GENDER DIVERSITY AND FIRMS' FINANCIAL PERFORMANCE IN MALAYSIA

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ABSTRACT

This study aims to investigate the relationship between gender diversity in a firm's board of directors and financial performance of firms listed on Bursa Malaysia for the period between 2009 and 2013. Using unbalanced panel data analysis, we tested whether gender diversity in the boardroom may influence the firm's performance, as measured by Tobin's Q. We employed four different proxies for gender diversity (the dummy variable for women, the percentage of women on the board, the Blau index, and the Shannon index) to provide a more comprehensive measure of gender diversity. This study suggests that a higher degree of female representation on the board increases a firm's financial performance. Positive discrimination favouring female boardroom appointment is therefore likely to persist as a feature of the corporate governance landscape in Malaysia.

Keywords: gender diversity, board of directors, firm performance, corporate governance, Shannon index, Blau index, panel data, Malaysia, board composition, female representation

INTRODUCTION

Following the collapse of high-profile firms such as Enron in 2001 and WorldCom in 2002, good corporate governance practices have been considered crucial and are now recognised as being among the driving forces sustaining a firm's growth in the long run. The corporate collapses of the last decade happened due to a lack of

corporate monitoring in the firms, which leads to significant agency problems in the management and the board of directors. This has resulted in an interest in looking at board composition in terms such as the percentage of independent directors, the diversity of the directors in terms of gender, education, experience, and age, and the networking of the directors. This is crucial as a better mix of directors offers greater perspective in decision-making processes (Randøy, Thomsen, & Oxelheim, 2006). In addition, Campbell and Minguez-Vera (2008) have also pointed out that ethnic and gender diversity among directors provides new and better perspectives and, hence, enhanced performance of the firm.

The corporate governance codes of conduct from both developed and developing countries (Norway, Italy, France, Malaysia, and other) have begun to impose gender quota systems as an initial measure to increase board diversity (Oba & Fodio, 2013). This system has received positive feedback in European countries, where the number of women on corporate boards has increased to over 40% (Corkery & Taylor, 2012). Nevertheless, in developing countries such as Malaysia, the corporate boardroom is still skeptical of policies that increase the percentage of women directors in the corporate boardroom. This is due to Asian cultural differences, according to which women in Asia are expected to have sole responsibility for family and household duties (see Chan & Lee, 1994; Omar & Davidson, 2001). This cultural difference may limit Asian women from advancing to higher positions in the workforce and may thus lead boards to see little evidence that gender imbalance affects firm performance. Due to the low number female directors in Malaysia, the Prime Minister has further urged that the incidence of female board members at government-linked companies and all listed firms be raised to 30% by 2016.

The value of including women in the corporate boardroom is debatable in terms of policy implication. This is because empirical evidence of the contribution of women directors on firm performance is still unclear. Greater gender diversity on the board tends to generate more conflicting opinions, thus leading to inefficient and ineffective decision making, which can reduce the firm's performance (Campbell & Minguez-Vera, 2008). Firms also incur higher costs associated with collective decision-making given a diversified board (Daunfeldt & Rudholm, 2012). In fact, mixed evidence has been reported in countries that have official gender quota systems (such as Norway, Italy, and France), with the consensus of evidence failing to find any relationship between gender diversity and firm performance (Daufeldt & Rudholm, 2012; Rose, 2007). Smith, Smith and Verner (2006), on the other hand, found only a weak negative relationship between gender diversity and firm performance.

Yet empirical studies also suggest the importance of gender diversity in producing a better perspective, and hence contributing to better financial performance (Dobbin & Jung, 2011; Gul, Hutchinson & Lai, 2013; Marinova, Plantenga & Remery, 2010; Rose, 2007). In a similar vein, Dezsö and Ross (2012), Rose (2007) and Smith et al. (2006) also found that gender diversity was positively related to the firm's performance in emerging economies. This is consistent with the studies of Barnett, Morley and Piterman (2010), Carter, Simkins, and Simpson (2003), and Shrader, Blackburn, and Iles (1997), which found that gender diversity leads to better financial performance in firms.

Consequently, it is questionable whether legislation is a good way to facilitate greater board gender diversity, as mixed results have been found regarding the contribution of women directors to the corporate boardroom. This is especially crucial for developing nations that try to implement the gender quota system, which may affect the performance of the firms in the long run. In this case, we aim to study the effect of gender diversity in the board of directors on financial performance among Malaysian public listed firms. We have selected Malaysia as the sample for our study because the participation rate of women in the corporate boardroom has remained below 10% even four years after the 2011 enforcement of the rule requiring that Malaysian boards of directors be composed of at least 30% women. It is this important to ascertain the performance of the public listed companies in Malaysia is not affected with the inclusion of female directors in corporate boardrooms in order to convince stakeholders and to fulfill the public policy.

