

# Non-linear relationship between gender diversity in the partnership and profit performance in accounting firms

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## Abstract

**Purpose** – This study aims to examine how gender diversity within the CPA partnership team impacts the firm's profit performance.

**Design/methodology/approach** – The authors use the two-stage least squares method in analyzing the gender–diversity–performance relationship using the pooled sample obtained from the National Survey Reports on Taiwan CPA firms between 1992 and 2008.

**Findings** – The authors observe a non-linear relationship between gender diversity at the partner level and profit performance. The relationship curves vary according to firm size. After identifying the point of inflexion for these curves, the findings indicate that the average gender diversity is below the inflexion point for large CPA firms, but exceeds the inflexion point for medium size firms.

**Practical implications** – According to the critical mass theory, increasing gender diversity within the partnership team can have a positive influence on the value of the firm. Hence, the authors argue that for large CPA firms in Taiwan, the proportion of female partners leaves room for improvement. If the average number of female partners could be increased by 0.95 persons, the critical mass would be attained.

**Originality/value** – The study provides the empirical evidence that increasing a CPA firm's proportion of female partners positively impacts the firm's profit performance. The findings serve a practical value as reference source for any further studies.

**Keywords** Taiwan, Gender diversity, CPA firm partnership, Profit performance

**Paper type** Research paper

## 1. Introduction

The under-representation of women in the partnership ranks of CPA firms is a common phenomenon around the world (Almer *et al.*, 2012; Kornberger *et al.*, 2010). Statistics indicate that the average proportion of female partners was only 14 per cent in the Top 70 accounting firms in the UK during 2013 and only 16.9 per cent in the top 100 accounting firms in Australia during 2013 (Accountancy, 2014; BRW, 2013). A 2013-2014 survey conducted by the American Institute of CPAs (AICPA) revealed that the average proportion of female partners among US CPA firms was 24 per cent (AICPA, 2015). All of the above indices are below the level in Taiwan, which was 35.8 per cent in 2013.

Partners in CPA firms are considered members of the top management team (TMT). Previous research into TMT has shown that gender diversity has a significant impact on team performance (Campbell and Minguez-Vera, 2008). Therefore, it could be inferred



that the proportion of female partners in a CPA firm may be a factor in TMT performance. Gender diversity on a TMT is generally accompanied by a more varied set of perspectives, values and networks. It is thought that this type of diversity fosters the development of unique organizational resources and competitive advantages, thereby helping in the creation of higher organizational value (Dezsö and Ross, 2012). For example, in a survey of executives around the globe, 70 per cent of the respondents agreed that gender diversity among executives is directly related to the financial performance of the firm, wherein firms with a higher proportion of female executives tend to outperform competitors with regard to ROE, operating income and growth in market value (McKinsey, 2010).

However, empirical research has yielded mixed results with regard to the relationship between TMT gender diversity and the performance of organizations. Many articles have indicated that the relationships are positive (Campbell and Minguez-Vera, 2008; Smith *et al.*, 2006; Francoeur *et al.*, 2008; Erhardt *et al.*, 2003); however, others identified the relationship as negative (Adams and Ferreira, 2009; Richard *et al.*, 2013; Chapple and Humphrey, 2014; Wellalage and Locke, 2012) or non-existent (Farrell and Hersch, 2005; Carter *et al.*, 2010; Wang and Clift, 2009). The lack of consistency in these conclusions highlights a few points worth noting. First, most previous research relied on small samples collected from different countries at different time points, or from samples with a small proportion of women in TMT. Second, many previous studies failed to take into account the fact that this relationship could be a non-linear one. Third, because of variations among industries, the inclusion of multiple industries in the analysis could easily confuse the direct relationship between TMT gender diversity and financial performance of the organization.

To capture and clarify this relationship, we obtained data from a single industry in a single country for analysis. By controlling for the effects of nation and industry, we attempted to explore the positive and negative effects of gender diversity on the performance of organizations and then examine this effect considering the size of the organization.

We believe it is easier to capture the impact of gender diversity in an industry when that industry demonstrates a relatively higher proportion of women in TMT; such is the case for female partners in CPA firms in Taiwan where the average proportion of female partners at CPA firms is far higher than that found in the UK, the USA or Australia. In a country with greater partnership gender diversity, we are more likely to observe greater variation in the gender variable and the statistical tests have greater likelihood of yielding significant results. This study takes advantage of these unique conditions to explore how the performance of CPA firms in Taiwan is affected by an increase in the proportion of female partners.

Extant literature on the link between gender diversity and the performance of organizations is based mainly on TMT with very little attention paid to how gender diversity at the partner level affects the performance of the organization. Thus, the empirical findings of this study are valuable for theoretical development as well as practical applications.

After controlling for the effects of size, age of firms, diversification in services offered, the internationalization of CPA firms and yearly trends in profits, we observed a non-linear relationship between gender diversity at the partner level and profit performance. A significant inverted U-shaped relationship was observed in the entire

sample and medium firm subsample. In contrast, a U-shaped was observed in the large firm subsample, while a positive significant linear relationship exists in the small firm subsample. We also attempted to determine the inflexion point of the relationship for the different size firms. Our findings indicate that the average gender diversity is below the inflexion point for large CPA firms; however, the average gender diversity exceeds the inflexion point among the medium size firms.

Our findings regarding the link between female partners and profits have practical applicability. In line with critical mass theory, our results indicate that large Taiwanese firms still have a long way to go regarding the proportion of female partners. In our sample, it appears that on average large firms must employ 0.95 or more female partners. When a firm reaches this critical mass, the unique qualities of the women appear to have a positive effect on the profits of the firm. However, in line with the value-in-diversity view, the gender diversity for medium Taiwanese firms exceeds the optimal level, falling within the region with negative profit performance for firms.

The remainder of this paper is organized as follows: Section 2 reviews the existing literature, distills the key theoretical relationship between gender diversity and firm performance and presents a testable hypothesis. Section 3 describes the research design. The empirical results are presented in Section 4. Finally, Section 5 offers a discussion of the results and their implications as well as a conclusion to the paper.

## 2. Theoretical foundation and hypothesis development

In recent years, a growing number of researchers have investigated the effects of gender diversity at the team level (Boulouta, 2013; Campbell and Minguez-Vera, 2008; Roberson and Park, 2007; Smith *et al.*, 2006). The existing literature has focused heavily on the link between TMT or the boardroom and the firm's financial performance in Western countries, and only a few empirical works have been undertaken to examine the relationship in Taiwan or other Asian countries (Julizaerma and Sori, 2012; Yang *et al.*, 2013; Low *et al.*, 2015). Also, few researchers have examined this issue at the partner level. The accounting industry is knowledge intensive, such that most accounting firms are established in the form of a partnership. In this type of organizational structure, the partners are owners who are held mutually responsible for management and monitoring, and are held accountable for results from those operating decisions. CPA partners offer professional services and undertake business responsibilities, such as the development and maintenance of customer relationships, leadership, decision-making and resource allocation (Harris and Helfat, 1997). Moreover, CPA partners play a monitoring role such as that played by the board of a corporation. Existing partners participate in the selection of new partners, the supervision of managers and the allocation of financial resources. Partners in a CPA firm act in a manner similar as those of a TMT, such that their decisions have considerable influence over the entire organization.

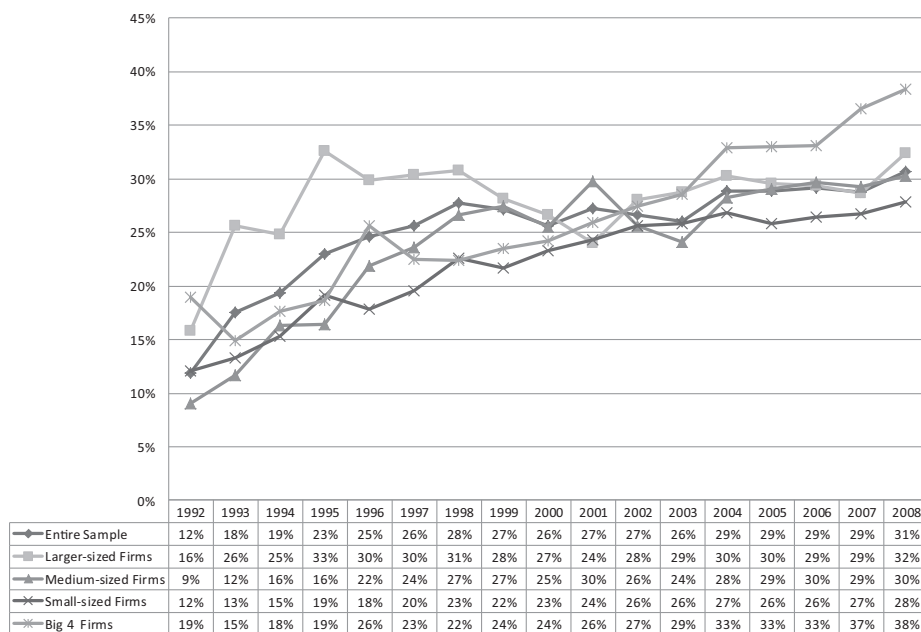
### 2.1 CPAs in Taiwan

The accounting profession has been gradually characterized by globalization and commercialization that emphasizes pursuit of profits (Carter and Spence, 2014). This trend and phenomenon applies to the accounting firms in Taiwan. For example, the larger-sized accounting firms in Taiwan have allied with the international branded accounting firms (i.e. the Taiwanese Big 4 allies with international Big 4), to accrue the

reputation power to attract clients. In addition to providing the audit service to the clients, they offer a range of “added-value” services such as finance and management consultation, to increase the gross margins to their lucrative businesses.

