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Gender Diversity in Boards and Performance of Philippine Publicly Traded Firms: Do Women Matter?

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By: Dr. Angelo A. Unite, De La Salle University

Dr. Michael J. Sullivan, University of Nevada, Las Vegas

Ms. Ailyn A. Shi, De La Salle University

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Abstract

The issue of gender diversity in corporate boards has been attracting research interest in various countries because of the many socioeconomic contributions women directors are purported to confer to the firm, some of which involve improved board monitoring quality and a more ethical and democratic form of leadership. This rationale forms part of the "economic case" for women's participation in boards, apart from the usual grounds of social or equality considerations. We examine this board-level gender diversity issue for the case of the firms traded in the Philippine Stock Exchange during the period 2003 to 2014. Using an unbalanced panel of 2,645 firm-years, we find that greater gender diversity in boards, which in the case of our sample firms also indicates the presence of more female directors in the board, does not significantly affect short-term firm performance as alternatively measured by ROA and ROE, but seems to drive down long-term firm value as measured by Tobin's Q. Our results are robust with respect to board-level gender diversity measures and are based on estimates that take into account the effects of unobserved individual effects and potential endogeneity of gender diversity.

Our findings are consistent with the investor bias theory, which argues that investors collectively drive down the market value of firms with more gender-diverse boards because they have a perceptual bias against women as capable firm leaders and directors. Our results put to question the economic rationale of imposing any minimum gender quota on boards of, at least, Philippine publicly listed firms, similar to the practice in most European countries. We suggest that policy makers must be cautious in proposing quotas that seek to promote gender parity in boards of directors of publicly traded firms based on a claim that it will significantly improve firm performance and shareholder value. Instead, enforcing board-level gender quotas may have to be justified in terms of social equality, business reputation, and purely ethical grounds.

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Keywords: Gender diversity, Boards of directors, Corporate governance, Firm performance, Philippine publicly listed firms

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1. Introduction

In corporate boardrooms of firms in various countries, progress on gender diversity is slow but unprecedented. In the United States, women occupy only 19.2% of board seats of firms included in the S&P 500 in 2014, when compared to 17% in 2012 (Catalyst, 2015; Ernst & Young, 2012). Similarly, women hold only 16.9% of Fortune 500 board seats in 2013, when compared to 15.7% in 2010 (Catalyst, 2014). Among European publicly-traded companies, Norway leads the way towards greater gender diversity in boardrooms with around 35.5% of board seats held by women in 2014, followed by Finland (29.9%) and France (29.7%) (Catalyst, 2015).[1] This is contrasted by the slow progress on board-level gender diversity among Asian publicly traded firms. As of 2014, Hong Kong reports only a 10.2% figure on the proportion of board seats held by women, followed by India (9.5%), and Japan (3.1%) (Catalyst, 2015).[2] Unsurprisingly, the Philippines surpasses other Asian listed firms when it comes to female presence in the boards. In 2014, 14.97% of board seats in PSE-listed firms are held by women, when compared to 13.03% in 2008 and 12.63% in 2003 (Unite *et al*., 2015).

There is also evidence that a majority of firms have only one female director in their boardrooms. Such solo female directors are widely regarded as "tokens" and are often victims of stereotyping and sexual bias.[3] In the United States, 81% of S&P 1500 companies have at least one female director in 2014, but only 44% have two or more female directors (Ernst & Young, 2015). In the United Kingdom, around 79% of FTSE 100 firms have at least one female director in 2010, but only 39% have more than one female director (Vinnicombe *et al.*, 2010). Among Philippine listed firms, 70.4% have at least one female board member in 2014, but only 19.6% have three or more female directors (Unite *et al.*, 2015).

It appears, however, that this board-level gender disparity is likely to change in the near future. Boards all over the world, particularly in Europe, are under increasing pressure to fill their ranks with women directors. In light of this, board gender quotas that recognize the importance of gender diversity have been imposed in a number of countries. For example, starting January 2006, Norwegian corporations are required by law to have at least 40% women in boards (Ahern and Dittmar, 2012). On the other hand, Italy has set a target of 33% women for boards of state-owned and listed companies by 2015, Germany requires 30% women in boards, whereas Spain, France, and Iceland have all set minimums at 40%. In the

[1] In Catalyst's (2015) census, Norway is represented by the OBX Index (24), Finland by the OMX Helsinki 25 Index, France by the CAC 40 Index, and Portugal by the PSI-20 Index.
[2] In Catalyst's (2015) census, Hong Kong is represented by the Hang Seng Index (50), India by the BSE 200 Index, and Japan by the TOPIX Core 30 Index.
[3] Kanter (1977) was the first to argue that the behavior of women in organizations is due to their numerical representation. Given that the typical corporate board is male-dominated, the presence of only one female director may induce a high risk of tokenism wherein the ideas and opinions of the lone female director are often taken for granted and summarily dismissed by the dominant group [i.e. male board members] as inconsequential. For a more thorough discussion of tokenism and the critical mass of women on board, see Kanter, 1977 and Konrad *et al.*, 2008.

United Kingdom, a recommendation of 25% female representation quota on boards of listed companies has been proposed and currently contended (Choudhury, 2014). On the other hand, most Asian countries, including the Philippines, do not have specific laws that mandate a gender requirement in corporate boards. However, there is a 2015 advisory released by the Philippine Securities and Exchange Commission (SEC) that espouses the election of at least one female independent director in boards of listed firms. This recommendation is in line with the best corporate governance practices outlined in the ASEAN Corporate Governance Scorecard.[4]

Although these initiatives that seek to foster gender parity in corporate boards are mostly rooted in social equality, business reputation, and purely ethical grounds, the economic rationale for gender diversity argues that the increased presence of women in boards may, in fact, improve organizational processes and firm performance (Rhode and Packel, 2014; Choudhury, 2014). The general consensus is that women are tougher monitors and are, hence, essential to overcoming agency problems between managers and shareholders (Adams and Ferreira, 2009; Campbell and Minguez-Vera, 2008). This implies that stronger governance improves shareholder value. Furthermore, a more diverse set of board members may bring fresh ideas and perspectives to the table that may encourage greater discussions over board decisions (Carter *et al.,* 2003; Konrad *et al.*, 2008). However, if diverse board members are marginalized, a different perspective may not ultimately result to improved board decisions (Carter *et al.*, 2003). Similarly, over-monitoring by women and independent directors may lead to greater interference in board decision-making and, thus, impede firm value (Adams and Ferreira, 2009).

Other arguments that link greater women participation in boards and improved firm performance are often grounded on theories of social psychology. These theories posit that women are more equipped to handle management positions because of their sharp interpersonal, problem-solving, and multitasking skills (Krishnan and Park, 2005). Women's inherent inclinations to adopt harmonious, democratic, and learning-based leadership approaches are also posited to improve the organizational climate of a firm. Their small appetite for risk and their tendency to possess greater empathy towards stakeholder issues also augur well for firm stability and performance (Krishnan and Park, 2005; Konrad *et al.,* 2008).

However, the empirical evidence on the issue is mixed. On the one hand, the survey results of both Catalyst (2011) and Credit Suisse (2012) appear to indicate that firms with more women directors are associated with higher capital returns.[5] Some studies that use regression analysis find a positive

[4] The ASEAN Corporate Governance Scorecard was developed to assess the corporate governance performance of six ASEAN member countries on the basis of best international corporate governance practices as outlined in the OECD Principles of Corporate Governance.

[5] Catalyst (2011) reports that firms with more women directors outperformed the rest of the firms by 16 percent on return on sales and by 26 percent on return on invested capital measures. Similarly, Credit Suisse (2012) finds that companies with at least one woman on the board are associated with higher returns on equity and market valuations.

association between board gender diversity and various measures of firm performance. Carter *et al.* (2003) examine data on publicly traded Fortune 1000 U.S. firms and find a positive link between firm value and the presence of women in the board. Erhardt *et al.*'s (2003) study of 112 large and publicly traded Fortune companies finds that greater board diversity leads to better organizational performance. For a sample of the 2,500 largest Danish companies analyzed over the period 1993 to 2001, Smith *et al.* (2006) find that female board members elected into position by the staff seem to positively affect firm performance. Finally, Campbell and Minguez-Vera (2008) analyze Spanish listed and non-financial firms and find that board gender diversity has a positive impact on firm value.

On the other hand, Adams and Ferreira (2009) study Standard & Poor indexed U.S. firms for the period 1996 to 2003 and find a negative relationship between the presence of female directors in the board and both firm accounting and market performance, which they attributed to the value-reducing effects of over-monitoring in firms with strong corporate governance measures already in place. Dobbin and Jung (2011) also examine data on large U.S. firms for the period 1997 to 2006 and find that female directors have no effect on profits but have negative effects on stock value, implying investor bias. Similarly, Haslam *et al.* (2010) find that the presence of women in FTSE 100 boards is negatively associated with firm value but has no significant effects on firm profits. Ahern and Dittmar (2012) also examine data on publicly listed Norwegian firms and find that the imposition of the board gender quota in Norway has led to a substantial decline in firm value. In contrast, Rose's (2007) study of Danish listed firms finds no evidence that board gender diversity affects firm value. Similarly, Francoeur *et al.* (2008) find no link between board gender diversity and firm financial performance for a sample of the 500 largest Canadian firms as reported by Financial Post.

Despite the large body of research examining the relationship between gender diversity and firm performance conducted in developed market settings, there is a dearth of such studies for emerging markets. Moreover, the findings of a limited number of emerging market studies are mixed. For instance, in his cross-sectional study of a sample of Indonesian publicly listed firms, Darmadi (2011) finds that the presence of women in boards has a negative impact on firm accounting and market-based performance. Kilic (2015) also finds that greater female presence in the boards of both publicly listed and privately held Turkish banks is negatively related with firm performance. In contrast, Ararat *et al.* (2010) find that having women in boards improves firm performance for a sample of firms listed in the Istanbul Stock Exchange. Abdullah *et al.* (2012), on the other hand, analyze a sample of Malaysian-listed firms and find that the presence of women in boards improves firm accounting performance, but reduces the market

value of the firm. However, in the Philippines, there is no study that analyzes the relationship between gender diversity in boards and firm performance.

Our study seeks to augment the literature on gender diversity and firm performance relationship by providing evidence from an emerging market. Specifically, we investigate the impact of gender diversity in the board on firm performance using annual firm-level data on about 250 Philippine firms listed in the Philippine Stock Exchange (PSE) during the period 2003 to 2014. We construct an unbalanced panel of firm-level data variables and examine the impact of board-level gender diversity on firm performance, as measured by Return on Assets (ROA), Return on Equity (ROE), and Tobin's Q.

