical to the firm (Jensen and Meckling 1976). We can argue that corporate boards with short-tenured members in the firm may not perform actively and effectively for firm performance because of lack of experience on routines, procedures and policies. Hence, tenure diversity is expected to increase the firm performance. Based on the discussion, the following hypotheses were developed:

**H8:** *Technical Education diversity among the board of directors has a positive impact on firm performance (Tobin's Q).*

**H9:** *Technical Experience diversity among the board of directors has a positive impact on firm performance (Tobin's Q).*

**H10:** *Tenure diversity among the board members has a positive impact on firm performance (Tobin's Q).*

The proposed research model is shown in Figure 1. There is a relationship between the demographic and cognitive diversity at the top-level management and firm performance. Here, the variables of the investigation were demographic and cognitive diversity. Demographic and cognitive diversity included gender, ethnic, age profile diversity, education diversity, experience diversity, tenure diversity, and interactive variables. Gender diversity (Muslim and Non-Muslim women) was measured by dividing the total number of females by the total number of board members on the board. Ethnic diversity (minorities) was measured by dividing the total number of Non-Bumiputera (Non-Malay) by the total number of board members. Ethnic women diversity was measured through the Ethnic women (Non-Malays)/Total board members. The dependent variable of this study was firm performance, which was measured by the firm performance indicator (Tobin's Q). The control variables were firm

age, firm size, financial leverage, business risk and growth opportunity. This study has shown the actual relationship between diversity and firm performance.

#### 4. Empirical Design and Method

The study was conducted for 125 listed companies from two sectors (plantations and energy) in Bursa, Malaysia. To investigate this empirical study, the data were collected from the Datastream database and manually, from the annual company reports, over the period of 2009 to 2013 (5 years). The rationale behind choosing listed companies (plantation and energy sectors) was to maintain the homogeneity factor in the data because of the similar nature of the companies and these two sectors having high market capitalization as compared to other sectors. The judgmental sampling technique was used on the basis of the average market capitalization of the firms.

##### 4.1. Measurement

The various constructs were operationalized in the context of demographic and cognitive diversity and firm value. This was a parametric study and used a ratio scale. All of the variables and their measurements are shown in Table 1.

**Table 1.** Operationalization of variables.

Variable	Acronym	Measurement
<i>Dependent Variables</i>		
TOBIN'S Q	Tobin's Q	Ratio: "BV Total Assets -BV of Equity + MV of Equity/BV of Total Asset" where BV = Book Value; MV = Market value
<i>Independent Variables</i>		
Gender Diversity	GENDIV	Ratio: Total number of females (Muslim and Non-Muslim women)/Total board members [Gender diversity]
Ethnic Diversity	ETHNDIV	Ratio: Total Non-Bumiputera (Non-Malay)/Total board members [Ethnic diversity]
Ethnic Women	ETHNFER	Ratio: Total number of ethnic females/Total board members [Ethnic Women Ratio]
Age Profile	AGEP	"By studying the birth year of board members and average age of board members" [Age Profile Diversity]
Foreign Participation	FPR	Ratio: "Number of foreign members/Total board members" (Number of Foreign Directors Nationality) [Foreign Participation]
Gender Diversity × Ethnic Diversity	GENDIV × ETHNDIV	Gender Diversity Ratio × Ethnic Diversity Ratio [Gender Diversity × Ethnic Diversity] (Interactive Approach)
Gender Diversity × Foreign Participation	GENDIV × FPR	Gender Diversity Ratio × Foreign Participation Ratio [Gender Diversity × Foreign Participation Ratio] (Interactive Approach)
Education Diversity	EDUDIVTECH	Ratio: "Total number of board members with Technical Education/Total Board members" [Education Diversity-Technical]
Experience Diversity	EXPDIVTECH	Ratio: "Total number of board members with Technical Experience/Total Board members" [Experience Diversity-Technical]
Tenure Diversity	TNDIV	"Top level management tenure can be calculated by subtracting from the base year (2013) the year in which the executive joined the top-level management" (Number of Years spent in Board) [Tenure Diversity]
<i>Control Variables</i>		
Firm Age	FAGE	"Number of years since incorporation" [Firm Age]
Firm Size	FSIZE	Log of total assets [Firm Size]
Financial Leverage	FINLEV	Total Debt/Total Asset [Financial leverage]
Business Risk	BR	"The standard deviation of operating income/mean of operating income" [Business Risk]
Growth opportunity	GROWTHOPPT	Sales <sub>0</sub> /Sales <sub>-1</sub> [Δ Sales]

Note: × stands for interaction term.



#### 4.2. Choice of Variables and Empirical Models

In choosing the relevant variables, we augmented prior research by incorporating our knowledge of board characteristics and firm performance in Malaysia. This study employed all possible primary and secondary diversity dimensions.

#### 4.3. Dependent Variable

##### Tobin's Q (Market Perspective)

To see the firm performance in the market perspective (market performance), we used Tobin's Q ratio in this study and computed as a ratio; book value of total assets minus the book value of equity plus the market value of equity divided by book value of assets. In recent literature, corporate diversity and women's participation has been positively associated with the stock market. They found that the presence of women is associated positively with the firm's Tobin's Q ([Campbell and Vera 2010](#)).

#### 4.4. Independent Variables

A few previous studies came to the same conclusion that gender is positively linked with performance. There is a strong argument that gender-diverse boards have more alternatives to support its decision ([Singh and Vinnicombe 2004](#)). Diverse boards can improve company image and customer perception in a positive way and achieve better performance. Furthermore, a more gender-diverse group of possible candidates for the board may lead to an increase in quality ([Smith et al. 2006](#)). In light of the "agency" and "resource dependency theories", having females on boards, because their behaviour is different from their counterparts, can change the whole board's behavior. Women are providing better monitoring and advisory services ([Ismail et al. 2013](#)). Furthermore, women on boards may portray a better reputation of the company ([Lückerath-Rovers and Bos 2011](#)).

In Malaysia, the three main ethnic groups are Malay, Chinese, and Indians. Malaysia is considered to be diverse on the basis of religious beliefs, customs, rituals, and languages. Having ethnic board members, they express their ideas logically and with clarity, which contributes to the firm's added value. To maintain a positive relationship with the stakeholders, ethnic boards have to act creatively and innovatively ([Marimuthu and Kolandaisamy 2009b](#)).

Due to the previous results of research on the level of education of the members of BODs and how it affects firm performance, studies showed that level of education diversity at the top management level affects firm performance negatively. There needs to be homogeneity in the educational attainment. However, the level of education also needs to be high. By this, we mean that if more of the members of the board have a higher education and, as a result of the education, more knowledge, firm performance is greater.