Malaysia has also been selected because it represents the Asian region well in terms of cultural diversity, which serves as the main avenue for such study to be conducted. Further, to enrich our model estimations, we used multiple proxies for gender diversity, including the Blau index of diversity (BLAU), a dummy for woman on the board of directors (DWOMEN), the Shannon index of diversity (SHANNON), and the percentage of women on board of directors (PWOMEN) by controlling the firms' debt level, return on assets, and firm size. Our study differs from earlier studies in the context of Malaysia. In comparison with the study by Taghizadeh and Saremi (2013), we have conducted a more robust estimation in our gender diversity and firm financial performance investigation. We have used Tobin's Q as our firm's financial performance proxy, while their study only used ROA and ROE. Furthermore, we have applied multiple proxies for our gender diversity measurement (BLAU, DWOMEN, SHANNON, and PWOMEN) while they focused only on the percentage of women on board of directors. Additionally, in comparison with the study of Johl, Kaur and Cooper (2015) which was focused on examining the effect of board characteristics on a firm's ROA, our analysis

attempts to identify how gender diversity affects a firm's financial performance. Based on our findings, we found that gender diversity on the boards of Malaysian public listed firms is positively related to the firm's financial performance. This provides further support of the implementation of the gender quota policy in the country, which aims to increase the performance and long-term survivability of the firms in the more complex business world of the future.

This remainder of the paper is structured as follows: The next section describes the empirical evidence related to gender diversity and firm financial performance in various countries. We then explain the development of the hypothesis in the subsequent section. This is followed by a discussion of the data and estimation models applied in the analysis. Next is a discussion of the empirical results and finally, the conclusion.

LITERATURE REVIEW

The topic of board composition is a growing area of study and one of the most important variables is the presence of women directors on the board and its relationship with firm performance. Research in this area has been prompted by the growing concern that women continue to be underrepresented on corporate boards in most countries of the world. Although the relationship between board gender diversity and firm performance is one of the focuses of related studies, the empirical evidence is inconclusive. A great amount of attention has been paid to analysing the relationship within mature economies such as the United States and Scandinavia, with only a handful studies have been performed using data from emerging economies. However, the evidence in these is also mixed. Campbell and Minguez-Vera (2008) suggest that these differences may be due to data collected from different countries having different board systems and due to different study periods. Other than the geographical region, different estimation methods and unobserved factors may affect the results. In addition, these differences may also be characterised by different cultural, legal, social, and economic environments in which the firms are operating.

Studies of the impact of gender diversity in Asian regions and in developing countries are relatively scant because of skepticism about including female directors in the corporate boardroom. Johl, Kaur and Cooper (2015) have studied the impact of board characteristics and firm performance of 700 public listed firms in Malaysia for the year 2009. They found that women's participation is positively related to the return on assets. This is consistent with the work of Taghizadeh and Saremi (2013); their study examined 150 public listed firms in Malaysia using

data from 2008. Similar results have been found by Fan (2012) for the firms listed on the main board of Singapore Exchange; Fan found that gender diversity increases the firm's value as measured by Tobin's Q. Nevertheless, Marimuthu and Kolandaisamy (2009) as well as Shukeri, Shin, and Shaari (2012) found no relationship between gender diversity and firm performance for 300 listed firms on Bursa Malaysia.

In addition, factors such as ethnicity and educational background also influence the performance of the board. This may be because gender diversity provides different perspectives and thought, as well as commitments in terms of time, unity, and collegiality, which can contribute positively to the firm's performance (Barnett et al., 2010). In fact, Jhunjhunwala and Mishra (2012), using data from 30 firms' data listed in Sensex, found that board diversity in terms such as gender, age, tenure, nationality, educational background, and working experience does not contribute to the firm's performance.

On the other hand, empirical studies on the contribution of female directors in the United States are rather positive. Erhardt, Werbel, and Shrader (2003) study the relationship between board diversity measured as the percentage of women and as female minority on board of directors and firm performance of 127 large American firms. They found that a diverse board positively affects the firm's performance measure in terms of return on assets and return on investment. This is supported by the study of Carter et al. (2003), where board diversity was found to positively relate to the firm's value.

Adams and Ferreira (2009) and Farrell and Hersch (2005) suggest that successful firms are more likely to recruit women to top management. They found that female directors have significant impact on board input and firm profitability, as well as on the value of the firm, which supports the results of Shrader et al. (1997) regarding 200 firms listed in the *Wall Street Journal*.