The rest of this study is structured as follows. In Section II we present the empirical literature, the theoretical stories related to the link between board-level gender diversity and firm financial performance, and develop our various hypotheses. We discuss the data and methodology used in this study in Section III. We report the results of our empirical analysis in Section IV. Finally, we summarize our results and conclude in Section V.

2. Related Literature, Theoretical Framework, and Hypotheses Development

2.1. Gender Diversity and Firm Financial Performance

Diversity in corporate boards is multi-faceted. It can be manifested through gender, race and culture, and religious background, among others. The economic case for diversity in corporate boards argues that such diversity confers a lot of benefits for companies, particularly for those whose governing and managing bodies are composed of a heterogeneous mix of gender and race. Cox and Blake (1991), Cox *et al.* (1991), and Robinson and Dechant (1997) provide a comprehensive account of the performance advantages of culturally diverse organizations. First, firms that recruit women and minorities will be able to benefit in the long run because they have a larger and unrestricted pool of talent to choose from (Catalyst, 2004; Amaram, 2007). Women, for example, account for 60% of master's degrees and 52% of doctorates being awarded in the U.S. in 2012 (Chamie, 2014). Second, a multicultural firm is posited to better serve the increasingly complex demands of a diverse clientele. Such firms are better suited to understand the cultural, political, and social environment of a foreign marketplace (Cox and Blake, 1991; Robinson and Dechant, 1997). Third, diversity of perspectives and ideas promotes creativity and innovation, which becomes a priceless advantage for research-oriented organizations (Cox and Blake, 1991; Amaram, 2007). Fourth, heterogeneous teams possess a broader set of skills and perspectives that enable them to analyze various alternatives and effectively solve complex issues (Cox and Blake, 1991; Robinson and Dechant, 1997). Finally, multicultural companies are able to build on their business

reputation as “culturally aware” and “socially just” organizations, which promotes more effective global relationships with international customers (Robinson and Dechant, 1997).

It is in this regard that considerable research has been devoted to exploring the impact of diversity, including gender diversity, on the board and management teams of firms. Gender constitutes an important measure of diversity and is a richer demographic variable than age, educational background or tenure because its effects have roots in the socio-cognitive base of the firm leaders (Krishnan and Park, 2005). Given that boards, in theory, help to solve agency problems between managers and shareholders by serving as prudent monitors of management (Hermalin and Weisbach, 2001; Fama and Jensen, 1983), it is interesting to identify how the presence of women directors moderates the monitoring effects of boards on firm performance and value. This objective is in line with the increasing attention devoted to the composition of boards and its monitoring activities since the infamous failure of high-profile companies such as Enron, WorldCom, and Parmalat.

2.1.1. Agency Theory, Stewardship Theory, and Resource Dependence Theory on Gender Diversity in the Board

The tenets of **agency theory** argue that in the modern corporation, where shares are diffusely held, the actions of the manager (agent) depart from those that are required to maximize shareholder (principal) returns (Donaldson and Davis, 1991). This results to an agency loss, such that returns to the owners fall far below than what is supposed to be when the principal exercises direct control of the firm (Jensen and Meckling, 1976). Agents commonly hold only minimal stakes in any residual returns to the owners. Thus, assuming that both parties are rational individuals that seek to maximize their own personal economic gain, it would make sense for the actions of the agents to diverge from the interests of the principals.

It is, however, costly to monitor the agent to ensure that he is making optimal decisions for the firm. Moreover, the principal may not have the ability to discern whether the actions of the agent are value-maximizing or not. As such, the agent may be inclined to withhold information about his true actions from the principal (i.e. moral hazard issue). Likewise, the principal may be unable to observe the agent’s genuine characteristics and actions (i.e. adverse selection issue). Both issues are characterized by information asymmetry between the two parties, and may result to conflicting decisions and actions that would impede firm value.

Therefore, Fama and Jensen (1983) argue that the board's role is of paramount importance because it serves as a mechanism to control and monitor managers. As the representative of the principals, the board may resolve agency issues by setting up compensation schemes that will reward agents for maximizing shareholder returns and by firing managers who do not contribute to shareholder value. Another key

element of agency theory is that outside directors will not subvert the best interests of shareholders by colluding with insiders (Carter *et al.*, 2003). That is, outside or independent directors are the best possible monitors of firm management because their incentives are not compromised by their dependence on management or the organization. In this vein, agency theory posits that board-level diversity enhances board independence and, ultimately, firm performance because directors with non-traditional characteristics can be considered as the "ultimate outsider" (Carter *et al.*, 2003). Women directors, for instance, are posited to be tougher firm monitors and are more inclined to ask questions about firm management that differ from those asked by male directors (Adams and Ferreira, 2009).

There is also empirical evidence that gender-diverse boards are associated with tougher firm monitoring. Adams and Ferreira (2009) find that women are more likely to join monitoring committees for a sample of S&P-indexed firms, and that the more gender-diverse the board is, the fewer the attendance problems of male directors are and the higher the sensitivity of CEO turnover to stock performance is. However, they also find evidence that over-monitoring in firms with strong corporate governance measures in place may only interfere with firm decision-making and, thus, impede firm value. Similarly, Carter *et al.* (2003) are careful to note that a more gender-diverse board may not necessarily result to better firm performance if the diverse board members are marginalized.

From a resource dependence theory perspective, board diversity facilitates access to unique resources that are otherwise difficult to obtain. This also allows boards to tap into broader pools of unrestricted talent for the role of directors (Singh and Vinnicombe, 2004). Studies that lean towards resource dependence theory have consequently found a positive relationship between board-level gender diversity and firm performance (Carter *et al.*, 2003; Erhardt *et al.*, 2003).

In contrast with agency theory, the stewardship theory posits that the manager or agent essentially desires to be "a good steward of corporate assets" (Donaldson and Davis, 1991). That is, acting in the best interests of the firm and of the shareholders yields a higher utility to the agent relative to self-serving behavior. This ensures that the agent makes decisions that are aligned with the objective of the principals, which is to maximize firm welfare and shareholder value.

As opposed to being motivated solely by economic gains, proponents of the stewardship theory tend to view higher-level human needs, such as self-actualization, as more important motivators (Donaldson, 1990). They are more likely to view the organization as a social institution, whose contribution is for the benefit of all stakeholders, and not just for the people at the top (Miller *et al.,* 2011). In particular, stewardship tends to arise in firms where relationships between principals and agents are stable and there is an interdependent social network among various levels in the firm's hierarchy.

Thus, the stewardship theory predicts that agents will perform actions that have positive impacts on the

value of the firm. However, this theory also implies that a more gender-diverse board may be detrimental to firm value because women may be more inclined to involve themselves in firm management processes and in helping improve organizational processes than in focusing on their role as prudent monitors of management. This may decrease their independency (Muth and Donaldson, 1998), and hence destroy shareholder value.

Based on preceding discussions, we formulate the following hypotheses:

H1: Gender diversity in the boardroom may be positively or negatively related with firm performance, according to the agency theory.

H2: Gender diversity in the boardroom is positively related with firm performance, according to the resource dependence theory.

H3: Gender diversity in the boardroom is negatively related with firm performance, according to the stewardship theory.

2.1.2. Social Psychology (Social Identity and Power) Theories on Gender Diversity in the Board

The economic case for gender diversity in boards and management bodies of organizations is often founded upon theories of social psychology that highlight gender-based behavioral differences between men and women. For instance, the literature documents that women are more risk-averse (Jianakoplos and Bernasek, 1998; Croson and Gneezy, 2009), are more likely to focus on avoiding losses and to hold more conservative levels of capital (He *et al.,* 2008; Palvia *et al.*, 2015), and are more likely to invest in a less aggressive and sustainable manner than men (Charness and Gneezy, 2012). In addition, women are found to be less competitive, but also less confident and myopic in their investments than men (Barber and Odean, 2001; Niederle and Vesterlund, 2007; Croson and Gneezy, 2009). Women are also found to add value to organizational discussions by bringing in a variety of backgrounds, expertise, and perspectives into meetings and by raising critical issues to awareness and questioning the general consensus, especially in all-male or male-dominated groups (Burke, 1997; Konrad *et al.*, 2008).

Overall, these findings support the argument that women have intrinsic capabilities that make them equally, if not more, competent firm leaders than men. In particular, Krishnan and Park (2005) draw upon the social identity and power theories to attest that greater gender diversity (i.e. the presence of more women in a typically male-dominated group) confers numerous benefits to an organization as follows:

(i) Women are more likely to emerge as leaders in situations that call for a lot of social interaction.[6]

[6] This theory is supported by Kent and Moss' (1994) findings. From an experimental study of 115 undergraduate students who were assessed after working in groups for one semester, the authors find that women, rather than men, are slightly more likely to be perceived as leaders by their fellow classmates. They contend that women are more likely to emerge as leaders in socially oriented settings, while men are more suited to perform as leaders in task-oriented groups.

This is particularly applicable in today's corporate setting where global connections are the norm, rather than the exception;

(ii) The challenges women encounter as they make their way up the corporate ladder equip them with the skills and resilience needed to face uncertain and complex tasks;

(iii) Women are more likely to adopt a harmonious and democratic style of leadership and, thus, inspire confidence and a sense of well-being among their colleagues and subordinates;[7]

(iv) Women are more likely to adopt a "learning" approach to leadership and utilize their ties to other networks in order to learn from others' experiences. The information gained can be advantageous when dealing with extensive decision making processes;

(v) The multiple roles that women play in their lives – as mothers, daughters, and wives – enable them to sharpen their multitasking skills and effectively cope with various demands in their workplace;

(vi) Women are more likely to view power in terms of information dissemination and knowledge facilitation, rather than through force or coercion. This is relevant in today's marketplace, which places a high premium on effective social intercourse; and

(vii) Greater representation of women in boards and management teams sends a positive signal to women and other minorities, which may well improve the firm's organizational climate.

However, gender diversity in the board has drawbacks that moderate its advantages. In situations that call for quick decision-making and resolutions, the clash of ideas and viewpoints brought about by a heterogeneous board may degenerate into dysfunctional conflicts. Such conflicts may create unfavorable dynamics that will result to work disadvantages for women and minorities (Amaram, 2007; Robinson and Dechant, 1997). Furthermore, turnover and absenteeism rates are higher for women than men. Lee (2012) analyzes U.S. data and finds that women have higher turnover propensities than men, especially when family reasons are concerned. Scott and McClellan (1990) also report a two-to-one turnover ratio for women versus men. These findings indicate that a more gender-diverse board and organization can also inhibit productivity and, consequently, destroy firm performance.

