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Received 22 November 2010
Revised 10 January 2011
Accepted 10 February 2011

Female participation in TMT and firm performance: evidence from Chinese private enterprises

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Abstract

Purpose – This paper proposes an examination of the relationship between female participation in top management teams and firm performance in the emerging Chinese private economy. It aims to examine the direct link between female participation in top management teams and firm performance. This is examined in the context of human capital and social capital associated with female top executives to investigate the origins and the contingencies of the linkage.

Design/methodology/approach – Drawing on resource dependence theory, the study develops and tests a set of hypotheses regarding the key relationships, using the data of listed private-owned companies in China's security exchanges in 2008, with critical information on financial performance, corporate governance structure and the top management team composition of the companies. Regression analyses are conducted to test the direct relationship and the moderating effects.

Findings – The empirical analysis supports a positive relationship between the degree of female participation and firm performance in Chinese privately owned companies. The positive relationship is further strengthened by female top executives' human capital and social capital, consistent with the hypotheses.

Research limitations/implications – The present study gains consistent results with research conducted in the Western context, suggesting that the top management behavior of Chinese private enterprises is similar to that of their Western counterparts, possibly due to the fact that they are less influenced by direct governmental control and are more profit-driven than state-owned companies.

Practical implications – The results of the study suggest that Chinese private companies can gain competitive advantages through identifying, attracting, and developing female managerial talents. And the female executives in the new era should be ones with systematic education and strong social connections. Both factors facilitate female executives to contribute better to their companies' performance.

Originality/value – The contribution of the present study is twofold. First, drawing on extant literature in the Western business context, the present study is the first to examine how female participation in top management influences firm performance in the context of the Chinese private sector, which contributes to the understanding of and offers insights to Chinese managerial practices. Second, the study enriches the extant literature by examining the moderating effects of female executives' human and social capitals.

Keywords Women executives, Company performance, Human capital, Senior management, Private sector organizations, China

Paper type Research paper

This is a translation from the Mandarin of Ren, T. and Wang, Z. (2010), "Female participation in TMT and firm performance: evidence from chinese private enterprises", *Nankai Business Review*, Vol. 13 No. 5, pp. 81-91



1. Introduction

According to Chinese conventional culture, women are positioned as dutiful wives and loving mothers. As the old doctrine from the Ming dynasty puts, “ignorance is women’s virtue”. Influenced by this culture, traditional Chinese society sets women’s domain mostly in the family, not in the workplace. In the viewpoint of conventional business wisdom, Chinese culture is notorious for its degree of masculinity. In business practices, the glass-ceiling is widely applied to talented Chinese female executives. However, in the emerging private economy in China, female entrepreneurs are not lacking in success compared to their male counterparts. Many extremely successful new entrepreneurial ventures are founded and run by female business leaders. Yet, no rigorous research has been done on this fascinating subject.

While many female top executives make their career by adding value to companies through their intellectual and social capabilities, there are others who sit in boardrooms simply because of rich fathers or husbands. In Forbes’ 2010 list of global young billionaires, the 28 year-old woman Yang Huiyan was ranked No. 3. In 2007, Ms. Yang’s father, a real-estate guru in China, designated most of his wealth to be under his daughter’s name, and then made her the richest woman in China. Also, among the richest 50 Chinese women chosen by 2009 Hurun Richest Chinese Women List, seven gain the position through their family, and nine share the honor with their husband. However, the majority of the top 50 are listed in their own name.

The aforementioned phenomenon raises interesting considerations. How much value do the top female entrepreneurs and executives add to companies? Can this added value be sustained, and through what channels? These questions are crucial, since the efficient identification and development of managerial talents are important to enhance companies’ competitive advantage (Hambrick and Mason, 1984; Barney, 1991; Castanias and Helfat, 1991, 2001; Lado and Wilson, 1994; Finkelstein and Hambrick, 1996). If female entrepreneurs and top executives indeed add value to companies in a way that is distinct from men, companies should deliberately design a system to encourage the participation of women in their top management teams.

The intriguing role of women in top management teams has drawn attention from practitioners. Adler (2001) found that the *Fortune* 500 firms with a stronger record of promoting women to the top management team have better financial performance. The nonprofit organization Catalyst (2004) conducted a research by using a sample of 353 *Fortune* 500 companies from 1996 to 2000 and found that gender diversity in top executive suites is positively associated with firm performance.