#### 4.5. Control Variables

Drawing from the vast body of corporate governance and strategic management literature, firm size, firm age (FAGE), financial leverage (FSIZE), business risk (BR) and growth opportunity (GROWTHOPPT) were used as the control variables for this study. These variables might have had an effect on our mathematical model. These variables have been used in previous studies of strategic management ([Hassan et al. 2015b](#); [Torchia et al. 2011](#)).

#### 4.6. Data Collection

The main source of the data collection was from annual reports of companies and DataStream (Thomson Reuters). The dependent variable and control variables were collected from DataStream and the independent variables data by reading (content analysis) and extracting information from annual reports. For the data extraction and recording, we used the Excel sheets.

#### 4.7. Data Analysis Strategy

Stata 13 software was used to analyse the data and to see the data's reliability, and validity, Cook's distance outlier test, Kolmogorov-Smirnova, Shapiro-Wilk, Skewness and kurtosis tests were used. As per the nature of the parametric data, other diagnostic checks were also run during the rigorous analysis. (See the Appendix B)

#### 4.8. Model Applied

The modeling equation below shows the relationship between the demographic and cognitive diversity (gender diversity, ethnic diversity, Gender Diversity  $\times$  Ethnic Diversity, Age Profile Diversity, Foreign Participation, Gender Diversity  $\times$  Ethnic Diversity, Gender Diversity  $\times$  Foreign Participation, Education Diversity, Experience Diversity and Tenure Diversity) and the market value of the firm (Tobin's Q). To check on the affect of diversity and firm performance, the following model was used:

$$\text{Model: } \text{TOBINQ}_{it} = \alpha + \beta_1 \text{GENDIV}_{it} + \beta_2 \text{ETHNDIV}_{it} + \beta_3 \text{ETHNFER}_{it} + \beta_4 \text{AGEP}_{it} + \beta_5 \text{FPR}_{it} + \beta_6 \text{GENDIV} \times \text{ETHNDIV}_{it} + \beta_7 \text{GENDIV} \times \text{FPR}_{it} + \beta_8 \text{EDUDIVTECH}_{it} + \beta_9 \text{EXPDIVTECH}_{it} + \beta_{10} \text{TNDIV}_{it} + \beta_{11} \text{FAGE}_{it} + \beta_{12} \text{FSIZE}_{it} + \beta_{13} \text{FINLEV}_{it} + \beta_{14} \text{BR}_{it} + \beta_{15} \text{GROWTHOPPT}_{it} + \varepsilon$$

### 5. Empirical Results

#### 5.1. Descriptive Statistics

Table 2 reports the descriptive statistics, and the Skewness and Kurtosis values. The results offer some important insights that parametric data were normally distributed, and there were no multi collinearity issues among variables. The threshold values for Skewness and Kurtosis between  $-2$  and  $+2$  were considered acceptable to prove the univariate normal distribution (George 2003). For further clarity, see Appendix B, the Normal AV plots. The maximum number of women on the board was 3, and the maximum board size was 14 members. Gender diversity (GENDIV) of the firms, on average, is 0.089. Concerning women participation maximum on the boards is 3. The maximum Bumiputera and Non-Bumiputera on board is 12, while a number of Bumiputera and Non-Bumiputera among boards, on average are 2.776 and 2.556 respectively. Ethnic diversity (ETHNDIV) among the boards, on average, is 0.656. Age profile (AGEP) of board of directors, on average, is 57.615. Foreign participation ratio (FPR) in Malaysian corporate boards, on average, is 0.594. Additionally, the board of directors having technical experience, on average, is 1.778 and the range between 0 to 9. Concerning non-technical experience members, on average, is 6.174 and the range between 0 to 14. The average of firms' age is 30.27 years. Firm size (FSIZE), the range between 4.95 to 18.41, with the mean of 13.990 after the total assets of the companies were re-computed as the natural log. The mean of financial leverage (FINLIV) is registered at 0.206, while business risk (BR) and growth opportunity (GROWTHOPPT) are  $-0.286$  and  $11.425$  respectively.

#### 5.2. Correlation Matrix

Pearson's correlation analysis was performed and reported in Table 3. The correlation matrix shows that there was a statistically significant correlation between the variables. The interaction variable [Gender Diversity  $\times$  Foreign Participation (GENDIV  $\times$  FPR)] was strongly positively correlated with firm performance (Tobin's Q). Gender diversity (GENDIV) and foreign participation were also positively correlated with firm performance. However, age profile (AGEP) and tenure diversity (TNDIV) were negatively correlated with firm performance. The variables values that were closer to 1 are strongly correlated.

**Table 2.** Descriptive statistics.

Variables	Abbreviations	Mean	Std. Dev.	Min	Max	Skewness		Kurtosis	
						Statistic	Std. Error	Statistic	Std. Error
Number of Females	FEM	0.699	0.796	0	3	0.879	0.098	−0.017	0.195
Gender Diversity	GENDIV	0.089	0.100	0	0.43	0.754	0.098	−0.46	0.195
Bumiputera	BUMI	3.510	2.776	0	12	0.775	0.098	−0.275	0.195
Non-Bumiputera	NONBUMI	4.360	2.556	0	12	0.217	0.098	−0.435	0.195
Ethnic Diversity	ETHNDIV	0.565	0.305	0	1	−0.336	0.098	−1.127	0.195
Ethnic Female	ETHNFE	0.363	0.584	0	3	1.419	0.098	1.239	0.195
Ethnic Women Ratio	ETHNFER	0.048	0.080	0	0.43	1.592	0.098	1.961	0.195
Age Profile	AGEP	57.615	4.756	44.88	71.5	0.554	0.098	0.144	0.195
Foreign Participation	FP	0.594	1.270	0	8	2.966	0.098	10.182	0.195
Foreign Participation Ratio	FPR	0.073	0.144	0	0.73	2.27	0.098	4.815	0.195
Gender Diversity × Ethnic Diversity	GENDIV × ETHNDIV	0.047	0.065	0	0.31	1.462	0.098	1.66	0.195
Gender Diversity × Foreign Participation	GENDIV × FPR	0.005	0.017	0	0.16	4.825	0.098	31.738	0.195
Technical Education (Members)	TEC EDU MEMB	1.778	1.504	0	7	0.91	0.098	0.572	0.195
Non-Technical Education (Members)	NONTEC EDU MEMB	6.139	2.158	1	14	0.451	0.098	0.248	0.195
Technical Education Ratio	EDUDIV TECH	0.224	0.178	0	0.86	0.63	0.098	−0.074	0.195
Technical Experience (Members)	TEC EXP MEMB	1.744	1.454	0	9	1.309	0.098	3.575	0.195
Non-Technical Experience (Members)	NONTEC EXP MEMB	6.173	2.366	1	14	0.558	0.098	0.278	0.195
Technical Experience Ratio	EXPDIV TECH	0.226	0.179	0	0.9	0.837	0.098	0.638	0.195
Tenure Diversity	TNDIV	7.804	4.635	0.5	25.25	1.032	0.098	1.044	0.195
Board Size	BSIZE	7.848	2.017	4	14	0.614	0.098	0.15	0.195
Firm Age	FAGE	30.271	21.166	1	103.8	1.559	0.098	2.628	0.195
Firm Size	FSIZE	13.990	1.661	4.95	18.41	−0.359	0.098	4.363	0.195
Financial Leverage	FINLEV	0.206	0.169	0	0.78	0.724	0.098	0.036	0.195
Business Risk	BR	−0.286	21.703	−520.75	77.64	−22.121	0.098	532.993	0.195
Growth Opportunity	GROWTHOPPT	11.775	28.793	−70.7	364.74	6.518	0.098	67.234	0.195
Tobin's Q	TOBIN's Q	1.420	0.993	0.36	9.25	3.313	0.098	16.277	0.195