Based on the preceding discussions, we formulate the following hypothesis:

H4: Gender diversity in the boardroom may be positively or negatively related with firm performance, according to social psychology theories and the existing literature.

[7] This is supported by Eagly and Johnson's (1990) study, which compares the leadership styles of men and women in a meta-analysis of university undergraduates. Consistent with gender stereotypic expectations, they find that women are more likely to lead in a democratic fashion while men tend to be more autocratic.

2.1.3. The Investor Bias Theory on Gender Diversity in the Board

Dobbin and Jung (2011) are among the first to investigate the effects on stock performance after women were appointed to corporate board positions. Amid the rising clamor for greater participation of women in boards during that time, their study uncovers a troubling finding – stock prices decline slightly after an increase in the participation of women in the board, not because of any corporate performance fallout, but because of investor bias, particularly among small institutional blockholders.[8] Because these investors are not yet accustomed to the possibility that women can be competent board members or managers, they react negatively to firms that appoint women directors (Dobbin *et al*., 2011). Hence, such investors are likely to depress the stock prices of firms that have more women board members.

Farrell and Hersch (2005) also argue that the increase in the number of female board member appointments may be merely a response to the outside pressure of meeting diversity quotas. In this case, board gender diversity may have no effect on firm performance and value. And if the female directors lack sufficient experience and talent to govern the firmeffectively, shareholder value may even fall. Thus, rather than focus on the potential positive economic implications of a more gender diverse board, investors are more likely to interpret appointments of female board members as a signal of underlying social and ethical preferences – unfortunately, to the detriment of a singular focus on profit and value maximization (Solal and Snellman, 2015). This perceived lack of focus on firm profitability sends a negative signal to investors regarding the firm's long-term prospects, hence prompting a decrease in firm value.

Investors can thus interpret a firm's commitment to gender diversity as a negative cue, which drives down market value. Moreover, Solal and Snellman (2015) argue, that there is no reason to suspect that the individual competence of female board members diverges substantially from that of their male counterparts to impact firm profits at all. Women board members often resemble their male colleagues in terms of educational background and experience (Zhu *et al*., 2014).[9] Rose (2007) argues that non-traditional board members (i.e. the minorities) may have already assimilated themselves into the dominant group to qualify themselves in the eyes of the firm decision-makers. In doing so, they would have managed to suppress any individual and unconventional qualities that would have contributed to improved firm performance. Thus, he posits that the gains from having female board members will not

[8] The role of financial institutions in recent years has shifted from being mere creditors to corporate blockholders. Fox (2014) confirms that the influence of these institutional blockholders has risen over time by observing that the average institutional investor in the U.S. owns up to 64% of a typical top-50 firm by end-2009, compared to only 49% by end-1987.

[9] For a sample of Danish firms, Rose (2007) documents that the board members' educational background does not significantly affect firm value. She reasons that the work required of board members may not possibly require any skills obtained from higher education. Regardless, her findings indicate that women board members may not significantly impact firm value relative to their male colleagues on the basis of only individual competence.

reflect upon any firm performance measure.

To empirically illustrate their story, Solal and Snellman (2015) examine U.S. data over a period of 14 years and find that the appointment of a female director causes firm value to decrease but has no effect on firm profitability. Likewise, based on a sample of large U.S. corporations, Dobbin and Jung (2011) find that greater presence of female directors in the board has a negative effect on firm value but an insignificant effect on firm profits, thus suggesting that market investors may have a perceptual bias against women board members. Haslam *et al.* (2010) also analyze U.K. firms included in the FTSE 100 index and find that the presence of women in boards is correlated with a decline in firm value, but is not significantly linked with firm profitability.

Based on the preceding discussions, we formulate the following hypotheses:

H5: Gender diversity in the boardroom is negatively related with firm market value, according to the investor bias theory.

H6: Gender diversity in the boardroom is insignificantly related with firm profitability, according to the investor bias theory.

2.2. Board Independence and Firm Financial Performance

Following an increase in the demand for reforms that seek to elevate standards in board practices, the merits of board independence have been widely debated. On the one hand, agency theory suggests that board members must be independent of the management they monitor to better serve as effective monitors. A board that is mostly independent is less likely to tolerate managers that are self-serving and underperforming than one that is made up of inside employees (Millstein and MacAvoy, 1998).

On the other hand, Fama and Jensen (1983) note that a board stacked with too many outsiders will not contribute to optimal board performance. While independent directors may perform well in monitoring tasks, they could also perform worse on other tasks for which inside directors are valuable. These insiders are often more knowledgeable on firm matters than outsiders are, which enables them to contribute valuable specific information about the firm when making board decisions (Klein, 1998; Bhagat and Black, 2002).

Likewise, Agrawal and Knoeber (1996) suggest that outside directors are sometimes included in the board, not because of their competencies, but to satisfy board independence quotas and political behests. Bhagat and Black (1999) also provide anecdotal evidence of independent directors who turn out to be

"lapdogs", rather than "watchdogs", of management.[10] In this case, outside directors seek to establish their reputation for not "rocking the boat", which makes the firm more attractive to investors that dislike conflict but contradicts the shareholders' interest of maximizing firm value.

Empirical evidence on the issue are also mixed. Hermalin and Weisbach (1991), Bhagat and Black (2002), Klein (1998), and Mehran (1995) report an insignificant relationship between board independence and firm performance. On the other hand, Baysinger and Butler (1985) find that U.S. boards with more outsiders reported higher performance levels after a decade, while Rosenstein and Wyatt (1990) find that the additional appointment of an outside director precipitated a 0.2% increase in stock prices. In contrast, both Bhagat and Black (1999) and Agrawal and Knoeber (1996) find a negative relationship between board independence and Tobin's Q.

Based on the preceding discussions, we formulate the following hypotheses:

H7: Board independence is positively related with firm performance, according to agency theory.

H8: Board independence is negatively related with firm performance when outside directors are merely appointed to fill up gaps in the board or to satisfy an existing quota or political constraint without regard for their individual competence or moral jurisdictions.

2.3. Other Factors Affecting Firm Performance

2.3.1. Board Size and Firm Financial Performance

Much of the literature on board size effects on firm performance originate from the studies of Lipton and Lorsch (1992), Jensen (1993), Yermack (1996), and Eisenberg *et al.* (1998). The general consensus is that larger boards are detrimental to firm performance because coordination, communication, and decision-making problems arise as group size increases. From an agency theory perspective, Jensen (1993) and Yermack (1996) argue that management seeks to suppress board discussions about managerial behavior. Because larger boards lead to less effective and candid discussions about managerial performance, their ability to resist CEO control will also diminish. On the other hand, Eisenberg *et al.* (1998) argue that larger boards may destroy firm value through board independence. Larger boards often have high proportions of outside directors, and these directors own only negligible stakes in the firm. Hence, these outside directors may choose to forgo high-risk-high-return projects for the firm since their gains are only limited but their reputation losses will be great if the project fails. Based on these, we construct the following hypothesis:

H9: Board size is negatively related with firm performance, according to agency theory and the related

[10] Bhagat and Black (1999) highlighted as examples the cases of General Motors, American Express, IBM, Kodak, Chrysler, Sears, Westinghouse, and Borden, which performed either abysmally or dubiously despite the presence of majority-independent boards.

literature.

2.3.2. Board Share Ownership and Firm Financial Performance

Agency theory posits that if managers and board members have a larger ownership stake in the firm, they will be strongly motivated to raise the value of the stocks, which is aligned with the interests of shareholders (Jensen and Meckling, 1976; Hermalin and Weisbach, 1991; Bhagat and Tookes, 2012). Similarly, Jensen (1993) and Bhagat and Tookes (2012) argue that substantial ownership interests of directors in the firm will incentivize them to exercise more effective oversight and steer managers towards more judicious and value-maximizing tasks. However, Morck *et al.* (1988) argue that board ownership can be negatively related with corporate performance because of the "entrenchment theory", which posits that boards and management with very large shareholdings in the firm can "guarantee their employment in the firm at attractive levels of salaries" and indulge in non-value-maximizing activities without being disciplined by shareholders. Based on these, we construct the following hypotheses:

H10: Board share ownership is positively related with firm performance, according to agency theory.

H11: Board share ownership is negatively related with firm performance, according to the entrenchment theory.

2.3.3. Firm Age, Firm Size, Diversification Extent and Firm Performance

Firm age is posited to have a positive relationship with firm profitability and value due to management's tendency to learn as they gain more experience in running the firm. Through investing in research and development, hiring more resources, and discovering a particular field of specialization, older firms enjoy higher profitability and value (Loderer and Waelchli, 2010). However, older firms are also more prone to inertia and are less quick to adapt to changes in bureaucratic conditions, which may destroy firm value (Majumdar, 1997).

As to the link between firm size and firm performance, larger firms are found to enjoy higher growth and firm value due to their ability to exploit scale economies and to easily access credit. Possessing a broader pool of resources also allows them to benefit from increased production (Mansfield, 1962). In contrast, small firms are found to suffer less from agency problems and are more flexible in their organizational framework, which allows them to easily adapt to changing conditions (Yang and Chen, 2009). Surviving smaller firms are also found to have higher growth rates than larger firms (Mansfield, 1962).

In terms of the extent of business diversification pursued by a firm, several authors propose that business diversification can have value-enhancing and value-reducing effects. Diversified firms can increase operational efficiency by engaging in various lines of business (Berger and Ofek, 1995) and are said to pay less tax as a whole than their individual segments would have paid separately (Majd and

Myers, 1987). The caveat, however, lies in the misallocation of resources among firm segments and the increased use of these resources to fund unprofitable investments, which would destroy firm value (Berger and Ofek, 1995). The tendency to over-diversify, the presence of huge information costs, and the complexity of the diversification process also cause greater uncertainty for the firm and may potentially endanger firm value (Markides, 1992).

Based on the preceding discussions, we construct the following hypotheses:

H12: Firm age may be positively or negatively related with firm performance.

H13: Firm size may be positively or negatively related with firm performance.

H14: The extent of business diversification pursued by the firm may be positively or negatively related with firm performance.

Table 1 provides a summary of the literature on the effects of board-level gender diversity on firm performance while Table 2 summarizes our hypotheses.

3. Data, Variable Measurement, and Methodology

3.1. Data and Sample

Our initial sample consists of an unbalanced panel of all firms whose common shares are traded in the Philippine Stock Exchange (PSE) during the period 2003 to 2014.[11] We exclude firms that did not trade during the year and firms that have missing data. Our final sample thus consists of an unbalanced panel dataset of more than 200 firms per year or a total of 2,645 firm-years. Table 3 summarizes this sample selection process.

