Economics Bulletin

Volume 40, Issue 3

Women on corporate boards, stated-owned enterprises and firm performance: Evidence from Vietnam and quantile regression

Jean-Michel Sahut
IDRAC Business School, France

Rey Dang
ISTEC Paris, France

L'Hocine Houanti
EM Normandie Business School, France

Nhu Tuyen Le
Grenoble Ecole de Management, France

Abstract

Using a unique sample of 498 non-financial companies listed on the two main Vietnamese stock exchanges between 2009 and 2014, we investigate the relationship between firm performance (FP) and women on corporate boards (WOCB), using the instrumental variable quantile regression panel data suggested by Powell (2016) to take into account heterogeneity and endogeneity issues. Compared to existing studies, we consider the Vietnamese institutional context through the weight and the role of the State. We find that, overall, WOCB have a negative influence on FP in State-owned enterprises (SOEs). This finding recognizes the importance of the State in a transactional economy, such as Vietnam, and the role of institutional context in the relationship between WOCB and FP.

Citation: Jean-Michel Sahut and Rey Dang and L'Hocine Houanti and Nhu Tuyen Le, (2020) "Women on corporate boards, stated-owned enterprises and firm performance: Evidence from Vietnam and quantile regression", *Economics Bulletin*, Volume 40, Issue 3, pages 2538-2549
Contact: Jean-Michel Sahut - jmsahut@gmail.com, Rey Dang - r.dang@istec.fr, L'Hocine Houanti - houantil@excelia-group.com, Nhu Tuyen Le - Nhu-Tuyen.LE@grenoble-em.com.
Submitted: December 31, 2019. **Published:** September 24, 2020.

Economics Bulletin

Submission Number: EB-19-01136

Women on corporate boards, stated-owned enterprises and firm performance: Evidence from Vietnam and quan-tile regression

Jean-michel Sahut
IDRAC Business School

Rey Dang
ISTEC

L'hocine Houanti
La Rochelle Business School-Excelia Group

Michel Simioni
INRIA

Abstract

Using a unique sample of 499 non-financial companies listed on the two main Vietnamese stock exchanges during 2009–2014, we investigate the relationship between firm perfor-mance and women on corporate boards (WOCB) using panel quantile regression following Canay's (2011) approach. Compared to existing studies, we consider the Vietnamese institu-tional context through the weight and the role of the State. We find that, overall, WOCB have no significant influence on firm performance in state-owned enterprises (SOEs). This finding recognizes the importance of the State in a transaction economy, like Vietnam, and the role of institutional context in the relationship between WOCB and firm performance.

Submitted: December 31, 2019.

1. Introduction

In recent years, the issue of women on corporate boards (WOCB) has been at the core of political and academic debate (Post and Byron, 2015). Indeed, some countries and states have enacted, or are considering, gender quotas on corporate boards (e.g., Norway, France, and recently California). The "business case" perspective deals with the effects of WOCB on board dynamics effectiveness and, ultimately, firm performance (FP) (Robinson and Dechant, 1997). Consequently, *whether* and *how* WOCB influence FP remains a critical issue.

Theoretically, the relationship between WOCB and FP is based on agency and resource dependence theories. According to agency theory (Eisenhardt, 1989; Jensen and Meckling, 1976), because of the separation of ownership and control in organizations, managers may pursue their self-interest to the detriment of profit maximization. One way to address this matter is the board of directors (BoD) (Fama and Jensen, 1983; Hillman and Dalziel, 2003). Building on this theory, Adams and Ferreira (2009) suggest that WOCB may significantly increase the monitoring effectiveness of the board (by increasing board independence, broadening board's perspectives, or improving board's attendance), which, in turn, influence FP.

Resource dependence theory (Pfeffer 1972, Pfeffer and Salancik 1978) confers four functions to the BoD: (1) advice and counsel, (2) legitimacy, (3) channels for communicating information between the external environment and the firm, and (4) commitments or support from critical elements outside the firm. Hillman *et al.* (2007) assert that female directors can bring all these benefits, which are directly related to FP. Consequently, WOCB are expected to create value for the company and shareholders through these different channels (Kirsch, 2018; Terjesen and Singh, 2008).

