12-2017

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Working Paper Series 2017-12-042

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Abstract

The idea that more women belong on corporate boards is attracting increased attention around the world. Some scholars argue that gender diversity on boards improves firm performance and induces more prudent corporate decision-making. This rationale is based on the hypothesis that women are less overconfident and are innately more risk-averse than men. Alternatively, other researchers argue that firms having more female directors are associated with greater corporate risk-taking as the profile of women making it to the board level has proven to be open to greater challenges and risks. Still another strand of literature argues that risk-aversion does not vary between homogeneously male boards and more gender-diverse boards. Thus, in this paper, we report results for our examination of the relationship between board diversity for Philippine firms on corporate risk-taking over the period 2003 to 2015. We use four alternative measures to proxy for corporate risk-taking and employ the two-step Blundell-Bond System Generalized Method of Moments estimation technique to account for endogeneity issues that may influence this relationship. Our findings show that we cannot definitively conclude that the relationship between board diversity and corporate risk-taking is negative. This suggests that the case for greater gender diversity on Philippine corporate boards should be based on fairness, social, and moral considerations, and not to try to improve the level of corporate risk-taking.

JEL Classification: G30, G34, J16

Keywords: Board diversity, Corporate risk-taking, Philippine corporations, Econometric techniques

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1. Introduction

Female representation on corporate boards has become increasingly more common in recent years around the world. However, the increase in the percentage of women on boards has been slow. For S&P 500 firms, the percentage of women on boards rose from 19.2% to 21.2% between 2014 and 2016 (Catalyst, 2015, 2017). Similarly, for Fortune 500 firms, women held 20.2% of board seats in 2016, an increase from 15.7% in 2010 and 16.6% in 2012 (Deloitte & Alliance for Board Diversity, 2017). For companies listed on the STOXX Europe 600 index, boards had an average of 2.8 female members in 2015, compared with 1.5 in 2011 and 2.1 in 2013 (European Women on Boards & Institutional Shareholder Services, Inc., 2016).[1]

Consistent with the findings in developed markets, emerging markets also exhibit an increase, although rather slow, in the representation of women in boardrooms. For example, Unite, Sullivan, and Shi (2015) found that women hold 14.97% of board seats in PSE-listed firms in 2014, compared with 13.03% in 2008. Among firms included in the MSCI Emerging Markets Index, female directors comprise 8.4% of board members in 2015 compared to 7.1% in 2014 (Lee et al., 2015).[2] In 2016, the percentage of women on boards of publicly listed firms in Hong Kong and India was 12.4% and 6.9%, respectively, constituting less than 2% increase from 2013 figures (Ngai, Chan, & Yu, 2017; "Less than 7% women part of boardrooms," 2016). Although progress has been slow, board diversity has gradually improved.

Board diversity is expected to narrow further due to efforts in many countries to empower women. For example, the ratification of the treaty on the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW, 1981) has led to the improved socioeconomic status of women worldwide.[3] In addition, initiatives to increase the number of women on corporate boards have been widely implemented. Most member countries of the United Nations have imposed gender quotas or soft law regulations, such as guidelines promoting good corporate governance pertaining to corporate boards (Smith, 2014). For instance, in 2014, Norway adopted a quota mandating that corporate boards be at least 40% female. Other countries have followed suit by adopting either mandatory quotas or voluntary targets. However, as of 2016, most of these countries have yet to reach the 40% quota.

The primary purpose of imposing these quotas was to eliminate gender inequality. The question then becomes, "what are the economic implications of gender diversity on corporate boards?" Results of studies investigating this question are mixed. For instance, Smith (2014) found that the overall effect of

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[1] According to a Credit Suisse (2016) report using 2015 data, Norway leads the way in gender diversity with 46.7% of board seats held by women, followed by France (34%) and Sweden (33.6%). In contrast, Taiwan (4.5%), South Korea (4.1%), and Japan (3.5%) are the least progressive of developed nations on board diversity.

[2] The MSCI Emerging Markets Index consists of 24 countries that represent 10% of global market capitalization and includes Brazil, China, Egypt, India, Indonesia, and the Philippines.

[3] The United Nations' CEDAW (1981) aims to eliminate all forms of inequality against women, including the promotion of equal opportunities of employment for both genders. In agreeing to ratify CEDAW, countries have agreed to take action to improve the welfare of women and children. For instance, the Philippines and Spain have improved maternity leave and child care for working mothers, and Honduras has initiated policies to make agricultural training and loans available to female farmers.

increasing board diversity on corporate performance is ambiguous, but having women on corporate boards improves decision-making processes and attendance. Other studies found a significant and positive relationship between board diversity and firm performance (Carter, Simkins, & Simpson, 2003; Campbell & Minguez-Vera, 2008; Smith & Parrotta, 2015).

For developed markets, there is extensive literature investigating the effects of board diversity on a firm's risk-taking behavior. This research demonstrates that gender-diverse boards behave differently than male-dominated boards because of the difference in risk appetite between genders. This is important because excessive risk-taking may result in a higher probability of default, while moderate risk-taking may optimize firm profitability (Khaw, Liao, Tripe, & Wongchoti, 2016). Therefore, it is argued that having women on company boards may mitigate financial difficulty crises due to the inherent risk-averse nature of women relative to men (Adams & Funk, 2012; Croson & Gneezy, 2009; Jianakoplos & Bernasek, 1998; Sunden & Surette, 1998). Consistent with this argument, Adams and Ferreira (2004) and Hillman, Shropshire, and Cannella (2007) found a negative link between board diversity and corporate risk-taking. Sila, Gonzalez, and Hagendorff (2016) found an insignificant relationship between board diversity and corporate risk-taking.

Research investigating the effects of board diversity within emerging markets has been less prevalent. On such study by Loukil and Yousfi (2016) found that the presence of women on Tunisian boards increases a firm's cash holdings, but has no effect on corporate risk-taking. In contrast, Khaw et al. (2016) found a significant, negative relationship between Chinese corporate board diversity and corporate risk-taking. Similarly, Setiyono and Tarazi (2014) found an inverse relationship between Indonesian corporation board diversity and the volatility of firm income. We find no studies that analyze the relationship between board diversity and corporate risk-taking for Philippine firms.

Our study seeks to augment the existing literature on board diversity and corporate risk-taking by providing evidence from an emerging market. We use annual firm-level data of non-financial firms listed on the Philippine Stock Exchange during the period from 2003 to 2015. We construct an unbalanced panel of firm-level data and examine the impact of board diversity on corporate risk-taking, as measured by the Leverage Ratio, the Current Ratio, the Annual Growth Rate of Assets, and the Volatility of Return on Assets (ROA). We also address endogeneity issues that may affect this relationship by using a two-step Arellano-Bover/Blundell-Bond System Generalized Method of Moments (GMM) estimation technique.

The rest of the paper is organized as follows. In section 2, we present the relevant literature and theoretical underpinnings related to board diversity and corporate risk-taking, and develop our hypotheses. In section 3, we discuss the data and methodology employed in this study. In section 4, we report results of our empirical analysis, and in section 5, we summarize our results and conclude.

2. Review of Related Literature, Theoretical Framework, and Hypotheses Development

Diversity not only encompasses gender and race, but also religion, ethnicity, age, other demographics, and sexual preferences. The idea of diversity was initially established to justify more inclusion of people, who were excluded because of unconscious bias (Nelson, 2014).[4] Most do not believe that height predicts competence, and yet, choices that reflect these assumptions are frequently made. For instance, a study on Fortune 500 companies shows that about 58% of CEOs are taller than 6 feet, which is approximately 183 centimeters (Banaji & Greenwald, 2013). Moreover, organizations with greater racial diversity have higher sales and market shares. Similarly, organizations with more women in senior positions manifest better financial results (Nelson, 2014). In addition, diversity influences the perception and purchasing power of consumers and enhances innovation (Nelson, 2014; Sen & Bhattacharya, 2001). These purported benefits of diversity have led to considerable research exploring the effects of diversity on corporate boards and management teams. Since gender is argued to be a richer demographic variable than age, race, or educational background (Krishnan & Park, 2005), this study focuses on gender diversity of corporate boards and its effects on firm risk-taking behavior.