Note:  $N = 625$ ,  $n = 125$ ,  $T = 5$ ,  $\times$  means interaction term.

**Table 3.** Correlation matrix (125 firms).

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
TOBINQ	1															
FAGE	<b>−0.142 **</b>	1														
FSIZE	<b>−0.134 **</b>	<b>0.214 **</b>	1													
FINLIV	<b>−0.137 **</b>	−0.090 *	<b>0.303 **</b>	1												
BR	−0.029	0.039	0.036	0.029	1											
GROWTHOPT	<b>0.111 **</b>	−0.074	−0.051	0.027	−0.047	1										
FPR	<b>0.181 **</b>	<b>0.173 **</b>	−0.034	<b>−0.203 **</b>	0.022	−0.054	1									
ETHNFER	−0.027	0.017	<b>−0.211 **</b>	0.040	−0.031	−0.013	0.030	1								
GENDIV	<b>0.094 *</b>	−0.037	<b>−0.125 **</b>	−0.009	−0.010	0.031	−0.070	<b>0.668 **</b>	1							
ETHNDIV	−0.023	0.010	<b>−0.183 **</b>	<b>−0.155 **</b>	0.003	0.065	<b>0.302 **</b>	<b>0.288 **</b>	<b>−0.095 *</b>	1						
AGEP	<b>−0.082 *</b>	<b>0.406 **</b>	<b>0.275 **</b>	<b>−0.100 *</b>	0.057	<b>−0.086 *</b>	<b>0.098 *</b>	<b>−0.118 **</b>	<b>−0.215 **</b>	0.029	1					
TNDIV	<b>−0.128 **</b>	<b>0.396 **</b>	0.053	−0.038	0.026	−0.064	<b>0.240 **</b>	<b>0.191 **</b>	−0.045	<b>0.438 **</b>	<b>0.491 **</b>	1				
TECHEDUR	0.009	<b>−0.098 *</b>	<b>−0.169 **</b>	<b>−0.118 **</b>	−0.059	0.045	0.035	−0.023	−0.003	0.012	<b>−0.137 **</b>	−0.048	1			
TECHEXPR	0.041	<b>−0.189 **</b>	<b>−0.216 **</b>	−0.008	−0.043	<b>0.121 **</b>	−0.053	−0.047	−0.061	<b>0.137 **</b>	<b>−0.220 **</b>	<b>−0.103 **</b>	<b>0.568 **</b>	1		
GENDIV × ETHDIV	0.050	−0.044	<b>−0.248 **</b>	−0.011	−0.006	0.075	0.045	<b>0.858 **</b>	<b>0.782 **</b>	<b>0.327 **</b>	−0.182 **	0.134 **	0.032	0.053	1	
GENDIV × FPR	<b>0.243 **</b>	0.014	<b>−0.124 **</b>	−0.015	0.024	0.008	<b>0.486 **</b>	<b>0.381 **</b>	<b>0.345 **</b>	<b>0.153 **</b>	<b>−0.108 **</b>	0.049	<b>0.087 *</b>	0.042	<b>0.457 **</b>	1

Note: \*\* Correlation is significant at the 0.01 level (2-tailed); \* Correlation is significant at the 0.05 level (2-tailed).

### 5.3. Cook's Distance Outliers Test

Cook's distance outlier test is used to measure the information of leverage and residual of the observation. Figure 2 is showing that there are some outliers, which are not consistent with the data. After deleting these problematic companies, some cases have large residuals (i.e., the difference between the predicted and observed value for cases are exceptionally large), but some cases do not have much leverage. Therefore, we can conclude that our panel is in smooth form after deleting these cases. [Number of obs. = 625m,  $F(15,609) = 7.47$ , Prob. >  $F = 0.0000$ ].

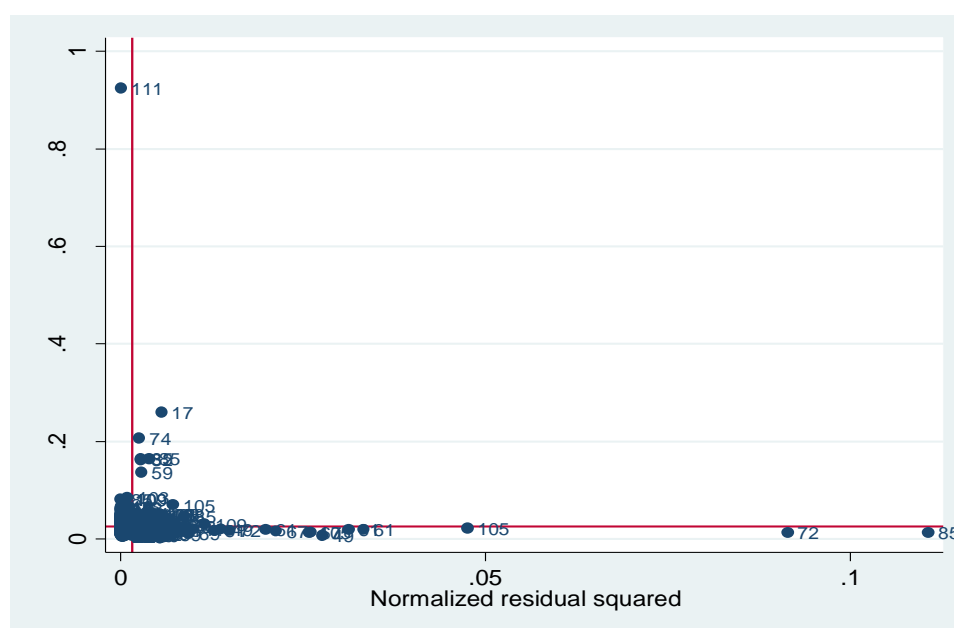


Figure 2. Cook's Distance Outliers Test.