In addition, Stigring and Lyxell (2011) also found a positive relationship between gender diversity and firms' profitability level as measured by the return on assets and return on equity. Nevertheless, their study failed to take into account the endogeneity problems and the causal relationship between gender diversity and firm performance, as highlighted by Dobbin and Jung (2011). Srinidhi, Gul and Tsui (2011) found that a higher number of female directors leads to higher earning quality, even after considering the endogeneity problems highlighted above. This is also supported by Dezsö and Ross (2012) in their analysis of 1500 firms listed in S&P. Gul et al. (2013) further suggest that a positive relationship between gender diversity on the board and analysts' earnings forecast accuracy for 2200 firms

listed in the United States. This clearly shows the importance of gender diversity in the United States.

In European and Scandinavia countries, the relationship of the gender diversity and various firm's performance measures (return on assets, return on equity, and Tobin's Q) are rather weak. Bianco, Ciavarella and Signoretti (2011), Daunfeldt and Rudholm (2012), Marinova et al. (2010), Randøy et al. (2006), Rose (2007), Schwizer, Soana and Cucinelli (2012), and Stigring and Lyxell (2011) all failed to identify any significant relationship between gender diversity and a firm's performance measures. Luckerath-Rovers (2011) found that firms with female directors performed better in their study of 116 Dutch firms listed on the Amsterdam Euronext Stock Exchange. However, Ahern and Dittmar (2006) found that the stock prices of Norwegian firms declines with the appointment of women directors to fulfill the gender quota system.

As the results are still mixed in terms of the contribution of gender diversity, especially in developing nations, we have further extended the study by analysing the gender diversity with different proxies (the Blau index of diversity, a dummy for women on the board of directors, the Shannon index of diversity, and the percentage of women on board of directors) to confirm the contribution of women's participation in corporate boardrooms. The use of different proxies is important to tap into developing markets such as Malaysia, as the percentage of woman directors may be low or insignificant; hence the use of different indexes to capture the lower representation.

Hypotheses Development

The relationship between gender diversity in the corporate boardroom and firm performance can be explained using the resource-based theory. According to resource-based theory, gender diversity in an organisation is view as an intangible and socially complex resourced that provides firms with sustainable competitive advantage (Grant, 1991; Barney, 2001). This is because gender diversity increases creativity and innovation in firms which is considered as valuable, rare, inimitable and non-replaceable. This is supported by Carter et al. (2003), Erhardt et al. (2003) and Stigring and Lyxell (2011) that found greater gender diversity in the boardroom may positively influence a firm's financial performance (Carter et al., 2003; Erhardt et al., 2003; Stigring & Lyxell, 2011). The resource-based theory highlights the importance of the female directors in the corporate boardrooms because it contributes to better synergy from the interaction of male and female directors as a source of competitive advantage. In this context, female directors are able to provide different perspectives and improve in decision-making processes

(Campbell & Minguez-Vera, 2008) and therefore contribute positively toward firms' performance. Besides, a study by Srinidhi et al. (2011) reveals several mechanisms through which female representation on the board of directors may improve the firm's earning quality, through expansion of scope in discussion and decision making in the board. In addition, women are said to exhibit greater diligence in monitoring and to demand greater accountability for managers' performance. In this case, female directors could improve board oversight and therefore improve earnings quality.

On the other hand, agency theory focuses on the relationship between the shareholder and manager relationship. The theory suggests that higher gender diversity creates a better control mechanism between the boards and management via enhancing boardroom independence and better monitoring system. Besides, female directors are able to improve firms' earning quality through the reduction of opportunistic earnings management, because women directors are said to be less tolerant of opportunistic behaviour (Srinidhi et al., 2011), hence reduces the conflict between the boards and the managers.

Consequently, gender diversity on the board sends a positive signal to the market that the organisation focuses more on corporate governance and that the company is doing well, thus improving the firm's reputation. Larkin, Bernardi and Bosco (2012) indicates that interaction between the firm's recognition and multiple female board directors is associated with higher overall returns and lower negative returns for stockholders, as measured by market prices of the firm's common stock. We therefore expect that there is a positive and significant relationship between board gender diversity and firm financial performance.

We measure the degree of female representation on the board of directors using a dummy variable for women on the board, the percentage of women on the board, the Blau index of diversity, and the Shannon index of diversity. The use of the Blau and Shannon indices is particularly useful in our study, because they take into account the number of gender categories, as well as the distribution of board members between them. The Blau index is calculated as $1 - \sum_{i=1}^{n} P_i^2$ where P_i is the percentage of board members in each category and n is the total number of board members. The Blau index for gender diversity thus lies between 0 and 0.5, with a value of 0.5 indicating that the board consists of an equal number of men and women.