Carter and Spence (2014) argued, from a gender perspective, that commercialization and globalization might offer opportunities for progress given the meritocratic focus on performance, nevertheless, accounting is commonly perceived as a gendered profession (Kornberger *et al.*, 2010), wherein most of the female workforce is concentrated at the level of professional assistant, while the proportion of women in the partnership ranks is very low (Almer *et al.*, 2012; Whiting *et al.*, 2015; Anderson-Gough *et al.*, 2005). As previously stated, underrepresentation of women at the partnership level is typical in the UK. The average proportion of female partners was estimated to be 14 per cent in 2013 for the top 75 UK accounting firms (Accountancy, 2014). Australia has an average proportion of 16.9 per cent in 2013 for its top 100 accounting firms (BRW, 2013). The USA has a slightly higher proportion at 24 per cent in 2013-2014 (AICPA, 2015). However, the situation in Taiwan is different.

If observed from our research data between 1992 and 2008, the proportion of female partners increased from 12 per cent in 1992 to 31 per cent in 2008, indicating an increase of 2.6 times (see Figure 1). Breaking these numbers down, the percentage of female partners in large firms over this period is between 16 and 32 per cent, whereas the percentage in small firms is between 12 and 28 per cent. The percentages in the Big 4 firms[1] in Taiwan were higher in 2008, at 38 per cent. More recent statistics from the National Survey Report of Business of CPA Firms (2013), among the CPA firms established as partnerships in Taiwan, 35.8 per cent of partners were female. This



**Figure 1.**  
Trend of changes in  
the proportion of  
female CPA partners:  
comparison by sizes

proportion far exceeds other Western countries, such as in the UK or USA where the proportion of female partners is between 14 and 24 per cent.

Possible reasons for the higher proportion of female partners in Taiwan are as follows:

*2.1.1 Larger pool of female professionals.* Lehman (1992) pointed out that when women have increased access to education, it leads to equal job opportunity between the sexes and a larger number of women working as professionals, particularly accountants. Over the past two decades, Taiwan has greatly expanded college-level education with 165 universities established as of 2011 (Ministry of Education, 2012). According to the latest statistics, the number of women receiving an accounting bachelor degree each year is approximately twice that of men (Ministry of Education, 2015).

According to the Minister of Examination statistics for Taiwan, over the past 10 years between 55 and 62 per cent of those who passed the Taiwanese CPA qualifying exam have been women. These data demonstrate that women are outpacing men in qualifying, thereby providing a steady supply of female professionals and ultimately female partners in accounting firms in Taiwan.

*2.1.2 Rise of female power in Taiwan.* The 2010 Human Development Report, which is published by the UNDP, used the Gender Inequality Index (GII) to measure losses in development potential because of gender inequity in the areas of “health”, “education and empowerment” and “labor”. Taiwanese GII in 2011 was 0.061, which was the 4th lowest among 146 nations worldwide, just trailing The Netherlands, Denmark, Switzerland and far lower than any other country in Asia (DGBAS, 2012). This demonstrates that losses in development potential because of gender inequality in Taiwan are lower than in other countries, attesting to the manifestation of female power in Taiwan.

*2.1.3 Lower fertility rate, family structure and inexpensive childcare.* Taiwan has by far the world’s lowest fertility rate[2], calculated as the average number of children born per woman during her reproductive period (age 15 to 49 years). From a low 1.05 in 2009 to 1.27 in 2012, it is much lower than Western countries such as the USA (1.88), UK (1.92) and Australia (1.93). Although these data figures represent the fertility rates of women overall and, hence, cannot attest to Taiwanese professional women having lower fertility compared to the rest of the world, nevertheless, for professional women, who perforce must attain higher education to get into the workplace, in their pursuit of professional development and economic independence, these women are often left with no alternative but to delay marriage and childbearing (Jones, 2007; Yu, 2005).

In addition, women in accounting professions perform diligent work, yet most female staff at 25-35 years of age leave accounting firms after childbirth. Because of the nature of accounting and auditing work, they find it hard to cope with job responsibilities and family obligations simultaneously. This double burden is one reason why the UK and Australia have a low proportion of female accounting partners (Whiting *et al.*, 2015; BRW, 2013).

However, the situation in Taiwan is different. Professional women with children are part of double-income families, with husband and wife both wage earners. Consequently, large numbers of professional women look to and receive family support when it comes to childcare[3]. Taiwanese (or say Chinese) family structure is such that, after marriage, a wife moves in her husband’s family and lives with his parents; thus,

Taiwanese grandparents assume active roles in looking after their grandchildren, taking the financial burden off professional women as far as childcare expenditure is concerned (Yu, 2005).

In terms of career development and promotion, Taiwanese professional women benefit from this assistance offered by their immediate families. Unfettered by family obligations, they are able to advance further in the workplace. In a high-pressure working environment such as the accounting profession, a woman with dreams of getting promoted to top executive or accounting partner position must carefully weigh the requisite time and energy this exacts against her personal family obligations. For Taiwan, the higher rate of unmarried women professionals coupled with lower birth rate, along with childcare assistance received from grandparents together help to explain why its proportion of women partners is higher than elsewhere in the world.

### *2.2 Diversity performance relationship from a theoretical perspective*

In the review by Terjesen *et al.* (2009) on the issue of female directors in the boardroom, Carter *et al.* (2010) indicated that no single theory predicts the nature of the relationship between board diversity and financial performance. This study draws on various theories associated with organization theory and economics to provide an explanation for the relationship between diversity and performance.

*2.2.1 Upper echelons theory.* Upper echelons theory maintains that corporate leaders have a decisive impact on firm performance because they have been entrusted with the power to make major organizational decisions (Roberson and Park, 2007). According to upper echelons theory, members of TMT (i.e. board members or CPA partners) differ in their cognitive tendencies and values, and these tendencies and values, in turn, influence firm performance. The directors' cognitive tendencies toward information-seeking and evaluation processes are contingent on their experiences, knowledge and values (Hambrick, 2007; Hambrick and Mason, 1984). Because these experience, knowledge and values shape how directors seek and interpret information, directors' cognitive tendencies influence board decisions and, ultimately, firm performance.

Because director's cognitive tendencies are difficult to capture, much research applying upper echelons theory to board directors has used observable characteristics of directors such as their gender or race as proxies for cognitive tendencies (Dezsö and Ross, 2012; Krishnan and Park, 2005). In this study, we argue that because female and male CPA partners may differ in their cognitive tendencies, partner heterogeneity in terms of gender is likely to influence firm performance. As such, we require an understanding of the background of CPA partners to gain insight into the processes of strategy formulation and problem-solving within the partnership team, which should shed light on the effect of gender diversity in the firm's performance.

*2.2.2 Value-in-diversity.* The theoretical foundation of the link between diversity in the background of TMT members and the performance of organizations is provided by the theory of value-in-diversity (Cox, 1993; Frink *et al.*, 2003), which stems from resource-based theory. According to this theory, an organization can maintain its competitive advantage only when it possesses one or more valuable, rare and imperfectly imitable or substitutable resources (Barney, 1991). Value-in-diversity suggests that TMT background diversity introduces diverse perspectives, values and social networks to the team (Cox *et al.*, 1991; Thomas and Ely, 1996). Broad views and perspectives can have a positive effect on problem-solving, idea formulation and



innovation, because of its effect on helping top managers to devise a variety of ideas for decision-making (Nielsen and Huse, 2010; Frink *et al.*, 2003; Cox, 1993). Thus, a TMT with wider background diversity (in the form of gender) could be expected to create organization-specific resources, which could strengthen the competitive advantage and improve the performance of the organizations beyond what could be attained with a homogeneous TMT (Frink *et al.*, 2003; Watson *et al.*, 1993; Barney, 1991).

Organizations must strive to develop an understanding of the needs and preferences of their target customers when releasing a new product or gaining more customers. Cox (1993) pointed out that organizations with a male-dominated TMT can maintain their competitive advantage and organizational value in the market by increasing the diversity of their human resources; this might be accomplished by employing more females and addressing the specific needs of their clients. The consideration of a woman's perspectives in decision-making can help to improve the effectiveness of decision-making[4]. Organizations can make use of the advantages women bring as a means of improving their ability to react to new market or customer needs (Cox, 1993).