We hand-collect information on the members of the board of directors, such as gender, age, and board position, from the Annual Reports submitted by the listed firms to the SEC and the PSE. Data on board members' common stock ownership are obtained from the Annual Reports and the Public Ownership Reports. Raw data used to calculate the accounting-based and market-based measures of firm performance, firm size, firm age, and the number of business segments are gathered from the Annual Reports and the financial database Osiris.

3.2. Variable Description and Measurement

3.2.1. Firm Performance

The measurement of firm performance used in the literature varies considerably, but these studies can be generally divided into two groups: those that use accounting measures of firm performance, and those

[11] We do not include exchange traded funds and firms that issue only preferred shares or Philippine Deposit Receipts and warrants in our sample of firms.

that use market-based measures. We use both accounting-based and market-based measures of firm performance in this study. Our accounting measures are Return on Assets (ROA) and Return on Equity (ROE), and our market-based measure of performance is a proxy for Tobin's Q. ROA is calculated as net income before tax divided by the book value of total assets, whereas ROE is calculated as net income before tax divided by the book value of total equity. Our proxy for Tobin's Q is computed as the ratio of the firm's market value to its book value. The firm's market value is computed as the book value of assets minus the book value of equity plus the market value of equity.

ROA is a short-term and historical (backward-looking) measure of firm profitability that measures the stockholder's return on investment based on how firm assets and resources are deployed. Likewise, ROE is a historical and short-term measure of firm performance that gauges the return on the value of the stockholder's investment based on the combined total worth of the firm's capital. Both measures are commonly used in the literature because they convey a general sense of the overall profitability of firms (Shrader *et al.*, 1997; Erhardt *et al.*, 2003). However, accounting measures may be distorted by biases in the calculation and by differences in systematic risk, tax laws, and accounting conventions that may vary across industries (Wernerfelt and Montgomery, 1988). Furthermore, these measures are based on events that have already occurred and so, provide only a snapshot of the firm's past performance.

Tobin's Q, on the other hand, is a long-term and forward-looking measure of firm performance because it reflects the market's expectations of future earnings and captures the value of the firm as a whole, rather than as the sum of its parts (Dezso and Ross, 2012; Wernerfelt and Montgomery, 1988). The unity value of Tobin's Q provides a clear measure of firm value: firms with a Tobin's Q ratio of greater than 1.0 are expected by investors to be able to utilize resources more effectively, while those with a Tobin's Q of less than 1.0 are expected to utilize assets rather poorly. In addition, Tobin's Q implicitly accounts for risk, imputes equilibrium returns, and is not liable to distortions due to tax and accounting conventions, which renders it a more fairly valued and comparable measure of financial performance than conventional accounting-based measures (Dezso and Ross, 2012; Wernerfelt and Montgomery, 1988).

3.2.2. Gender Diversity in the Board

Table 4 reports summary statistics of board-level gender diversity indicators for the period 2003 to 2014. For each year, it is evident that boards of Philippine publicly traded firms are predominantly comprised of male directors, i.e., only around 14% of the boards are female directors. Also, for each year, around 33% of the listed firms have boards that are completely male, but there are no firms with boards that are completely comprised of female directors. These imply that all boards in our sample of Philippine

listed firms that are homogeneous in terms of gender are completely male boards.

For each year, the maximum proportion of female directors ranges from 0.6 to 0.8, but only around 1.9% to 2.8% of Philippine listed firms have boards that are comprised of more than 50% women. These statistics are all strongly indicative of the huge and persistent gender gap in boards of Philippine listed firms, in contrast with the improving gender situation in most European corporate boards (Unite *et al.*, 2015).

Similar to Campbell and Minguez-Vera (2008) and Darmadi (2011), we use various alternative measures to capture the extent of gender diversity in the board of directors. Our first proxy variable is the proportion of female directors in the board, *PROPFEMALE*, which is calculated as the number of female directors in the board divided by the total number of directors, and is a standard measure of board-level gender diversity used in the literature. However, while the proportion of female board members is a good indicator for the presence of women in the board, it is not necessarily an ideal measure of gender diversity. First, the proportion captures the degree of concentration of board members in only one gender category, i.e., the female category (Campbell and Minguez-Vera, 2008). Second, higher proportions of women in the board do not always imply greater board-level gender diversity when comparing firms with female proportions less than 0.5 and those with proportions greater than 0.5. For instance, if Board A has 30% women and Board B has 40% women, then the board with the higher proportion of women (Board B) also exhibits greater gender diversity. However, if Board A has 60% women and Board B has 70% women, then the board with the lower proportion of women (Board A) is the more gender-diverse board.

Thus, we employ more appropriate board-level gender diversity measures, as suggested by Blau (1977) and Shannon (1948). Campbell and Minguez-Vera (2008) note that the Blau and Shannon indices are more appropriate measures of gender diversity than the proportion of female directors because both indices take into account the number of categories and the distribution of individuals among those categories. Both indices are also widely employed in the economics, ecology, psychology, and communications literature, and are argued to be optimal measures of diversity because they satisfy the four criteria for a good diversity measure: (i) the indices have a zero (or asymptotically zero) value to represent complete homogeneity; (ii) larger numbers indicate greater diversity; (iii) the indices do not assume negative values; and (iv) the indices are not unbounded (Harrison and Sin, 2006).

The Blau index is calculated as:

$$Blau = 1 - \sum_{i=1}^{n} P_i^2$$

where n is the number of categories (two gender categories: male and female), and P_i is the proportion of board members in category i. Values of the Blau index range from 0 (perfectly homogeneous board) to a

maximum of 0.5 (the board is comprised of an equal proportion of men and women). Thus, higher Blau index values imply a more gender-diverse board. Given that there are no firms with boards that are completely comprised of female directors, we can also interpret a zero Blau index value to represent a homogeneously male board.

Similar to our preceding argument, higher Blau index values do not necessarily imply greater proportions of women in the board. Say, for instance, that Board A is predominantly male (has a significantly greater proportion of males than females), while Board B is predominantly female (has a significantly greater proportion of females than males). This implies that both boards will have low Blau index values. Thus, increasing the proportion of female board members in Board A, which will subsequently reduce the proportion of males in that board, will lead to greater gender diversity and, thus, a higher Blau index value. In contrast, increasing the proportion of male board members in Board B, which will subsequently decrease the proportion of females in that board, will also lead to greater gender diversity and, thus, a higher Blau index value. All in all, these imply that an increase in the proportion of males or an increase in the proportion of females may both lead to a higher Blau index value, depending on the gender composition of the board.

We have reason to believe, however, that in the case of Philippine listed firms, a higher Blau index value is associated with a greater proportion of female board members. Again, the statistics reported in Table 4 all point to the predominance of men in corporate boards of Philippine listed firms. These results suggest that an increase in the proportion of female directors in the board of a typical Philippine listed firm is more likely to lead to greater gender diversity in the board and, thus, imply a higher Blau index value. The preceding argument seems to be supported by our results in Table 4, which shows that during our sample period, the average Blau index values rise and fall with the average proportion of women board members.

On the other hand, the Shannon index is calculated as:

$$Shannon_i = -\sum_{i=1}^{n} P_i \ln P_i$$

where, again, n is the number of categories (two), and P_i is the proportion of board members in category i. The minimum value of the Shannon index is 0, which occurs when the board is completely male or completely female. The maximum value is 0.693, which occurs when both genders are present in equal proportions.[12] Given that there are no firms with boards that are completely comprised of female directors, we can interpret a zero Shannon index value to represent a homogeneously male board. The

[12] Since the logarithm of 0 is not defined, we follow Campbell and Minguez-Vera (2008) and adopt the convention that $P_i lnP_i$ is equal to 0, if P_i is 0.

properties of the Shannon index are also qualitatively similar to those of the Blau index, although it will always yield a larger number than the Blau index and is more sensitive to small differences in the gender composition of boards since it is a logarithmic measure of diversity (Campbell and Minguez-Vera, 2008). Thus, similar to the Blau index, higher Shannon index values imply greater gender diversity in the board, which, in turn, implies greater proportions of women board members in the case of Philippine listed firms. Similar to our Blau statistics, Table 4 shows that the average Shannon index values rise and fall with the average proportion of women board members.

3.2.3. Board Characteristics and other Control Variables

We control for other board characteristics that are known in the literature to affect firm performance. Board independence, *IND*, is measured as the proportion of independent directors in the board or the number of independent directors in the board divided by the total number of directors. Board size, *BSIZE,* is measured as ln (total number of directors in the board), while board ownership, *BODOWN*, is computed as the total number of common shares outstanding held by the firm's directors divided by the number of common shares outstanding of the firm.

Other control variables that have been found in the literature to affect firm performance are: firm size, as proxied by ln (book value of total assets), firm age – measured by ln(number of years that have passed since the incorporation of the firm), and diversification extent, as proxied by the number of business segments engaged in by the firm.

Table 5 summarizes the variables used in the study and their respective measures.

3.3. Methodology

To analyze the effect of board-level gender diversity on firm performance, we use regression analysis based on unbalanced panel data. We also include industry dummy variables and year dummy variables to account for annual fluctuations in firm performance that are due to macroeconomic or market-wide shocks that vary across industries and over time.[13] Our model is similar to Adams and Ferreira (2009), except that we include board ownership (*BODOWN*) and firm age (*AGE*) as additional independent variables. Specifically, to determine the impact of board-level diversity on firm performance, we estimate regression equation

[13] The industry dummy variables are based on the two-digit National American Industrial Classification Standard (NAICS) codes, whose industry classifications are almost similar to that of the Philippine Standard Industrial Classification (PSIC) system. In our estimations, we exclude the Professional, Scientific, and Technical Services sector because we find that there is no Philippine listed firm in our eliminated sample that is classified under this sector. The base industry for the regression is Agriculture, Forestry, Fishing, and Hunting.

$$PERFORMANCE_{it} = \beta_0 + \beta_1 GENDER_{it} + \beta_2 IND_{it} + \beta_3 BSIZE_{it} + \beta_4 BODOWN_{it} + \beta_5 ASSETS_{it} + \beta_6 AGE_{it} + \beta_7 NSEG_{it} + \delta' NAICS_i + \gamma' YEAR_t + u_{it} \quad (1)$$

where *PERFORMANCE* is a measure of the firm's market performance (*lnQ*) or accounting performance (*ROA* or *ROE*)[14], *NAICS* is a vector of dummy variables based on the two-digit NAICS industry classification, *YEAR* is a vector of dummy variables representing the years 2004 to 2014, and *GENDER* is a proxy for gender diversity in the board that is alternatively measured by the proportion of female directors in the board (*PROPFEMALE*), the Blau index (*BLAU*), and the Shannon index (*SHANNON*).