Yet, based on a meta-analysis of 140 studies representing roughly 90,070 firms worldwide, Post and Byron (2015) show that the empirical findings regarding the WOCB-FP relationship are mixed. Indeed, although some studies find that WOCB add value, other studies suggest not, even providing evidence of a negative relationship.

The existing empirical literature is heavily discussed for firms in the US or European countries (Post and Byron, 2015). Few studies have investigated the link between WOCB and FP in emerging markets or economies in transition. Some studies (e.g., Abdullah *et al.,* 2016) suggest that the relationship between corporate governance (CG) and FP is significantly influenced by the institutional context in which this relationship takes place and, in particular, the nature of CG (Aguilera and Jackson, 2003). Consequently, it seems unclear if WOCB are as beneficial as acclaimed in Western developed countries.

From an empirical standpoint, several factors may explain the contrasting findings, for example, different geographic areas, time periods, or measures of FP across studies. Additionally, the existing empirical literature has commonly relied on either OLS (ordinary least squares) or fixed-effects (FE) models. However, these approaches tend to focus on the central tendency of the distribution, thus not accounting for the possibility that the influence of an independent variable may be differentiated according to varying levels of the dependent variable. Conyon and He (2017) question this assumption. They show that WOCB have a differentiated effect on the firm's performance. Hence, the relationship between WOCB and FP is not linear. Furthermore, those methods do not take into account the skewed distribution of variables due to outliers or heavy-tailed distributions that may significantly influence the mean-centered frameworks. Therefore, existing empirical findings may be tainted by this skewed distribution.

From an institutional viewpoint, Vietnam is characterized by a concentrated ownership structure and a weak institutional environment (low level of investor protection; World Bank 2012). Additionally, as a transition economy, Vietnam presents a particular feature: the influence of stated-owned enterprises (SOEs) in the Vietnamese economy. Despite the economic renovation policy (*đổi mới*) in 1986, the SOEs still continue to contribute to about 30% of the

State budget and approximately one-third of Vietnam's GDP (OCDE 2018). This situation suggests that the weight of the State is still prevalent, creating differentiation in terms of rights and responsibilities among SOEs and private firms. Hence, this can cause a differential impact of WOCB on FP.

Our study contributes to the existing literature in four ways. First, different from the existing literature (see Post and Byron, 2015), our study examines the WOCB-FP relationship in Vietnam, a country where the CG systems is underdeveloped and where there are no specific regulations regarding WOCB (Nguyen *et al.,* 2015). Consequently, Vietnam constitutes a favorable context for examining the nexus of WOCB and FP. To our knowledge, apart from Nguyen *et al.* (2015), no other study has yet examined this relationship in Vietnam.

Second, because CG practices are significantly affected by the institutional context, every CG study should consider these factors (Aguilera and Jackson, 2003). According Post and Byron (2015), it is important to assess conditions and contexts affecting the WOCB-FP relationship. Consequently, we view the weight and role of SOEs in the WOCB-FP relationship because it is very specific to Vietnam. To our knowledge, no study has yet considered this point.

Third, consistent with Conyon and He (2017), we make a theoretical and methodological contribution to the literature by reexamining the WOCB-FP relationship through quantile regression (QR) for panel data. QR captures both the differentiated effect of WOCB on different levels of FP (because it disentangles this relationship at the different quantiles of the distribution, rather at the conditional mean) and deals with the heterogeneity of variables (outliers and heavy-tailed distributions) and the non-normality of the variables. To address these areas in our study, we use the non-additive FE panel quantile model, suggested by Powell (2016).

Finally, the mixed results reported by Post and Byron (2015) are likely due to endogeneity issues not fully addressed in the existing literature, as suggested by Wintoki *et al.* (2012), namely, omitted/unobserved firm characteristics, reverse causality, and dynamic endogeneity. This can result in possible inferences regarding the causal relationship between WOCB and FP (Đặng *et al.,* 2020; Sila *et al.,* 2016).

The purpose of this article is, therefore, to investigate the relationship between WOCB and FP by providing novel evidence based on the Vietnamese case using the instrumental variables quantile regression technique for panel data (QRPD). The contribution of this article is to address the endogeneity issue by using the instrumental quantile regression for panel data developed by Powell (2014, 2016).