The link between financial performance and gender diversity on the TMT or board has been emphasized in numerous studies on organizational management. For instance, Francoeur *et al.* (2008), Smith *et al.* (2006), Krishnan and Park (2005) and Carter and Wagner (2007) have performed empirical investigations on the effect of gender diversity in TMTs. Wellalage and Locke (2012), Nielsen and Huse (2010), Adams and Ferreira (2009), Campbell and Minguez-Vera (2008), Bøhren and Strøm (2006) and Carter *et al.* (2010) have performed empirical investigations on the effect of gender diversity in the boardroom. These articles are based primarily on samples collected from multiple industries or large corporate organizations. Very few articles have addressed the effect of gender diversity on the performance of organizations in the accounting industry, in which most firms are established in the form of a partnership. However, it cannot be denied that the accounting industry plays an important role in capital markets and economic development.

*2.2.3 Critical mass theory.* Kanter (1977) pointed out that boards can be divided into four groups according to the gender makeup of its members:

- (1) uniform groups;
- (2) skewed groups with up to 20 per cent women;
- (3) tilted groups in which women account for approximately 20-40 per cent; and
- (4) balanced groups, which are 40 to 60 per cent female.

As far as group interaction is concerned, skewed groups are particularly problem-prone because the minority gender (such as women in male-dominated groups) is likely to be a token that may be readily dismissed or subjected to stereotyping (Joecks *et al.*, 2013; Kanter, 1977).

From skewed to tilted or balanced groups, the relative increase in the number of women directors eventually leads to women being identified as a distinct group (Torchia *et al.*, 2011; Kanter, 1977). As such, they may bring a different knowledge base and perspective. Literature confirms that women and men differ in many aspects; for instance, the behavior of women tends to be more conservative than that of men. Women have been shown to be more risk-averse than men (Jianakoplos and Bernasek, 1998; Croson and Gneezy, 2009) and are disinclined to adopt aggressive strategies. Women

have also been shown to be more likely to opt for sustained investment (Apesteguia *et al.*, 2012; Charness and Gneezy, 2012). In a male-dominated board, Farrell and Hersch (2005) suggested that female members provide a fresh perspective, ask different sets of questions and engage in more productive discussions, resulting in an overall positive impact on group performance. Accordingly, women in skewed groups tend to be neglected or dismissed as mere tokens, such that they feel unable to fully express their views. In tilted or balanced groups, male and female gender characteristics allow for a more productive discussion, which promotes group performance in a positive manner (Konrad *et al.*, 2008; Apesteguia *et al.*, 2012).

In summary, critical mass theory maintains that when the number of women reaches a particular threshold or “critical mass” tilted groups (20-40 per cent women) tend to perform better than homogeneous or skewed groups (Torchia *et al.*, 2011; Kanter, 1977).

*2.2.4 Agency theory.* Agency theory lies at the heart of board supervision and governance mechanisms (Jensen and Meckling, 1976). Agency theory arose as a result of the perceived separation of interests between management and shareholders. Agency theory is based on the assumptions that managers have an advantage over all others regarding access to information and act in their own self-interest, which may conflict with the interests of shareholders, which can lead to agency problems (Jensen and Meckling, 1976; Fama and Jensen, 1983).

Reducing agency problems depends on the board taking actions to monitor and control managers. Carter *et al.* (2003) claimed that gender diversity tends to enhance the functional independence of the board, which can, in turn, improve the monitoring of managers and thereby improve financial performance.

Diverse boards are able to function more independently than are homogeneous boards. Board composition with diversity in gender, race or cultural background is better able to formulate diverse views, explore different issues and have more frequent meetings. However, situations in which female directors are marginalized (when the proportion of female directors is low), do not necessarily enhance the independence of the board (Carter *et al.*, 2003).

Agency theory has contributed significantly to research on corporate governance; however, it does not provide adequate explanations in some areas specific to the board of directors (Hermalin and Weisbach, 2003). A case in point is the relationship between board diversity and the performance of organizations, which has yet to be clearly elucidated (Carter *et al.*, 2010).

### *2.3 Summary of prior empirical research*

The relationship between the performance of organizations and TMT diversity has been examined in numerous articles. Nonetheless, as far as gender diversity is concerned, the previous research has led to widely variant conclusions, including assertions of a positive relationship, a negative relationship or no relationship at all.

*2.3.1 Positive relationship.* According to the value-in-diversity perspective, gender diversity in TMT or the boardroom provides a wider range of knowledge with which to expand creativity and innovation (Campbell and Minguez-Vera, 2008) and improve problem-solving. Interactions among members from diverse backgrounds can provide a deeper understanding of the complexities of the business environment. TMTs with gender diversity often provide a wider range of ideas to deal with specific problems; therefore, these teams tend to be more effective with regard to decision-making (Nielsen



and Huse, 2010; Frink *et al.*, 2003). This, in turn, enhances competitive advantage and the performance of the organization (Boulouta, 2013; Watson *et al.*, 1993).

Gender diversity improves corporate image, lays the foundation for higher customer diversity and positively affects customer behavior (Campbell and Minguez-Vera, 2008). Groysberg and Bell (2013) indicated that female directors are more likely to report having strengths on marketing and sales. Francoeur *et al.* (2008) claimed that most firms are serious about managing their relationship with stakeholders and are, therefore, willing to employ female senior managers so as to create a working environment without gender discrimination and signal their commitment to a gender reform. Groysberg and Bell (2013) reported that women tend to have a more diverse set of non-work interests and to have greater interest in philanthropy and community service. Female directors could bring different experiences to the board by virtue of their roles and experiences outside of work. In a board dominated by male members, any addition to the number of female members on the board allows for selection from a larger pool of candidates, including when a new chief executive officer (CEO) is selected (Krishnan and Park, 2005; Campbell and Minguez-Vera, 2008). In other words, increasing the proportion of women on the board increases the likelihood of finding a truly outstanding and capable CEO.

In the following, we list a number of empirical studies that show a significant and positive relationship between gender diversity in TMT/boardroom and financial performance. By using a multi-country approach, Low *et al.* (2015) investigated boardroom gender diversity for the year 2012 and 2013 based on the sample size of 5,503 firm observations from Hong Kong, South Korea, Malaysia and Singapore. Luckerath-Rovers (2013) investigated the presence of women on boards among 99 listed Dutch companies. Julizaerma and Sori (2012) used content analysis to examine the effect of gender diversity on financial performance among 280 listed companies in Malaysia for the year 2008 and 2009. Campbell and Minguez-Vera (2008) investigated boardroom gender diversity using 168 listed firms in Spain over the period from 1995 to 2000. Carter and Wagner (2007) surveyed the gender diversity in the boardroom among 520 firms listed in the Fortune 500. Smith *et al.* (2006) examined 2,500 firms in Denmark over the period 1993-2001 as panel data of TMT gender diversity. Francoeur *et al.* (2008) focused on gender diversity in boardrooms as well as TMTs among 230 of the top 500 firms in Canada. Krishnan and Park (2005) examined 679 firms listed in the Fortune 1,000 for the year 1998.

*2.3.2 Negative relationship.* A number of studies have identified a negative relationship between gender diversity and firm performance. The main reason appears to be that a team with higher member homogeneity is more likely to cooperate and less prone to emotional conflicts (Earley and Mosakowski, 2000). Thus, members of a diverse group are more likely to experience a lack of cohesion, communication and cooperation, which, in turn, heightens the potential for dissatisfaction and conflict (Shapcott *et al.*, 2006; Mathisen *et al.*, 2013). In such situations, the team requires more time and effort to reach a consensus. When faced with intense competition, firms must be able to react to changes in the market without delay through the introduction of new products or services. Despite the fact that gender diversity can lead to improvements in decision-making quality, these benefits are easily outweighed by inefficiencies in the decision-making process. In this manner, diversity can have a negative effect on the performance of an organization (Adams and Ferreira, 2009).

Women also tend to be risk-averse and more conservative than men, particularly when making financial decisions (Croson and Gneezy, 2009). Women prefer to be conservative and are less tolerant of opportunistic behavior (Krishnan and Parsons, 2008). Thus, increasing gender diversity can lead to a shift in resource allocation to less risky assets, and thereby lead to lower financial performance.

A number of the empirical studies showing a negative relationship between gender diversity and firm performance have been based on data from the USA. For instance, Adams and Ferreira (2009) focused on the boards of S&P 500 firms and S&P small and medium-sized enterprises over the period 1996-2003. Richard *et al.* (2013) investigated the effects of racial and gender diversity on the performance of 535 banking institutions in the USA. Chapple and Humphrey (2014) used a sample of 577 firms listed on the S&P/ASX 300 Australian companies over the period 2004-2011. In Norway, Bøhren and Strøm (2006) used a sample of listed non-financial firms over the period 1989-2002. Wellalage and Locke (2012) investigated the relationship between the proportion of women on the board and agency cost using a sample of 88 listed firms in Sri Lanka over the period 2006-2010. Their results indicate that increasing the proportion of women on the board often leads to an increase in agency problems, a surge in agency costs and a reduction in financial performance.