Board independence (*IND*), board size (*BSIZE*), board ownership (*BODOWN*), firm size (*ASSETS*), firm age (*AGE*), and the extent of diversification pursued by the firm (*NSEG*) are as defined in the previous subsection.

We estimate our model using Ordinary Least Squares (OLS) and the one-step Arellano and Bond Generalized Method of Moments (Arellano-Bond) estimation techniques.[15] The Arellano-Bond method controls for endogeneity due to omitted and unobservable firm-specific characteristics, reverse causality, and dynamic endogeneity (i.e. past firm performance is correlated with the endogenous variable), whereas the OLS method does not (Roodman, 2009). Similar to Adams and Ferreira (2009), for the Arellano-Bond procedure, we augment Equation (1) by including one-period lag of the performance variable as an additional independent variable. As instruments, we use two and all further period lags of the performance variable, as well as one-period lags of all independent variables, except for the year dummies.

When analyzing the effects of gender diversity on firm performance, Adams and Ferreira (2009) and Dezso and Ross (2012) note that endogeneity is usually a cause for concern. Studies that analyze the relationship between board-level gender diversity and firm performance have produced mixed results because some do not control for (i) unobserved individual effects associated with each firm or time period that might simultaneously affect firm performance and the extent of gender diversity in the board, and/or (ii) the possibility of reverse causality between firm performance and board-level gender diversity.[16] Dynamic endogeneity is also a generally overlooked and important source of endogeneity because of the fact that "relations among a firm's observable characteristics are likely to be dynamic" (Wintoki *et al.,* 2011), i.e., in our study, past firm performance may be correlated with current levels of gender diversity in the board.

[14] We winsorize the performance variables – Tobin's q, ROA and ROE – at the 1% level to mitigate the effect of outliers.

[15] We use Stata 13 to estimate all regression models in this study, and include industry dummy variables in the pooled OLS estimation method. However, similar to Adams and Ferreira (2009), we do not use industry dummies in the Arellano-Bond one-step estimation procedure because we argue that any differences in firm performance due to industry effects is reflected in the individual fixed effects that are accounted for in this procedure.

[16] See, for instance, Krishnan and Park (2005), Erhardt *et al.* (2003), and Shrader *et al.* (1997).

Concerning the issue of reverse causality, Hermalin and Weisbach (2001) point out the problem of endogeneity when examining board composition and firm value, i.e., while board diversity could affect firm value, firm value could also affect board diversity. Adams and Ferreira (2009) point out that reverse causality is a concern in firm performance regressions because of the potential for women board members to seek or self-select into high-performing firms as much as high-performing firms appoint women board members because of the positive effects of gender diversity in the board. For example, Adams and Ferreira (2009) study U.S. firms for the period 1996 to 2003 and find that the relationship between the proportion of women in the board and firm performance has changed from negative to positive, after controlling for the endogeneity of the diversity variable using the Instrumental Variable-Two Stage Least Squares (IV-2SLS) and the Arellano-Bond techniques. Carter *et al.* (2003) also use the IV-2SLS method to account for the endogenous gender diversity variable and find that the presence and proportion of women in the board improve firm value for a sample of U.S. firms. On the other hand, Farrell and Hersch (2005) analyze U.S. firm-level data and provide empirical evidence to support the theory that women tend to self-select into better-performing firms, which further justifies that board-level gender diversity is endogenous.[17]

For all model specifications, we report standard errors that are robust to both heteroskedasticity and within-group serial correlation. Finally, we emphasize that the richness of the panel data we have gathered on more than 200 Philippine listed firms over a twelve-year period allows us to control for a wide array of firm and time-specific unobservable factors that may affect firm performance, as well as to address the issue of reverse causality and dynamic endogeneity. This, in turn, provides a more robust analysis of the effects of gender diversity in the board on firm performance than prior studies that did not account for unobserved firm-specific characteristics and other endogeneity issues.

4. Results

Table 6 shows the results of estimating our firm performance model, where we examine the effects of board-level gender diversity on various firm performance measures. Panel A of Table 6 uses lnQ as a

[17] To address the issue of unobserved heterogeneity, the fixed effects or random effects estimation methods are commonly employed to control for omitted corporate culture (or any other time-invariant firm characteristic) that significantly affects firm performance. However, these techniques do not address other endogeneity issues, such as reverse causality and dynamic endogeneity. To address the concern that gender diversity in the board is potentially correlated with the error term of the performance regression due to other endogeneity issues, Instrumental Variable techniques that include the Two-Stage-Least-Squares Instrumental Variables (2SLS-IV) estimation method and the one-step Arellano-Bond GMM procedure are commonly used. While the 2SLS-IV method addresses the reverse causality issue, it does not address the endogeneity issue that arises because past performance could influence board-level gender diversity. In contrast, the Arellano-Bond one-step procedure controls for the potential correlation between past performance and board-level gender diversity, in addition to reverse causality. The first-differencing technique of the Arellano-Bond method also eliminates any potential individual firm specific effects that may affect firm performance.

measure of a firm's market performance, panel B uses ROA as a measure of a firm's accounting performance, and finally, panel C employs ROE as an alternative measure of a firm's accounting performance. Columns (1), (3) and (5) present the pooled OLS estimation results while columns (2), (4) and (6) show the estimates based on the one-step Arellano-Bond procedure.

We first discuss the results shown in columns (1), (3), and (5) of panel A of Table 6 where we use the natural logarithm of Tobin's Q as our measure of a firm's market performance. The overall results based on the pooled OLS estimation procedure indicate a negative relationship between gender diversity in the board and firm performance, regardless of the measure of gender diversity used. However, the evidence of such negative relationship appears to be significant, albeit weak (10% level), only when gender diversity is measured in terms of the Blau index and the Shannon index. While the coefficient is negative when proportion of women on the board is used as a proxy for board-level gender diversity, its effect on all measures of firm performance is statistically insignificant.

In addition, our OLS results indicate that firm size is significantly and negatively related to firm value, regardless of the measure of gender diversity used. This result is consistent with the findings of Yang and Chen (2009) and possibly indicates that larger firms suffer from less flexibility to adapt to changing market conditions, which can lead to slower firm growth. We also find that board independence, board size, board share ownership, firm age, and the extent of business diversification engaged in by a firm do not significantly affect firm value.

It should be noted, however, that these OLS results do not take into account potential issues of omitted firm-specific effects on firm value, reverse causality between gender diversity in the board and firm performance, and dynamic endogeneity.[18] To address these issues, we estimate our firm performance model using the Arellano-Bond one-step procedure.

The results are presented in columns (2), (4) and (6) of panel A of Table 6. We observe from these columns that, similar to Adams and Ferreira (2009), past performance has a significant and positive effect on current performance. Our overall results indicate that regardless of the measure of gender diversity used, the relationship between board-level gender diversity and firm performance remains to be negative even after controlling for endogeneity. As in the pooled OLS case, we find a negative relationship between gender diversity and firm performance that is statistically significant at the 10% level when the

[18] To determine whether or not omitted firm-specific effects on firm performance are driving our OLS regression results, we estimated the Fixed Effects and Random Effects models and used the Wald's Test for Fixed Effects and the Breusch-Pagan Lagrange Multiplier Test for Random Effects. Based on the test results, we rejected the null hypotheses of no firm-specific effects for both tests. Furthermore, to address the fact that gender diversity in the board could be correlated with the error term in our performance regression due to reverse causality, we use the Hausman Test of Endogeneity and subsequently reject the null that gender diversity in the board is exogenous, even after controlling for the presence of firm-specific effects on firm performance.

Shannon index is used as a measure of board-level gender diversity. However, unlike the pooled OLS results, we find (i) a significant negative relationship (10% level) between the proportion of women in the board and lnQ, and (ii) a more statistically significant and negative relationship (5% level) between board-level gender diversity and firm performance when the Blau index of gender diversity is used.

Moreover, our Arellano-Bond estimation results show that the coefficients of board independence and firm age are now statistically significant, in contrast with the pooled OLS results. Specifically, we find that board independence has a significant negative relationship with firm value. This result is consistent with the findings of Bhagat and Black (1999) and Agrawal and Knoeber (1996), and possibly suggests that most outsider directors in Philippine listed firms are appointed not because they are competent, but because of their affiliation to the firm owner, i.e., independent directors may not be truly "independent". We also find that firm age has a positive and statistically significant relationship with firm value, which is consistent with the theory that older firms enjoy higher firm value because of the valuable experience management has gained in running the firm over time. These findings emphasize the importance of controlling for issues arising from simultaneity, unobserved heterogeneity, and potential bias due to endogeneity over time.

Our general finding of a significant negative gender diversity effect on firm value is also consistent with that of recent studies, which hypothesize that women directors tend to over-monitor (Adams and Ferreira, 2009), women serve merely as "window-dressing" for firms to signal that they satisfy existing board gender quotas (Ahern and Dittmar, 2012), and women are perceived by the market to perform rather poorly as firm directors (Dobbin *et al.*, 2011; Solal and Snellman, 2015; Haslam *et al.*, 2010).

We also estimate our performance model using ROA as a measure of a firm's accounting performance. The parameter estimates shown in columns (2), (4) and (6) of panel B of Table 6 suggest that past ROA does not significantly affect current ROA. Moreover, the overall results indicate that whether or not we control for endogeneity issues and regardless of gender diversity measure used, board-level gender diversity does not seem to have a significant impact on short-term firm performance, as measured by ROA. This result is consistent with the empirical findings of Solal and Snellman (2015) and Dobbin and Jung (2011) for U.S. firms, and of Haslam *et al.* (2010) for U.K. firms. Likewise, our finding is consistent with the investor bias theory, which posits that greater gender diversity in the board (i.e. greater presence of female board members) will have no significant impact on firm profits because women tend to be appointed not on the basis of distinguishable individual competence, but because of the need to satisfy existing board gender quotas, political constraints, and family behests.

Moreover, in contrast with our Tobin's Q results, we find that firm size is positively and significantly related to ROA, regardless of the estimation technique used. This may suggest that larger firms benefit

from improved firm profitability due to their ability to exploit scale economies (Mansfield, 1962), although such firms may suffer from value losses in the long run. We also find that greater business diversification extent has a negative and significant relationship with ROA, which possibly indicates that well-diversified firms do not enjoy improved short-term firm performance due to their tendency to over-diversify or to misallocate their resources among business segments (Markides, 1992; Berger and Ofek, 1995).