2. Data

2.1. Sample and data

The initial sample encompasses all companies listed in Vietnam on the Hochiminh Stock Exchange (HoSE) and the Hanoi Stock Exchange (HNX), for which we had complete information, excluding financial firms and utility firms. The data spans from 2009 to 2014. The final sample includes 498 firms and 2,621 firm-year observations (covering approximately 65% of the Vietnamese market capitalization during the study period); on average, this represents about 65% of every firm listed in Vietnam during the research period.

All data were provided by *Vietstock*, a leading financial information service provider in Vietnam.

2.2. Variables

Return on assets (*ROA*)—calculated as the ratio of net income to total assets (Liu *et al.,* 2014)—is our measure of performance. Tobin's Q is not used as a measure of FP due to Vietnamese stock market volatility (Dang *et al.,* 2018)—the share price could be skewed and not reflect the fundamental value of the firm—and because Wintoki *et al.* (2012) view Tobin's Q more as a proxy for growth opportunities.

Our variable of interest is *WOCB* calculated as the percent of WOCB (Liu *et al.,* 2014). Furthermore, *SOE* is a dummy variable taking the value of 1 if 50% of the total capital of an enterprise is owned by the State and 0 otherwise (see Article 4, Section 22 of the 2005 Enterprise Law).

Consistent with Reguera-Alvarado *et al.* (2017), we use the firm's visibility as our instrumental variable. Because there is no fine measurement of visibility, we operationalize this by using a dummy variable (*HoSE*) that equals 1 if a firm belongs, in a given year, to the Hochiminh Stock Exchange. Indeed, the Securities Law (which regulates Vietnamese stock markets) sets stricter eligibility criteria for the HoSE than for the HNX. Furthermore, Meyer and Nguyen (2005) show that foreign investors are more likely to invest in firms listed on the HoSE than the HXN due to the economic influence of Ho Chi Minh City (HCMC) and the performance of its listed companies. Connelly *et al.* (2017) find a positive relationship between CG and FP in HCMC but not in Hanoi. They explained their findings by the fact that HCMC is the economic heartland of the country (where the majority of headquarters of foreign companies are based) and is recognized for its business-friendly environment, although Hanoi is the political center of Vietnam. They therefore argue that the financial and economic development levels of the two cities differ significantly. Accordingly, due to their visibility, these companies are probably subject to more scrutiny from stakeholders (especially to foreign investors). Following Hillman *et al.* (2007), we argue that firms listed on HoSE are more gender diverse due to their geographical location.

Following prior studies (Adams and Ferreira, 2009; Liu *et al.,* 2014), we include some control variables. First, we include firm characteristics: *firm size* (measured by the natural logarithm of total assets), *leverage* (ratio of total debt to total assets), and the *age* of the firm (number of years since inception). Second, we include board characteristics: *board independence* (ratio of independent directors to the total number of directors), *CEO duality* (measured as a binary variable taking the value of 1 if the CEO also serves as the board chair, and 0 otherwise), and *board size* (total number of board members).

3. Empirical framework

3.1. Empirical model

The baseline model is as follows:

$$ROA_{i,t} = \beta_0 + \beta_1 ROA_{i,t-1} + WOCB_{i,t} + SOE_{i,t} + \sum \beta_j CV_{i,t} + \mu_i + \varepsilon_{i,t} \quad \textbf{(1)}$$

where β_i are the coefficients, $CV_{i,t}$ = (firm size, leverage, firm age, board size, board independence, and duality), μ_i corresponds to the time-invariant firm-specific FE, and $\varepsilon_{i,t}$ is the usual error term for firm i at time t.

However, taking account the role and weight of the State (via SOEs) in the relationship between WOCB and FP, we include an interaction term, hence:

$$ROA_{i,t} = \beta_0 + \beta_1 ROA_{i,t-1} + WOCB_{i,t} + SOE_{i,t} + WOCB_{i,t} \times SOE_{i,t} + \sum \beta_j CV_{i,t} + \mu_i + \varepsilon_{i,t} \quad \textbf{(2)}$$