Academic research has investigated whether female participation in TMT can improve firm performance, with mixed findings differing across contexts (Dezso and Ross, 2008). In general, female participation in TMT was found positively associated with firm performance as measured by Tobin’s Q (Dezso and Ross, 2008), post-IPO stock price performance (Welbourne, 1999), return on investment (Shrader *et al.*, 1997; Krishnan and Park, 2005), and gross margin (Smith *et al.*, 2006). However, the positive relationships do not always hold in different specifications (Krishnan and Park, 2005; Smith *et al.*, 2006), at different levels of management (Shrader *et al.*, 1997; Dezso and Ross, 2008), or in different empirical contexts and contingencies (Dwyer *et al.*, 2003; Richard *et al.*, 2004; Wolfers, 2006). Also, Hillman and Cannella (2007) concerned the endogeneity of female participation in TMT, such as the condition which can increase the likelihood of female representation on boards, considering the endogenous

factors including organizational size, industry type, firm diversification strategy, and network effects.

To summarize, the existing literature of the impact of female participation in TMT on firm performance depicts an appealing yet blurry picture. Furthermore, most of the studies were conducted in Western settings. To extend the stream of literature, the present study investigates the relationship in the context of Chinese private enterprises. It seeks to find out the existence of the role that female entrepreneurs and top executives may play in enhancing companies' performance, and the contingencies that may affect the relationship. The study is taken up in China's unique economic, cultural and political environment, where the emerging Chinese private enterprises are run. As Figure 1 shows, the study first examines the main relationship between female participation in TMT and firm performance, and then examines the relationship in the context of the female top executives' human capital and social capital.

2. Theory and hypotheses

2.1 Resource dependence theory

Resource dependence theory (Pfeffer, 1972; Pfeffer and Salancik, 1978) states that organizations are open systems, and need to obtain resources from and have interdependent relationships with the outside environment. So organizations need to build up linkages with the external environment to facilitate the gaining of resources. Boards of directors act as the primary linkage between firms and the outside environment. The board brings the company benefits in three ways:

- (1) advice and counsel;
- (2) legitimacy; and
- (3) channels for communication and gaining commitments or support from external parties (Pfeffer and Salancik, 1978).

This theory was employed by Hillman and Cannella (2007) to explain the benefits of female participation in the boardroom.

Also, to take advantage of the linkage mechanism of boards, the firm can select directors with valuable skills, influence or connections with external sources to reduce dependency and gain valuable resources. As the external environment changes, so do the resource needs for organizations and accordingly the needs for specific types of

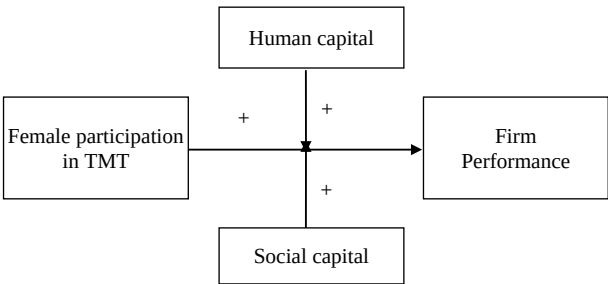


Figure 1.
The relationship between female participation and firm performance, and the moderating role of human capital and social capital

Notes: ^aHigh level of human capital is set at one standard deviation above the mean; low level of human capital is set at one standard deviation below the mean

directors (Hillman *et al.*, 2000). Furthermore, Hillman and Dalziel (2003) categorized the previously mentioned benefits boards can bring firms as directors' human capital, such as expertise, skills, knowledge, and reputation; and relational capital, such as resources available through a network of relationships. Many studies have been done on the firm-level benefits of directors' human and relational capital (Boyd, 1990; Westphal, 1999; Carpenter and Westphal, 2001), providing evidence of the linkage benefits of boards of directors (Pfeffer and Salancik, 1978).

2.2 Female participation in top management team and firm performance

The resource dependence theory can be applied to female participation in TMT in Chinese private firms. And female participation in the top management team can bring the company three kinds of benefit accordingly. First of all, female participation generates different perspectives for advice and counsel. The decision-making process of top executives is in line with cognitive bases (Hambrick and Mason, 1984), and different genders possess different norms, attitudes, and beliefs (Pelled *et al.*, 1999) that enhance a firm's cognitive bases to make sound decisions at top managerial levels. Although different opinions may lead to disagreement and internal conflicts among team members, reducing decision-making efficiency and potentially hindering team performance (Hambrick and Mason, 1984; Hambrick and D'Aveni, 1992; Hambrick *et al.*, 1996), they may essentially act as a team's "functional conflict" (Amason, 1996) that brings up creativity and a wide range of perspectives in decision making. Therefore, the benefits may outweigh the negative effects.