2.1 Board-level Gender Diversity and the Risk-taking Behavior of Firms

Prior literature suggests that behavioral differences between men and women influence risk-taking behavior. Croson and Gneezy (2009) studied the social, competitive, and risk preferences of men and women and establish three general underlying differences: (i) women are more risk-averse than men, (ii) women are more vulnerable to social cues, and (iii) men are more competitive than women. In addition, a meta-analysis by Byrnes, Miller, and Schafer (1999) compared the risk-taking preferences between males and females and concluded that men are expected to take on more risk. Wilson and Daly's (1985) sociobiological model also explains the presence of gender differences. The theory suggests that men have historically experienced more competition than women. This leads to an implication that men are more confident and are more inclined to take risks than women.

These innate behavioral differences between men and women may lead to different corporate decisions. From agency theory perspective, the actions of managers (agents) may deviate from that of the owners of the firm (principals) because of contrasting interests (Fama & Jensen, 1983). As rational individuals, agents seek to maximize their own personal gain at the expense of profit maximization, creating agency costs to shareholders (Fama & Jensen, 1983). Eisenhardt (1989) also argued that the differences in risk attitude between the agents and principals could lead to agency costs. For instance, managers may choose more conservative research-intensive projects at the expense of riskier projects with higher potential gains for the shareholders (John, Litov, & Yeung, 2008). To mitigate the losses incurred from agency costs, Jensen and Meckling (1976) and Fama and Jensen (1983) emphasized the importance of the board of directors, which serve as the instruments to monitor and control managers. This agency theory-based argument leads to the conclusion that outside or independent directors are reliable monitors of the firm (Carter et al., 2003). Moreover, according to Adams and Ferreira (2009) and Carter, D'Souza, Simkins, and Simpson (2010), female directors are deemed to be more "independent" than male directors because women are more effective firm monitors than men. Post and Byron (2015) argued that as the proportion of women directors increases, board effectiveness improves, leading to better firm performance.

[4] The term "unconscious bias" pertains to stereotyping. Nelson (2014) argued that this form of bias is very prevalent in the workplace, especially when it involves stereotyping based on age, sex, and race.

From a resource dependency theory perspective, a more gender-diverse board provides firms a broader pool of talent (Carter et al., 2010). However, such appointments may be indicative of tokenism (Adams & Ferreira, 2009).[5] As evidence, Farrell and Hersch (2005) analyzed a sample of Fortune 500 firms during the period of 1990 to 1999 and found that the appointment of women in boardrooms is more likely if another woman, as opposed to a man, has been replaced or has stepped down from the board.

The Upper Echelons Theory further explains why and how board diversity influences the firms' level of risk-taking and decision-making (Hambrick, 2007). This theory states that the values, knowledge, and experience of the board of directors influence how they understand information and make prudent decisions (Carpenter, Geletkanycz, & Sanders, 2004). A more diversified board offers a wider range of perspective that can affect the decision-making of the board, thus minimizing internal and external risks faced by firms (Carter et al., 2010).

The general consensus in the literature is that the increased presence of females in the board entails fewer risk-taking activities for the firm. For instance, Khaw et al. (2016) studied a sample of non-financial listed firms in China for the period of 1999 to 2010 and found a significant and negative relationship between gender diversity in the board and corporate risk-taking. They found that having only men in boardrooms intensifies corporate risk-taking behavior. Likewise, Adams and Ferreira (2004) and Hillman et al. (2007) studied a sample of U.S. firms and found a negative link between total firm risk and board-level gender diversity. Moreover, in the context of Tunisian boardrooms, Loukil and Yousfi (2016) found that the presence of women tends to increase a firm's cash holdings, which indicates lower leverage for the firm. Huang and Kisgen (2013) also found that firms with male executives issue more debt and engage in more acquisitions than firms with female executives.

However, recent literature argues that an increase in female representation in the boardroom does not always correspond to less risky behavior (Sila et al., 2016). For instance, Sila et al. (2016) studied a sample of U.S. listed firms for the period of 1996 to 2010 and observed that firms with greater proportions of women on boards take similar risk-to-firms with male-dominated boards. Moreover, in Norway, after introducing a female representation quota in their boardrooms, Matsa and Miller (2013) found no change in the leverage of firms and assert that risk aversion may not be a distinctive part of women's approach to corporate decision-making. In contrast, Adams and Funk (2012) studied a sample of Swedish publicly listed firms and found that female directors tend to be more risk-loving and are enticed to make riskier decisions. This is because women who make it to the board in the first place have been handpicked as having a high taste for stimulation and a low need for security[6] (Adams and Funk, 2012).

Based on the preceding discussions, we hypothesize that:

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[5] Tokenism occurs when organizations or firms hire people who belong to the minority or the underrepresented group, which gives the impression of social or racial equality. In the sociological literature, the term "token" refers to minorities or women who are admitted to a group in order to possibly disprove the presence of discrimination among them (Zimmer, 1988).

[6] According to Schwartz (1992), the 10 basic human values explain why men are slightly more risk-averse than women. Although all individuals have the same system of values (i.e. achievement, power, security, conformity, tradition, benevolence, universalism, self-direction, stimulation, and hedonism), the level of importance of these values for both men and women are different. Women in the board are more concerned about stimulation (openness to change or challenges) and less on tradition and security (stability), when compared to men (Adams & Funk, 2012). Therefore, women in the board are willing to take on more risk when compared to men (Adams & Funk, 2012).

H1: Based on agency theory and upper echelons theory, there is a negative relationship between board diversity and corporate risk-taking.

H2: Based on findings of previous research, greater female participation in the boardroom may either have a positive or insignificant effect on corporate risk-taking.

3. Data, Variable Measurements, and Methodology

3.1. Sample and Data Collection

Our initial sample consists of all firms whose common shares are publicly traded in the Philippine Stock Exchange (PSE) during the period 2003 to 2015. We exclude financial firms[7] and firms that did not trade during the year from our sample. Our final sample consists of an unbalanced panel of more than 2,000 firm-years for each measure of corporate risk-taking employed.

We hand-collect data on the board's and directors' characteristics (i.e. board size, board independence, and gender diversity) from the Annual Reports submitted by our sample firms to the Philippine Stock Exchange (PSE) and the Securities and Exchange Commission (SEC). Raw data used to compute for family ownership are gathered from the Annual Reports and the Public Ownership Reports. Raw financial data used to construct corporate risk-taking measures are obtained from the Thomson Reuters financial database and the Annual Reports.

3.2. Variable Definitions and Measurements

3.2.1. Dependent Variable: Corporate Risk-taking

According to Gilley, Walters, and Olson (2002), corporate risk-taking is not limited to the financial dimension; rather, it is a multidimensional concept that, if summarized into a single dimension, will yield ambiguous results (Loukil & Yousfi, 2016). Corporate risk-taking can be viewed through either financial risk-taking, managerial risk-taking, or the total riskiness of outcomes faced by the firm.

Financial risk-taking

One dimension of corporate risk-taking is financial risk-taking, which is commonly proxied for by the leverage ratio *(LEV)* or by the liquidity or current ratio (*CURRENT)* (Loukil & Yousfi, 2016). On one hand, leverage ratios describe the firm's use of debt financing and measure the firm's solvency or its ability to meet its financial commitments. Loukil and Yousfi (2016), John et al. (2008), and Faccio, Marchica, and Mura (2016) show that leverage ratios are directly proportional to corporate risk-taking: greater use of leverage implies a greater degree of risk-taking because the firm is relying on external sources of financing.

[7] We exclude financial firms from our sample because such firms have different regulatory structures that subject them to certain requirements, restrictions, and guidelines that help maintain the integrity of the financial system (Ely, 2008). Moreover, Sila et al. (2016) suggested that findings from the financial sector on the relationship between board-level gender diversity and corporate decision-making may not apply to other sectors. This is because women in the financial sector are found to be less risk-averse than women in other industries (Sapienza, Zingales, & Maestripieri, 2009). According to the PSE Industry Classification System, financial firms are classified as "financials".