On the other hand, the Shannon index is calculated as $-\sum_{i=1}^{n} P_i$ where P_i and n have the same meanings as in the case of the Blau index. The larger the Shannon index, the more diversified is the corporate board structure; in our case,

the more diverse in terms of gender. The Blau and Shannon indices both measure diversity, though the Shannon index is more sensitive to small changes in the gender composition of boards, given that it is calculated as a logarithm of gender diversity (Campbell & Minguez-Vera, 2008). The use of both indices allows us to check for consistency and robustness in the results. In this case, a similar hypothesis is developed as for female representation, because greater gender diversity may lead to more imagination in company strategies and hence in better firm performance. Besides, diversity may also improve the decision making of firms from different perspectives due to differences in the cognitive levels of males and females. Based on this discussion, we propose the following hypotheses:

> H1: There is a significant positive relationship between female representation on the board of directors and the firm's financial performance.

> H2: There is a significant positive relationship between gender diversity (measured by the Blau and Shannon indices) and a firm's financial performance.

METHODOLOGY

We used unbalanced panel data analysis based on generalised least square (GLS) to ascertain the relationship between women directors and firm performance. The use of GLS estimation helps to take into account the unobserved heterogeneity that would result in bias. The impact of gender diversity on firm performance is estimated using Equation (1):

$$Q_{it} = \beta_0 + \beta_1 WOMEN_{it} + \beta_2 LEVER_{it} + \beta_3 ROA_{it} + \beta_4 SIZE_{it} + \eta_I + \varepsilon_{it} \qquad (1)$$

where Q_{it} represents Tobin's Q value for firm i at time t, $WOMEN_{it}$ is female representation on board of directors for firm i at time t (measured by the four alternative variables: the dummy variable for women, the percentage of women on the board of directors, the Blau index, and the Shannon index). $LEVER_{it}$ is the debt level for firm i at time t, and ROA_{it} is the return on assets for firm i at time t; $SIZE_{it}$ denotes the firm's size for firm i at time t and η_I represents unobservable heterogeneity.

We employ the pooled ordinary least square (POLS) model in conjunction with the fixed effect model (FEM) and the random effect model (REM) for more robust estimations. The Breusch–Pagan Lagrange Multiplier is used to decide the

appropriateness of the random effects estimation over the normal OLS estimation. The rejection of null in the LM test shows the existence of heterogeneity in the variables, meaning that the use of OLS may not be appropriate. We then proceed to perform the Hausman test to identify whether a correlation between unobservable heterogeneity and the explanatory variables exists. This test is used to test the correlation between the unique errors (U_i) and the regressors. The rejection of the null hypothesis favors the fixed effect model in which unobserved heterogeneity and explanatory variables exist (Campbell & Minguez-Vera, 2008).

Data and Sample

Panel data analysis is employed to examine the relationship between board gender diversity and firm performance. The sample consists of nonfinancial firms listed on the FTSE Bursa Malaysia Top 100 Index for the period between 2009 and 2013. We used a five-year period to mitigate any potential sample bias due to changes from KLCI to FTSE Bursa Malaysia KLCI. Due to data constraints, we were only able to collect a sample of 76 nonfinancial firms and use 336 observations for the estimation process. The identities of directors were obtained from the firms' annual reports. From these reports, the number of board members is calculated. Accounting data, such as the book value of debt, the book value of total assets, and the return on assets were obtained from Bloomberg. Similarly, the number of shares and share prices were also obtained from Bloomberg.

Variables Definition

We use Tobin's Q as a proxy of firm value to measure the firm's financial performance. Tobin's Q is calculated using the sum of the market value of stock and the book value of debt divided by the book value of total assets. We employed Tobin's Q in our study because it reflects the market's expectation of the firm's competitive advantage. Unlike accounting data that reflects only past performance, Tobin's Q is more forward looking and portrays a firm's future prospect, given the superiority of managerial control. Firms with a high Tobin's Q of more than 1.00 have better investment opportunities, higher growth potential, and shows indications that management has performed well with its assets (Wolfe & Sauaia, 2003). Firms with Tobin's Q ratio of less than 1.00 are associated with poor utilisation of available resources (Campbell & Minguez-Vera, 2008).