### 5.4. Pooled OLS, Random Effect, and Fixed Effect

The key aspects of diversity and firm value are discussed in literature reviews. Here, appropriate statistical tests were applied with the view of confirming diversity at board level and firm value among Malaysian listed companies. In this study, panel data sets were used for the analyses that involved pooled effect, fixed effect, fixed effect with robust S.E., panel corrected the standard error and random effect methods. The summary of the regression results is shown in Table 4 below. The regressands are Tobin's Q, and regressors are demographic diversity and cognitive diversity. Furthermore, Breusch-Pagan LM Test is rejected  $H_0$ , 455.17 (0.000,  $p < 0.05$ ) pooled OLS effect (PEM) in favor of the random effect model (REM), and the random effect model is rejected in favor of the fixed effect model (FEM) based on Hausman Test 154.42 (0.000,  $p < 0.05$ ) for top listed companies. Referring to Table 4 (fixed effect), for a diagnostic check of panel (i) Multicollinearity (ii) Heteroskedasticity (iii) Serial correlation checks were applied to see the panel data reliability. Under multicollinearity check, it was found that there was no multicollinearity problem in panel data. As ( $vif = 2.38$ )  $< 10$ , it means no multicollinearity problem. In the case of heteroskedasticity, the  $p$ -value is less than 0.05. It means variance is constant. In serial correlation, the  $p$ -value is highly significant, which means there is a serial correlation problem. To address the Heteroskedasticity and Serial Correlation problem, we used robust standard error and panel corrected standard error techniques. The results are based on panel corrected standard error technique.

Table 4 presents the results of the panel data analyses for the 125 firms. The empirical Model tested the effect of the independent variables, control variables and interactive variables on the dependent variable (Tobin's Q). Firstly, we looked at independent variables which have a positive and significant impact on Tobin's Q. GENDIV ( $\beta = 1.667$ ,  $p < 0.01$ ), AGE ( $\beta = 0.010$ ,  $p < 0.01$ ), FPR ( $\beta = 0.855$ ,  $p < 0.01$ ),

and  $GENDIV \times FPR$  ( $\beta = 13.060$ ,  $p < 0.10$ ). Thus, the hypotheses ( $H1$ ), ( $H4$ ), ( $H5$ ) and ( $H7$ ) were supported showing a positive and significant impact on performance (Tobin's Q). Having gender diversity (Muslim and Non-Muslim women), there was a positive and significant impact on firm performance (Tobin's Q). Age profile and foreign participation ratio had a positive and significant impact on firm performance. Moreover, when gender interacted with Foreign participation diversity, there was also a positive and significant impact on performance (Tobin's Q). While,  $ETHNFER$  ( $\beta = -2.013$ ,  $p < 0.05$ ),  $EDUDIV TECH$  ( $\beta = -0.443$ ,  $p < 0.05$ ), and  $TNDIV$  ( $\beta = -0.017$ ,  $p < 0.01$ ). However, hypotheses ( $H3$ ), ( $H8$ ) and ( $H10$ ) were not supported but showing a negative and significant impact on performance (Tobin's Q). Besides,  $ETHNDIV$  ( $\beta = -0.067$ ,  $p > 0.10$ ),  $GENDIV \times ETHNDIV$  ( $\beta = -0.876$ ,  $p > 0.10$ ), and  $EXPDIV TECH$  ( $\beta = 0.212$ ,  $p > 0.10$ ) were not significant. Hence, hypotheses ( $H2$ ), ( $H6$ ) and ( $H9$ ) were not supported and unable to contribute to firm performance. The adjusted  $R^2$  is 0.155. Additionally, control variable  $FAGE$  ( $\beta = -0.006$ ,  $p < 0.01$ ),  $FSIZE$  ( $\beta = -0.050$ ,  $p < 0.10$ ),  $FINLEV$  ( $\beta = -0.590$ ,  $p < 0.01$ ),  $BR$  ( $\beta = -0.001$ ,  $p < 0.05$ ) and  $GROWTHOPPT$  ( $\beta = -0.003$ ,  $p < 0.05$ ) were negative significant which means that all these factors influenced firm performance.

Table 4. Regression analyzes (125 firms).

Variables	Pooled OLS (PEM)	Random Effect (REM)	Fixed Effect (FEM)	Fixed Effect with robust s.e.	Panel Corrected Standard Error
Constant	1.876 *** (2.99)	1.471 * (1.77)	0.869 (0.83)	0.869 (0.92)	1.876 *** (3.69)
GENDIV	1.667 ** (2.18)	0.831 (1.03)	-0.149 (-0.17)	-0.149 (-0.25)	1.667 *** (6.19)
ETHNDIV	-0.067 (-0.36)	-0.085 (-0.32)	-0.378 (-0.96)	-0.378 (-1.00)	-0.067 (-1.11)
ETHNFER	-2.013 ** (-2.12)	2.091 ** (2.22)	3.470 *** (3.42)	3.470 ** (2.39)	-2.013 ** (-2.35)
AGEP	0.010 (0.99)	0.011 (0.85)	0.001 (0.12)	0.002 (0.11)	0.010 *** (2.84)
FPR	0.855 ** (2.52)	0.884 * (1.94)	0.039 (0.07)	0.039 (0.06)	0.855 *** (3.97)
$GENDIV \times ETHNDIV$	-0.876 (-0.54)	-2.184 (-1.33)	-1.949 (-1.09)	-1.949 * (-1.64)	-0.876 (-1.16)
$GENDIV \times FPR$	13.060 *** (4.32)	-11.549 *** (-3.46)	-20.326 *** (-5.57)	-20.326 * (-1.79)	13.060 * (1.81)
EDUDIV TECH	-0.443 * (-1.71)	-0.171 (-0.48)	-0.278 (-0.61)	-0.278 (-0.47)	-0.443 ** (-2.46)
EXPDIV TECH	0.212 (0.79)	-0.043 (-0.12)	-0.193 (-0.46)	-0.193 (-0.26)	0.212 (1.12)
TNDIV	-0.017 (-1.46)	-0.012 (-0.74)	-0.005 (-0.26)	-0.006 (-0.28)	-0.017 *** (-4.14)
FAGE	-0.006 *** (-3.01)	-0.053 (-1.41)	0.039 ** (2.36)	0.039 (2.00)	-0.006 *** (-4.42)
FSIZE	-0.050 * (-1.88)	-0.028 (-0.86)	-0.0262 (-0.62)	-0.026 (-1.02)	-0.050 * (-1.7)
FINLEV	-0.590 ** (-2.34)	0.002 (0.01)	0.236 (0.87)	0.236 (0.7)	-0.590 *** (-3.66)
BR	-0.001 (-0.78)	-0.0007 (-0.67)	-0.000 (-0.09)	0.000 (-0.19)	-0.001 ** (-2.12)
GROWTHOPPT	0.003 *** (2.60)	0.0001 (0.21)	-0.000 (-0.44)	0.000 (-0.62)	0.003 ** (2.00)
$R^2$	0.155	0.087	0.132	0.132	0.155
Breusch-Pagan LM test	455.17 (0.000) *** Reject Ho (means RE is more appropriate)				
Hausman test	154.42 (0.000) *** Reject Ho (means support FE)				
Observations	625	625	625	625	625



Table 4. Cont.