Lastly, we estimate our performance model using ROE as an alternative measure of accounting performance of a firm. The results are shown in panel C of Table 6. Similar to the case of ROA, we find that board-level gender diversity appears to have no significant effect on ROE, regardless of the estimation technique and diversity measure used. The finding that gender diversity in the board does not have a significant effect on accounting performance seems to suggest that making boards of Philippine listed firms more gender-diverse (i.e. hiring more women directors) does not have a material impact on short-term firm performance. Also, consistent with our ROA results, we find that firm size is positively and significantly related to ROE in our pooled OLS estimation results, while greater business diversification extent has a negative and significant relationship with ROE when the Arellano-Bond estimation technique is employed.

All in all, we find strong evidence in favor of the investor bias theory: greater gender diversity in the board does not significantly affect short-term profitability but appears to significantly reduce long-term market value of the firm. Dobbin and Jung (2011) argue that this bias proposition should be complemented by the wider effects of other board and firm governance characteristics on firm profitability and value. For instance, investors are also thought to favor firms with more outside directors because of their value-enhancing effects. These firms are expected to enjoy improvements in firm profits and market valuation. However, we find evidence to the contrary: when we control for omitted firm-specific effects, reverse causality, and the potential correlation between past firm performance and board-level gender diversity, we find that boards with a larger proportion of outside directors suffer from value declines. Likewise, we find that greater board independence does not significantly affect firm profitability. Since this fundamental change that is designed to improve board functioning seems to be ineffective, then there is also little reason to suspect that improvements in the gender composition of boards should enhance firm performance as well via board efficacy (Dobbin and Jung, 2011).

Furthermore, we find that the negative gender diversity – firm market value relationship becomes more apparent when we control for unobserved firm-specific effects and other endogeneity issues. This suggests the importance of accounting for endogeneity issues in estimating board composition and firm value relationships, as put forward by Hermalin and Weisbach (2001) and Adams and Ferreira (2009).

It should be noted, however, that Joecks *et al.* (2013) offer an alternative story, based on Kanter's (1977) critical mass theory, to explain the negative relationship between gender diversity and firm performance. They posit that if the critical mass theory holds, there should be a nonlinear and U-shaped relationship between gender diversity and firm performance. Given that such nonlinear relationship holds, Joecks *et al.* (2013) argue that studies comprising of sample firms with boards having rather low female representation may find the link between gender diversity and firm performance to be negative, if the relationship is estimated in a linear fashion. On the other hand, studies in which sample firms have boards with high female representation may find the link to be positive. In contrast, studies for which the sample firms have boards with both low and high female representation would most likely find no significant linear relationship between gender diversity in the boardroom and firm performance. In a regression context with firm performance as the dependent variable, such U-shaped link implies a negative coefficient on the gender diversity variable and a positive coefficient on the squared gender diversity variable.

To test this theory, Joecks *et al.* (2013) analyze a sample of publicly listed German firms over the period 2000 to 2005. They employ pooled OLS and the Random Effects (RE) panel data estimation technique, which controls for individual firm-specific effects on firm performance, and use ROE as a proxy for firm performance and the Blau index as their board-level gender diversity measure. To address potential problems of endogeneity, they use as regressors the one-year lag values of gender diversity and that of the board-related explanatory variables that are potentially related to gender diversity. Based on their RE estimates, they find a statistically significant and non-linear (U-shaped) relationship between board-level gender diversity and firm performance, which they argue to be consistent with the critical mass theory.

To test the critical mass hypothesis, we estimate our Equation (1) similar to Joecks *et al.* (2013) and report standard errors that are robust to both heteroskedasticity and within-group serial correlation. Table 7 reports our estimation results. Panel A of Table 7 uses lnQ as the measure of a firm's market performance, whereas Panel B uses ROA and Panel C uses ROE as measures of a firm's accounting performance. Columns (1), (3), and (5) of Table 7 report the pooled OLS estimation results, while columns (2), (4), and (6) present the estimates based on the Random Effects estimation method.

Although the OLS estimates shown in column (1) of panel A seem to suggest a significant nonlinear and U-shaped relationship between the proportion of women in the board and firm performance as measured by lnQ, results of the Breusch-Pagan LM tests suggest that the RE model is more appropriate for all our model specifications, similar to the findings of Joecks *et al.* (2013). Based on the RE estimates in columns (2), (4), and (6), we find no significant evidence of a nonlinear and U-shaped relationship

between gender diversity and firm performance, regardless of firm performance measure and gender diversity measure used. These results imply that the relationship between firm performance and gender diversity in Philippine boards may be more appropriately modeled by a linear specification such as that which we used in our study. Thus, we conclude that our results do not support the critical mass theory implication put forward by Joecks *et al.* (2013). Rather, it seems that our results support the investor bias theory proposed by Dobbin and Jung (2011).

Furthermore, it should be noted that Joecks *et al.* (2013) do not find such nonlinear U-shaped relationship when they use other performance measures such as Tobin's Q. Moreover, they do not test their hypothesis using other measures of gender diversity, and they are not able to address potential endogeneity problems that arise because past firm performance could influence board-level gender diversity (i.e. the RE model does not allow for such dynamic endogeneity since it is a static model). Neglecting to control for such dynamic endogeneity between past performance and current board structure and composition may yield inconsistent estimates (Wintoki *et al.*, 2011), especially given that our results based on the Arellano and Bond one-step GMM procedure indicate that dynamic endogeneity is present in the case of Philippine publicly traded firms.

5. Conclusions

The issue of gender diversity in boards is rapidly gaining worldwide attention because of the purported social and economic advantages of engaging more women in leadership and board positions in the corporate sector. On the one hand, appointing more women into corporate board seats is purported to help break down the barriers of the "glass ceiling" syndrome and to contribute towards the empowerment of women and minorities alike. On the other hand, the arguably more practical viewpoint of diversity argues that women have distinct psychosocial traits and characteristics that enable them to serve as tougher and more empathetic firm monitors and leaders, which helps improve firm performance. This study empirically investigates the latter rationale.

Using an unbalanced panel of 2,645 firm-years for the period 2003 to 2014, we find that greater gender diversity in boards, which in the case of our sample of Philippine firms also indicates the presence of more female directors in the board, does not significantly affect short-term firm performance, but seems to drive down long-term firm value. Our findings are consistent with more recent studies, which suggest that greater gender diversity in boards has a negative or neutral impact on firm performance. In contrast with earlier cross-sectional studies that report positive effects of gender diversity on firm performance, these recent studies tend to use panel data and statistical methods that are designed to control for endogeneity and unobserved differences across firms and years, which makes their results more robust

than previous studies that did not account for such econometric issues. Against this background, our results suggest that greater board-level gender diversity does not help firms improve firm value; rather, it hurts them or, at best, does not affect their performance. This finding is consistent with the investor bias theory, which argues that investors collectively drive down the market value of firms with more gender-diverse boards (i.e. boards with more women members) because they have a perceptual bias against women as capable firm leaders and directors.

Our findings put to question the economic rationale of imposing any minimum gender quota on boards of, at least, Philippine publicly listed firms, similar to the practice in most European countries. We suggest that policy makers must be cautious in proposing quotas that seek to promote gender parity in boards of directors of publicly traded firms based on a claim that it will significantly improve firm performance and shareholder value. Instead, enforcing board-level gender quotas may have to be justified in terms of social equality, business reputation, and purely ethical grounds.

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Table 1. *Overview of the literature on board-level gender diversity (chronological order, by performance variable)*

Author(s) (Year)	Board-level gender diversity measure used	Data sample (*n*, country, years)	Statistical/estimation method used	General result
Panel A: Tobin's Q				
Carter, Simkins, and Simpson (2003)	Dummy (presence of at least one female director); percentage of female directors	638 Fortune 1000 (U.S.) firms (1997)	2SLS-IV	Positive link
Rose (2007)	Dummy (presence of at least one female director); percentage of female directors	Almost all Danish firms listed in the Copenhagen Stock Exchange (1998-2001)	OLS	Insignificant link
Campbell and Minguez-Vera (2008)	Dummy (presence of at least one female director); percentage of female directors; Blau index; Shannon index	68 Spanish firms (1995-2000)	2SLS-IV	Dummy variable is insignificant; otherwise, positive link
Adams and Ferreira (2009)	Proportion of female directors	1,939 S&P-indexed (U.S.) firms based on IIRC (1996-2003)	OLS, Fixed effects, 2SLS-IV, One-step Arellano Bond	Negative link
Ararat, Aksu, and Cetin (2010)	Blau index	95 Istanbul Stock Exchange (ISE-100) index listed firms (2006)	OLS	Positive link
Bohren and Strom (2010)	Proportion of female directors	129 to 203 non-financial firms listed in the Oslo	OLS, Random effects GLS, 2SLS-IV	Negative link

		Stock Exchange (1989-2002)		
Haslam, Ryan, Kulich, Trojanowski, and Atkins (2010)	Dummy (presence of at least one female director)	126 FTSE 100-indexed firms (2001-2005)	Bivariate correlations, ANOVA, independent t-tests	Negative link
Darmadi (2011)	Dummy (presence of at least one female director); proportion of female directors; Blau index; Shannon index	169 firms listed in the Indonesian Stock Exchange (2007)	OLS	Negative link
Dobbin and Jung (2011)	Number of female board members	432 Fortune 500 (U.S.) firms (1997-2006)	Fixed effects, with one-year lag of all explanatory variables	Negative link
Abdullah, Ku Ismail, and Nachum (2012)	Dummy (presence of at least one female director); number of female directors; proportion of female directors	841 firms listed in Bursa Malaysia (2008)	OLS (Hierarchical regression analysis)	Negative link for dummy variable; otherwise, insignificant
Ahern and Dittmar (2012)	Percentage of female directors	248 publicly listed Norwegian firms (2001-2009)	2SLS-IV	Negative link
Solal and Snellman (2015)	Number of female board members; percentage of female board members	1,971 publicly traded U.S. firms (1998-2011)	OLS and Fixed effects, with one-year lag of gender diversity measure	Negative link
Panel B: ROA				