Second, female participation strengthens the legitimacy of the company. There is pressure to enhance gender representativeness in top management teams and on boards from society. Some institutional investors even make it a requirement. In this sense, a higher level of female participation in the top management team can help the firm gain support from outside stakeholders such as government, shareholders, the community and society at large.

Third, female participation gains more support from consumers and higher commitment from employees. For instance, in the US women make up 52 percent of the population, but control two-thirds of the nation's disposable income and 88 percent of all purchases (Kanner, 2004). To employees, female bosses send them signals that the company is female-friendly and those female managers have promising career opportunities so that the turnover costs can be significantly reduced (Hillman *et al.*, 2002). Based on news reports in China, women account for 20 percent of all entrepreneurs in China, and 65 percent of firms led by female entrepreneurs have women as more than half of their employees (Xinhua Net, 2009). Female managers are also accompanied by a less hierarchical and more interactive management style. These attributes facilitate team building, motivation, and creativity (Bass, 1985; Helgesen, 1990; Rosener, 1995; Book, 2000). Dezso and Ross (2008) demonstrates that the positive relationship between female participation and firm performance applies specifically when a firm is pursuing an "innovation intensive" strategy and would accordingly benefit most from the female management style. However, female managers are found less effective in, or inclined to avoid, competitive environments like the executive suites of many firms (Gneezy *et al.*, 2003; Niederle and Vesterlund, 2007).

Nonetheless, comparing the pros and cons of female participation, this study holds the view that the benefits outweigh the costs incurred. Thus, we propose the following:

H1. Female participation in top management teams is positively related to firm performance.

2.3 *The moderating role of human capital*

As to human capital, the present study refers to the education level of female top executives. In a large sample of a longitudinal study of 32 US airlines over eight years, Hambrick *et al.* (1996) found a positive relationship between the average education level of the top management team and firm performance as measured by growth in market share and growth in profits, indicating overall benefits from the top management team's education levels.

The level of education is consistent with an individual's cognitive ability and skills. Higher levels of education represent stronger capability for information processing and ability to discriminate among a variety of stimuli (Schroder *et al.*, 1967). Dollinger (1984) articulates the importance of the information processing capability of the top management team to firm performance through boundary spanning activities in the sample of small firms. Boundary spanning activities are strategic activities conducted by entrepreneurs of small business (Dollinger, 1984), acting as the "linking pin" between the organization and its environment (Organ, 1971). Individuals with a higher education level who possess a higher capacity for information processing are likely to engage in boundary spanning activities. And boundary spanning activities and information processing capabilities including tolerance of ambiguity and integrative complexity are positively associated with organizational performance; also information processing capability can strengthen the positive relationship between boundary spanning activities and firm financial performance (Dollinger, 1984). Furthermore, an average education level of the top management team has been found positively associated with the team's receptive attitude and cognitive ability toward innovation (Becker, 1970; Rogers and Shoemaker, 1971; Kimberly and Evanisko, 1981; Bantel and Jackson, 1989). Thus, based on all these evidences, we propose the following:

H2. Human capital strengthens the positive relationship between female participation in top management teams and firm performance.

2.4 *The moderating role of social capital*

Social capital refers to a valuable resource lying in social networks and relations of individuals and groups. Bourdieu (1985) defined social capital as "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition". An organization can benefit from the social capitals of its members through gaining external resources (Hitt *et al.*, 2002) and facilitating collectivity cohesiveness (Sirmon *et al.*, 2007). Although how to measure social capital has been a controversial issue, political connections have been bracketed with or used as a proxy for social capital in the literature (Dezalay and Garth, 1997; Yang, 2005). From the structure perspective of social capital, social relations and hierarchical relations constitute the dimensions of social structure, which create and indirectly influence social capital, respectively, (Adler and Kwon, 2002). And organization's political connections fall in these relations, tying the firm with the external environment, and generating a "bridging" form of social capital. Thus, as we measure social capital in the present study, we mainly examine governmental

background and the political connections of top executives, and also include some other influential and valuable social connections brought by TMT members.