Variables	Pooled OLS (PEM)	Random Effect (REM)	Fixed Effect (FEM)	Fixed Effect with robust s.e.	Panel Corrected Standard Error
Diagnostic Check					
Serial correlation		6.598 (0.001) *** Reject Ho (means auto prob.)			
Heteroskedasticity		$2.7 \times 10^6$ (0.000) *** Reject Ho (means hetero prob.)			
Multicollinearity, VIF	2.38				
Note: Dependent Variable ‘Tobin’s Q’. <i>t</i> -values are in parentheses; Significance levels are * $p < 0.10$ ; ** $p < 0.05$ ; *** $p < 0.01$ EXCEPT Breusch-Pagan LM Test, Hausman Test, Heteroskedasticity and Serial Correlation, which are <i>p</i> -values.					

### 5.5. Interaction Effect

The below Figures 3 and 4 presents the interaction effect between (Gender Diversity, Ethnic diversity, and foreign participation). Moreover, when gender interacted with ethnic diversity, there was also no significant impact on performance (Tobin's Q), but it was negatively correlated. When low gender diversity and low ethnic diversity is on the board, the firm performance is better. However, when the high gender diversity and high ethnic diversity is on the board, the firm performance reduces. Moreover, when gender interacted with Foreign participation diversity, there was also a positive and significant impact on performance (Tobin's Q). When there is low gender diversity and low foreign participation, the firm performance will reduce. Higher the Gender diversity and high foreign participation will increase the firm performance.

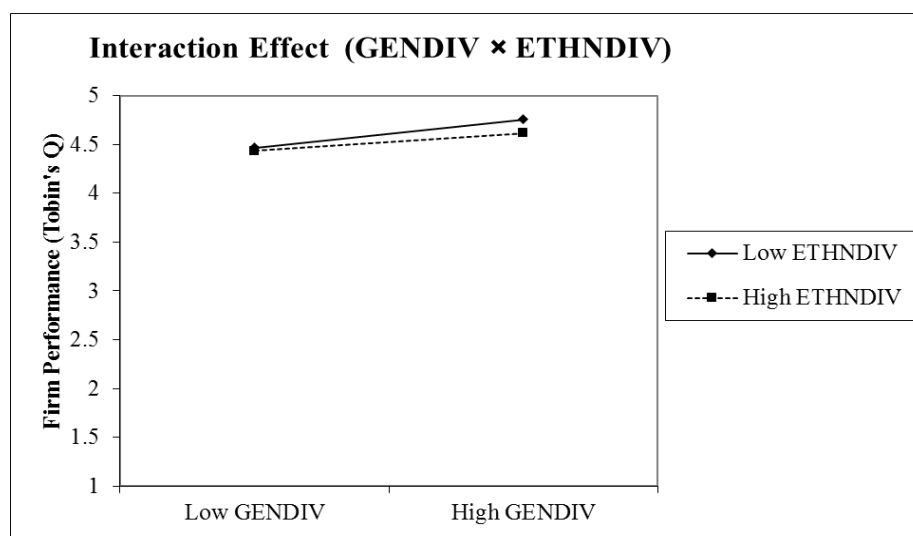
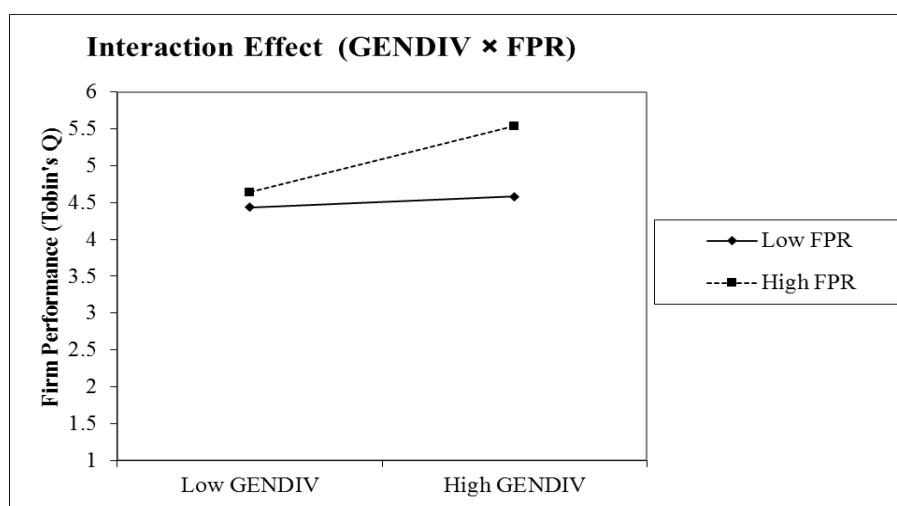


Figure 3. Interaction Effect (Gender Diversity × Ethnic Diversity).



**Figure 4.** Interaction Effect (Gender Diversity × Foreign Participation Ratio).

### 5.6. Summary of the Results

Table 5 summarises the results from the hypotheses testing. Overall, the results support the proposed research model. Women's participation (GENDIV) at the board level contributes towards firm performance, and with the combination of other diversity characteristics, the results are different and meaningful. Women who belong to the minority or majority group are both contributing towards firm performance. However, the only presence of ethnic women (ETHNFER) on the corporate boards can effect firm performance negatively. Foreign participation (FPR) on boards also affects firm performance with the help of women's participation. However, tenure diversity has a negative impact on firm performance. Based on these results, there is evidence for the importance of demographic and cognitive diversity and firm performance.