Shrader, Blackburn, and Iles (1997)	Proportion of female directors	200 U.S. firms with the largest market value from the WSJ (1992 and 1993)	Hierarchical regression analysis	Insignificant link
Erhardt, Werbel, and Shrader (2003)	Proportion of female and minority (nonwhite) directors	112 Fortune 1000 (U.S.) firms (1998)	Hierarchical regression analysis	Positive link
Adams and Ferreira (2009)	Proportion of female directors	1,939 S&P-indexed (U.S.) firms based on IIRC (1996-2003)	OLS, Fixed effects, 2SLS-IV, One-step Arellano Bond	Negative link
Bohren and Strom (2010)	Proportion of female directors	129 to 203 non-financial firms listed in the Oslo Stock Exchange (1989-2002)	OLS, Random effects GLS, 2SLS-IV	Negative link
Haslam, Ryan, Kulich, Trojanowski, and Atkins (2010)	Dummy (presence of at least one female director)	126 FTSE 100-indexed firms (2001-2005)	Bivariate correlations, ANOVA, independent t-tests	Insignificant link
Darmadi (2011)	Dummy (presence of at least one female director); proportion of female directors; Blau index; Shannon index	169 firms listed in the Indonesian Stock Exchange (2007)	OLS	Proportion of women variable is insignificant; otherwise, negative link
Dobbin and Jung (2011)	Number of female board members	432 Fortune 500 (U.S.) firms (1997-2006)	Fixed effects, with one-year lag of all explanatory variables	Insignificant link

Abdullah, Ku Ismail, and Nachum (2012)	Dummy (presence of at least one female director); number of female directors; proportion of female directors	841 firms listed in Bursa Malaysia (2008)	OLS (Hierarchical regression analysis)	Positive link for dummy variable; otherwise, insignificant
Kilic (2015)	Dummy (presence of at least one female director); proportion of female directors; Blau index	26 publicly listed and privately held banks in Turkey (2008-2012)	Random effects	Dummy variable is insignificant; otherwise, negative link
Solal and Snellman (2015)	Number of female board members; percentage of female board members	1,971 publicly traded U.S. firms (1998-2011)	OLS and Fixed effects, with one-year lag of gender diversity measure	Insignificant link
Panel C: ROE				
Shrader, Blackburn, and Iles (1997)	Proportion of female directors	200 U.S. firms with the largest market value from the WSJ (1992 and 1993)	Hierarchical regression analysis	Insignificant link
Ararat, Aksu, and Cetin (2010)	Blau index	95 Istanbul Stock Exchange (ISE-100) index listed firms (2006)	OLS	Positive link
Haslam, Ryan, Kulich, Trojanowski, and Atkins (2010)	Dummy (presence of at least one female director)	126 FTSE 100-indexed firms (2001-2005)	Bivariate correlations, ANOVA, independent t-tests	Insignificant link
Luckerath-Rovers (2013)	Dummy (presence of at least one female	99 publicly listed Dutch firms (2005-	OLS	Positive link

	director); proportion of female directors	2007)		
Kilic (2015)	Dummy (presence of at least one female director); proportion of female directors; Blau index	26 publicly listed and privately held banks in Turkey (2008-2012)	Random effects	Negative link

Table 2. *Summary of hypotheses*

	Agency Theory / Entrenchment Theory	**Stewardship Theory**	**Resource Dependency Theory**	**Social Psychology Theories**	**Investor Bias Theory**	**Other Theories**
Board-level gender diversity	**(+/-)**	**(-)**	**(+)**	**(+/-)**	**(-)** for Tobin's Q; (insignificant) for ROA	--
Board independence	**(+)**	--	--	--	--	**(-)**
Board size	**(-)**	--	--	--	--	--
Board share ownership	**(+/-)**	--	--	--	--	--
Firm age	--	--	--	--	--	**(+/-)**
Firm size	--	--	--	--	--	**(+/-)**
Diversification extent	--	--	--	--	--	**(+/-)**

Table 3. *Sample data elimination*

	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**Total**
Initial number of firms	234	233	235	238	243	245	7	252	252	255	255	260	2,949
Firms that did not trade during the year	(23)	(19)	(17)	(24)	(23)	(26)	(28)	(27)	(20)	(19)	(18)	(16)	(260)
Firms with missing data	(5)	(5)	(3)	(5)	(3)	(3)	(2)	(2)	(3)	(5)	(3)	(5)	(43)
Remaining firms	**206**	**209**	**215**	**209**	**217**	**216**	**217**	**223**	**229**	**231**	**234**	**239**	**2,645**

Table 4. *Summary statistics on board-level gender diversity related indicators*

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Proportion of firms with completely female boards	0	0	0	0	0	0		0	0	0	0	0	0
Proportion of firms with completely male boards	0.345	0.335	0.358	0.368	0.346	0.357	41	0.323	0.323	0.299	0.303	0.293	0.332
Proportion of firms with at least 1 female board member	0.655	0.665	0.642	0.632	0.654	0.644	59	0.677	0.677	0.701	0.697	0.707	0.668
Proportion of firms with more than 50% women in the board	0.019	0.019	0.019	0.019	0.028	0.019	0.028	0.022	0.026	0.026	0.017	0.017	0.022
Average proportion of women in the board	0.132	0.137	0.133	0.133	0.140	0.134	0.140	0.138	0.140	0.147	0.153	0.147	0.140
Maximum proportion of women	0.714	0.714	0.714	0.714	0.600	0.636	0.800	0.800	0.800	0.800	0.800	0.727	0.800
Minimum proportion of women	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Blau index values	0.189	0.194	0.190	0.188	0.198	0.191	0.197	0.197	0.199	0.207	0.215	0.211	0.198
Maximum Blau index values	0.496	0.496	0.496	0.500	0.500	0.500	0.494	0.494	0.494	0.496	0.496	0.496	0.500
Minimum Blau index values	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Shannon index values	0.299	0.306	0.298	0.294	0.310	0.300	0.308	0.310	0.313	0.326	0.334	0.331	0.311
Maximum Shannon index values	0.689	0.689	0.689	0.693	0.693	0.693	0.687	0.687	0.687	0.689	0.689	0.689	0.693

Minimum Shannon index values	0	0	0	0	0	0	0	0	0	0	0	0	0
Average number of directors in the board	9.243	9.306	9.219	9.129	9.226	9.264	9.341	9.368	9.459	9.494	9.397	9.406	9.325
Maximum number of directors[19]	18	17	16	18	18	1.8	17	15	15	15	15	15	18
Minimum number of directors	3	5	5	4	4	4	5	5	5	5	5	5	3
Number of firms	**206**	**209**	**215**	**209**	**217**	**216**	**217**	**223**	**229**	**231**	**234**	**239**	**2,645**

[19] The Corporation Code of the Philippines sets the limits on the number of the members of the board of directors of private corporations to a minimum of five and a maximum of 15. However, for banks and non-bank financial institutions, per Bangko Sentral ng Pilipinas (BSP) Circular No. 296 Series of 2001 which amends Republic Act No. 8791 (The General Banking Law of 2000), the number of directors may be increased up to twenty-one in case of a bank/quasi-bank/trust entity merger or consolidation. In our sample, the maximum number of directors corresponds to a bank whose merger with two other banks was approved by the BSP and SEC in 2002. The minimum value of 3 directors in our sample indicates a temporary vacancy.

Table 5. *Description of dependent and independent variables*

Variable (Code)	Description	Measurement/s
Dependent Variables (*PERFORMANCE*)		
Return on Assets (*ROA*)	Short-term measure of firm performance	$ROA = \frac{NIBT}{BVA}$ *NIBT* = Net income before taxes; and *BVA* = Book value of total assets
Return on Equity (*ROE*)	Short-term measure of firm performance	$ROE = \frac{NIBT}{BVE}$ *NIBT* = Net income before taxes; and *BVE* = Book value of total equity
ln(Tobin's Q)	Long-term measure of firm performance and firm value	$Tobin's\ Q = \frac{BVA - BVE + MVE}{BVA}$ *BVA* = Book value of total assets; *BVE* = Book value of total equity; and *MVE* = Market value of equity = Market value of common shares outstanding + Book value of preferred shares outstanding
Independent Variables		
Gender Diversity		
Board-level gender diversity (*GENDER*)	Measure of the presence of females in the board of directors	$PROPFEMALE = \frac{WOMEN}{BOARD}$ *WOMEN* = Number of female directors in the board; and *BOARD* = Number of directors in the board $BLAU = 1 - \sum_{i=1}^{n} P_i^2$ *n* = Number of categories (two: male and female);

		P_i = Proportion of board members in each category $SHANNON = -\sum_{i=1}^{n} P_i \ln P_i$ n = Number of categories (two: male and female); P_i = Proportion of board members in each category
Board Characteristics and Ownership Structure		
Board independence (*IND*)	Proportion of independent directors in the board	$IND = \frac{INDEP}{BOARD}$ *INDEP* = Number of independent directors in the board; *BOARD* = Number of directors in the board
Board size (*BSIZE*)	Board size	ln(Total number of directors in the board)
Board ownership (*BODOWN*)	Percentage of share ownership in the firm by all directors	$BODOWN = \frac{OSDIR}{OS} \cdot 100$ *OSDIR* = Number of common shares outstanding held by all directors in the firm; and *OS* = Total number of common shares outstanding
Control Variables		
Firm size (*ASSETS*)	Firm size	$ASSETS = \ln(BVA)$ *BVA* = Book value of total assets

Firm age (*AGE*)	Firm age	$AGE = \ln(YEARS)$ *YEARS* = Number of years since the incorporation of the firm
Diversification extent (*NSEG*)	Extent of business diversification pursued by the firm	Number of business segments in the firm

Table 6. *Regression of board-level gender diversity on firm performance*

	Proportion of females in the board		**Blau index**		**Shannon index**	
	OLS	**One-step Arellano-Bond**	**OLS**	**One-step Arellano-Bond**	**OLS**	**One-step Arellano-Bond**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
PANEL A: lnQ						
Gender diversity in the board	**-0.2821** (0.3437)	**-0.5291 *** (0.2978)	**-0.4300 *** (0.2579)	**-0.4812 **** (0.2394)	**-0.2998 *** (0.1745)	**-0.3001 *** (0.1568)
Board independence	**-0.2301** (0.3269)	**-0.4511 *** (0.2397)	**-0.2408** (0.3225)	**-0.4516 *** (0.2337)	**-0.2500** (0.3228)	**-0.4738 **** (0.2330)
Board size	**-0.0313** (0.2179)	**0.1851** (0.1644)	**-0.0405** (0.2157)	**0.2383** (0.1620)	**-0.0350** (0.2149)	**0.2396** (0.1606)
Board ownership	**0.0011** (0.0028)	**0.0031** (0.0045)	**0.0011** (0.0027)	**0.0030** (0.0046)	**0.0011** (0.0027)	**0.0031** (0.0046)
Firm size	**-0.2165 ***** (0.0432)	**-0.5340 ***** (0.0609)	**-0.2173 ***** (0.0433)	**-0.5356 ***** (0.0607)	**-0.2175 ***** (0.0433)	**-0.5362 ***** (0.0606)
Firm age	**0.0525** (0.0578)	**0.6940 **** (0.2860)	**0.0545** (0.0575)	**0.7320 ***** (0.2780)	**0.0556** (0.0576)	**0.7306 ***** (0.2761)
Extent of business diversification	**0.0175** (0.0324)	**0.0241** (0.0232)	**0.0183** (0.0323)	**0.0244** (0.0233)	**0.0187** (0.0324)	**0.0280** (0.0233)
Lagged lnQ		**0.1325 **** (0.0528)		**0.1358 **** (0.0524)		**0.1307 **** (0.0519)
PANEL B: ROA						
Gender diversity in the board	**-0.0004** (0.0534)	**-0.0832** (0.1117)	**0.0106** (0.0349)	**0.0009** (0.0671)	**0.0076** (0.0236)	**-0.0028** (0.0411)