This increases the probability of default whenever a negative shock affects the firm's operating and financial conditions (Loukil & Yousfi, 2016). Similar to Faccio, Marchica, and Mura (2011), we define our leverage ratio as the ratio of total liabilities to the book value of total assets *(LEV)*.[8]

On the other hand, the liquidity or current ratio is defined as the ratio of current assets to current liabilities. It measures a firm's riskiness through its ability to pay short-term debts; low cash ratios imply that the firm is more susceptible to default.[9] Loukil and Yousfi (2016) argued that the cash ratio is inversely related to corporate risk-taking: when environmental contingencies arise, firms that hold more cash can easily adapt to uncertain conditions than firms that are relatively illiquid.

Managerial risk-taking

Another dimension of corporate risk-taking is managerial risk-taking. The tenets of managerial risk-taking argue that human behavior, initially posited by March and Shapira (1987) to be immeasurable in financial models, is a significant factor that accounts for much of corporate decision-making. Since managerial risk-taking takes into account human behavior, it serves as an important proxy measure of corporate risk-taking. Similar to Loukil and Yousfi (2016), we measure managerial risk-taking using the annual growth rate of assets *(GrASSETS)*.

According to Loukil and Yousfi (2016), a higher growth rate of assets is associated with lower corporate risk-taking because assets are inherently less risky than growth options in place (Berk, Green, & Naik, 1999).[10] Thus, when a firm invests in assets by exercising these growth options, the risky options are replaced with less risky assets and firm risk declines (Loukil & Yousfi, 2016). In this study, we define the growth rate of assets as the difference between the natural logarithm of the book value of total assets of the current period and the natural logarithm of the book value of total assets of the previous period.[11]

Riskiness of firm outcomes

The final dimension of corporate risk-taking involves the riskiness inherent in firm outcomes. This is commonly measured in the literature by the volatility of operating return on assets *(volROA)* of the firm (Faccio et al., 2016; John et al., 2008), which we define as the standard deviation of accounting returns, as measured by the ratio of net income to the book value of total assets, over a three-year ahead overlapping period, including the current year, that is, 2003-2005, 2004-2006, 2005-2007, and so forth. The intuition is simple: investments in risky projects imply high-risk operations, which, in turn, result to high volatility of corporate earnings (John et al., 2008). Volatility of returns is a commonly used proxy in the financial literature.[12]

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[8] As robustness checks, we employ two additional measures of leverage: (i) the ratio of total debt to the book value of assets *(LEV2)*, and (ii) the ratio of long-term debt to the book value of assets *(LEV3)*.

[9] Low liquidity ratio values (less than 1) imply liquidity problems for the firm.

[10] Growth options provide discretionary opportunities to invest capital in productive assets like plant and equipment at some future point in time (Schwartz & Trigeorgis, 2001).

[11] Research and Development (R&D) Intensity is an ideal measure of corporate risk-taking because even though investments in research are value-enhancing, the returns of such ventures are uncertain (Sila et al., 2015; Loukil & Yousfi, 2016; Saeed, Belghitar, & Yousaf, 2016). However, in this study, we do not consider R&D Intensity as a measure of corporate risk-taking because out of around 197 PSE-listed firms per year in our sample, only 19 firms on average (246 firm-years out of 2,563 firm-years) have invested in R&D.

[12] Khaw et al. (2016) measures the volatility of operating ROA using a three-year ahead overlapping window as well because they argued that board members in China are subject to re-appointment every three years.

3.2.2. Independent Variables

Gender diversity in the board

The measure of gender diversity in the boardroom varies widely across the literature. Some studies (Carter et al., 2010; Loukil & Yousfi, 2016) use the number of females in the boardroom as a measure of board-level gender diversity, whereas others (Carter et al., 2003; Loukil & Yousfi, 2016) use a dummy variable that takes the value of one when at least one woman is present in the board, and zero otherwise. However, it is not always the case that the increased presence of women in the boardroom implies greater gender diversity in the board.[13]

In this study, one proxy for board-level gender diversity is the proportion of female directors in the board *(GD_P)*. We calculate this proportion by dividing the total number of female directors in the board by the total number of directors in the board. While used as a standard measure of board-level gender diversity in the literature (Loukil & Yousfi, 2016; Nguyen, Locke, & Reddy, 2015; Campbell & Minguez-Vera, 2008; Rose, 2007; Adams & Ferreira, 2009; Khaw et al., 2016; Unite, Sullivan, & Shi, 2016), the proportion of women board members is not the most ideal measure to capture the extent of gender diversity in the boardroom because having a greater concentration of women in boardrooms does not always imply greater gender diversity. For instance, further increasing the number of women in boards with already more than 50% women will lead to lesser, rather than greater, gender diversity in the board.

Unite et al. (2016) and Campbell and Minguez-Vera (2008) cited other more appropriate measures for board-level gender diversity. These measures are indices devised by Blau (1977) and Shannon (1948). Because the Blau and Shannon indices consider the number of gender categories and the distribution of board members between the two-gender classification, Campbell and Minguez-Vera (2008) argued that these two indices are more appropriate proxies for board-level gender diversity.[14]

The Blau index *(GD_B)*. is measured as $Blau = 1 - \sum_{i=1}^{n} P_i^2$ where P_i is the percentage of board members in each gender category *i*, and *n* is the number of categories (i.e. two gender categories: male and female). If there are only two categories, the values of the Blau index can range from 0 (a perfectly homogeneous board) to a maximum of 0.5 (the board has an equal proportion of male and female members). In the case of Philippine listed firms, Unite et al. (2016) found that a zero Blau index value signifies a homogeneously male board because none of the firms listed in the Philippine Stock Exchange has a board that is completely comprised of female board members.

On the other hand, the Shannon index *(GD_S)*, or most commonly known as the Shannon index, is computed as $Shannon = 1 - \sum_{i=1}^{n} P_i \, ln \, P_i$ where P_i and *n* are as previously defined. In contrast with the Blau index, values of the Shannon index range from 0 to 0.693, where 0 represents a completely homogeneous

[13] Unite et al. (2016) argued that while the number and proportion of female board members are good indicators for the presence of women in the board, they are not the most ideal measures of board-level gender diversity. This is because both measures capture the degree of concentration of members in only one gender category (i.e. the female category). Furthermore, increased presence of women in the board does not always correspond to greater gender diversity in the board, especially when considering boards with female proportions that are already greater than 50%.

[14] Both indices are commonly employed to measure biodiversity in the field of ecology (Baumgartner, 2006), and are also widely used in the field of economics (Al-Shaer and Zaman, 2016; Campbell & Minguez- Vera, 2008; Unite et al., 2016).

board while 0.693 signifies an equal proportion of male and female board members. Again, in the case of Philippine listed firms, a Shannon index with a value of 0 represents a board that is completely comprised of male directors since there are no firms traded in the Philippine Stock Exchange with completely homogeneous female boards (Unite et al, 2016). Compared to the Blau index, the Shannon index is more sensitive to small differences in the gender composition of boards since it is a logarithmic measure of diversity (Campbell & Minguez-Vera, 2008).[15]

In the case of Philippine listed firms, Unite et al. (2016) argued that higher values for both the Blau and Shannon indices seem to imply greater proportions of female board members. Because boards of Philippine listed firms are found to be consistently and predominantly male, it is reasonable to suggest that an increase in the proportion of females in boards of Philippine listed firms is likely to lead to greater gender diversity in boards and, therefore, imply higher Blau and Shannon index values (Unite et al., 2016).[16]

Family ownership

Unite, Sullivan, Brookman, Majadillas, and Taningco (2008) and La Porta, Lopez-de-Silanes, and Shleifer (1999) classified a firm as family-controlled when at least 20% of its total outstanding shares are owned by the largest shareholder or by the controlling family.[17] However, we use the absolute percentage of total outstanding shares owned by a family or the largest individual shareholder to proxy for family ownership within the firm *(FOWN),* irrespective of any ownership threshold, because such measure encompasses not only the firms with families having a majority ownership stake, but also those with families having only a minority stake in the firm.