*2.3.3 No relationship.* Another series of studies have indicated that diversity at the TMT- or board-level is entirely unrelated to firm performance. Carter *et al.* (2010) do not find a significant relation between firm performance and diverse boards, using a sample of US firms from the S&P 500 index for the period 1998-2002. Wang and Clift (2009) discuss an absence of any statistically significant association between firm performance (ROA and ROE) and the percentage of women on boards for the top 500 listed Australian companies. Farrell and Hersch (2005) came to this conclusion using a set of firms on the Fortune 500 and Service 500 listed for the period from 1990 to 1999. They applied event study analysis to determine whether there were any significant changes in the market value of firms following the release of news that women had been added to the board. Randøy *et al.* (2006) used a sample of top 500 firms in Scandinavia. Controlling for the effects of firm size and industry type, their results did not indicate that board member diversity lead to any significant effects on the performance of the organization.

#### 2.4 Hypothesis development

We attempted to determine the relationship between gender diversity and firm performance through a review of related literature; however, this search led to mixed conclusions. We, therefore, postulate that this relationship is non-linear rather than linear. Accordingly, the proportion of women in TMT is related to financial performance.

Strong demographic representation of one group within a larger group can be taken as an indication of limited diversity. In the case of gender, homogeneity is higher when the ratio of women to men in the team deviates from the midpoint. The value-in-diversity perspective suggests that variations in TMT diversity tend to increase homogeneity, which, in turn, reduces team diversity, with subsequent adverse effects on the performance of the organization (Frink *et al.*, 2003).

With an increase in the proportion of women from a skewed to a tilted group, according to critical mass theory, women may add value to a male-dominated team by providing different knowledge bases and perspectives and by asking different

questions. In tilted group, the combination of women and men attributes will more likely allow for productive discussions and will thus positively affect the firm's financial performance. In line with the critical mass theory, until a certain threshold of women in a group is reached, the firm's performance is not positively affected by the different abilities and skills that women bring into the group. As a consequence, skewed groups will have a lower performance, and the tilted groups will outperform uniform and skewed groups.

Previous empirical studies have analyzed similar hypotheses. [Richard et al. \(2004\)](#) used social identity theory to propose that the relationship between gender diversity and firm performance follows a U-shaped curve, moderated by organizational risk preference. Using US National Organization Survey data, [Frink et al. \(2003\)](#) explored how the background composition of organizational members influences the performance of organizations. Their findings revealed an inverted U-shaped relationship. As mentioned previously, the partnership team in a CPA firm is responsible for the selection of new partners, the supervision of managers and the allocation of financial resources. Like a TMT, their decisions and choices can have a considerable impact on the profit performance the firm. Based on the above discussion related to the nature of this relationship, we propose the following hypothesis:

*H1.* A non-linear relationship exists between gender diversity on a CPA partnership team and the profit performance of the firm.

### 3. Research design

#### 3.1 Empirical model

Previous empirical research studies on corporate governance have pointed out that the board gender diversity variable is not entirely exogenous, it can be endogenous ([Hermalin and Weisbach, 2003](#)), i.e. gender diversity can be affected by firm performance ([Adams and Ferreira, 2009](#); [Carter et al., 2010](#)). [Farrell and Hersch \(2005\)](#) suggest the better the firm's ROA, the more likely the firm is to appoint female directors. [Carter et al. \(2003\)](#) and [Adams and Ferreira \(2009\)](#) also contend that the firm's market value does have an effect on the proportion of female directors. Their argument applies to our study as well. High-performing CPA firms tend to increase the female presence on their accountancy partnership team. This is due to the fact that firms typically attract women with better ability and experience, plus the fact that women are more risk-adverse ([Croson and Gneezy, 2009](#)) and would want to align themselves with a higher-performing firm ([Farrell and Hersch, 2005](#)).

The above-mentioned research studies show that the endogeneity issue exists in the diversity-performance relationship. Endogeneity is a statistical issue. Using OLS estimation fails to provide an effective solution to the endogeneity problem, as it produces biased coefficient estimates that lead to incorrectly accepting the hypothesis that gender diversity is associated with firm profit performance. The use of time-lag-dependent variables can provide a solution ([Garay and Gonzalez, 2008](#); [Carter et al., 2010](#)); however, our study did not use panel data, but rather pooled data[5]. As our study was unable to track annual firm-specific information and match the data across years, financial performance lag testing could not be carried out on the research data. Thus, we use the two-stage least squares (2SLS) method, with the number of female employees (*FEMP*) as the instrumental variable, for considerations of endogeneity and

reverse causality and allow us to robustly examine the diversity–performance relationship[6].

Social role theory suggests that, because of prejudices related to gender or managerial stereotypes within an organization, female managers face disadvantages and obstacles when it comes to upward promotion (Eagly and Carli, 2003; Eagly and Karau, 2002). Meanwhile, Vecchio and Boatwright (2002) indicated that the employees' gender is relevant for leadership stereotypes. Female employees tend to have strong preference for female characteristics and for female leaders. In their study of factors relating to managerial stereotypes, Stoker *et al.* (2012) have found that if gender ratio of female employees or female managers is high, the preference for male leaders is significantly less strong. Therefore, if firm culture is such that women are not discriminated against or stereotypically treated, or if firms have structure and norm that are more conducive to women's career advancement, then these firms are more likely to have a greater number of female employees and managers (Low *et al.*, 2015), and also more likely to have more female partners. However, the number of female employees or managers should not directly affect the direction of the firm (Low *et al.*, 2015; Lam *et al.*, 2013); hence, we expect the number of female employees to be highly correlated to gender diversity but not correlated to profit performance.

In addition, Gujarati and Porter (2009) recommended that in cases where the hypothesized equation is determined to be simultaneous, the OLS estimation method can be replaced with the 2SLS method. We use the Hausman test (Hausman, 1978; Wooldridge, 2003) for identifying whether the regression model produces endogenous errors. As OLS assumes explanatory variables and error term are mutually independent, if this assumption is untrue, endogeneity errors will arise. To solve the endogeneity problem, we replace the explanatory variable (gender diversity) that contained endogenous errors by the instrumental variable (*FEMP*). We estimate the following system of equations using 2SLS:

$$GENDIV_i = \alpha_0 + \alpha_1 FEMP_i + \alpha_2 MPOW_i + \alpha_3 PROR_i + \alpha_4 INTER_i + \alpha_5 BIG4_i + \varepsilon_i \quad (1)$$

$$PROR_i = \beta_0 + \beta_1 \hat{GENDIV} + \beta_2 \hat{GENDIV}^2 + \beta_3 DIVERSE_i + \beta_4 AGE_i + \beta_5 HC_i + \beta_6 BRANCH_i + \beta_7 SIZE_i + \beta_8 TREND_i + \beta_9 INTER_i + e_i \quad (2)$$

In the expression of the equation (1), we selected the number of female employees (*FEMP*), managerial power[7] (*MPOW*), the profit performance of the firm (*PROR*), firm internationalization (*INTER*) and status as Big 4 firms (*BIG4*) as endogenous independent variables for the identification of coefficients. The gender diversity of partners (*GENDIV*) in Model 1 is used to estimate simultaneously the two independent variables gender diversity of partners ( $\hat{GENDIV}$ ) and its squared term ( $\hat{GENDIV}^2$ ) in Model 2.

### 3.2 Variable definition

**3.2.1 financial performance.** Previous studies on financial performance have indicated that profit ratio[8] is more effective in highlighting the overall operating performance of CPA firms because it is the key to a firm's survival and represents the overall synergistic

effectiveness of marketing strategies and management (Palepu *et al.* 2009). Hitt *et al.* (2001) used profit ratio to measure financial performance in law offices. Chen *et al.* (2008) employed profit ratio in their research on the financial performance of CPA firms. CPA firms in Taiwan distribute earnings among partners after annual closing. Many partners do not receive a salary on a monthly basis. Instead, they receive a lump sum salary following the annual closing of all income and expense summaries. To ensure consistency in measurement, we adopted the method presented by Chen *et al.* (2008) in using the ratio of pre-tax income plus the salaries of all partners to operating revenue (denoted by *PROR*) as a measure of profit performance.

*3.2.2 Gender diversity of partners.* Gender diversity of partners is the major research variable in this study. Many previous studies have focused only on gender variables, such that gender diversity was measured directly using the proportion of women (Adams and Ferreira, 2009; Carter *et al.*, 2003; Francoeur *et al.*, 2008). This study also measured this variable according to the proportion of female partners in the firm.