We employed different proxies to measure gender diversity. This includes the use of the dummy variable for women (DWOMEN), the percentage of women on the board (PWOMEN), the Blau index, and the Shannon index. The use of various measures enables more comprehensive analysis of female representation

in the corporate boardroom. The Blau index is measured as $1 - \sum_{i=1}^{n} P_i^2$, where P_i is the percentage of board members in each category and *n* is the total number of board members. The values of the Blau index range from 0 to a maximum of 0.5. The maximum value of 0.5 occurs when the firm has an equal number of men and women on the board of directors. On the other hand, the Shannon index is calculated as $\sum_{i=1}^{n} P_i In P_i$, where P_i and *n* are similarly the percentage of board members in each category and the total number of board members. The values for the Shannon index range from 0 to a maximum of 0.69. The maximum value of 0.69 occurs when both males and females are present in equal proportions and diversity is thus maximised. The advantage of the Blau and Shannon indices is that they take into account the number of gender categories as well as the evenness of the distribution of the board members among them. The Shannon index is also more sensitive to small differences in the gender composition of boards, given that it is a logarithm of total assets (Campbell & Minguez-Vera, 2008). Besides these indices, we also resort to conventional measures of female representation by using the dummy variable for women representing the firm (i.e., when there is at least one woman on the board) and also the size of the female representation in the boardroom as the percentage of women on the board of directors. Board gender diversity is expected to have a positive and significant relationship with firm financial performance, given that there are various benefits for appointing women to the boardroom, as discussed above.

Several control variables have also been adopted from the study of Campbell and Minguez-Vera (2008). Among these are the *debt level* (*LEVER*, the ratio of total debt to total assets), the return on assets (ROA)*,* and the *firm size* (*SIZE*, the natural logarithm of total assets). The debt level (*LEVER*) is used as a control variable because a firm's debt policy is considered to be significant decision that influences the firm's value (Sadeghian, Latifi, Soroush, & Aghabagher, 2012). The debt level is expected to have a positive and significant relationship with Tobin's Q, since debt is an efficient mechanism for reducing the agency problem and therefore for increasing the firm's financial performance (Campbell & Minguez-Vera, 2008). The return on assets (ROA) is used as a control variable because it is an indicator of the firm's ability to produce income for its shareholders (Carter, D'Souza, Simkins, & Simpson, 2010). The return on assets is also expected to have positive and significant relationship with Tobin's Q, since more profitable firms tend to have higher value. Firm size (*SIZE*) is often used as a control variable in the analysis of firm financial performance and several studies have shown that asset size is related to Tobin's Q (Yermack, 1996). The firm size is expected to be positively and significantly related to Tobin's Q, since larger firms have greater competitive power (Dogan & Yildiz, 2013) and also enjoy the advantage of economies of scale.

Descriptive Statistics

The statistical characteristics for the tested variables are summarised in Table 1. Based on this, we see that Tobin's Q has a mean value of 1.94. This value is close to the value obtained by Hillier and McColgan (2001) for the UK market (1.96), by Demsetz and Villalonga (2001) for the US market (1.10), and by Campbell and Minguez-Vera (2008) for the Spanish market (1.64). Firms with a Tobin's Q value of more than 1.00 have better investment opportunities, have higher growth potential, and have a management that has managed the assets well.

The mean value for DWOMEN, which represents the percentage of firms with at least one or more women on the board of directors, is 0.54. In other words, approximately 54% of Malaysian public listed firms have one or more women on board, compared to 70% of US firms, as reported by Farrell and Hersch (2005). Surprisingly, the percentage of Malaysian firms having one or more female directors is higher than in the Spanish market, where the value is 23.7%, as reported by Campbell and Minguez-Vera (2008).

The mean percentage of women on the board of directors, PWOMEN, is 8.61%. This is higher than the value of 7.5% disclosed by Tan Sri Zarinah of the Securities Commission (SC), according to a report by The Edge Financial Daily (2011). Bernama (2013) reported that 8.7% of the directors on Malaysian boards are women, which is consistent with the result reported in Table 3.1. In the US market, Carter et al. (2003) reported a value of 9.6%, while The Catalyst (2004) reported a value of 10.2%. The mean percentage of female directors on the boards of Malaysian listed firms is much higher than in Spain. Campbell and Minguez-Vera (2008) reported a value of only 3.28% in the Spanish market. According to PR Newswire (2011), Malaysia has the highest percentage of female non-independent nonexecutive directors in the Asia Pacific. These female directors on the boards of Malaysian firms are likely to be family members.