Research based on Western culture has recognized the value of the political connections of the top management team for companies. Fisman (2001) posited that the political connections of top executives are valuable resources for listed enterprises. This is especially the case in developing countries where governmental control is rigid. For example, in countries such as Indonesia, Malaysia, Pakistan and Brazil, top management teams with governmental connections can facilitate companies to gain easier access to loans and taxation benefits (Johnson and Mitton, 2003; Mian and Khwajia, 2006; Faccio, 2006; Adhikari *et al.*, 2006; Claessens *et al.*, 2007). Even in North America, companies can gain policy benefits via connections with congress or election donations (Roberts, 1990; Krozner and Stratmann, 1998; Ang and Boyer, 2007).

Social capital is especially important in China's business environment. Transformed from a highly centrally planned economic system, China is emerging as a new market economy. In this market environment, the government's influence and control on the market is significant and rigid. Therefore, companies may find it easier to gain access to key resources through social networks or even political connections of their higher level executives, and thus achieve a higher level performance in comparison to the competitors who do not have this kind of social capital. The beneficial social capital can be at the central or local government level, related to the military, the party, or important state-owned companies such as major banks or other financial institutions.

The present study uses the sample of Chinese private enterprises, which is the most vigorous segment of the Chinese market economy, with fewest "Chinese characteristics". The sample selection has several benefits: first of all, the private enterprises are driven by profit-maximization so that they have intrinsic motivation to improve performance. Second, the private enterprises are less influenced by direct governmental intervention than the SOEs, or are not forced to assume social responsibilities beyond their capacity. In this case, the present research can draw more consistent conclusions with what the relevant literature research has done. Third, using the sample of private enterprises avoids the confusion made by using state-owned enterprises that the convenience of financing and taxation preferential treatment may not come from the governmental connections of TMT but from the identity of the state-owned enterprise itself.

Social capital of top executives in the present study includes governmental background and political connections, and also some other influential and valuable social resources brought by TMT members. Political connections are defined by the relevant studies as: TMT members have work experience in central or local government, or the military (Faccio, 2006; Fan *et al.*, 2007); or are members of the national and local people's congress, members of the national and local committee of CPPCC (Chinese People's Political Consultative Conference), and committee members of federations of industry and commerce. Some non-governmental social resources may also have a significant impact on the company. For instance, in our data some female top executives have held positions in the top management teams of some main state-owned monopolistic enterprises (e.g. China Petrochemical Corporation, China Foods Corporation), and are still working in the same industry after transferring to private enterprises. Some others have been at top executive levels of nationally or provincially owned financial corporations or of state-owned banks (e.g. CEO of the International Investment and Trust Corporation of Hainan Province, vice president of Bank of China

city branch, etc.). Some female top executives are also presidents or vice presidents of some trade associations. We believe all these kinds of social capital that female top executives are equipped with will help to magnify the virtue of their participation in top management teams in enhancing firm performance:

H3. Social capital strengthens the positive relationship between female participation in top management teams and firm performance.

3. Methods

3.1 Data

The present study uses the sample of private listed companies in China's market in 2008. The data was mainly collected from the China Stock Market & Accounting Research (CSMAR) Database. CSMAR database is the first database developed following international standards in Great China Area and it reports the exchange data of the Chinese securities market and relevant financial and economic information. The present study uses the private listed companies categorized by the database directly. It also took reference of Wind Info database to complete some missing financial information of the CSMAR database. Wind Info is a leading financial database with the largest market share in the financial data area in China. And for social capital and human capital, besides the available information in CSMAR, data was extracted from the companies' annual reports and public information from SINA finance, www.finance.sina.com, one of the major financial web portals in China.

We secured information for 672 private listed companies from the CSMAR database. After deleting ST (special treatment) and PT (particular treatment) companies which have been specially treated or suspended because of abnormal financial performance, and companies with negative net assets, 567 private listed companies were left and used for the full set of analyses as reported in Table II. A subsample of 526 companies with female participation in the top management team was used to examine the moderating effects as a robustness check (not reported here but available upon request). The 567 companies are distributed across 12 industries by the definition of China Securities Regulatory Commission (CSRC) first level industry classification (data of private listed companies extracted from the CSMAR database do not include the "L" category industry: communications and culture), and 7 regions of the nation (northeast, north, east, south, central China, northwest and southwest).