**Table 5.** Summary results of the hypotheses tested.

Objective: To investigate diversity at top-level management of listed companies with regard to their performance.	Status
<b>Tobin's Q</b>	
<b>H1:</b> Gender diversity (Muslim and Non-Muslim women) among the board members (BODs) has a positive impact on firm performance (Tobin's Q).	<b>Supported (Positive Significant)</b>
<b>H2:</b> Ethnic diversity among the board members (BODs) has a positive impact on firm performance (Tobin's Q).	Not Supported (Insignificant)
<b>H3:</b> Ethnic women participation among the board of directors has a positive impact on firm performance (Tobin's Q).	Not Supported (Negative Significant)
<b>H4:</b> The age profile of the board of directors has a positive impact on firm performance (Tobin's Q).	<b>Supported (Positive Significant)</b>
<b>H5:</b> Foreign participation among the board of directors has a positive impact on firm performance (Tobin's Q).	<b>Supported (Positive Significant)</b>
<b>H6:</b> Gender diversity with ethnic diversity (Gender Diversity × Ethnic Diversity) among board members (BODs) has a positive impact on firm performance (Tobin's Q).	Not Supported (Insignificant)
<b>H7:</b> Gender diversity with foreign participation (Gender Diversity × Foreign Participation) among board members (BODs) has a positive impact on firm performance (Tobin's Q).	<b>Supported (Positive Significant)</b>
<b>H8:</b> Technical Education diversity among the board of directors has a positive impact on firm performance (Tobin's Q).	Not Supported (Negative Significant)
<b>H9:</b> Technical Experience diversity among the board of directors has a positive impact on firm performance (Tobin's Q).	Not Supported (Insignificant)
<b>H10:</b> Tenure diversity among the board members has a positive impact on firm performance (Tobin's Q).	Not Supported (Negative Significant)

## 6. Discussion and Findings

Drawing on the upper-echelon theory and its implication for top-level management. Table 5 presents the hypotheses, which were formulated and tested. Firstly, we investigated the direct relationship between the demographic and cognitive diversity. Independent variables are gender diversity (GENDIV), ethnic diversity (ETHNDIV), ethnic women (ETHNFER), age profile (AGEP), foreign participation (FPR), educational diversity (EDUDIVTECH), experience diversity (EXPDIVTECH) and tenure diversity TNDIV. In addition, interactive variables are (GENDIV  $\times$  ETHNDIV) and (GENDIV  $\times$  FPR) examined. The dependent variable (firm performance – Tobin's Q) and we developed the hypotheses H1 to H10. The results from hypotheses (H1), (H4), (H5) and (H7) show that gender diversity (Muslim and Non-Muslim women), age profile, foreign participation and interactive effect among the board members (BODs) had a positive impact on firm performance (Tobin's Q). The results suggest that gender diversity (Muslim and Non-Muslim women) on the board has a positive and significant impact on performance (Tobin's Q). By validating that Muslim and non-Muslim women are contributing towards firm performance, gender diversity's impact on performance is similar to the previous research findings (Hassan and Marimuthu 2014), but here we combined both majority class women and minority class women together. The results are positive and reliable. The findings show that women's (Muslim and non-Muslim) participation should be promoted at the corporate board levels. This contributes substantially to strengthening the importance of gender diversity in boards. In addition, our results are changing the debate direction of women's participation in the majority (Bumiputera), and minority (Non-Bumiputera) groups occupied companies. As ethnic women participation has a negative and significant impact on firm performance (Tobin's Q), we can argue that the only presence of ethnic women on the corporate boards can reduce the firm performance. Besides, ethnic diversity has no impact on firm performance. Hence, ethnic (minorities/Non-Bumiputera) groups can not perform alone on the corporate boards. It is necessary for companies to promote the diversity by considering all ethnic groups in top-level management (BODs). The majority and minorities can not perform alone better than each other on boards; they are essential for each other. Therefore, the age profile of board of directors has a positive impact on performance. Hence, more aged directors on the board, greater the firm performance. Similarly, foreign participation on the boards has a positively significant impact on firm performance. Companies should encourage to induct foreign board members; it will value addition to organisations by utilizing their skills, ideas, different educational and cultural background. By the combination of gender diversity and foreign participation (interaction term; GENDIV  $\times$  FPR) has a positive outcome on the boards. In addition, when gender diversity interacts with ethnic diversity (interaction term; GENDIV  $\times$  ETHNDIV) on corporate boards, there is no impact on firm performance. We can argue that companies' corporate boards only consist of minorities groups, it could produce the low firm performance. By looking at cognitive diversity, tenure diversity has a negative impact on firm performance. Thus, the longer tenure of directors as a board member can reduce firm performance. It means companies should change top level management with the passage of time and hire new talent to bring positive change in companies. With regard to technical education diversity and experience, diversity have no positive impact. We can debate that companies should introduce board members those have the diverse educational background and versatile experience. In addition, cognitive diversity is also not contributing towards firm performance. Overall, the results are in favour of women's participation with the majority group. The boards should have a mixture of diversity from the majority and minority groups. Those countries who have ethnic groups like Malaysia, the USA, India, and Indonesia should consider including female members of all ethnic groups as female participation is essential to get better performance of the company.

### 6.1. Theoretical Implications and Practical Contributions

After looking at the findings of this study, demographic and cognitive diversity at the board level (i.e., ethnic diversity, experience diversity) have no impact on firm performance (Tobin's Q). Thus, the study failed to support the upper echelon theory in terms of the association between ethnic

diversity, experience diversity and the listed companies' market performance. However, the findings seem to support the theoretical and conceptual assumptions by researchers like (Marimuthu and Kolandaisamy 2009a; Hassan et al. 2015c) that there is an inconsistent result of demographic diversity and cognitive diversity. They suggested that there is a need to investigate this issue in a more holistic way and with different variables, measures that affect this diversity and performance relationship. This view is in line with prior empirical findings (Hassan et al. 2017; Hambrick and Mason 1984; Marimuthu and Kolandaisamy 2009b; Booth et al. 2002; Zainal et al. 2013). In recent years, diversity issues have been investigated with regards to the firm performance of the listed companies. While extensive literature exists on diversity issues, this issue is still under debate, and there have been inconsistent results. Furthermore, this paper attempts to fill the gap in the existing literature, discuss the empirically diverse corporate boards with the interaction approach, and impact on firm performance (Tobin's Q). The contribution refers to the foreign diversity with women's participation, cognitive diversity and their implications for firm performance, shifting the debate from women's participation ratio or presence in boards to a combination of diversity (Interactive approach). The findings provide insightful information for companies with a lesson that suggests that diverse corporate boards can enhance firm performance and these findings are relevant to prior researchers (Hassan et al. 2015a; Darmadi 2013; Kiel and Nicholson 2003). Finally, the article has significant implications for government and policy makers, suggesting that the importance of diversity in the corporate sector has a positive outcome. The results of this paper will help firms' top management, regulatory bodies, and policy makers when they are going to design any policies or strategies.

## 6.2. Limitations and the Pathway for Researchers

Some limitations of this study are addressed here. There were 125 Malaysian listed companies selected out of 798 companies. The variables used in this study were verbalised by different measures as given in the literature and thus might result in inconsistent interpretations. For example, firm size can be measured by total assets, total sales, total market capitalization, etc. Moreover, an individual company may have different accounting policies and practices inclined to result in different figures in the financial data and, therefore, have different implications. In addition, this study used financial databases for the dependent variable and control variables. There is a possibility that the figures are slightly different from actual company annual reported figures. These financial databases do not provide the data with the right formulae as required by the research models and hypotheses in particular.