The mean values for the BLAU and SHANNON indices are 0.14 and 0.23 respectively, which compare to the values of 0.05 and 0.09 reported by Campbell and Minguez-Vera (2008) in Spain. The results indicate that the board gender diversity in Malaysia is greater than that in Spain. The incorporation of women into the workplace has been slower in Spain than in other developed countries. This could be due to its traditionally deep-rooted societal attitudes towards the role of women (Campbell & Minguez-Vera, 2008). Although Malaysian firms tend to outperform Spanish firms, the level of board gender diversity is far below the perfect diversity score, which is 0.5 for Blau and 0.69 for Shannon. A perfect Blau index of 0.5 indicates that the firm has an equal balance of men and women on

the board of directors, while a Shannon index of 0.69 means that the firm has maximised the number of women on the board of directors.

The mean value of the leverage variable *LEVER* is 44%; this can be compared to the value of 19% reported by Demsetz and Villalonga (2004) in the US and to the value of 38% reported by Campbell and Minguez-Vera (2008) in Spain. Although highly leveraged firms may be at risk of bankruptcy if they are unable to make repayment on their debts, high leverage is not necessarily bad. According to the agency cost hypothesis, an increase in leverage may reduce agency costs and increase firm value by encouraging managers to act more in the interest of the shareholders (Grossman & Hart, 1982) through a variety of mechanisms, including the monitoring of activities by debt holders, the threat of liquidation (which would affect the managers' reputation and salaries), the pressure to generate cash flow for the payment of interest expenses and, finally by curtailing overinvestment (reviewed by Zhang & Li, 2008).

The mean value of the return on assets ROA is 9.14%, while the mean value of the firm's size (taking the natural log of total assets) was found to be 22.31.

Table 1
Descriptive statistics

Variables	Mean	Median	Minimum	Maximum	Standard Deviation	Skewness	Kurtosis
Q	1.9375	1.3457	0.4998	13.9825	1.7978	3.5732	18.5832
DWOMEN	0.5357	1.0000	0.0000	1.0000	0.4995	-0.1432	1.0205
PWOMEN	0.0861	0.0833	0.0000	0.4444	0.0954	0.9623	3.7175
BLAU	0.1392	0.1528	0.0000	0.4938	0.1426	0.4186	1.8911
SHANNON	0.2274	0.2868	0.0000	0.6870	0.2232	0.1800	1.4619
LEVER	0.4346	0.4275	0.0326	1.3698	0.2032	0.4620	3.8341
ROA	0.0914	0.0642	-0.2023	0.5847	9.0432	2.3143	10.6035
SIZE	22.3050	22.2409	19.4538	25.3187	1.3589	0.0995	2.1504

Notes: Q (approximation of Tobin's Q), DWOMEN (binary variable that takes a value of 1 where there is at least one woman on the board of directors, and 0 otherwise), PWOMEN (percentage of women on the board of directors), BLAU (Blau index of diversity), SHANNON (Shannon index of diversity), LEVER (total debt over total assets), ROA (return on assets), SIZE (logarithm of the book value of the total assets of the firm).

Correlation Coefficients

Table 2
Correlation coefficients between gender diversity proxies and other variables

Panel 1 : DWOMEN				
Correlation	DWOMEN	LEVER	ROA	SIZE
DWOMEN	1			
LEVER	0.0935	1		
ROA	−0.1296	−0.096	1	
SIZE	0.1153	0.3201	−0.4618	1
Panel 2 : PWOMEN				
Correlation	PWOMEN	LEVER	ROA	SIZE
PWOMEN	1			
LEVER	0.0763	1		
ROA	−0.1441	−0.096	1	
SIZE	0.1512	0.3201	−0.4618	1
Panel 3 : Blau Index				
Correlation	BLAU	LEVER	ROA	SIZE
BLAU	1			
LEVER	0.0899	1		
ROA	−0.1415	−0.096	1	
SIZE	0.147	0.3201	−0.4618	1
Panel 4: Shannon Index				
Correlation	SHANNON	LEVER	ROA	SIZE
SHANNON	1			
LEVER	0.095	1		
ROA	−0.1408	−0.096	1	
SIZE	0.1394	0.3201	−0.4618	1

Notes: DWOMEN (binary variable that takes a value of 1 where there is at least one woman on the board of directors, and 0 otherwise), PWOMEN (percentage of women on the board of directors), BLAU (Blau index of diversity), SHANNON (Shannon index of diversity), LEVER (total debt over total assets), ROA (return on assets), SIZE (logarithm of the book value of the total assets of the firm).

Severe multicollinearity occurs when two explanatory variables are significantly related in the sample. When explanatory variables are highly correlated, it becomes difficult to estimate the coefficients accurately. As a rule of thumb, multicollinearity is a concern if the absolute value of simple correlation coefficients exceeds 0.80 (Studenmund, 2011). The results presented in Table 2

show that the independent variables (DWOMEN, PWOMEN, the Blau index and the Shannon index) are not highly correlated with the other explanatory variables, which are the control variables (LEVER, ROA and SIZE).