3.2 Measures

- (1) *Firm performance.* Tobin's Q, the standard measure of firm performance is adopted. It is defined by Bertrand and Schoar (2003) as the ratio of the market value of a firm's assets to their replacement cost or book value. The present study took the tradable market price of the company in 2008 to calculate Tobin's Q, which is actually the product of stock price on December 31, 2008 and tradable shares:

$$\text{Tobin's Q} = \frac{\text{Equity Market Value} + \text{Liabilities Book Value}}{\text{Total Book Assets}}, \quad \text{where}$$

$$\begin{aligned} \text{Equity Market Value} = & \text{Tradable Shares} * \text{Share Price} \\ & + \text{Non-tradable Shares} * \text{Net Assets per Share}. \end{aligned}$$

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- (2) *Female participation.* There are two ways to measure the variable. The first is to generate a dummy variable to measure female participation in the top management team. The variable takes the value of 1 if any of the executives reported for a given firm is female, and 0 if otherwise. Of the 567 companies, 92.6 percent have one or more female top managers. The second one, which is used in the analyses, is the female participation ratio, the number of female executives divided by the total number of executives.
- (3) *Human capital.* This variable is measured as the average education level of female top managers. The education level is coded in the CSMAR database by a scale of 1-5 with 1 representing technical school graduate or below, 2 junior college graduate, 3 bachelor's degree, 4 master's degree, and 5 doctoral degree, respectively.
- (4) *Social capital.* This variable is measured by the percentage of female top executives who have social capital. We include all political connections as the following: any female executives who have held positions in government and the military, or are deputies to the National and Local People's Congress, National and Local Committee of CPPCC and democratic parties; top management of federations of industry and commerce, industry associations and other influential NGOs. Besides, political connections, we also counted other social resources, including the experience of having held a high status position in large or monopolistic state-owned companies, such as president or vice president in state-owned banks or large branches, or some national or province level international trust and investment corporations. The following formula is used to compute the ratio:

$$\text{Social capital} = \frac{\text{Female top executives with social capital}}{\text{the total number of top executives}}.$$

- (5) *Control variables.* To rule out alternative explanations, there are several control variables commonly found in relevant papers on manager effects included in the analysis:
- firm size, measured by the natural log of book assets from the prior year;
 - book leverage, measured by the ratio of debt to assets;
 - team size, measured by the total number of top management team members reported in CSMAR, including members of top executives, directors of board and board of supervisors;
 - firm age, measured by the existing duration of the company from its establishment to the end of year 2008; and
 - dummy variables of industries and regions to control for firm heterogeneity.

According to the first level of classification of CSRC, there are a total of 13 industries, but the present sample includes 12 industries. The sample companies are located in seven regions from the information in CSMAR database.

3.3 Empirical strategy

Following Baron and Kenny (1986), a set of hierarchical regressions is conducted to examine the main relationship and the moderating effects of human capital and social

capital on the relationship between female participation in the top management team and firm performance, respectively. The main estimation equation can be specified as follows:

$$\begin{aligned}\text{Tobin's } Q = & \alpha + \beta_1 \text{Female Participation Ratio} + \beta_2 \text{Team Size} \\ & + \beta_3 \text{Firm Size} + \beta_4 \text{Book Leverage} + \beta_5 \text{Firm Age} + \beta_6 \text{Industry} \\ & + \beta_7 \text{Region} + \varepsilon\end{aligned}\quad (1)$$

And the moderating effects can be specified as follows:

$$\begin{aligned}\text{Tobin's } Q = & \alpha + \beta_1 \text{Female Participation Ratio} + \beta_2 \text{Social Capital} \\ & + \beta_3 \text{Female Participation Ratio} * \text{Social Capital} \\ & + \beta_4 \text{Human Capital} \\ & + \beta_5 \text{Female Participation Ratio} * \text{Human Capital} \\ & + \beta_6 \text{Team Size} + \beta_7 \text{Firm Size} + \beta_8 \text{Book Leverage} \\ & + \beta_9 \text{Firm Age} + \beta_{10} \text{Industry} + \beta_{11} \text{Region} + \varepsilon\end{aligned}\quad (2)$$

In the moderating effect models, the variables of female participation ratio, human capital and social capital were mean-centered prior to the formation of interaction terms (Cohen and Cohen, 1983; Aiken and West, 1991). For all models, the variance inflation factors (VIF) values are all below ten. That resolves the problem of multicollinearity (Neter *et al.*, 1985; Ryan, 1997).