### *3.2.3 Control variables*

*3.2.3.1 Firm size (SIZE).* This variable is calculated by taking the natural logarithm of business service revenue in the firm. In most surveys on the accounting industry, firms are ranked according to revenue. For instance, *Accounting Today* ranks the top 100 CPA firms in the USA in this manner (Banker *et al.*, 2005). Business service revenue represents the total amount of revenue generated from a variety of professional practices. Firms with higher revenue usually hold a larger market share and also tend to be larger in size.

*3.2.3.2 Number of years in business (AGE).* This variable refers to the number of years that the firm has been in business. Firms that entered the market earlier are more likely to have cost advantages, which are reflected in higher profits. Both Bröcheler *et al.* (2004) and Chen *et al.* (2008) found that older CPA firms tend to have stronger financial performance.

*3.2.3.3 Service diversification (DIVERSE).* CPA firms provide a variety of professional services. A diversity of services can help to reduce risk, increase profits and enhance competitiveness on the market. According to Chen *et al.* (2008), service diversification is positively related to business performance. We measure this variable using a Herfindahl–Hirschman index (HHI[9]). Previous researchers, such as Chen *et al.* (2008) and Hitt *et al.* (2001), used HHI to measure diversification in the service provided by professional businesses. This study also adopted HHI to capture the diversity of services offered by accounting firms, as calculated by the sum of squares of the proportion of total revenue in the four primary businesses conducted by each CPA firm[10]. This value is inversely related to diversification (high values indicate lower diversification); therefore, the value of the variable is subtracted from 1.

*3.2.3.4 Human Capital (HC).* CPA firms rely on employees with professional knowledge and experience related to accounting to service their clients effectively. The human capital of these employees can have a considerable influence on the business performance of the CPA firm. Bröcheler *et al.* (2004) suggested that human capital has a significant impact on firm performance. This variable takes into consideration various categories of practitioners (partners, professionals and other employees) and their years of experience in each CPA firms[11].

*3.2.3.5 Number of branches (BRANCH).* This variable refers to the number of branches owned by the CPA firm (see Greenwood *et al.*, 2005; Chen *et al.*, 2008).



3.2.3.6 Year trend (*TREND*). This variable is used to capture variations in the dependent variable – PROR – over the period from 1992 to 2008. The year of 1992 was set as 1 and that of 2008 was set as 17.

3.2.3.7 Internationalization (*INTER*). This variable is a dummy variable, taking 1 for the international firms and 0 for domestic firms. Accounting firms in Taiwan are internationalized through alliances with large international firms. Despite these alliances, most of the firms dictate their own managerial strategies, such as work commitment and promotion, without being subject to the global norms (Chen *et al.*, 2008). However, firms allied with large international firms tend to provide higher quality services and come with a stronger reputation, which, in turn, promotes profit performance (Matthews and Peel, 2003; Chen *et al.*, 2008).

### 3.3 Industry choice and data sources

3.3.1 Industry choice. Numerous empirical studies have been conducted on the diversity–performance relationship; however, most of them are based on large firms in the USA or European nations. Furthermore, few studies have used panel data from a single industry in a single nation for empirical analysis. A number of studies have focused on a single nation but explore this relationship using a multiple-industry sample. Cross-industry research is used to consider variations among industries with the aim of obtaining results that are more generalizable. However, industries differ in their competitive environments. Heterogeneity in the competition between industries can undermine the robustness of empirical results (Lei and Slocum, 2005). This is probably the reason why most previous researchers whose work was based on multiple-industry samples have failed to arrive at consistent conclusions. We believe that limiting the sample to a single industry will make it easier to capture the substantive effects of the research variables.

To the best of our knowledge, no previous study in accounting has provided an empirical exploration of the gender–performance relationship among CPA firms. Accounting is a professional service industry characterized by high knowledge intensity, low asset investment threshold and high specialization of labor (Nordenflycht, 2010). Professional practices are independent, representative, structured and require customer trust (Kornberger *et al.*, 2010). These characteristics make the accounting industry distinct from the manufacturing, retail or general service industries. Moreover, accounting firms in Taiwan have a relatively high proportion of female partners when compared to other countries. Few studies have examined whether the partnership gender–performance relationship that they found among CPA firms matches previous conclusions in the literature. It is for these reasons that we opted to investigate this relationship as it pertains to CPA firms in Taiwan.

3.3.2 Data source. This study employed as a sample census data from Taiwanese accounting firms with a partnership structure. Data were obtained from the National Survey Reports on Taiwan CPA firms published by the Department of Statistics in the Ministry of Finance or Financial Supervisory Commission of the Executive Yuan for the period from 1992 to 2008. The survey covered partnership-based CPA firms registered in Taiwan[12]. The pooled data, excluding samples with missing data, included 3, 317 sample points.



## 4. Empirical results

### 4.1 Descriptive statistics

Table I presents the descriptive statistics of the variables used in this study. In the entire sample, the average profit ratio of CPA firms was about 17 per cent, with a standard deviation of 0.12. The average proportion of female partners was 26 per cent, with a standard deviation of 0.27, suggesting that most CPA firms in Taiwan are dominated by male partners. The CPA firms averaged 12.9 years of age with an average operating revenue (operation scale) of NT\$60.74 million.

To identify differences in profit performance and the proportion of female CPA partners, we split the sample according to business service revenues into large, medium, small and Big 4 firms. The percentages of female partners in large, medium and small-sized accounting firms were 23, 25 and 28 per cent, respectively. These figures show the proportion of female partners to be lower in larger accounting firms. Furthermore, among the large firms, the subsample consisting of Big 4 firms had an average of 25 per cent female partners. The above data imply that female partners are more prevalent in smaller firms; however, even in larger firms, the proportion of female partners is higher than that in the UK or USA.

Further evidence from the Report of Business of CPA Firms issued by the Taiwan FSC reveals that the proportion of female partners rose annually from 15 per cent in 1993 to 38 per cent in 2008, an increase of nearly 2.5 times over the span of 15 years (see Figure 1). We infer that the increase in the proportion of female partners in Taiwan can be attributed to the larger pool of female professionals, the higher rate of unmarried women professionals coupled with lower birth rate and childcare assistance provided by family members, especially grandparents.

Table II presents the Pearson correlation coefficients for the entire sample. The correlation coefficient between profit ratio and the gender of partners is not significantly different from zero, and all coefficients are smaller than 0.5 in absolute value, such that there is a small degree of autocorrelation among the variables.

### 4.2 Regression analysis considering reverse causality

We used a pooled data model combining sample points of CPA firms over the period from 1992 to 2008 and estimated coefficients using 2SLS regression. The sample period spans 17 years; therefore, we included a yearly trend variable in the model to control for the effect of yearly variations on the dependent variable. We use the Hausman test (Hausman, 1978; Wooldridge, 2003) and F statistics [13] in first-stage regression to examine instrumental variable validity. Table III shows that the  $F$ -value under the entire sample is 21.57 with statistical significance and Hausman test results (see Table IV and Table VI) provide the evidence that the gender variable is endogenous. After considering reverse causality, the regression carries no bias associated with endogeneity. This suggests that the endogeneity consideration in the OLS approach is appropriate.

The second stage regression results are shown in Table IV. The regression for the entire sample suggests that gender diversity of partners has a significantly positive relationship with firm profit performance ( $\beta = 2.4136$ ,  $t = 8.31$ ). However, the quadratic term of gender diversity has a significantly negative effect on firm profit performance ( $\beta = -6.287$ ,  $t = -11.81$ ). This finding supports our hypothesis of a non-linear relationship existing between gender diversity within the partnership team and profit

Variables	Entire sample		Large firms		Medium firms		Small firms		Big-4 firms					
	Max.	Mean	SD	Max.	Mean	SD	Max.	Mean	SD	Max.				
<i>PROR</i>	0.71	0.17	0.12	0.41	0.15	0.08	0.71	0.19	0.09	0.68	0.15	0.35	0.15	0.05
<i>GENDIV</i>	1.00	0.26	0.27	0.6	0.23	0.13	1.00	0.25	0.26	1.00	0.28	0.30	0.54	0.13
<i>GENDIV</i> <sup>2</sup>	1.00	0.14	0.21	0.36	0.07	0.06	1.00	0.13	0.20	1.00	0.17	0.24	0.29	0.07
<i>SIZE</i> (in million)	6,298.0	60.74	30.89	6,298.0	448.16	863.29	56.99	22.17	11.61	9.99	5.86	2.51	6,298.0	1,492.8
<i>DIVERSE</i>	0.89	0.50	0.13	0.89	0.73	0.09	0.87	0.61	0.13	0.89	0.54	0.17	0.90	0.79
<i>AGE</i>	55.00	12.91	8.84	43.00	19.80	10.21	55.00	13.85	8.61	42.00	9.58	7.13	43.00	28.59
<i>HC</i>	24.67	6.71	2.38	8.17	4.87	0.98	14.75	6.24	1.64	24.67	7.91	2.92	6.47	4.20
<i>BRANCH</i>	6.00	0.62	0.86	6.00	1.85	1.06	5.00	0.64	0.79	3.00	0.23	0.46	6.00	2.31
<i>TREND</i>	17.00	9.34	4.68	17.00	9.68	4.77	17.00	9.40	4.67	17.00	9.15	4.65	17.00	8.21
<i>INTER</i>	1.00	0.08	0.27	1.00	0.72	0.45	1.00	0.00	0.05	N.A.	N.A.	N.A.	1.00	0
<i>FEMP</i>	1,852	39.65	124.47	1,852	233.48	323.99	102	22.61	13.32	106	8.94	6.13	1,852	677.98
														391.49