In essence, a firm with concentrated ownership may generate two types of agency conflicts: principal-agent and principal-principal conflicts (Young *et al.* 2008). Under the principal-principal conflict, the controlling shareholder may use and waste firm resources for its own interest at the expense of other shareholders (Claessens *et al.* 2002). Furthermore, the controlling shareholder can appoint whomever he/she wants on corporate boards. In addition, State companies are viewed to be managed differently from private firms, because the primary goal of a State is to pursue social or political goals (e.g., employment) rather than profit or value

maximization (Bruton *et al.,* 2015). Consequently, we argue that the State (through SOEs) is likely to affect the relationship between WOCB and FP. Following Khaw *et al.* (2016), we include an interaction term to examine the effect of WOCB on FP in SOEs (*WOCB*SOE*).
Eqs. (1) and (2) include lagged FP ($ROA_{i,t-1}$), because Wintoki *et al.* (2012) argue that endogeneity could arise in the general framework of the relation between CG and FP due to CG mechanisms, FP, and control characteristics being determined by the firm's past performance. They called it *dynamic endogeneity.* Consequently, Wintoki *et al.* (2012) assert that corporate financial decisions are likely to be dynamic in nature, that is, past performance has a significant influence on the WOCB-FP relationship. Recent studies (Đặng, Houanti, Reddy *et al.,* 2020; Dang, Houanti, Sahut *et al.,* 2020) have confirmed this point. Consequently, our model incorporates past performance ($ROA_{i,t-1}$) in the specification to take into account dynamic endogeneity.

3.2. Estimation method

To investigate the heterogeneity effects of WOCB on FP, a panel quantile regression (QR) model with the non-additive effects suggested by Powell (2016) was used. QR enables a comprehensive picture of the interaction between a dependent variable Y and an independent variable X at different points of a conditional distribution (Koenker and Bassett 1978, Koenker and Hallock 2001). Additionally, QR does not require strict assumptions regarding normality, homoskedasticity, and the absence of outliers (Johnston and DiNardo 1997).
In a mean regression, the panel data allow for the inclusion of FEs to capture within-group variations. Many QR methods for panel data use the same assumptions. However, the additive FEs alter the underlying model. Here, we use the QR estimator for panel data (QRPD) with nonadditive FEs as suggested by Powell (2016).
The main advantage of this method relative to the existing quantile estimators with additive FEs (α_i) is that it gives estimates of the distribution of Y_{it} given D_{it} instead of $Y_{it} - \alpha_i$ given D_{it}. Powell's (2016) method provides point estimates that can be understood in a similar way to those originating from cross-sectional regressions. It is also consistent with those derived from studies with a small T. Formally, we get the following relationship:

$$Y_{it} = D'_{it}\beta_j(U^*_{it}) \qquad \textbf{(3)}$$

where Y_{it} is the firm's CSP, β_j is the variable of interest (WOCB), and U^*_{it} is the error term encompassing several either fixed or time-dependent disturbance terms. The model is linear in parameters, and $D'_{it}\beta_{(\tau)}$ strictly increases in τ. Generally, for the τ^{th} quantile of Y_{it}, QR relies on the following conditional restriction:

$$P(Y_{it} \leq D'_{it}\beta(\tau)/D_{it}) = \tau. \qquad \textbf{(4)}$$

Eq. (4) indicates that the probability that the outcome variable is smaller than the quantile function is the same for all D_{it} and equal to τ. Powell's (2016) QRPD estimator considers this probability as varying by individual, and even within-individual, along with variations being orthogonal to the instruments. Consequently, RPD relies on a conditional restriction and an unconditional restriction, letting $D_i = (D_{i1}, \ldots, D_{iT})$.

$$\begin{gathered} P(Y_{it} \leq D'_{it}\beta(\tau)/D_i) = P(Y_{is} \leq D'_{is}\beta(\tau), \\ P(Y_{it} \leq D'_{it}\beta(\tau)/D_i) = \tau \end{gathered} \qquad \textbf{(5)}$$

Powell (2016) develops the estimator in an instrumental variable context given instruments $Z_i = (Z_{i1}, \ldots, Z_{iT})$. His estimation uses a generalized method of moments. Sample moments are defined as:

$$\hat{g}(b) = \frac{1}{N}\sum_{i=1}^{N} g_i\,(b)\; with\; g_i(b) = \frac{1}{T}\left\{\sum_{i=1}^{T}(Z_{it} - \overline{Z}_\iota)[Y_{it} \leq D'_{it}b]\right\}, \qquad \textbf{(6)}$$

where $\overline{Z}_\iota = \frac{1}{T}\sum_{i=1}^{T} z_{it}$.