4. Results

Table I presents means, standard deviations and Pearson correlations for the studied variables. The mean of Tobin's Q is 1.45; half of the companies have more than 15.4 percent female top managers, and the maximum of the female participation ratio is 64.7 percent. As previously mentioned, 92.6 percent of the 567 companies have one or more female top managers. This provides an interesting comparison to the situation in the USA. As of 2006, less than a third of the top 1,500 US firms reported having any women among their top executives, and less than 6 percent reported having more than one (Dezso and Ross, 2008). However, the method of counting top executives may not be consistent, which needs to be further examined.

In the present sample, the percentage of female executives who have social capital (per the definition and measurement adopted by the present study) is below 20 percent, and only 17.99 percent (102 firms) of all firms have female top managers with social capital. The mean of the average education level of top female managers is 2.75, and half of female top managers have a bachelor's degree or above. The relationship between Tobin's Q and the female participation ratio is positive and significant ($r = 0.149$, $p < 0.001$). Firm size and book leverage have a significant negative relationship with Tobin's Q. While team size is negatively correlated with female participation ratio, human capital and social capital are positively correlated with the ratio and significant at the 0.001 level. Significantly positive correlation also exists between social capital and human capital ($r = 0.150$, $p < 0.001$). And interestingly, firm age and human capital are positively correlated ($r = 0.135$, $p < 0.001$). However, all these correlations are not strong enough to be redundant measures (all coefficients are less than 0.5).

Table II presents the results of hierarchical OLS regressions. Model 1 includes control variables only. And the effects of these control variables are generally

Variables	Mean	SD	1	2	3	4	5	6	7	8
1. Tobin's Q	1.450	0.704	1							
2. Female participation ratio	0.167	0.108	0.149***	1						
3. Social capital	0.013	0.032	0.0593	0.286***	1					
4. Human capital	2.752	1.034	0.0486	0.290***	0.150***	1				
5. Team size	16.732	3.850	-0.0715	-0.146***	-0.048	0.063	1			
6. Firm size	20.989	0.999	-0.246***	-0.084	-0.026	0.076	0.272***	1		
7. Book leverage	0.451	0.188	-0.214***	-0.052	0.012	0.084	0.148	0.452***	1	
8. Firm age	11.481	5.450	0.021	0.081	-0.025	0.135***	0.052	0.273	0.256***	1

Notes: Significance at: * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$ (two-tailed), ^a $n = 567$

Table I.
Means, standard
deviations, and Pearson
correlations of key
variables^a

Table II.
Hierarchical regressions
of female participation in
TMT and firm
performance: the
moderating role of human
capital and social capital