Future research could include more variables such as structural diversity as well as other types of diversity like corporate diversity. The structural diversity, functional diversity and corporate diversity include board size, type of directorship, CEO duality and director's ownership, etc. To verbalize these constructs, the new researchers may use ratio scale and content analysis. In addition, another possible extension could be the investigation of diversity issues between small scale and large scale or high and low-profit firms. In terms of the methodology, econometrics techniques like GMM, 2SLS, OLS, and GLS, etc. may be adopted to explore this remarkable phenomenon.

## 7. Conclusions

By looking at the demographic and cognitive diversity, the article attempts to investigate the contribution of diverse corporate boards in firm performance. The findings from the demographic and cognitive diversity at the board level with regards to firm performance have significantly positive and negative results. The interaction approach is very positively significant with firm performance. As ethnic women, participation on corporate boards and ethnic diversity have no significant impact on firm performance, and as previous studies also showed inconsistency in the results, it should be noted that foreign diversity with gender diversity has a positive and significant impact on firm performance. Companies should promote gender diversity and foreign participation at board level. Hence, women's (Muslim and Non-Muslim) participation at the board level can enhance the profits

and perhaps improve the internal operations of their companies. Additionally, tenure and technical education diversity have significantly positive and negative results. Hence, longer the tenure of directors on the corporate boards can decrease the firm performance. Similarly, technical education diversity on the boards can have an adverse impact on firm performance. As a result, this study is inconsistent with previous research in the case of ethnic diversity. There might be several reasons behind this issue. Nevertheless, the results depict an interesting picture regarding diversity and firm performance. Having women's participation (Muslim and Non-Muslim) on boards enhances firm performance. In a nutshell, we can conclude that countries with a majority population, must have women's participation on corporate boards, which will result in greater performance. However, the presence of diversity at the board level does have an impact on firm value, and hence, in the case of listed companies, the more diversified a board is, the higher the firm performance will be.

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**Author Contributions:** All authors equally contributed to the paper.

**Conflicts of Interest:** The authors declare no conflict of interest.

## Appendix A

**Table A1.** Review of research related to diverse corporate boards and firm performance.

Factor “A” (Diversity in BODs)	Factor “B” (Corporate Governance)	Factor “C” (Firm Performance)	Key Findings/Outcomes	Methods/Techniques/Theories/Models	Author Name/Year
Demographic Diversity	Conceptual	ROA & ROE	There is inconsistency in previous results.	Develop a conceptual framework	<a href="#">Hassan et al. (2015c)</a>
Women on Boards	Positive	Market capitalization	Women participation enhance firm performance	Regression, Correlation	<a href="#">Hassan et al. (2016)</a>
Ethnic diversity	Negative	Market capitalization	Ethnic diversity is negatively associated with market performance	Regression, Correlation	<a href="#">Hassan et al. (2015a)</a>
Demographic Diversity (Gender Diversity, Ethnic diversity, Age profile of board members)	Age has positive impact	Tobin’s Q	Demographic diversity at board level does have a relationship with market value.	Panel Data	<a href="#">Hassan et al. (2015b)</a>
Corporate governance mechanism	Mechanism	Ownership & Control	Effective corporate governance mechanism is the best practice to reduce the ownership and control problems in the organisations	Linear Regression	<a href="#">Hassan and Marimuthu (2015)</a>
Gender Diversity	Positive	Firm value	Women participation does have a relationship with increasing market value.	ANOVA, Linear Regression	<a href="#">Hassan and Marimuthu (2014)</a>
Gender Diversity among BODs	Positive impact	Average effect is positive.	- Gender diversity in US firms, females have a significant impact on firm inputs & outcomes of firms. - Gender quotas for BODs can reduce the firm value.	- The source of data from annual reports. - Agent Theory - Statistical tools used for empirical analysis.	<a href="#">Adams and Ferreira (2009)</a>
Gender Diversity among TMTs	Positive impact	The effect is positive.	- Gender diversity in Top Mgt. Effects Agency Cost. - Greater percentage of females in top management of companies, lower agency cost, - companies those have less competitive market showed the negative relation of diversity & agency cost.	- The source of data from annual reports. - Univariate/Regression analysis used - Ratio formula, Weighted moving average	<a href="#">Jurkus et al. (2011)</a>
Gender Diversity among BODs	Good Governance	Positive	Diversity resolves problem and issues and a case of good governance.	Comparison of different studies.	<a href="#">Fitzsimmons (2012)</a>
Gender Diversity among BODs	Positive impact on Governance	High Performance	Companies with a higher proportion of women in top mgt. Perform better.	Questionnaire or survey method used.	<a href="#">McKinsey &amp; Company (2007)</a>
Demographic diversity in TMTs	Not discussed	High Performance	- Diversity at a high level can raise conflicts & performance gain results. - Improved the decision-making and performance.	- Upper echelon theory - a longitudinal study. - Demographic Characteristics. -Homogeneity & Heterogeneity.	<a href="#">Carson et al. (2004)</a>



Table A1. Cont.

Factor “A” (Diversity in BODs)	Factor “B” (Corporate Governance)	Factor “C” (Firm Performance)	Key Findings/Outcomes	Methods/Techniques/Theories/Models	Author Name/Year
Workforce Diversity (Racial)	Not discussed	Positive Impact	<ul style="list-style-type: none"> <li>- Diversity is positive factor</li> <li>- The minority is friendly and significantly impact on results.</li> <li>- Diversity is economic benefits Competitive advantage &amp; stakeholder profitability</li> </ul>	<ul style="list-style-type: none"> <li>- Cultural diversity</li> <li>- Financial Performance through</li> <li>- ROS</li> <li>- ROE</li> <li>- ROA</li> <li>- ROI</li> </ul>	Von Bergen et al. (2005)
Workforce Diversity (Racial)	Not discussed	Positive Impact	<ul style="list-style-type: none"> <li>- Diversity Driver Model” which is based on BEM.</li> <li>- Diversity Model has used to manage diversity and for improvement.</li> </ul>	<ul style="list-style-type: none"> <li>- Diversity Driver Model used</li> <li>- Self- assessment approach</li> </ul>	Farrer (2004)
Demographic Diversity (Ethnic diversity and Gender diversity)	Not discussed	Positive Impact	BOD diversity has a significant impact on financial performance; TMT’s Diversity does not any impact on financial performance.	<ul style="list-style-type: none"> <li>- Agency theory</li> <li>- Stewardship theory</li> <li>- ROE</li> <li>- Ratio tool</li> <li>- Non-probability sampling</li> </ul>	Marimuthu and Kolandaisamy (2009a)
Diversity in TMTs	Not discussed	Positive Impact	Demographic diversity of senior management teams is positively	<ul style="list-style-type: none"> <li>- Partial correlation analysis</li> <li>- Upper Echelon Theory</li> </ul>	Nishii et al. (2007)
Diversity among BODs	Not discussed	Significant Impact	<ul style="list-style-type: none"> <li>- Gender diversity has a positive influence on firm financial performance.</li> <li>- Women directorship may affect firm performance.</li> </ul>	<ul style="list-style-type: none"> <li>- ROA</li> <li>- OLS regression analysis</li> <li>- Random Sampling</li> </ul>	Julizaerma and Sori (2012)
Diversity (Gender)	Good Governance	Positive	Gender of the CEO matters regarding firm performance.	<ul style="list-style-type: none"> <li>- ROA</li> <li>- T-test</li> </ul>	Khan and Vieito (2013)
Diversity in BODs (Gender, Ethnic, Nationality)	Good Governance	Positive	Gender diversity was negatively linked with firm performance while board nationality and board ethnicity were positive in firm performance	<ul style="list-style-type: none"> <li>- Resource dependency theory</li> <li>- Agency theory</li> <li>- Generalized Least Square (GLS)</li> <li>- Fixed-Effect and Random-Effect models</li> </ul>	Ujunwa et al. (2012)
Diversity in BODs (Gender, Ethnic, Nationality)	Good Governance	Positive Impact	Personal characteristics BODs may affect corporate performance	<ul style="list-style-type: none"> <li>- Resource dependency theory</li> <li>- EPS, ROA</li> </ul>	Cheng et al. (2010)