Using Eq. (5), the parameter set is defined as:

$$B = \left\{b/\tau - \tfrac{1}{N}\leq\tfrac{1}{N}\textstyle\sum_{i=1}^{N} 1\left(Y_{it}\leq D'_{it}b\leq\tau\right)\right\} \text{ for all } t. \qquad \textbf{(7)}$$

Then, the parameter of interest is estimated as:

$$\hat{\beta}(\tau) = \arg\min \hat{g}_{\iota_{b\in\beta}}(b)\,\hat{A}\hat{g}(b) \qquad \textbf{(8)}$$

for some weighting matrix $\hat{A}$. We used the Markov chain Monte Carlo (MCMC) optimization method (see Powell 2016 for more details).

Several recent articles used the QRPD method,, for example, Boumparis *et al.* (2017) and Tansel *et al.* (2020).

4. Results

4.1. Descriptive statistics and correlation analysis

Table 1 reports the descriptive statistics. We observe that the average (median) ROA is 6.20% (8.10%), whereas 13.40% of all directors in our sample are women. Finally, 31% of firms in our sample are SOEs. Generally, data are normally distributed if the value of skewness is 0 and kurtosis is lower than 3 (Mukherjee *et al.,* 1998). Table 1 shows that none of our variables is close to 0, suggesting that they are not symmetrically distributed. Furthermore, the value of kurtosis is greater than 3 for our dependent variable (*ROA*) and variable of interest (*WOCB*), as well as for *firm size*, *firm age*, and *board size*, suggesting the presence of extreme values. Moreover, in many cases, the mean is significantly different from the median, implying that the distribution of our data is not normal. Moreover, in many cases, the mean is significantly different from the median, implying that the distribution of our data is not normal. For completeness, we run the Jarque-Bera and Doornik-Hansen tests (unreported)[1] and reject the null hypothesis that our data are normally distributed at the 1% level of confidence. These preliminary diagnostics suggest that the distribution of our data significantly departs from normality and is heterogeneous, justifying the use of QR.

Table 2 reports the pairwise correlation matrix of the key variables. As highlighted in Table 2, our dependent variable (*WOCB*) is significantly correlated with the dependent variable (*ROA*), which is likely to support that there is some link between *WOCB* and *ROA*.

Table 2 does not offer any serious multicollinearity concerns as suggested by the correlation among the variables less than 0.70 in absolute value and VIFs (variance inflation factors) being well below the cutoff of 10 as recommended by Wooldridge (2014).

4.2. Main results

Table 3 presents the estimates of Eq. (1), including, for comparison, the results for OLS, FE, and the system GMM (generalized method of moments), because these methods are commonly used in the literature (e.g., *et al.* 2020).

For all models (except model 2), we find that the coefficient of past CSP is positively and significantly correlated (at the 1% level) with current CSP, supporting Wintoki *et al.*'s (2012) claim that FP is path-dependent, that is, past performance has a significant effect on current performance. This finding is consistent with *et al.* (2020) and Nguyen *et al.* (2015) in the Vietnamese context.

---

[1] Available on request from the authors.

In models 1 to 3 of Table 3, we find that WOCB is not significantly correlated to FP (at the 10% level), which is consistent with Rose (2007) and Carter *et al.* (2010), among others. However, our findings differ from Nguyen *et al.* (2015) in the Vietnamese context. These authors find a positive and significant relationship between WOCB and FP.

Panel QR offers a more nuanced picture of the WOCB-FP relationship. On the left and right tails of the distribution (10^{th} and 90^{th} percentiles, respectively), we find that WOCB negatively and significantly affects FP (at the 1% level), and also at the 30^{th} and 50^{th} percentiles. The effect of WOCB on FP is neutral at the 20^{th} and 40^{th} percentiles. By contrast, at the 60^{th}, 70^{th}, and 80^{th} percentiles, we find a positive and significant relation (at the 1% level) between WOCB and FP.

Our findings in Table 3 thus suggest, in accordance with Conyon and He (2017), that there is heterogeneity in the way WOCB influence the economic performance of Vietnamese listed companies. Specifically, it appears that female directors have a significant influence on FP in profitable companies relative to low influence in unprofitable companies.