RESULTS AND DISCUSSION

The results of the study are presented in Table 3. Estimation is carried out using the pooled ordinary least square (POLS) model, the fixed effect model, and the random effect model. The results of all models are presented for comparison. The Hausman test, the Breusch–Pagan Lagrange Multiplier test, and the *F*-test are performed to determine which of the pooled ordinary least square model, fixed effect model, and random effect model is more appropriate. The results indicate that the fixed effect model is more appropriate. The results for the fixed effect model are therefore analysed and discussed.

The results of the Breusch–Pagan Lagrange Multiplier test in Table 3 show that the null hypothesis is rejected and the random effect model is more appropriate over the pooled ordinary least square model. Similarly, the *F*-test results indicate that the fixed effect model is more appropriate than the pooled ordinary least square model. When the random effect model is compared to the fixed effect model using the Hausman test, the null hypothesis is rejected; the fixed effect model is thus employed for analysis and discussion.

The results in Table 3 show that the performance of firms with female directors does not differ significantly from that of firms without female directors. However, based on Table 3, our hypotheses H1 and H2 are fully supported, where Tobin's Q and three proxies (BLAU, SHANNON, and PWOMEN) are statistically highly significant. Our findings suggest that a higher percentage of women directors in the corporate boardroom increases the firm's value. This is consistent with the study of Johl et al. (2015), which found that the participation of women was positively related to the return on assets for 700 public listed firms in Malaysia. Similarly, Taghizadeh and Saremi (2013) also found that female directors contribute positively to the performance of 150 public listed firms in 2008. The results are also consistent with studies found in the US, where female directors have been found to improve the firm's profitability (Adams & Ferreira, 2009; Erhardt et al., 2003; Farrell & Hersch, 2005; Stigring & Lyxell, 2011) and value (Srinidhi et al., 2011).

Table 3
Estimation results for women director on firm's Tobin's Q

	Dependent Variable - Tobin's Q			
Variable	Model 1	Model 2	Model 3	Model 4
Constant	6.6279	8.5999	8.4503	8.0489
	(3.8107)	(3.7747)	(3.7839)	(3.7940)
DWOMEN	0.2499	–	–	–
	(0.1635)			
PWOMEN	–	3.1716***	–	–
		(0.8985)		
BLAU	–	–	1.9788***	–
			(0.5917)	
LEVER	3.6450***	3.6193***	3.6318***	3.6333***
	(0.7217)	(0.7072)	(0.7089)	(0.7121)
ROA	0.1060***	0.1067***	0.1064***	0.1061***
	(0.0118)	(0.0116)	(0.0116)	(0.0117)
SIZE	−0.3308*	−0.4252**	−0.4187**	−0.3997**
	(0.1719)	(0.1703)	(0.1708)	(0.1713)
Model fit:				
R-squared	0.6693	0.6455	0.6477	0.6525
Redundant fixed effect	5.02***	5.30***	5.24***	5.17***
BP-LM test	86.20***	91.26***	90.46***	89.33***
Hausman test	36.35***	39.52***	39.09***	38.24***

Notes: *, **, *** Denote significance at the 10%, 5% and 1% levels, respectively. Standard errors are reported in parenthesis. Tobin's Q (sum of market value of stock and book value of debt divided by book value of total assets), DWOMEN (binary variable that takes a value of 1 where there is at least one woman on the board of directors, and 0 otherwise), PWOMEN (percentage of women on the board of directors), BLAU (Blau index of diversity), SHANNON (Shannon index of diversity), LEVER (total debt over total assets), SIZE (logarithm of the book value of the total assets of the firm), ROA (return on investment).

In addition, we found that both the Blau and Shannon indices are positively related to the firm's Tobin's Q, with statistical significance at the 1% significance level. This confirms that female representation in the board of directors enhances the firm's value and suggests that a mixture of men and women is important to forming a stronger board that boosts the firm's performance. This may be due to greater gender diversity offering a broader perspective in terms of decision making, as the directors come from different demographic backgrounds. This is supported by studies in gender diversity, where higher female representation contributes to higher quality decisions, to increases in creativity and innovation (Cox & Blake, 1991; Westphal & Milton, 2000), and to enhancing problem-solving ability (Miller, Burke, & Glick, 1998). In addition, the differences of the women's

demographic background as compared to men offers variety in terms of personality, communication style, educational background, career experience, and expertise (Liao, Luo, & Tang, 2015), which contribute to a wider perspective in decision making and strategic planning. This contributes positively to the firms' value and hence increases their competitive advantage. According to Kramer, Maguire, Brewer, Chmielewski, Kishner and Krugman (2007), women demonstrate a strong collaborative leadership style that promotes win-win situations at the board table, which can enhance the firm's decision-making process.