**Notes:** Profit ratio (*PROR*): (Net income before tax + owner's salary) ÷ total service revenues of the firm; gender diversity of partners (*GENDIV*): number of woman partners ÷ total number of partners; gender diversity of partners squared (*GENDIV*<sup>2</sup>); *GENDIV* × *GENDIV*; size of the firm (*SIZE*): total service revenues of the firm; service diversification (*DIVERSE*); *HII* minus 1; age of the firm (*AGE*); 2008 minus the year of the firm's establishment; human capital (*HC*): (number of partners × 6 + number of professionals × 2 + number of other employees × 1) ÷ total number of employees; number of branch (*BRANCH*): the number of branches operated by the firm; year trend (*TREND*): the continuous variable preset from 1 as the initial year of the data acquired, to 17 as the final year; internationalization (*INTER*): dummy variable, 1 for the firms with international alliance, and 0 otherwise; female employees (*FEMP*): total number of female employees of the firm

**Table I.** Descriptive statistics: mean and standard deviation for the entire and subgroups sample

**Table II.**  
Pearson correlation  
matrix: entire sample

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
Profit ratio ( <i>PROF</i> )	1***												
Gender diversity of partners ( <i>GENDIV</i> )	0.055***	1***											
Gender diversity of partners squared ( <i>GENDIV<sup>2</sup></i> )	0.056***	0.916***	1***										
Service diversification ( <i>DIVERSE</i> )	0.141***	-0.069***	-0.090***	1***									
Age of the firm ( <i>AGE</i> )	-0.035***	-0.121***	-0.145***	0.201***	1***								
Human capital ( <i>HC</i> )	0.177***	-0.068***	-0.040***	-0.157***	0.218***	1***							
Number of branches ( <i>BRANCH</i> )	-0.027***	-0.082***	-0.149***	0.281***	0.218***	-0.312***	1***						
Year trend ( <i>TREND</i> )	-0.058***	0.131***	0.122***	0.041***	0.303***	0.113***	-0.012***	1***					
Size of the firm ( <i>SIZE</i> )	0.094***	-0.092***	-0.175***	0.389***	0.426***	-0.487***	0.573***	0.048***	1***				
Internationalization ( <i>INTE</i> )	0.036***	-0.026***	-0.092***	0.262***	0.261***	-0.226***	0.485***	-0.021***	0.653***	1***			
Female employees ( <i>FEMP</i> )	-0.109***	0.123***	-0.106***	0.171***	0.353***	-0.622***	0.602***	-0.041***	0.185***	0.632***	1***		
Managerial power ( <i>MPOW</i> )	-0.196***	-0.090***	-0.114***	0.185***	0.260***	-0.576***	0.449***	-0.066***	0.665***	0.487***	0.380***	1***	
Big4 firms ( <i>BIG4</i> )	0.025***	-0.003***	-0.043***	0.198***	0.290***	-0.172***	0.323***	-0.039***	0.566***	0.565***	0.728***	0.460***	1***

**Notes:** See Table I for explanation for each variable, except for the following variables. *SIZE*: the logarithm of total service revenues of the firm; *MPOW*: total number of employees ÷ total number of CPA partners in that firm; *BIG4*: dummy variable, 1 for the Big-4 firms in Taiwan, and 0 otherwise; \*, \*\*, and \*\*\* represent significance at the 0.05, 0.01 and 0.001 levels, respectively (two-tailed)

Variables	Entire sample		Large-sized firms		Medium-sized firms		Small-sized firms	
	$\beta$	t-value	$\beta$	t-value	$\beta$	t-value	$\beta$	t-value
	$GENDIV_i = \alpha_0 + \alpha_1 FEMP + \alpha_2 MPOW_i + \alpha_3 PROR_i + \alpha_4 INTER_i + \alpha_5 BIG4_i + \varepsilon_i$							
Female employees ( <i>FEMP</i> )	0.0002	3.23***	0.0002	4.87***	0.0014	2.14***	0.0163	7.76***
Managerial power ( <i>MPOW</i> )	-0.0078	-6.69***	-0.0033	-2.90***	-0.0117	-5.22***	-0.0380	-7.93***
Profit ratio ( <i>PROR</i> )	-0.1331	-3.48***	-0.1025	-1.27***	-0.3648	-5.28***	-0.0070	-0.13***
Internationalization ( <i>INTER</i> )	0.0173	-0.79***	0.0053	0.34***	-0.1201	-1.04***	NA	NA
Big 4 firms ( <i>BIG4</i> )	-0.0458	-0.76***	-0.0379	-1.33***	NA	NA	NA	NA
Constant	0.3334	27.51***	0.2540	11.30***	0.3783	16.51***	0.3350	16.01***
F-statistics	21.57***		14.82***		11.71***		23.38***	
Adjusted R <sup>2</sup>	0.017		0.1029		0.0261		0.0546	
Sample size	3,317		347		1,751		1,219	

Note: See Table II for an explanation for each variable; \*, \*\* and \*\*\* represent significance at the 0.05, 0.01 and 0.001 levels, respectively (two-tailed)

Table III. The first stage regression results: entire sample and subsamples

**Table IV.**  
The second-stage regression analysis results: entire sample and subsamples

Variables	Entire sample		Large-sized firms		Medium-sized firms		Small-sized firms	
	$\beta$	t-value	$\beta$	t-value	$\beta$	t-value	$\beta$	t-value
	$PROR_i = \beta_0 + \beta_1 \hat{GENDIV} + \beta_2 \hat{GENDIV}^2 + \beta_3 DIVERSE_i + \beta_4 AGE_i + \beta_5 HC_i + \beta_6 BRANCH_i + \beta_7 SIZE_i + \beta_8 TREND_i + \beta_9 INTER_i + e_i$							
Gender diversity of partners ( <i>GENDIV</i> )	2.4136	8.31***	-3.2546	-4.66***	0.7150	0.70***	0.3868	3.04***
Gender diversity of partners squared ( <i>GENDIV</i> <sup>2</sup> )	-6.4287	-11.81***	5.0801	4.66***	-2.5189	-3.94***	0.1882	1.52***
Service diversification ( <i>DIVERSE</i> )	0.1012	6.87***	0.0517	0.97***	0.1088	6.61***	0.0965	3.46***
Age of the firm ( <i>AGE</i> )	-0.0028	-10.13***	0.0022	4.17***	-0.0014	-5.09***	-0.0063	-8.20***
Human capital ( <i>HC</i> )	0.0228	21.10***	0.0235	4.80***	0.0224	15.90***	0.0215	11.92***
Number of branches ( <i>BRANCH</i> )	-0.0160	-5.28***	-0.0052	-1.19***	-0.0071	-2.40***	-0.0277	-2.65***
Size of the firm ( <i>SIZE</i> )	0.0395	13.30***	-0.0004	-0.06***	0.0218	4.32***	0.0860	10.00***
Year trend ( <i>TREND</i> )	-0.0007	-1.50***	-0.0007	-0.74***	-0.0017	-3.51***	-0.0022	-1.98***
Internationalization ( <i>INTER</i> )	-0.0168	-1.56***	0.0297	2.63***	-0.0910	2.18***	NA	NA
Constant	-0.5936	-10.58***	0.4722	3.60***	-0.0946	-1.31***	-0.9961	-9.94***
Hausman test	40.26***		4.33*		3.97*		56.36***	
F	92.15***		7.82***		11.71***		33.92***	
Adjusted R <sup>2</sup>	0.1983		0.0897		0.0239		0.1779	
Sample size	3,317		347		1,751		1,219	

**Note:** See Table II for an explanation for each variable; \*, \*\* and \*\*\* represent significance at the 0.05, 0.01 and 0.001 levels, respectively (two-tailed)



performance. This finding is also consistent with the conclusions in previous studies by Richard *et al.* (2004) and Frink *et al.* (2003). In the OLS regression results, we observed a significant U-shaped relationship between gender diversity and profit performance; however, no statistically significant curvilinear relationships were observed in the large firm or medium firm subsamples. The full results of these estimates equations are available from the authors.