Board characteristics and other control variables

We also control for numerous variables that are known in the literature to influence corporate risk-taking. Board independence *(BIND)* is measured as the ratio of the number of independent directors in the board to the total number of directors in the board, whereas board size *(BSIZE)* is measured as the natural logarithm of the total number of directors in the board.

We also control for other variables that may affect corporate risk-taking. For instance, firm size *(FSIZE)* is measured as the natural logarithm of the book value of total assets, whereas firm age *(FAGE)* is proxied by the natural logarithm of the number of years from the date of incorporation of the firm. Moreover, in order to account for the effects of past firm performance, as measured by Return of Assets (*ROA*), on corporate risk-taking, we also use the one-year lag of the Return of Assets (ROA_{t-1}) as a control variable in equations (1), (3), and (4).

Table 1 summarizes the variables used in this study and their corresponding measurements.

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

16 Unite et al. (2016) observed that during the period 2003 to 2014, the average proportion of women members in boards of Philippine listed firms is 14%, which suggests that the typical board of a PSE-listed firm is predominantly male. They also observe that only around 2.2% of PSE-listed firms have more than 50% women in the board during the period 2003 to 2014, yet around 66.8% of PSE-listed firms have at least one female in the boardroom. This might be indicative of tokenism (Kanter, 1977).

17 La Porta et al. (1999) argued that the idea behind using the 20% benchmark is that having 20% of voting rights is usually enough to have effective control of a firm.

[INSERT TABLE 1 HERE]

3.3. Methodology

We use regression analysis on unbalanced panel data to analyze the relationship between board-level gender diversity and corporate risk-taking. We adopt the models of Loukil and Yousfi (2016) and Khaw et al. (2016), and include a family ownership variable, as well as industry dummy variables and year dummy variables to control for fluctuations in corporate risk-taking behavior due to macroeconomic or market-wide shocks that vary across industries and over time.[18] Thus, we estimate using the following equations:[19]

Financial Risk-taking[20]

$$LEV_{it} = \beta_0 + \beta_1 GD_{k,it} + \beta_2 BSIZE_{it} + \beta_3 BIND_{it} + \beta_4 FOWN_{it} + \beta_5 FSIZE_{it} + \beta_6 FAGE_{it} + \beta_7 ROA_{i,t-1} + \delta' PSE_i + \gamma' YEAR_t + u_{it} \quad (1)$$

$$\ln(CURRENT_{it}) = \beta_0 + \beta_1 GD_{k,it} + \beta_2 BSIZE_{it} + \beta_3 BIND_{it} + \beta_4 FOWN_{it} + \beta_5 FSIZE_{it} + \beta_6 FAGE_{it} + \beta_7 ROA_{i,t-1} + \beta_8 LEV_{it} + \beta_9 GrASSETS_{it} + \delta' PSE_i + \gamma' YEAR_t + u_{it} \quad (2)$$

Managerial Risk Taking

$$GrASSETS_{it} = \beta_0 + \beta_1 GD_{k,it} + \beta_2 BSIZE_{it} + \beta_3 BIND_{it} + \beta_4 FOWN_{it} + \beta_5 FSIZE_{it} + \beta_6 FAGE_{it} + \beta_7 ROA_{i,t-1} + \beta_8 CURRENT_{it} + \delta' PSE_i + \gamma' YEAR_t + u_{it} \quad (3)$$

Riskiness of Firm Outcomes

$$volROA_{it} = \beta_0 + \beta_1 GD_{k,it} + \beta_2 BSIZE_{it} + \beta_3 BIND_{it} + \beta_4 FOWN_{it} + \beta_5 FSIZE_{it} + \beta_6 FAGE_{it} + \beta_7 ROA_{i,t-1} + \beta_8 LEV_{it} + \beta_9 GrASSETS_{it} + \delta' PSE_i + \gamma' YEAR_t + u_{it} \quad (4)$$

Similar to Sila et al. (2016), we employ the two-step Arellano-Bover/Blundell-Bond System General Method of Moments (GMM) estimation technique to estimate equations (1) to (4) because two-step GMM gives more asymptotic efficient estimates than one-step GMM (Roodman, 2009).[21] Moreover, the System GMM method addresses the issues of unobserved heterogeneity, reverse causality, and dynamic endogeneity (i.e. past corporate risk-taking affects current levels of board-level gender diversity). Similar to Sila et al. (2016), we augment equations (1) to (4) by including one- and two-period lags of the dependent

[18] We use the PSE Industry Classification System to construct our industry dummies. In our regressions, we use the mining and oil sector as our base industry dummy, and we use 2015 as our base year dummy.

[19] We winsorize our corporate risk-taking variables (i.e. Leverage Ratio, Current Ratio, Growth Rate of Assets, and Volatility of Return on Assets), as well as our past firm performance variable, at the 1st and 99th percentiles to mitigate the effect of outliers.

[20] The current ratio values in our sample are highly skewed to the right (skewness value = 5.80); thus, we take the natural logarithm of the current ratio to have the data behave more in line with the normality assumption.

[21] Roodman (2009) noted that the downward bias in the two-step GMM standard errors has been addressed by Windmeijer's (2005) correction procedure. Both one-step and two-step GMM estimators yield consistent estimates, but the latter yields more asymptotically efficient estimates.

variable as additional independent variables and by treating all independent variables as endogenous except for firm age and the industry and year dummy variables. Moreover, for all model specifications, we follow Sila et al. (2016) and instrument our endogenous variables by two of their past values.[22]

Sila et al. (2016) and Hermalin and Weisbach (2001) noted that board characteristics are not exogenous variables because boards are endogenously chosen by firms to suit their operating environment. In line with this, there are three endogeneity issues that should always be addressed when analyzing the effects of board-level gender diversity on corporate risk-taking. First of all, individual and unobserved characteristics that might simultaneously affect board appointments and corporate risk-taking (i.e. unobserved heterogeneity) may bias our regression results in the opposite direction. Panel data methods, such as fixed and random effects estimation techniques, are commonly used to account for omitted and unobserved individual firm-specific factors that may significantly affect both board appointments and corporate risk-taking, that is, firm culture and corporate social responsibility (Sila et al., 2016). Secondly, the issue of reverse causality implies that a firm's level of risk-taking affects board appointments as much as board appointments affect corporate risk-taking, that is, women may also self-select into firms with lower corporate risk-taking because they are inherently risk-averse (Adams & Ferreira, 2009). With regards to this, fixed or random effects estimators will be insufficient; instrumental variable approaches are commonly used to address reverse causality. Lastly, Wintoki, Linck, and Netter (2012) noted that reverse causality issues in corporate governance are usually of a dynamic nature. In our study, this implies that past realizations of corporate risk-taking behavior affect current female representation in boards. This is because board appointments are usually made before the effects of current risk-taking become observable; thus, the existing board considers only past realizations of risk-taking when they make decisions pertaining to board appointments (Sila et. al., 2016). In this regard, the Arellano-Bover/Blundell-Bond System GMM estimation method may be employed to account for both reverse causality and dynamic endogeneity.[23] Similarly, both methods control for unobserved heterogeneity through the method of first differencing, which eliminates any potential unobserved firm-specific effects that may affect both board appointments and corporate risk-taking.

To test for the validity of the instrument set used in System GMM, we employ the Arellano-Bond first- and second-order autocorrelation test and the Hansen test for overidentifying restrictions. Failure to reject the null hypotheses of no second-order autocorrelation and that the instrument set used is exogenous, respectively, implies that the moment conditions and instruments used are valid (Roodman, 2009). We likewise check the validity of the subset instruments used at levels and differences, and those used as standard instrumental variables (IVs), using the difference-in-Hansen tests of exogeneity.[24] Again, failure to reject the null hypothesis of exogenous instruments indicates that the instruments used are valid. Furthermore, all standard errors reported in our estimations are robust to both heteroskedasticity and within-firm serial correlation.