Table 4 presents the estimates of Eq. (2), where we add an interaction term to examine the WOCB-FP in SOEs (Khaw *et al.,* 2016). In models 13, 14, and 15, we find that the interaction term, *WOCB*SOE*, is not significantly correlated (at the 10% level) to FP. This suggests that WOCB in SOEs have relatively little weight on the board of directors of State-controlled firms to influence economic performance.

However, panel QR offers more contrasting results. From the median percentile (i.e., $\theta = 50, 60, \ldots, 90$), we observe a negative and significant relationship (at the 1% level) between WOCB and FP. These results suggest that the effect of WOCB on FP is negative in SOEs. On the contrary, we notice that WOCB are positively and significantly correlated (at the 1% level) to FP, suggesting that in other types of firms (i.e., where the State owns a minority), female directors have a significant influence on FP. Below (except for the 20^{th} percentile, where the relationship between WOCB and FP is negative and significant), there is no evidence of a significant link between WOCB and FP.

Regarding control variables, some interesting links should be mentioned. In Tables 3 and 4, we find that firm size and leverage have, respectively, a positive and negative effect on FP in most cases (e.g., Adams and Ferreira, 2009; Đặng *et al.,* 2020; Wintoki *et al.,* 2012). The differentiated effects of CG mechanisms (board independence, board size, and duality) on FP based on the distribution of performance is consistent with Dang *et al.* (2018).

5. Conclusion

The purpose of this study was to examine the relationship between WOCB and FP, using a large and unique data set of 498 Vietnamese listed companies (N = 2,621) over the period from 2009 to 2014. First, consistent with Conyon and He (2017), we find that the effect of WOCB on FP is heterogenous across the performance distribution. Specifically, we find that WOCB have a stronger influence on FP among profitable firms compared to unprofitable firms. Our findings are important because they complete the classic hypothesis in the existing literature, which considers a uniform effect of WOCB on FP. From an empirical standpoint, this article shows how the QR method is useful for a better understanding of the WOCB-FP relationship. QR extends the classical least squares estimation of the conditional mean because it portrays the effect of a regressor to change at different points of the conditional distribution (Koenker, 2004; Koenker and Hallock, 2001). Second, when we consider the effect of the controlling shareholder, namely the State through the SOEs, the differentiating effect of WOCB on FP disappears, giving way to a negative and significant effect. This finding thus suggests the weight of the State in the WOCB-FP relationship. Not addressing this issue may blur the effect of WOCB on FP. Hence, the relationship between WOCB and FP is not straightforward because of institutional factors (Aguilera and Jackson, 2003). Third, we use the IV-QRPD approach developed by Powell (2014, 2016) to take into account the heterogeneity and the non-normality of our variables, as well as the endogeneity issues. Indeed, Wintoki *et al.* (2012) argue that existing studies on the relationship between the CG mechanism and FP are generally plagued with endogeneity issues. Dang *et al.* (2020) confirm this assertion in the WOCB-FP relationship. Powell (2014) suggests an instrumental variable QR technique for panel data to handle endogeneity issues (omitted/unobserved firm characteristics and reverse causality). Our finding that past performance is significantly correlated to current performance (in all our models) supports the argument of Wintoki *et al.* (2012) and the empirical evidence of Đặng *et al.* (2020), among others, who take into account that the dynamic nature of the relationship between WOCB and FP is essential to ensure the reliability of causal inferences.

The findings of this study offer important implications for policy makers regarding the WOCB-FP relationship. The effect of WOCB on FP is negative because of the presence of the State, which is likely to blur any benefits of female directors, regardless of the level of a firm's performance. Finally, our findings might be interesting for foreign investors because we show that the governance of SOEs is far from being efficient in terms of performance as shown by the negative effect of female directors. Investing in this type of company might be problematic.

References

Abdullah, S. N., Ismail, K. N. I. K., and Nachum, L., 2016. Does having women on boards create value? The impact of societal perceptions and corporate governance in emerging markets. Strategic Management Journal. 37**,** 466-476. https://doi.org/10.1002/smj.2352.

Adams, R. B., and Ferreira, D., 2009. Women in the boardroom and their impact on governance and performance. Journal of Financial Economics. 94**,** 291-309. https://doi.org/10.1016/j.jfineco.2008.10.007.