Firm size was shown to have a significantly positive effect on profit; therefore, we further split the sample according to operating revenue into large, medium and small firms for regression analysis of whether the relationship varies by firm size. The sample has to be divided carefully because the accounting profession is regarded as an industry with a “dual market” structure (Bröcheler *et al.*, 2004); i.e. a few large accounting firms (i.e. the Big 4) enjoy a huge market share with large number of small accounting firms taking the remaining market share. Banker *et al.* (2005) argued that highly skewed revenue distribution in the accounting industry is influenced by large firms with regard to the cross-sectional distribution of revenue. Thus, it is appropriate to consider the skewed distribution when splitting the sample by revenue [14].

A significant U-shape was observed in the gender diversity–performance relationship ( $\beta = 5.0801$ ,  $t = 4.66$ ) in the large firm subsample, while an inverted U-shape was observed among the medium size firms ( $\beta = -2.5189$ ,  $t = -3.94$ ). However, in the regression using a linear term and a quadratic term for gender diversity in the small firm subsample, both beta-coefficients were greater than zero, which indicates a significantly positive link between the number of female partners and profit performance.

We applied the first derivative test in differential calculus to locate the points of inflexion in the curves, which indicated that the optimal inflexion points of the inverted U-curve were 18.77 per cent for the entire sample and 14.19 per cent for medium firm subsample. However, the lowest point of the U-curve was 32.03 per cent for the large firm subsample. Table V summarizes the inflexion points, the average number of total partners and female partners for different firm sizes.

#### 4.3 Robustness checks

To check the robustness of our results, we re-ran the regression using 2001 as a dividing point to split the sample period into two sub-periods: 1992-2000 and 2001-2008. 2001 was chosen because this was the point at which the CPA Association lifted price controls on auditing fees. It has been reported that this event had a significant impact on the profit performance of CPA firms (Chen *et al.*, 2008). By dividing the sample into two sub-periods, we were able to determine whether the significant non-linear relationship was consistent across the two sub-periods. As shown in Table VI, the squared term of gender diversity has a significant effect on profit performance in both sub-periods. Therefore, our results robustly indicate that the non-linear relationship does exist by year.

In this study, the control variable for the size of accounting firm was proxied as the firm’s revenue. However, there are others measures used in previous studies, such as the number of firm employees (Collins-Dodd *et al.*, 2004) or the market share (Chen *et al.*, 2008, 2002). We used the number of employees in a firm as an alternative proxy to control for firm size and re-ran the regression model. The untabulated results show that the significant U-shaped relationship exists for the entire sample. The other results for



**Table V.**  
The gender –  
diversity –  
performance  
relationships  
for Taiwan  
accounting firms

*Panel A: Entire Sample*

Average number of CPA partners	4.9 (person)
Inflexion point of female partners	18.77 per cent
Average number of female CPA partners: computed by inflexion	0.92 (person)
Average number of female CPA partners	1.29 (person)
Remark: the gender diversity exceeds the inflexion point, falling within the region with negative performance for firms	

*Panel B: Large-sized firms*

Average number of CPA partners	19.14 (person)
Inflexion point of female partners	32.03 per cent
Average number of female CPA partners: computed by inflexion	6.13 (person)
Average number of female CPA partners	5.18 (person)
Remark: the average gender diversity is below the inflexion point. There is room for improvement by increasing 0.95 female partners on average	

*Panel C: Medium-sized firms*

Average number of CPA partners	3.79 (person)
Inflexion point of female partners	14.19 per cent
Average number of female CPA partners: computed by inflexion	0.54 (person)
Average number of female CPA partners	0.93 (person)
Remark: the average gender diversity exceeds the inflexion point, falling within the region with negative profit for firms	

*Panel D: Small-sized firms*

Average number of CPA partners	2.43 (person)
Inflexion point of female partners	Not Applicable
Average number of female CPA partners: computed by inflexion	Not Applicable
Average number of female CPA partners	0.7 (person)
Remark: there is a positively significant linear relationship of gender diversity-performance. The addition of women enhances profit performance	

the large, medium and small firm subsample are qualitatively similar to our main findings and consistent with our hypotheses.

In addition, in the study, we used 17 consecutive numbers as the *Year* trend variable to represent the years 1992 to 2008. To examine the effect of using a different measure of year trend on the robustness result, we replaced the *Year* trend variable by 16 *Year* trend dummies (year 2008 as reference group) to re-run the second-stage regression model. The untabulated results remain consistent with our main findings for the entire sample and the three subsamples.

In their study of the Netherland's accounting firms, Bröcheler *et al.* (2004) found that for accounting professionals, the higher their education level, the better the firm's financial performance. Our previous *HC* formula used as weights the professional's years of working experience. We now use an alternate *HC* measure[15] in the second-stage regression model by taking into consideration the educational level of each individual professional by factoring in the number of years it takes the professional to obtain his educational degree. For example, in Taiwan, it takes 23 years to obtain a PhD degree. Of these, 6 years are spent in primary school, 6 years in high school, 4 years in college, 2 years in the master's program and 5 years in the PhD program. Reexamining the gender-diversity-performance relationships using this alternate measure, the

Table VI.

Regression results:  
two sub-periods split  
by the year of 2001

Variables	1992-2000		2001-2008	
	$\beta$	<i>t</i> -value	$\beta$	<i>t</i> -value
Gender diversity of partners ( <i>GÉNDIV</i> )	3.3595	12.79***	-2.7379	-2.21***
Gender diversity of partners squared ( <i>GÉNDIV</i> <sup>2</sup> )	-9.6922	-16.14***	2.3036	1.99***
Service diversification ( <i>DIVERSE</i> )	0.1420	6.56***	0.0897	4.60***
Age of the firm ( <i>AGE</i> )	-0.0034	-7.94***	-0.0021	-5.78***
Human capital ( <i>HC</i> )	0.0245	14.50***	0.0225	16.14***
Number of branches ( <i>BRANCH</i> )	-0.0214	-4.67***	-0.0110	-2.84***
Size of the firm ( <i>SIZE</i> )	0.0318	6.84***	0.0351	9.05***
Year trend ( <i>TREND</i> )	0.0022	1.84***	-0.0023	-1.84***
Internationalization ( <i>INTER</i> )	0.0014	0.09***	-0.0187	-1.26***
Constant	-0.5884	-9.30***	0.2465	1.08***
Hausman test		16.462***		61.211***
<i>F</i>		66.95***		36.21***
Adjusted <i>R</i> <sup>2</sup>		0.2569		0.1655
Sample size		1,718		1,599

**Notes:** See Table II for an explanation for each variable; \*, \*\* and \*\*\* represent significance at the 0.05, 0.01 and 0.001 levels, respectively (two-tailed)

untabulated results indicate that only in the medium firm subsample was the inverted U-shaped relationship below statistical significance. The other results for the entire sample and large and small firm subsample are similar to our main findings and consistent with our hypotheses.

## 5. Discussion and conclusion

Most empirical studies may have had low levels and range of gender diversity and have reported the gender–performance relationship as linear, i.e. either positive or negative, while other studies have indicated that this relationship is non-existent. These equivocal conclusions can probably be attributed to the fact that the samples in these studies were collected from multiple industries or that the studies failed to examine the effect of the size of the organization. A failure to account for heterogeneity in competition between industries could easily bias the empirical effects of TMT gender diversity on financial performance. For this reason, we focused on a single industry, the accounting industry, with results suggesting a non-linear relationship. This conclusion is consistent with the arguments posited by Frink *et al.* (2003) and Richard *et al.* (2004).

However, unlike Frink *et al.* (2003) and Richard *et al.* (2004), we used data spanning duration of 17 years and divided the sample into three groups according to business revenue (i.e. large, medium and small). Taking into account the effects of service diversification and yearly trends, we obtained a non-linear relationship. After finding an inverted U-shaped relationship between TMT gender diversity and performance among risk-taking banks, Richard *et al.* (2004) concluded that this relationship is moderated by the risk-taking behavior of the entrepreneur. Nonetheless, they did not examine whether this non-linear relationship persists across banks of various sizes.

For the entire sample, we find the relationship between gender diversity and profit performance to be that of an inverted U-shaped curve, with inflexion point at 18.77 per

cent. The average number of CPA partners in our study sample is 4.9 persons (see panel A of Table V). Therefore, if computed by inflexion point, the average number of female CPA partners should come to 0.92 persons. However, our survey figures indicate the average number of female CPA partners is 1.29 persons. This means the diversity–performance relationship is located in the negative upward direction, and the proportion of female CPA partners in Taiwan, on average, has exceeded the optimal level, with negative impact on the firm’s performance.

This study finds it interesting that the relationship curve is U-shaped for large firms, inverted U shape for medium sized firms and linear for small firms. It appears that in terms of firm profit performance, homogeneous partnership is best for large firms, but worst for medium firms. For the latter, the optimal ratio for performance is 14.19 per cent female partners.