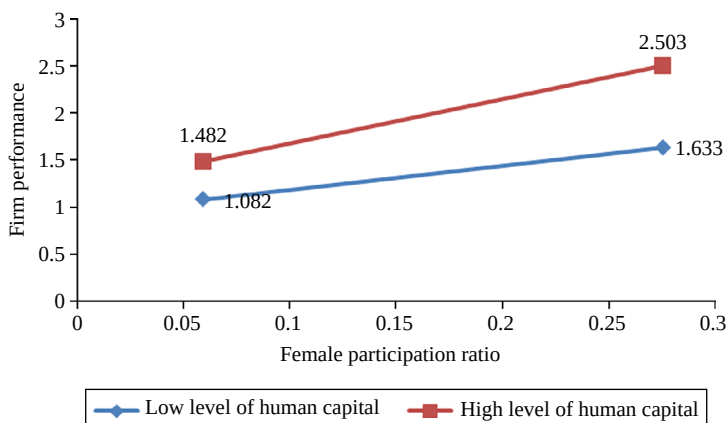
Variables	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<i>Main effects</i>												
Female participation ratio			0.781**	(0.268)	0.804**	(0.278)	0.712**	(0.279)	0.740**	(0.289)	0.932**	(0.298)
<i>Controls</i>												
Team size	−0.007	(0.008)	−0.005	(0.008)	−0.005	(0.008)	−0.004	(0.008)	−0.004	(0.008)	−0.003	(0.008)
Firm size	−0.180***	(0.034)	−0.175***	(0.033)	−0.175***	(0.033)	−0.175***	(0.033)	−0.175***	(0.033)	−0.180***	(0.033)
Book leverage	−0.548**	(0.173)	−0.512**	(0.173)	−0.508**	(0.171)	−0.501**	(0.173)	−0.501**	(0.171)	−0.497**	(0.171)
Firm age	0.016**	(0.006)	0.015**	(0.006)	0.016**	(0.006)	0.015**	(0.006)	0.015**	(0.006)	0.014*	(0.006)
<i>Interaction</i>												
Human capital					0.133***	(0.042)			0.131**	(0.042)	0.150***	(0.042)
Female participation ratio* human capital					1.149***	(0.310)			1.053***	(0.315)	0.811**	(0.329)
Social capital							−0.499	(1.153)	−0.635	(1.160)	−1.042	(1.167)
Female participation ratio* social capital												
social capital							15.116*	(7.751)	12.360	(7.921)	22.998**	(9.010)
Female participation ratio* human capital* social capital												
Constant	5.119***	(0.768)	4.878***	(0.767)	4.503***	(0.765)	4.845***	(0.765)	4.497***	(0.765)	−33.039*	(13.54)
R ²	0.168		0.181		0.202		0.188		0.206		4.527***	(0.762)
Adjusted R ²	0.136		0.148		0.166		0.152		0.167		0.214	
F	5.23***		5.45***		5.70***		5.22***		5.38***		0.175	
N	567		567		567		567		567		5.45***	
Fixed effects	Industry and region	Industry and region	Industry and region	Industry and region	Industry and region	Industry and region	Industry and region	Industry and region	Industry and region	Industry and region	567	

Note: Significance at: * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$ (two-tailed)

consistent across different models. Model 2 tests the main effect of the key independent variable, the female participation ratio. The coefficient is positive and significant ($p < 0.01$). This supports *H1*, which suggests that firm performance is positively correlated with female participation. Firm size and book leverage are negatively related with Tobin Q as expected. This is consistent with the calculation of Tobin's Q. And firm age is positively related with Tobin Q. That may be because the longer the firm has been established, the higher the stock price.

Models 3 and 4 examine the moderating effect of female top managers' political and social connections and education level, respectively. And the results support *H2* and *H3*. In Model 3, the interaction term of the female participation ratio multiplied by human capital has the coefficient of 1.149, and significant at the 0.001 level. In Model 4, the interaction term of the female participation ratio multiplied by social capital has the coefficient of 15.116, and significant at the 0.05 level. Model 5 is a full model, including both of the interaction terms. The positive moderating effect of human capital is found to be statistically significant ($p < 0.001$), but the positive moderating effect of social capital is absorbed and only marginally significant ($p = 0.119$).

Figures 2 and 3 show the patterns of moderating effects of human capital and social capital on the main relationship between female participation in TMT and firm performance, respectively. The interaction effect of human capital was plotted using one standard deviation above and below the mean to represent high and low levels of human capital (Aiken and West, 1991) based on the coefficients in Model 5 (Hoetker, 2007; Li and Tang, 2010). The interaction effect of social capital was plotted following the same way except for using its minimum value 0 to represent the low level of social capital because one standard deviation below the mean is already out of the range of the variable's valid value. Figure 1 shows that the slope is much steeper at a high human capital level. It means that as female participation increases from one standard deviation below the mean to one standard deviation above, the firm performance increases significantly faster when the female executives' human capital is at a high level (the firm performance increases from 1.482 to 2.503). Figure 2 shows



Notes: ^aHigh level of social capital is set at one standard deviation above the mean; low level of social capital is set at the minimum value 0

Figure 2.
The moderating effect
of female top executives'
human capital

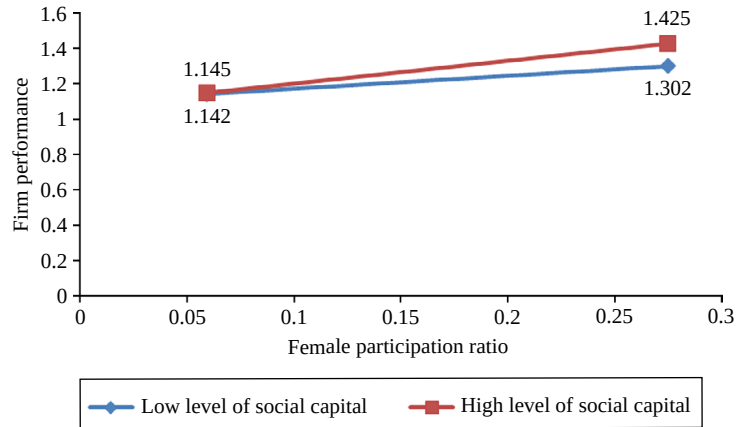


Figure 3.
The moderating effect of
female top executives'
social capital

Notes: ^aHigh level of social capital is set at one standard deviation above the mean; low level of social capital is set at the minimum value 0