4. Results and Analysis

[22] Unlike Sila et al. (2016), we also employ the current ratio and the annual growth rate of assets as additional measures of corporate risk-taking. In addition, we use the Blau and the Shannon indices as additional proxies for board-level gender diversity, and we also employ two additional measures of leverage as robustness checks, that is, the ratio of total debt to the book value of total assets and the ratio of long-term debt to the book value of total assets (see Appendix 1 and Appendix 2).

[23] The Arellano-Bover/Blundell-Bond System GMM estimation technique allows the model to be estimated simultaneously in levels and first differences, which improves both the efficiency of the estimator and the power of the hypothesis tests by allowing for more instrumental variables to be included in the estimation (Sila et al., 2016).

[24] The difference-in-Hansen test of exogeneity employs System GMM with and without a subset of instruments to assess the validity of such subset of instruments while considering their contribution to the Hansen test (Roodman, 2009).

Table 2 reports the descriptive statistics on the dependent and independent variables used in this study. We report the annual means, standard deviations, and minimum and maximum values of each variable across all years. The leverage ratio and the current ratio have mean values of 0.5785 and 6.8123, respectively, whereas the annual growth rate of assets and the volatility of ROA have mean values of 0.0998 and 0.0986%, respectively.

[INSERT TABLE 2 HERE]

On the other hand, we observe that, similar to Unite et al. (2016), there is no firm in our sample that has a homogeneously male board, that is, the maximum proportion of women in the board of a PSE-listed firm is 0.80. However, similar to Unite et al. (2016), the average proportion of women in boards of PSE-listed firms is only 0.14, which indicates that most Philippine publicly listed firms have boardrooms that are dominated by men. Furthermore, we observe that the board of a typical PSE-listed firm consists of approximately nine members of which 25% are independent directors. In terms of family ownership, we observe that family ownership is prevalent among Philippine publicly listed firms, that is, a single family or individual shareholder owns, on average, 46.49% (almost half) of the total outstanding shares of a typical PSE-listed firm.

Table 3 reports the results of estimating the effects of board-level gender diversity on the three dimensions of corporate risk-taking, that is, managerial risk-taking, financial risk-taking, and the riskiness of firm outcomes. Panels A and B of Table 3 use *LEV* and *CASH* as measures of financial risk-taking, panel C uses *GrASSETS* as a measure of managerial risk-taking, and panel D uses *volROA* to measure the riskiness of firm outcomes. Column (1) presents the estimation results using the proportion of women in the board as a measure of board-level gender diversity, column (2) presents the estimates using the Blau Index, and column (3) reports the estimates using the Shannon Index as a proxy for board-level gender diversity.

.

[INSERT TABLE 3 HERE]

Panel A of Table 3 reports the effects of estimating board-level gender diversity on corporate risk-taking, as measured by the leverage ratio (*LEV*). Overall, we find that board-level gender diversity has a statistically insignificant effect on corporate risk-taking, regardless of the gender diversity measure used. This implies that greater presence of women in the board does not translate into more prudent risk-taking behavior for the firm. Such finding is consistent with that of Sila et al. (2016) for U.S. firms and Matsa and Miller (2013) for Norwegian firms, who argued that a more gender-diverse board is not significantly more risk-averse than a homogeneous board because risk-aversion may not be a distinctive characteristic of women who were able to make it to the board, that is, the degree of risk-aversion of female directors does not differ significantly from that of their male counterparts.

We also find that past firm performance, as measured by the one-period lag of the leverage ratio, has a positive relationship with corporate risk-taking regardless of the gender diversity measure used, although such relationship is only significant at the 10% level. This may indicate that firms with good previous performance tend to adopt riskier strategies to further increase their competitive advantages. Moreover, we find that past corporate risk-taking, as measured by the one-period lag of the leverage ratio, has a positive and significant relationship with current corporate risk-taking, although we do not find evidence that family ownership and other board characteristics (i.e. board size and board independence) significantly affect the risk-taking behavior of firms.[25]

On the other hand, Panel B of Table 3 reports the results using ln(*CURRENT)* as a measure of corporate risk-taking. When we use the proportion of women in the board to proxy for gender diversity, we find that board-level gender diversity has a negative and statistically significant relationship with the firm's current ratio. This result suggests that greater presence of women in the board is associated with lower firm liquidity and, therefore, implies greater corporate risk-taking, perhaps due to the inherent preference of risk and stimulation by women who were able to make it to the board in the first place (Adams & Funk, 2012). However, when we use more appropriate measures of gender diversity, Columns (2) and (3) report that the coefficients of board-level gender diversity are still negative but now statistically insignificant. Again, such results are consistent with the findings of Sila et al. (2016) and Matsa and Miller (2013).

Moreover, Panel B results show that firm size has a significant and negative effect on ln(*CURRENT*), regardless of the gender diversity measure used. This may indicate that large firms tend to rely more on debt financing, which results to lower firm liquidity. Consistent with the findings of Loukil and Yousfi (2016), we also find a significant inverse relationship between firm liquidity (i.e. short-term borrowing) and firm leverage (i.e. long-term borrowing) across all gender diversity measures used. We likewise find that past corporate risk-taking, as measured by the one-period lag of ln(*CURRENT*), has a positive and significant relationship with current corporate risk-taking.

Panel C of Table 3 reports the results of estimating the relationship between gender diversity in the board and corporate risk-taking as measured by the annual growth rate of assets (*GrASSETS*). Similar to our results in Panel A, we find that board-level gender diversity has an insignificant effect on corporate risk-taking, regardless of the gender diversity measure used. We also find that board size has a positive and significant effect on the firm's annual growth rate of assets, which implies that larger boards lead to lesser corporate risk-taking. This finding is consistent with the tenets of resource dependency theory, which posit that larger boards allow for more individual financial and managerial expertise that can bring about more prudent decision-making and reduce excessive risk-taking.

Moreover, regardless of the gender diversity measure used, we find ln(*CURRENT)* to have a positive, albeit weakly significant, effect on the firm's growth rate of assets. This indicates that high liquidity leads to lower corporate risk-taking. We also find that past firm performance has a negative and significant effect on the firm's growth rate of assets. This indicates that better performance in the past results to greater corporate risk-taking, similar to our findings in Panel A.

[25] As robustness checks, we estimate Equation (1) using two additional measures of leverage: the ratio of total debt to the book value of total assets *(LEV2)* and the ratio of long-term debt to the book value of total assets *(LEV3)*. We report the corresponding estimation results in Appendix 1 and Appendix 2, respectively. Similar to our *LEV* results, we find that board-level gender diversity, irrespective of the gender diversity measure used, does not have a statistically significant effect on corporate risk-taking, as measured by *LEV2* and *LEV3*. Likewise, we find that the coefficients of the one-period lagged values of *LEV2* and *LEV3* are both positive and statistically significant across all diversity measures used. However, unlike our *LEV* results, we find that firm size has a positive and significant relationship with both *LEV2* and *LEV3,* regardless of the diversity measure used. This indicates that larger firms undertake more risky activities. Similarly, across all diversity measures used, we find that firm age has a negative and significant relationship with *LEV3*, which indicates that older firms undertake fewer risky activities.

Panel C results also show that larger firms and younger firms enjoy a higher growth rate of assets and, therefore, undertake lesser corporate risk-taking, regardless of the diversity measure used. Larger firms may not be as flexible in adapting to market fluctuations and may want to protect their image by engaging in fewer risky activities (Yang & Chen, 2009), whereas younger firms may not have as much knowledge and access to risk and growth opportunities in the marketplace than older firms do. Likewise, we find that past corporate risk-taking, as measured by the one-period lag of the growth rate of assets, has a positive and statistically significant effect on current corporate risk-taking.