Aguilera, R. V., and Jackson, G., 2003. The cross-national diversity of corporate governance: Dimensions and determinants. Academy of Management Review. 28**,** 447-465. https://doi.org/10.5465/amr.2003.10196772.

Boumparis, P., Milas, C., and Panagiotidis, T., 2017. Economic policy uncertainty and sovereign credit rating decisions: Panel quantile evidence for the Eurozone. Journal of International Money and Finance. 79**,** 39-71. https://doi.org/10.1016/j.jimonfin.2017.08.007.

Bruton, G. D., Peng, M. W., Ahlstrom, D., Stan, C., and Xu, K., 2015. State-owned enterprises around the world as hybrid organizations. Academy of Management Perspectives. 29**,** 92-114. https://doi.org/10.5465/amp.2013.0069.

Carter, D. A., D'Souza, F., Simkins, B. J., and Simpson, W. G., 2010. The gender and ethnic diversity of US boards and board committees and firm financial performance. Corporate Governance: An International Review. 18**,** 396-414

Claessens, S., Djankov, S., Fan, J. P. H., and Lang, L. H. P., 2002. Disentangling the incentive and entrenchment effects of large shareholdings. The Journal of Finance. 57**,** 2741-2771. https://doi.org/10.1111/1540-6261.00511.

Connelly, J. T., Limpaphayom, P., Nguyen, H. T., and Tran, T. D., 2017. A tale of two cities: Economic development, corporate governance and firm value in Vietnam. Research in International Business and Finance. 42**,** 102-123. https://doi.org/10.1016/j.ribaf.2017.04.002.

Conyon, M. J., and He, L., 2017. Firm performance and boardroom gender diversity: A quantile regression approach. Journal of Business Research. 79**,** 198-211. https://doi.org/10.1016/j.jbusres.2017.02.006.

Dang, R., Houanti, L. H., Le, N. T., and Vu, M.-C., 2018. Does corporate governance influence firm performance? Quantile regression evidence from a transactional economy.

Applied Economics Letters. 25, 984-988. https://doi.org/10.1080/13504851.2017.1390309.
Đặng, R., Houanti, L. H., Reddy, K., and Simioni, M., 2020. Does board gender diversity influence firm profitability? A control function approach. Economic Modelling. 90, 2020. https://doi.org/10.1016/j.econmod.2020.05.009.
Dang, R., Houanti, L. H., Sahut, J.-M., and Simioni, M., 2020. Do women on corporate boards influence corporate social performance? A control function approach. Finance Research Letters. Forthcoming. https://doi.org/10.1016/j.frl.2020.101645.
Eisenhardt, K. M., 1989. Agency theory: An assessment and review. Academy of Management Review. 14, 57-74. https://doi.org/10.5465/amr.1989.4279003.
Fama, E. F., and Jensen, M. C., 1983. Separation of ownership and control. The Journal of Law and Economics. 26, 301-325. https://doi.org/10.1086/467037.
Hillman, A. J., and Dalziel, T., 2003. Boards of directors and firm performance: Integrating agency and resource dependence perspectives. Academy of Management Review. 28, 383-396. https://doi.org/10.5465/amr.2003.10196729.
Hillman, A. J., Shropshire, C., and Cannella, A. A., 2007. Organizational predictors of women on corporate boards. Academy of Management Journal. 50, 941-952. https://doi.org/10.5465/amj.2007.26279222.
Jensen, M. C., and Meckling, W. H., 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics. 3, 305-360. https://doi.org/10.1016/0304-405X(76)90026-X.
Johnston, J., and DiNardo, J., 1997. Econometrics methods - 4th ed. McGraw-Hill, New York.
Khaw, K. L.-H., Liao, J., Tripe, D., and Wongchoti, U., 2016. Gender diversity, state control, and corporate risk-taking: Evidence from China. Pacific-Basin Finance Journal. 39, 141-158. https://doi.org/10.1016/j.pacfin.2016.06.002.
Kirsch, A., 2018. The gender composition of corporate boards: A review and research agenda. The Leadership Quarterly. 2, 346-364. https://doi.org/10.1016/j.leaqua.2017.06.001.
Koenker, R., 2004. Quantile regression for longitudinal data. Journal of Multivariate Analysis. 91, 74-89. https://doi.org/10.1016/j.jmva.2004.05.006.
Koenker, R., and Bassett, G., 1978. Regression quantiles. Econometrica. 46, 33-50. https://doi.org/10.2307/1913643.
Koenker, R., and Hallock, K. F., 2001. Quantile regression. Journal of Economic Perspectives. 15, 143-156. https://doi.org/10.1257/jep.15.4.143.
Liu, Y., Wei, Z., and Xie, F., 2014. Do women directors improve firm performance in China? Journal of Corporate Finance. 28, 169-184. https://doi.org/10.1016/j.jcorpfin.2013.11.016.
Meyer, K. E., and Nguyen, H. V., 2005. Foreign investment strategies and sub□national institutions in emerging markets: Evidence from Vietnam. Journal of Management Studies. 42, 63-93. https://doi.org/10.1111/j.1467-6486.2005.00489.x.
26. Mukherjee, C., White, H., and Wuyts, M., 1998. Econometrics and data analysis for developing countries. Routledge, New York.
Nguyen, T., Locke, S., and Reddy, K., 2015. Does boardroom gender diversity matter? Evidence from a transitional economy. International Review of Economics & Finance. 37, 184-202. https://doi.org/10.1016/j.iref.2014.11.022.
OCDE, 2018. Economic Outlook for Southeast Asia, China and India 2018 - Update. Éditions OCDE, Paris.
29. Pfeffer, J., 1972. Size and composition of corporate boards of directors: The organization and its environment. Administrative Science Quarterly. 17, 218-228. https://doi.org/10.2307/2393956.