Few accounting studies explore this interesting phenomenon. Our conjecture for the reason why these firms exhibit different relationship curves is perhaps the factor of size synergy. The size of TMT has an impact on organizational decisions (Haleblian and Finkelstein, 1993; Mak and Kusnadi, 2005). Because operational complexity varies with size, the decision-making strategy also varies; consequently, the impact on firm performance also differs.

We observe in the subsample of large size firms, the average number of CPA partners is 19.14 persons (Panel B of Table V). The average of female CPA partners is 6.13 persons if computed by the turning point of inflexion 32.03 per cent. The average number of female CPA partners within this subsample is 5.18 persons. This suggests there is room for improvement as far as the proportion of female partners in Taiwanese large firms is concerned. If the average number of female partners could increase by 0.95 persons, the critical mass can be attained.

According to Kanter (1977), in tilted groups (20 to 40 per cent female partners), female CPAs are more than mere tokens; rather, they are a distinct group capable of positively influencing profit performance. Female partners in Taiwanese large firms fall within the category of tilted groups; however, their impact on firm performance is negative because the female partnership proportion has yet to attain critical mass. If 0.95 females were added to the partnership team so as to attain this optimal level, new ideas provided by female partners would garner support, foster collaboration, cooperation and empathy at critical moments, and thus have a positive effect on firm profit performance in the end (Konrad *et al.*, 2008).

In addition, for the subsample of medium firms, the significant inverse U-shaped relationship indicates there is an optimal level of male–female match in the partnership team. In a homogeneous male partnership team, the inclusion of women promotes wider visions and interpersonal networks, fosters innovative idea development, with positive repercussions on problem-solving and decision-making. Thus, gender diversity in the partnership team creates a unique human resource for the firm that can enhance firm profit performance. This is totally in line with the value-in-diversity view (Nielsen and Huse, 2010; Frink *et al.*, 2003; Cox *et al.*, 1991).

It should be noted that value-in-diversity does not mean including more women would necessarily result in better performance. Rather, there exists an optimal level of gender diversity. If the proportion of females exceeds this optimal level, firm performance will be adversely affected. The Panel C of Table V shows the average of female CPA partners is 0.54 persons if computed by the turning point of inflexion (14.19

per cent). For the subsample of medium firms, the survey results show the average number of CPA partners to be 3.79 persons. Within this subsample, the average number of female CPA partners is 0.93 persons. This suggests that in Taiwan, the proportion of female CPAs for medium size firms has exceeded the optimal level, with negative impact on the firm's performance.

In the subsample of small firms, the number of partners is quite small (averages to 2.43 persons). The results show a positively significant linear relationship between CPA partners' gender diversity and profit performance. Thus, for small size accounting firms in Taiwan, the addition of women enhances profit performance.

The main contribution of this study is insights into how an increase in the proportion of female partners affects profit performance. This study extends the literature related to gender diversity, particularly with regard to the accounting profession. We provide new evidence to reinforce the existing literature with regard to value-in-diversity and critical mass theory, which both suggest that gender diversity affects profit performance. Our findings show that this relationship is curvilinear, which differs for the different size firms. Moreover, large accountancy firms in Taiwan have the furthest to go in terms of gender diversity improving firm performance.

This study viewed the partners of CPA firms as TMT; however, managers are also responsible for strategy execution in CPA firms. Furthermore, diversity can be measured using other background variables, such as tenure and industry experience. Both of these factors affect profit performance and are, therefore, worthy of further study.

This study considers only Taiwan-based accounting firms. Other countries differ in their laws, cultural environments, historical backgrounds and other factors that might affect the gender diversity of partnerships. Any interpretation of our study results should be done with caution because of the lack of generalizability to other countries.

## Notes

1. Currently, four major accounting firms in Taiwan have allied with the international Big 4, which are ranked as follows: Deloitte & Touche, PricewaterhouseCoopers, KPMG and Ernst & Young. Each of Taiwan Big 4's 2008 total revenue, the number of employees and proportion of female CPA partners is, respectively, NT\$6.3 billion, 2,907 and 35.8 per cent for D&T; NT\$3.47 billion, 2,023 and 36.8 per cent for PWC; NT\$3.26 billion, 1,757 and 49.4 per cent for KPMG; and NT2.12 billion, 1,202 and 31.4 per cent for EY.
2. The Ministry of Interior of Taiwan, ROC has annually published the total fertility rate by the selected major countries. We have reviewed the statistics and found that fertility rate in Taiwan was lowest during 2003 to 2012. The statistics are available from Interior National Indicators: Total Fertility Rate by Selected Countries, at: [www.moi.gov.tw/stat/english/interior.asp](http://www.moi.gov.tw/stat/english/interior.asp) (accessed 1 November 2015).
3. According to current childcare statistics published on the survey report by Taiwanese Ministry of Interior, for children aged 3 years and under, daycare handled directly by family members accounted for 76.8 per cent, by preschools 11.6 per cent, by nannies or FDH 1 per cent (MOI, 2011). For the childcare by family members, 59.1 per cent are mainly handled by grandparents, 32.8 per cent by parents and 8.1 per cent by other relatives.
4. The founder of Facebook, Mark Zuckerberg, stated that despite the considerable proportion of female users of Facebook, Facebook has an all-male board. He suggested that the future

development of Facebook may be hindered if it does not increase the gender diversity on its board [extracted from Bloomberg, on-line available at [www.bloomberg.com/news/2012-06-25/facebook-appoints-sandberg-to-board-adding-first-woman-director.html](http://www.bloomberg.com/news/2012-06-25/facebook-appoints-sandberg-to-board-adding-first-woman-director.html) (accessed 26 June 2012).

5. Our study utilized pooled data because the data are collected from the National Survey Reports on Taiwanese CPA Firms. The Survey Report is protected by the Enforcement Rules of the Statistics Act – any information made public by management authorities may not disclose names of individual firms.
6. We thank an anonymous referee for suggesting this as an area of analysis.
7. According to the study by [Hitt et al. \(2001\)](#), it is computed by taking the total numbers of employees in the accounting firm divided by the total number of CPA partners in that firm. This measures to what capacity CPA partners can manage the employees, in effect capturing the managerial power of partners.
8. Profit ratio, also called profit margin on sales, is computed by taking the firm's net income divided by its total revenues.
9. HHI is used in the previous literature to capture the service diversification. HHI is an economic concept and defined as the sum of the squares of the percentage market shares of firms within the industry. It is a measure of the change in proportional market share of firms and an indicator of the degree of competition among these enterprises. Researchers in the past such as [Chen et al. \(2008\)](#) and [Hitt et al. \(2001\)](#) have used HHI to capture the service variance of professional businesses.
10. The National Survey Reports on Taiwanese CPA firms makes available data on the major forms of business revenue earned by the firm. We use the largest four areas of business to calculate this measure using the HHI index over the four largest business revenues earned by the firm: revenue of audited financial statements, revenue of accounting services, revenue of tax services and revenue of advisory services.
11. The formula for computing  $HC$  is  $HC = (\text{number of partners} \times 6 + \text{number of professionals} \times 2 + \text{number of other employees}) \div \text{total number of employees}$ .
12. Census of accounting firms in Taiwan is managed by governmental agency. CPA firms are mandated to annually report their firms' demographical and financial data to the appropriate authority. Prior to 2004, this authority was the Ministry of Finance, which was in charge of publishing the National Survey Reports on Taiwanese CPA Firms. Since 2004, the Financial Supervisory Commission, created that year, has been in charge of conducting the census work and publishing the Survey Report. However, this level of detail in the data was unavailable after 2008.
13. [Steiger and Stock \(1997\)](#) pointed out that, as a rule of thumb, a first-stage  $F$ -value less than 10 indicates the chosen instrumental variable is weak, i.e. coefficient estimation error can easily occur in the second stage regression model.
14. According to the National Survey Report on Taiwanese CPA firms, the top 30 firms are regarded as large-sized firms, accounting for approximately 10 per cent of the total number of firms (277 firms in 2008) in Taiwan. Their revenues account for 83 per cent of the market share ([Lin and Chen, 2009](#)). Therefore, taking the skewed revenue distribution into consideration, we selected NT\$57 million and NT\$10 million as the basis of the split-point for our sample. Firms with earning revenues exceeding NT\$57 million are grouped as large-sized firms for

347 observations. Revenues between NT\$57 million and NT\$10 million were grouped as medium-sized firms with 1,751 observations. The remaining, at less than NT\$10 million, were allocated as small-sized firms for 1,219 observations.

15. *HC* measure:  $(\text{number of professionals with PhD degree} \times 23 + \text{number of professionals with master's degree} \times 18 + \text{number of professionals with bachelor's degree} \times 16 + \text{number of professionals with high school diploma} \times 12) \div \text{total number of professionals}$ .

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