Finally, Panel D of Table 3 reports our estimation results using the volatility of *ROA* (*volROA*) as our proxy for corporate risk-taking. We find that greater board-level gender diversity is significantly associated with lesser corporate risk-taking when we use the Blau index to proxy for gender diversity; however, such negative relationship becomes insignificant when we use the proportion of females in the board and the Shannon index to measure gender diversity. Again, this is consistent with the findings of Sila et al. (2016), who found an insignificant gender diversity effect on corporate risk-taking when the volatility of *ROA* is used to measure corporate risk-taking. Likewise, we find evidence that (i) higher growth rate of assets is associated with lesser corporate risk-taking, (ii) larger firms undertake fewer risky activities, and that (iii) past corporate risk-taking, as measured by the one- and two-period lags of *volROA*, has a significant positive and negative effect, respectively, on current risk-taking.[26]

All in all, we find evidence to support the general consensus that greater gender diversity in boards leads to lesser corporate risk-taking, only when the Blau index and volatility of *ROA* are used to proxy for gender diversity and corporate risk-taking, respectively. However, such finding does not extend to other diversity and risk-taking measures used in this study. If anything, our overall results show that greater female participation in the boardroom has an insignificant effect on the risk-taking behavior of firms. According to Dobbin and Jung (2011), there is no reason to suppose that greater gender parity in boards will have a visible effect on firm performance and risk-taking, especially when other more fundamental changes that are designed to improve board effectiveness (i.e. appointing more independent directors) seem to be ineffective. Consistent with their argument, we indeed find that greater board independence does not significantly affect corporate risk-taking among PSE-listed firms, regardless of the risk-taking measure employed. Therefore, there is also little reason to suspect that greater gender diversity in boards will significantly affect corporate risk-taking in the case of Philippine publicly listed firms.

5. Conclusion

From developed markets to the emerging ones, women firm leaders are slowly becoming more ubiquitous. The progress in promoting gender parity in workplaces around the world is still relatively sluggish. Nevertheless, the issue of gender diversity in corporate boards continues to attract increased attention because of the benefits women are said to confer to firms. One such economic benefit is that women in boards are posited to improve firm performance and contribute to better corporate governance

[26] As robustness checks, we estimate Equations (1) to (4) using other measures of family ownership, that is, (i) family and individual shareholder ownership using a 50% ownership threshold, (ii) family and individual shareholder ownership using a 20% ownership threshold, (iii) a dummy variable that takes the value of 1 when a family or individual shareholder owns at least 50% of the firm, and 0 otherwise; (iv) a dummy variable that takes the value of 1 when a family or individual shareholder owns at least 20% of the firm, and 0 otherwise; and (v) a dummy variable that takes the value of 1 when a family or dominant individual shareholder exists, regardless of the ownership threshold used. For all our estimations using different measures of corporate risk-taking, we find qualitatively similar results, regardless of the gender diversity and family ownership measure used.

because they are known to be keener and stricter firm monitors than their male counterparts. Moreover, women are posited to contribute to greater risk-aversion when firm decision-making is concerned. The latter is consistent with the theoretical assumption that women are inherently less competitive and more risk-fearing than men are.

Using an unbalanced panel of approximately 2,000 firm-years for the period 2003 to 2015, we fail to definitively conclude that greater board-level gender diversity leads to lesser corporate risk-taking for the case of firms listed in the Philippine Stock Exchange (PSE). If anything, we find that there is a negative and significant relationship between board-level gender diversity and corporate risk-taking, only when the Blau index is used to measure diversity and the volatility of *ROA* is used as a measure of corporate risk-taking; otherwise, the relationship seems to be insignificant. Our findings support those of Sila et al. (2016) and Matsa and Miller (2013), who found that an increase in female representation in the board generally leads to no significant effect on the risk-taking behavior of firms. Such a result typically relies on the use of the GMM estimator, which accounts for endogeneity issues that may yield biased estimates.

Our findings are consistent with more recent studies that show how greater female participation in the boardroom does not significantly affect corporate risk-taking. In contrast with earlier literature that found an inverse relationship between board diversity and firm risk-taking, these more recent studies tend to use estimation methods that take into account possible endogeneity issues between board characteristics and corporate decision-making. Against this background, we conclude that the lack of strong empirical evidence on the relationship between the presence of women in corporate boards and firm risk-taking does not make women director appointments more or less desirable (Sila et al., 2016). Ultimately, female director appointments still have to rest, not on the basis of improving corporate risk-taking decisions, but on the grounds of social equality, gender parity, and other ethical and moral considerations.

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Table 1
Description of Dependent and Independent Variables

Variable Name	Description	Measurement
DEPENDENT VARIABLES (CORPORATE RISK-TAKING)		
Financial Risk-taking		
Leverage (*LEV_{it}*)	Measure of a firm's solvency	$LEV_{it} = \frac{LIAB_{it}}{TA_{it}}$ where: $LIAB_{it}$ – Book Value of total liabilities; and $BVTA_{it}$ –Book value of total assets
Current ratio (*$CURRENT_{it}$*)	Measure of a firm's liquidity	$CURRENT_{it} = \frac{CA_{it}}{CL_{it}}$ where: CA_{it} – Current assets; and CL_{it} – Current liabilities
Managerial Risk-taking		
Growth of Assets (*$GrASSETS_{it}$*)	Annual growth rate of assets	$GrASSETS_{it} = \ln(TA_{it}) - \ln(TA_{i,t-1})$ where: TA_{it} – Current year's book value of total assets; and $TA_{i,t-1}$ – Previous year's book value of total assets
Riskiness of Firm Outcomes		
Volatility of Return on Assets (*$volROA_{it}$*)	Standard deviation of the firm's *ROA* over a three-year ahead period, including the current year	$volROA_{it} = \sqrt{\frac{\sum_{k=t}^{t+2}\left(ROA_{ik} - \frac{1}{n}\sum_{k=t}^{t+2} ROA_{ik}\right)^2}{n-1}}$ where: *ROA* – Proportion of net income to the book value of total assets

INDEPENDENT VARIABLES		
Board-level Gender Diversity		
Board-level gender diversity $(GD_{k,it})$	Measure of the presence of female directors in the boardroom	$GD_{P,it} = \frac{WOMEN_{it}}{BOARD_{it}}$ where: $WOMEN_{it}$ – Number of female directors in the board; and *BOARDit* – Total number of directors in the board $GD_{B,it} = Blau = 1 - \sum_{i=1}^{n} P_i^2$ where: *n* = Number of categories (two: male and female); and P_i = Proportion of board members in each category $GD_{S,it} = Shannon = -\sum_{i=1}^{n} P_i \ln P_i$ where: *n* = Number of categories (two: male and female); and P_i = Proportion of board members in each category
Ownership Structure		
Family ownership $(FOWN_{it})$	Presence of family/individual control within the firm	$FOWN_{it}$ = Percentage of total outstanding shares owned by members of a family or by the largest individual shareholder
Board Characteristics		
Board size $(BSIZE_{it})$	Board size	*ln* (total number of directors in the board)
Board independence $(BIND_{it})$	Proportion of independent directors in the board	$BIND_{it} = \frac{INDEP_{it}}{BOARD_{it}}$ where: $INDEP_{it}$ – Number of independent directors in the board; and $BOARD_{it}$ – Total number of directors in the board

Other Control Variables		
Past firm performance ***($ROA_{i,t-1}$)***	Measure of firm accounting performance for the previous year (Proportion of net income of year *t-1* to the book value of total assets of year *t-1*)	$ROA_{i,t-1} = \frac{NI_{i,t-1}}{TA_{i,t-1}}$ where: $NI_{i,t-1}$ – Net income of year *t-1*; and $TA_{i,t-1}$ – Book value of total assets of year *t-1*
Firm size ***($FSIZE_{it}$)***	Size of the firm	$FSIZE_{it} = \ln\left(TA_{it}\right)$ where: TA_{it} – Book value of total assets
Firm age ***($FAGE_{it}$)***	Age of the firm	*ln*(number of years since incorporation of the firm)

Table 2
Summary of Descriptive Statistics

	Mean	Std. Dev.	Min	Max
RISK-TAKING MEASURES				
Leverage ratio	0.578502	0.923713	0.001330	7.135621
Current ratio	6.812311	21.200370	0.013662	162
Annual growth rate of assets	0.099829	0.400583	-1.171507	2.322964
Volatility of ROA (in %)	0.098589	0.274985	0.000563	2.231557
BOARD CHARACTERISTICS				
Proportion of females in the board	0.140961	0.147571	0	0.80
Blau index	0.198618	0.169165	0	0.50
Shannon index	0.310706	0.246829	0	0.693147
Board size	9.067240	2.105957	3	15
Board independence	0.250824	0.099430	0	0.818182
OWNERSHIP STRUCTURE				
Family ownership (in %)	46.485740	30.305700	0	99.972201
CONTROL VARIABLES				
Firm age	38.108010	23.489510	0.037645	112.386721
Firm size (in PhP million)	33,003	101,000	100,000	1,369,670
Past firm performance (in %)	-0.011330	0.239278	-1.609756	0.448258