## Appendix B

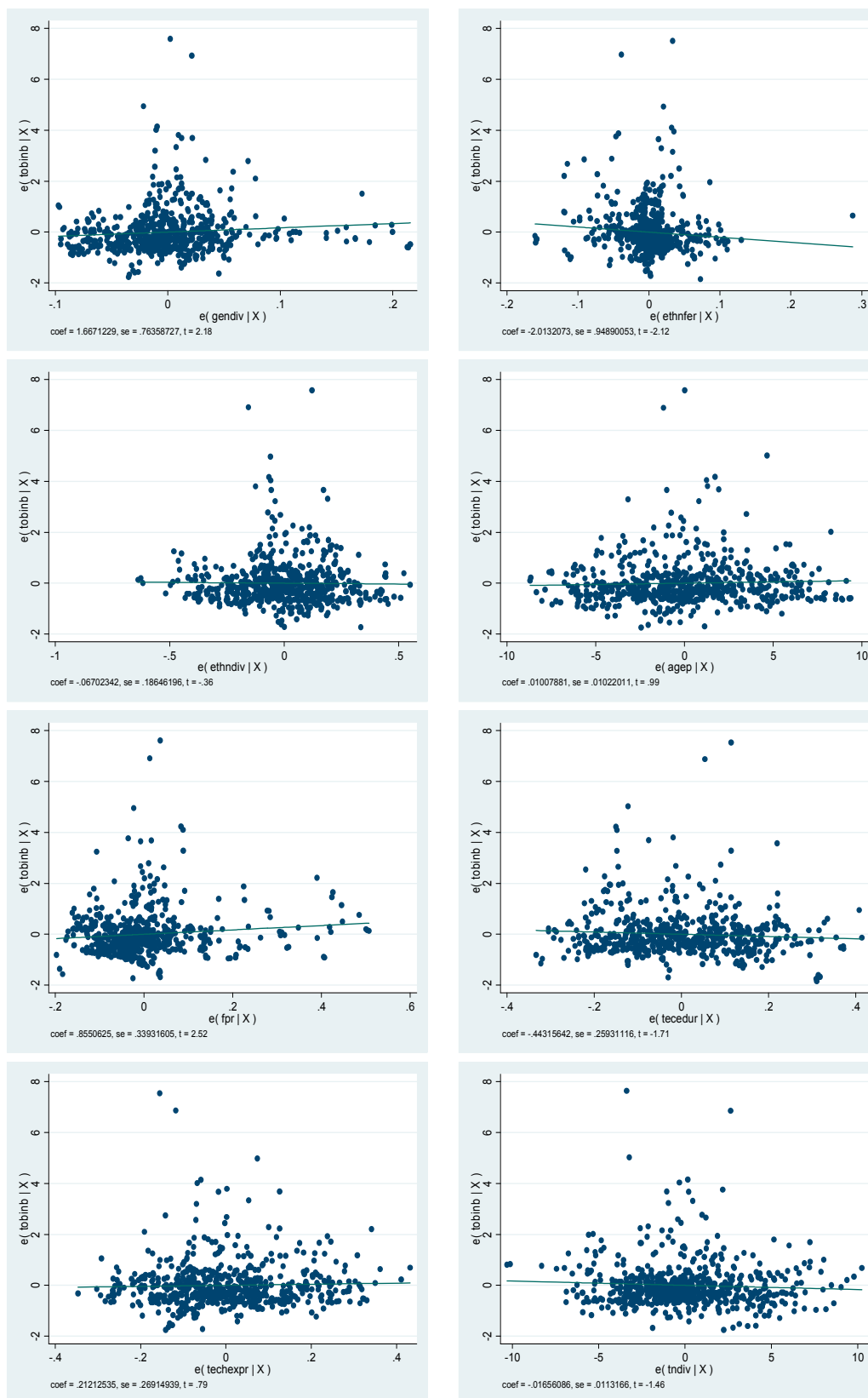


Figure A1. Cont.

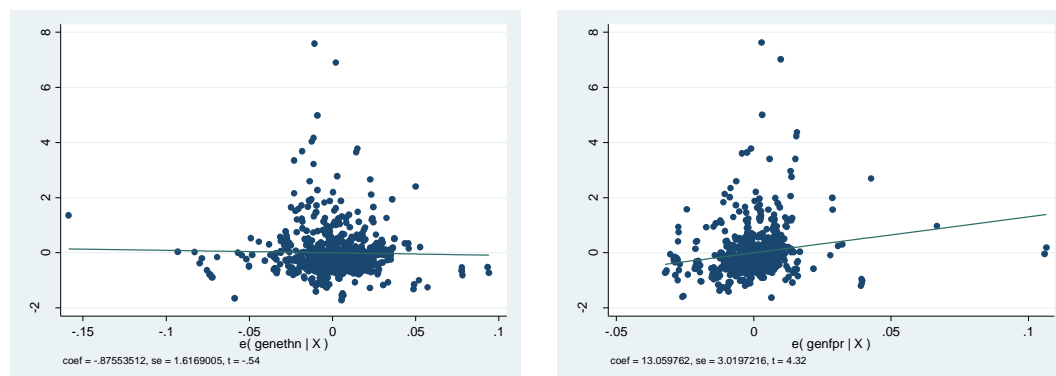


Figure A1. AV plots for outliers.

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