Board independence	**0.0801** (0.0499)	**-0.0633** (0.0725)	**0.0805** (0.0497)	**-0.0469** (0.0670)	**0.0807** (0.0496)	**-0.0465** (0.0680)
Board size	**-0.0268** (0.0319)	**-0.0513** (0.0621)	**-0.0258** (0.0327)	**-0.0429** (0.0626)	**-0.0259** (0.0326)	**-0.0406** (0.0626)
Board ownership	**0.0003** (0.0004)	**0.0018** (0.0011)	**0.0003** (0.0004)	**0.0018** (0.0011)	**0.0003** (0.0004)	**0.0018** (0.0011)
Firm size	**0.0368** *** (0.0074)	**0.0897** *** (0.0227)	**0.0369** *** (0.0073)	**0.0885** *** (0.0226)	**0.0369** *** (0.0073)	**0.0889** *** (0.0226)
Firm age	**-0.0082** (0.0078)	**-0.0390** (0.0574)	**-0.0082** (0.0078)	**-0.0483** (0.0595)	**-0.0082** (0.0078)	**-0.0471** (0.0576)
Extent of business diversification	**-0.0127** *** (0.0046)	**-0.0323** *** (0.0105)	**-0.0127** *** (0.0047)	**-0.0340** *** (0.0108)	**-0.0127** *** (0.0047)	**-0.0344** *** (0.0108)
Lagged ROA		**0.0859** (0.0606)		**0.0794** (0.0618)		**0.0790** (0.0613)
PANEL C: ROE						
Gender diversity in the board	**-0.0895** (0.0858)	**0.0724** (0.2685)	**-0.0639** (0.0762)	**0.2606** (0.1972)	**-0.0397** (0.0518)	**0.2052** (0.1462)
Board independence	**0.0915** (0.1169)	**0.4375** (0.2979)	**0.0905** (0.1169)	**0.4265** (0.2862)	**0.0895** (0.1169)	**0.4309** (0.2870)
Board size	**-0.0123** (0.0554)	**-0.0622** (0.1681)	**-0.0089** (0.0546)	**-0.0869** (0.1671)	**-0.0075** (0.0542)	**-0.0982** (0.1668)
Board ownership	**0.0006** (0.0005)	**0.0026** (0.0031)	**0.0006** (0.0005)	**0.0026** (0.0031)	**0.0006** (0.0005)	**0.0026** (0.0031)
Firm size	**0.0298** *** (0.0098)	**0.0634** (0.0552)	**0.0299** *** (0.0098)	**0.0609** (0.0551)	**0.0299** *** (0.0098)	**0.0609** (0.0550)
Firm age	**-0.0115** (0.0171)	**0.0592** (0.1721)	**-0.0113** (0.0171)	**-0.0277** (0.1578)	**-0.0111** (0.0171)	**-0.0361** (0.1526)

Extent of business diversification	**-0.0083** (0.0111)	**-0.0936 *** (0.0479)	**-0.0080** (0.0111)	**-0.0952 **** (0.0471)	**-0.0079** (0.0111)	**-0.0946 **** (0.0469)
Lagged ROE		**0.0739** (0.0632)		**0.0693** (0.0624)		**0.0673** (0.0620)
Number of obs.	2,645	2,046	2,645	2,046	2,645	2,046
Industry dummies	YES	NO	YES	NO	YES	NO
Year dummies	YES	YES	YES	YES	YES	YES

Coefficient estimates are in bold; standard errors are in parentheses

**** significant at 0.10 level; ** significant at 0.05 level; *** significant at 0.01 level***

Table 7. *Regression of board-level gender diversity in its quadratic form on firm performance*

	Proportion of females in the board		**Blau index**		**Shannon index**	
	OLS	**Random effects**	**OLS**	**Random effects**	**OLS**	**Random effects**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
PANEL A: lnQ						
Gender diversity in the board$_{t-1}$	**-1.5788 **** (0.7860)	**-0.8631** (0.6369)	**-0.6511** (0.7202)	**-0.0070** (0.4809)	**-0.4554** (0.5194)	**-0.0275** (0.3287)
Gender diversity in the board (squared)$_{t-1}$	**3.0164 *** (1.7748)	**2.3629** (1.6073)	**0.6458** (1.6387)	**-0.2878** (1.2851)	**0.3199** (0.8702)	**-0.0941** (0.6315)
Board independence$_{t-1}$	**-0.1710** (0.3373)	**0.1800** (0.1879)	**-0.1786** (0.3473)	**0.2081** (0.2085)	**-0.1861** (0.3473)	**0.2042** (0.2076)
Board size$_{t-1}$	**-0.0528** (0.2286)	**0.1242** (0.1648)	**-0.0911** (0.2317)	**0.0524** (0.1481)	**-0.0857** (0.2318)	**0.0571** (0.1485)
Board ownership$_{t-1}$	**0.0009** (0.0028)	**0.0040** (0.0030)	**0.0010** (0.0028)	**0.0038** (0.0030)	**0.0010** (0.0028)	**0.0038** (0.0030)
Firm size	**-0.2113 ***** (0.0450)	**-0.3264 ***** (0.0437)	**-0.2120 ***** (0.0446)	**-0.3308 ***** (0.0447)	**-0.2121 ***** (0.0447)	**-0.3308 ***** (0.0448)
Firm age	**0.0754** (0.0641)	**0.1024** (0.0673)	**0.0729** (0.0645)	**0.0893** (0.0667)	**0.0737** (0.0645)	**0.0901** (0.0666)
Extent of business diversification	**0.0202** (0.0335)	**0.0380** (0.0239)	**0.0159** (0.0334)	**0.0376** (0.0238)	**0.0162** (0.0335)	**0.0376** (0.0238)
PANEL B: ROA						
Gender diversity in the board$_{t-1}$	**0.0485** (0.1085)	**-0.0291** (0.0743)	**0.0209** (0.1113)	**-0.0094** (0.1007)	**0.0386** (0.0808)	**0.0157** (0.0720)

Gender diversity in the board (squared)$_{t-1}$	**-0.1027** (0.2661)	**0.0787** (0.1311)	**-0.0286** (0.2556)	**0.0169** (0.2438)	**-0.0530** (0.1340)	**-0.0290** (0.1256)
Board independence$_{t-1}$	**0.1157 **** (0.0484)	**0.0775 *** (0.0453)	**0.1161 **** (0.0472)	**0.0780 *** (0.0452)	**0.1179 **** (0.0474)	**0.0794 *** (0.0452)
Board size$_{t-1}$	**-0.0113** (0.0341)	**-0.0416** (0.0295)	**-0.0099** (0.0353)	**-0.0433** (0.0296)	**-0.0111** (0.0354)	**-0.0446** (0.0296)
Board ownership$_{t-1}$	**0.0001** (0.0004)	**0.0001** (0.0003)	**0.0001** (0.0004)	**0.0001** (0.0003)	**0.0001** (0.0004)	**0.0001** (0.0003)
Firm size	**0.0351 ***** (0.0073)	**0.0418 ***** (0.0078)	**0.0351 ***** (0.0072)	**0.0416 ***** (0.0078)	**0.0351 ***** (0.0073)	**0.0417 ***** (0.0078)
Firm age	**-0.0104** (0.0090)	**-0.0101** (0.0082)	**-0.0103** (0.0090)	**-0.0103** (0.0083)	**-0.0106** (0.0089)	**-0.0106** (0.0083)
Extent of business diversification	**-0.0130 ***** (0.0046)	**-0.0121 ***** (0.0042)	**-0.0128 ***** (0.0046)	**-0.0122 ***** (0.0042)	**-0.0129 ***** (0.0046)	**-0.0122 ***** (0.0042)
PANEL C: ROE						
Gender diversity in the board$_{t-1}$	**-0.2802** (0.2193)	**-0.2783** (0.2449)	**0.1377** (0.2425)	**0.2705** (0.2413)	**0.1453** (0.1773)	**0.2425** (0.1737)
Gender diversity in the board (squared)$_{t-1}$	**0.4414** (0.3876)	**0.4452** (0.5014)	**-0.5480** (0.5284)	**-0.8741** (0.5531)	**-0.3445** (0.2838)	**-0.5099 *** (0.2902)
Board independence$_{t-1}$	**0.0455** (0.1093)	**-0.0107** (0.1040)	**0.0580** (0.1113)	**0.0086** (0.1072)	**0.0592** (0.1114)	**0.0096** (0.1072)
Board size$_{t-1}$	**-0.0018** (0.0603)	**-0.0266** (0.0659)	**-0.0137** (0.0589)	**-0.0458** (0.0626)	**-0.0151** (0.0591)	**-0.0473** (0.0631)
Board ownership$_{t-1}$	**0.0004** (0.0005)	**0.0006** (0.0005)	**0.0005** (0.0005)	**0.0006** (0.0005)	**0.0005** (0.0005)	**0.0006** (0.0005)
Firm size	**0.0336 *****	**0.0328 *****	**0.0338 *****	**0.0328 *****	**0.0338 *****	**0.0328 *****

	(0.0100)	(0.0107)	(0.0101)	(0.0108)	(0.0101)	(0.0108)
Firm age	**-0.0188** (0.0192)	**-0.0175** (0.0187)	**-0.0210** (0.0191)	**-0.0213** (0.0188)	**-0.0210** (0.0190)	**-0.0212** (0.0188)
Extent of business diversification	**-0.0088** (0.0116)	**-0.0109** (0.0119)	**-0.0100** (0.0116)	**-0.0121** (0.0118)	**-0.0101** (0.0116)	**-0.0121** (0.0118)
Number of obs.	2,333	2,333	2,333	2,333	2,333	2,333
Industry dummies	YES	YES	YES	YES	YES	YES
Year dummies	YES	YES	YES	YES	YES	YES

Coefficient estimates are in bold; standard errors are in parentheses

**** significant at 0.10 level; ** significant at 0.05 level; *** significant at 0.01 level***