Table 3
Regression Results Using the Two-Step Arellano-Bover/Blundell-Bond System GMM Procedure

	Proportion of females in the board (1)	**Blau Index** (2)	**Shannon Index** (3)
PANEL A: ***Leverage (LEV)***			
Board-level gender diversity	**0.1984** (0.4388)	**-0.0363** (0.2699)	**-0.0088** (0.1924)
Board size	**-0.0571** (0.2003)	**-0.0106** (0.1777)	**-0.0077** (0.1836)
Board independence	**-0.3218** (0.3861)	**-0.5312** (0.4307)	**-0.4966** (0.4506)
Family ownership	**0.0009** (0.0010)	**0.0005** (0.0012)	**0.0005** (0.0012)
Firm size	**-0.0314** (0.0207)	**-0.0283** (0.0224)	**-0.0281** (0.0214)
Firm age	**0.0243** (0.0231)	**0.0096** (0.0218)	**0.0101** (0.0221)
Past firm performance	**0.2836 *** (0.1616)	**0.2743 *** (0.1636)	**0.2708 *** (0.1627)
Past leverage (LEV_{t-1})	**0.7937** *** (0.1093)	**0.8058** *** (0.1140)	**0.8061** *** (0.1140)
Past leverage (LEV_{t-2})	**0.0641** (0.0878)	**0.0611** (0.0882)	**0.0616** (0.0884)
Constant	**0.8645** (0.7501)	**0.8436** (0.7833)	**0.8263** (0.7845)
AB Test for AR(1) *p-value*	**0.048**	**0.047**	**0.047**
AB Test for AR(2) *p-value*	**0.943**	**0.959**	**0.958**
Hansen test of overidentifying restrictions *p-value*	**0.365**	**0.233**	**0.245**
Difference in Hansen tests of exogeneity of instrument subsets:			
Instruments for levels:			
Hansen test excluding group *p-value*	**0.139**	**0.150**	**0.175**
Difference (null H = exogenous) *p-value*	**0.805**	**0.543**	**0.514**
Instruments for GMM-Style:			
Hansen test excluding group *p-value*	**0.283**	**0.207**	**0.224**
Difference (null H = exogenous) *p-value*	**0.722**	**0.521**	**0.497**
Instruments for IV-Style:			
Hansen test excluding group *p-value*	**0.251**	**0.207**	**0.223**
Difference (null H = exogenous) *p-value*	**0.946**	**0.563**	**0.540**

*Coefficients are in bold; standard errors are in parentheses; * significant at 0.10 level; ** significant at 0.05 level; *** significant at 0.01 level*

PANEL B: ***Current Ratio (lnCurrent)***			
Board-level gender diversity	**-0.8668** ** (0.4319)	**-0.5804** (0.4540)	**-0.3877** (0.2828)
Board size	**-0.0765** (0.2805)	**-0.0265** (0.2841)	**-0.0209** (0.2796)
Board independence	**-0.4081** (0.6511)	**-0.3221** (0.6882)	**-0.2989** (0.7001)
Family ownership	**0.0001** (0.0020)	**-0.0002** (0.0021)	**-0.0002** (0.0021)
Firm size	**-0.0617** ** (0.0244)	**-0.0617** *** (0.0232)	**-0.0616** *** (0.0235)
Firm age	**0.0068** (0.0407)	**0.0084** (0.0397)	**0.0124** (0.0385)
Leverage	**-0.3231** *** (0.0665)	**-0.3384** *** (0.0706)	**-0.3404** *** (0.0704)
Annual growth rate of assets	**0.0917** (0.1580)	**0.0645** (0.1614)	**0.0601** (0.1603)
Past current ratio ($lnCURRENT_{t-1}$)	**0.5698** *** (0.0721)	**0.5722** *** (0.0742)	**0.5718** *** (0.0739)
Past current ratio ($lnCURRENT_{t-2}$)	**0.0739** (0.0502)	**0.0736** (0.0524)	**0.0769** (0.0521)
Constant	**2.1450** ** (0.8581)	**2.0269** ** (0.8663)	**1.9933** ** (0.9021)
AB Test for AR(1) *p-value*	**0.000**	**0.000**	**0.000**
AB Test for AR(2) *p-value*	**0.372**	**0.373**	**0.360**
Hansen test of overidentifying restrictions *p-value*	**0.774**	**0.787**	**0.763**
Difference in Hansen tests of exogeneity of instrument subsets:			
Instruments for levels:			
Hansen test excluding group *p-value*	**0.561**	**0.470**	**0.440**
Difference (null H = exogenous) *p-value*	**0.842**	**0.922**	**0.917**
Instruments for GMM-Style:			
Hansen test excluding group *p-value*	**0.308**	**0.415**	**0.446**
Difference (null H = exogenous) *p-value*	**1.000**	**1.000**	**1.000**
Instruments for IV-Style:			
Hansen test excluding group *p-value*	**0.568**	**0.697**	**0.629**
Difference (null H = exogenous) *p-value*	**1.000**	**0.934**	**0.994**

*Coefficients are in bold; standard errors are in parentheses; * significant at 0.10 level; ** significant at 0.05 level; *** significant at 0.01 level*

PANEL C: *Annual Growth Rate of Assets (GrASSETS)*			
Board-level gender diversity	**0.2013** (0.2364)	**0.1349** (0.1959)	**0.0552** (0.1307)
Board size	**0.3526** ** (0.1407)	**0.3114** *** (0.1190)	**0.3093** ** (0.1219)
Board independence	**0.2218** (0.2824)	**0.2445** (0.2838)	**0.2055** (0.2749)
Family ownership	**0.0007** (0.0008)	**0.0008** (0.0009)	**0.0009** (0.0008)
Firm size	**0.0337** ** (0.0146)	**0.0326** ** (0.0146)	**0.0322** ** (0.0139)
Firm age	**-0.0653** *** (0.0250)	**-0.0598** ** (0.0238)	**-0.0639** *** (0.0229)
ln(Current Ratio)	**0.0352** * (0.0192)	**0.0332** * (0.0188)	**0.0327** * (0.0183)
Past firm performance	**-0.5242** *** (0.1877)	**-0.5195** *** (0.1939)	**-0.5280** *** (0.1969)
Past annual growth rate of assets ($GrASSETS_{t-1}$)	**0.1268** ** (0.0562)	**0.1295** ** (0.0557)	**0.1322** ** (0.0566)
Past annual growth rate of assets ($GrASSETS_{t-2}$)	**-0.0388** (0.0344)	**-0.0367** (0.0344)	**-0.0375** (0.0344)
Constant	**-1.2614** ** (0.4868)	**-1.1602** *** (0.4116)	**-1.1200** *** (0.4162)
AB Test for AR(1) *p-value*	**0.000**	**0.000**	**0.000**
AB Test for AR(2) *p-value*	**0.652**	**0.644**	**0.660**
Hansen test of overidentifying restrictions *p-value*	**0.892**	**0.886**	**0.888**
Difference in Hansen tests of exogeneity of instrument subsets:			
Instruments for levels:			
Hansen test excluding group *p-value*	**0.832**	**0.889**	**0.904**
Difference (null H = exogenous) *p-value*	**0.765**	**0.641**	**0.608**
Instruments for GMM-Style:			
Hansen test excluding group *p-value*	**0.550**	**0.518**	**0.508**
Difference (null H = exogenous) *p-value*	**1.000**	**1.000**	**1.000**
Instruments for IV-Style:			
Hansen test excluding group *p-value*	**0.801**	**0.858**	**0.769**
Difference (null H = exogenous) *p-value*	**0.993**	**0.740**	**1.000**