The results of Table 3 also indicate that higher leverage increases the firm value and that this is statistically significant at the 1% significance level for all the models. This is consistent with the study of Grossman and Hart (1982), who suggested that higher leverage encourages managers to act in the interest of shareholders and hence to reduce the agency problem. This is because managers are now not answerable only to the shareholders, but also to the creditors, to whom they must pay off their long-term obligations. This will eventually reduce the motivation of managers to engage in risky activities, thus increasing the firm's value. In addition, Signaling Theory suggests that firms signal their quality with an optimal combination of dividends and leverage. In this case, signals of high leverage to the investors can suggest an optimistic future and a higher quality firm. Modigliani and Miller's theorem also asserts that firms are capable of increasing their value by taking on additional debt, because it could give advantage in terms of tax savings.

The results indicate that the return on assets is positively related to firm value at the 1% significance level. This is consistent with the expectation that higher profits help to increase the firm's value. According to Haugen and Baker (2010), the greater the profitability of a firm, the greater the distribution of earnings to the shareholders, and therefore the greater the expected value of the firm. The return on assets is crucial because it indicates the efficiency of the management in managing the assets, and is hence a positive measure of firm value (Chen, Chen, Lobo, & Wang, 2011).

On the other hand, we found that firm size is negatively related to firm value. This contradicts the expectation that larger firms have greater competitive power and are more likely to enjoy economies of scale and greater bargaining power than clients and suppliers (Serrasqueiro & Paulo, 2008). Our results are consistent with the study by Campbell and Minguez-Vera (2008). This finding implies that a firm will exhibit decreasing returns with scale because when it reaches an optimal size, its growth rate will decrease, affecting in turn the firm's value.

CONCLUSION

Previous studies have suggested that gender diversity in the boardroom tends to lead to better financial performance on the part of the firm. This scenario may be different in Asia, where gender diversity may not increase a firm's performance. To determine if this is the case, we investigated the effects of gender diversity on firms' financial performance in Malaysia. Unlike previous researchers, we used nonfinancial firms listed on Bursa Malaysia for the period spanning from 2009 to 2013. Using the pooled ordinary least square model, the fixed effect model, and the random effect model, we tested whether gender diversity in the boardroom influences a firm's performance. In our estimation models, we include Tobin's Q as our dependent variable and four different proxies for gender diversity (the dummy variable for women, the percentage of women on the board, the Blau index, and the Shannon index), controlling with the firm's debt level, return on assets and size.

Based on our results, we failed to find any relationship between the presence of women on board and firm performance. However, the percentage of women on the board, the Blau index, and the Shannon index were positively and significantly related to firm performance. This suggests that the mere fact of there being at least one female on the board has no impact on firm performance, but a higher degree of female representation does increase the firm's financial performance. This may reflect the fact that the presence of female directors on the board generates a greater market expectation of the firm's competitive advantages, which are reflected by an increase in the value of the firm, as suggested by Tobin's Q. This is because a greater representation of women is expected to contribute a different perspective, as well as more comprehensive thinking in the decision-making process, which is crucial for firms' strategic decision making and for ensuring their long-term performance. This could be due to the socialisation process whereby unconventional female directors adopt the behavior and norms of conventional male directors to be recognised by top decision makers (Rose, 2007). Consequently, the advantages of having females on the board of directors are not reflected in the measure of firm performance and, as a result, positive discrimination favoring female boardroom appointment is likely to persist as a feature of the corporate governance landscape in Malaysia. Consistent with the literature, we infer that the debt level and return on assets of a firm are significantly positively correlated with firm financial performance, while firm size is significantly negatively correlated with it.

One limitation of this study is that the results are valid only for Malaysian firms and cannot be generalised to firms in other countries, which may have different legal and cultural attributes. Malaysia may suffer from the weak corporate governance common to many developing countries. Therefore, it is important to

determine the strength of corporate governance in Malaysia and its association with the relationship between board gender diversity and firm performance. It is also unclear whether the appointment of female directors in Malaysian firms is socially motivated. Malaysian firms have high levels of family ownership, and so it is unclear whether board members are nominated by family members so as to permit continuity of the family business. To address these issues, future research needs to account for corporate governance and the family ownership structure in the estimation model.

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