the moderating effect of social capital. The moderating effect still exists yet is not significant: when the social capital is high, firm performance increases from 1.145 to 1.425; when the social capital is low, firm performance increases from 1.142 to 1.302.

In Model 5, the interaction effect of social capital somewhat disappears. Since social capital and human capital variables are significantly correlated ($r = 0.150, p < 0.001$), and the female participation ratio is also significantly correlated with social capital ($r = 0.286, p < 0.001$) and human capital ($r = 0.290, p < 0.001$), the correlations among social capital and human capital, and their interactions with the female participation ratio may affect the results. To investigate this effect, Model 6 uses a three-way interaction that is the product of the female participation ratio, human capital and social capital. The model shows an interesting result that the moderating effect of social capital becomes statistically significant ($p < 0.01$), and the three-way interaction is significantly and negatively correlated with firm performance. In other words, at the high level of social capital or human capital, the positive correlation between female participation and firm performance is strengthened. However, when both the human capital and social capital are high, the positive impact of female participation on firm performance is weakened.

5. Discussion and conclusions

The present paper is the first empirical study to examine the relationship between female participation in top management teams and firm performance in the Chinese context and, in particular, for the first time simultaneously investigates the moderating effects of human capital and social capital accompanied with Chinese female top managers.

The study enriches the extant understanding of top management team dynamics. It acknowledges the value of gender diversity in a top management team and female management style to firm performance. In particular, the study gives a high regard to female power in an emerging business environment and also a masculine society like China. The findings are consistent with the existing studies conducted in the

US context, and provide further empirical evidence that women joining the top management team do add value to the company. Also, the results provide a very interesting comparison to results generated by US counterparts. Although Chinese women's social status, culture and economic environment are vastly different from that of American women, the impact of female participation in a top management team on firm performance is quite consistent between the two cultural contexts. Additionally, the higher level of female participation in TMT in China motivates the present research, which is quite a different story from that in the USA.

The present study also highlights the moderating effects of human capital and social capital that Chinese female executives possess. It shows that more than half of the sampled female executives have gained higher education, which is very different from the conventional impression in Chinese society that entrepreneurs are often rich yet ignorant. And the high education background of female executives actually facilitates them to manage their companies more successfully. In contrast, the social connections of female top managers are not very prevalent. Most firms do not have female executives with strong social capital such as political connections, yet the positive moderating effect of social capital is sustained. In this case, firms can gain competitive advantages by building political connections through the female executives.

One of the reasons that the present study gains consistent results with research done in the Western context may stem from the sample of Chinese private enterprises. As previously stated, Chinese private enterprises can be less influenced by direct governmental control, and are profit driven. These are in line with the features of Western companies in market economies.

While Chinese private enterprises are still catching up with mature Western enterprises in many aspects, they run ahead of their foreign counterparts in empowering women. Based on the findings of the present study, if our private firms can fully recognize the importance of identifying, attracting, and developing female managerial talents and nurture the extant advantage, they may gain a competitive advantage against multinational firms and local firms without female participation in senior management. Also, we observed that a large proportion of female entrepreneurs and executives made wealth from low value-added industries such as wholesales, retailing and catering service industries, and that many are still running businesses relying on intuition and experience. However, our findings indicate that a higher education background can significantly improve their performance and help them play a better role in facilitating innovation and creativity. Thus, to extend their domain, and to be better decision makers and managers, female executives of private enterprises in the new era should be people with better systematic education. Furthermore, in the present Chinese market environment, since the market economy is still significantly influenced by governmental influence, building political ties is crucial for companies. Given the low average ratio of female managers with social capital (1.3 percent), gaining social capital through recruiting female managerial talents with social resources and helping female executives build up political connections should be put on private companies' agendas.

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