*Coefficients are in bold; standard errors are in parentheses; * significant at 0.10 level; ** significant at 0.05 level; *** significant at 0.01 level*

PANEL D: ***Volatility of ROA (volROA)***			
Board-level gender diversity	**-0.1466** (0.2036)	**-0.2504** ** (0.1026)	**-0.0846** (0.0520)
Board size	**-0.0578** (0.0468)	**-0.0660** (0.0673)	**-0.0004** (0.0651)
Board independence	**-0.1261** (0.1909)	**-0.2026** (0.1340)	**-0.1679** (0.1419)
Family ownership	**0.0006** (0.0007)	**0.0005** (0.0006)	**0.0004** (0.0007)
Firm size	**-0.0131** * (0.0074)	**-0.0168** ** (0.0074)	**-0.0099** (0.0066)
Firm age	**-0.0190** (0.0126)	**-0.0192** (0.0130)	**-0.0204** * (0.0108)
Leverage	**0.0154** (0.0116)	**0.0161** (0.0114)	**0.0070** (0.0118)
Annual growth rate of assets	**-0.1412** *** (0.0483)	**-0.1157** *** (0.0444)	**-0.1789** *** (0.0422)
Past firm performance	**0.0549** (0.1149)	**0.0901** (0.1167)	**0.1602** (0.1137)
Past volatility of ROA ($volROA3_{t-1}$)	**0.6218** *** (0.0872)	**0.6299** *** (0.0712)	**0.7343** *** (0.0558)
Past volatility of ROA ($volROA3_{t-2}$)	**-0.0999** * (0.0524)	**-0.1078** ** (0.0534)	**-0.0480** (0.0433)
Constant	**0.7010** *** (0.2464)	**0.8535** *** (0.2458)	**0.4605** ** (0.1922)
AB Test for AR(1) *p-value*	**0.003**	**0.003**	**0.001**
AB Test for AR(2) *p-value*	**0.619**	**0.505**	**0.762**
Hansen test of overidentifying restrictions *p-value*	**0.613**	**0.538**	**0.618**
Difference in Hansen tests of exogeneity of instrument subsets:			
Instruments for levels:			
Hansen test excluding group *p-value*	**0.117**	**0.181**	**0.122**
Difference (null H = exogenous) *p-value*	**0.987**	**0.911**	**0.985**
Instruments for GMM-Style:			
Hansen test excluding group *p-value*	**0.356**	**0.318**	**0.287**
Difference (null H = exogenous) *p-value*	**1.000**	**1.000**	**1.000**
Instruments for IV-Style:			
Hansen test excluding group *p-value*	**0.518**	**0.360**	**0.436**
Difference (null H = exogenous) *p-value*	**0.903**	**1.000**	**1.000**

*Coefficients are in bold; standard errors are in parentheses; * significant at 0.10 level; ** significant at 0.05 level; *** significant at 0.01 level*

APPENDIX 1

Robustness Check Using the Two-Step Arellano-Bover/Blundell-Bond Procedure

	Proportion of females in the board (1)	Blau Index (2)	Shannon Index (3)
LEV2 (Ratio of total debt to book value of total assets)			
Board-level gender diversity	**0.0575** (0.0685)	**0.0131** (0.0627)	**0.0019** (0.0427)
Board size	**0.0332** (0.0513)	**0.0252** (0.0470)	**0.0266** (0.0477)
Board independence	**-0.0519** (0.1031)	**-0.0586** (0.1055)	**-0.0553** (0.1033)
Family ownership	**-0.00004** (0.0003)	**0.00001** (0.0004)	**0.00003** (0.0003)
Firm size	**0.0171** *** (0.0058)	**0.0172** *** (0.0060)	**0.0169** *** (0.0059)
Firm age	**-0.0093** * (0.0053)	**-0.0085** (0.0053)	**-0.0083** (0.0060)
Past firm performance	**-0.0746** * (0.0402)	**-0.0731** * (0.0438)	**-0.0735** (0.0447)
Past leverage ($LEV2_{t-1}$)	**0.7159** *** (0.0607)	**0.7216** *** (0.0643)	**0.7278** *** (0.0655)
Past leverage ($LEV2_{t-2}$)	**0.0217** (0.0485)	**0.0159** (0.0488)	**0.0077** (0.0496)
Constant	**-0.3727** ** (0.1778)	**-0.3580** ** (0.1729)	**-0.3541** ** (0.1714)
AB Test for AR(1) ***p-value***	**0.000**	**0.000**	**0.000**
AB Test for AR(2) ***p-value***	**0.270**	**0.298**	**0.353**
Hansen test of overidentifying restrictions ***p-value***	**0.584**	**0.459**	**0.453**
Difference in Hansen tests of exogeneity of instrument subsets:			
Instruments for levels:			
Hansen test excluding group ***p-value***	**0.381**	**0.319**	**0.279**
Difference (null H = exogenous) ***p-value***	**0.757**	**0.653**	**0.700**
Instruments for GMM-Style:			
Hansen test excluding group ***p-value***	**0.682**	**0.549**	**0.499**
Difference (null H = exogenous) ***p-value***	**0.182**	**0.196**	**0.299**
Instruments for IV-Style:			
Hansen test excluding group ***p-value***	**0.414**	**0.298**	**0.294**
Difference (null H = exogenous) ***p-value***	**0.993**	**0.992**	**0.991**

*Coefficients are in bold; standard errors are in parentheses; * significant at 0.10 level; ** significant at 0.05 level; *** significant at 0.01 level*

Appendix 2
Robustness Check Using the Two-Step Arellano-Bover/Blundell-Bond Procedure

	Proportion of females in the board (1)	Blau Index (2)	Shannon Index (3)
LEV3 (Ratio of long-term debt to book value of total assets)			
Board-level gender diversity	**0.0099** (0.0378)	**-0.0206** (0.0339)	**-0.0172** (0.0204)
Board size	**0.0219** (0.0211)	**0.0181** (0.0244)	**0.0226** (0.0228)
Board independence	**-0.0065** (0.0428)	**-0.0099** (0.0470)	**-0.0114** (0.0473)
Family ownership	**-0.0001** (0.0002)	**-0.0001** (0.0002)	**-0.0001** (0.0002)
Firm size	**0.0153** *** (0.0037)	**0.0146** *** (0.0036)	**0.0148** *** (0.0038)
Firm age	**-0.0093** ** (0.0038)	**-0.0100** ** (0.0045)	**-0.0096** ** (0.0042)
Past firm performance	**-0.0239** (0.0184)	**-0.0188** (0.0199)	**-0.0263** (0.0199)
Past leverage ($LEV3_{t-1}$)	**0.7119** *** (0.0584)	**0.7098** *** (0.0566)	**0.7292** *** (0.0663)
Past leverage ($LEV3_{t-2}$)	**-0.0489** (0.0443)	**-0.0534** (0.0448)	**-0.0776** (0.0512)
Constant	**-0.3103** *** (0.0947)	**-0.2794** *** (0.0932)	**-0.2911** *** (0.1046)
AB Test for AR(1) *p-value*	**0.000**	**0.000**	**0.000**
AB Test for AR(2) *p-value*	**0.325**	**0.343**	**0.530**
Hansen test of overidentifying restrictions *p-value*	**0.479**	**0.345**	**0.372**
Difference in Hansen tests of exogeneity of instrument subsets:			
Instruments for levels:			
Hansen test excluding group *p-value*	**0.178**	**0.198**	**0.223**
Difference (null H = exogenous) *p-value*	**0.875**	**0.663**	**0.663**
Instruments for GMM-Style:			
Hansen test excluding group *p-value*	**0.638**	**0.511**	**0.398**
Difference (null H = exogenous) *p-value*	**0.132**	**0.109**	**0.359**
Instruments for IV-Style:			
Hansen test excluding group *p-value*	**0.400**	**0.253**	**0.346**
Difference (null H = exogenous) *p-value*	**0.790**	**0.884**	**0.546**

*Coefficients are in bold; standard errors are in parentheses; * significant at 0.10 level; ** significant at 0.05 level; *** significant at 0.01 level*