Pfeffer, J., and Salancik, G. R., 1978. The external control of organizations: A resource dependence perspective. Harper & Row, New York.

Post, C., and Byron, K., 2015. Women on boards and firm financial performance: A meta-analysis. Academy of Management Journal. 58, 1546-1571. https://doi.org/10.5465/amj.2013.0319.

Powell, D., 2014. Did the economic stimulus payments of 2008 reduce labor supply? Evidence from quantile panel data estimation. RAND Corporation, Santa Monica, CA.

Powell, D., 2016. Quantile regression with nonadditive fixed effects. RAND Corporation, Santa Monica, CA.

Reguera-Alvarado, N., de Fuentes, P., and Laffarga, J., 2017. Does board gender diversity influence financial performance? Evidence from Spain. Journal of Business Ethics. 141, 337-350. https://doi.org/10.1007/s10551-015-2735-9.

Robinson, G., and Dechant, K., 1997. Building a business case for diversity. Academy of Management Executive. 11, 21-31. https://doi.org/10.5465/ame.1997.9709231661.

Rose, C., 2007. Does female board representation influence firm performance? The Danish evidence. Corporate Governance: An International Review. 15, 404-413. https://doi.org/10.1111/j.1467-8683.2007.00570.x.

Sila, V., Gonzalez, A., and Hagendorff, J., 2016. Women on board: Does boardroom gender diversity affect firm risk? Journal of Corporate Finance. 36, 26-53. https://doi.org/10.1016/j.jcorpfin.2015.10.003.

Tansel, A., Keskin, H. I., and Ozdemir, Z. A., 2020. Public-private sector wage gap by gender in Egypt: Evidence from quantile regression on panel data, 1998–2018. World Development. 135, 105060. https://doi.org/10.1016/j.worlddev.2020.105060.

Terjesen, S., and Singh, V., 2008. Female presence on corporate boards: A multi-country study of environmental context. Journal of Business Ethics. 83, 55-63. https://doi.org/10.1007/s10551-007-9656-1.

Windmeijer, F., 2005. A finite sample correction for the variance of linear efficient two-step GMM estimators. Journal of Econometrics. 126, 25-51. https://doi.org/10.1016/j.jeconom.2004.02.005.

Wintoki, M. B., Linck, J. S., and Netter, J. M., 2012. Endogeneity and the dynamics of internal corporate governance. Journal of Financial Economics. 105, 581-606. https://doi.org/10.1016/j.jfineco.2012.03.005.

Wooldridge, J. M., 2014. Introduction to econometrics. Cengage Learning, Andover.

World Bank, 2012. Doing business 2012: Doing business in a more transparent world. FC and World Bank, Washington DC.

Young, M. N., Peng, M. W., Ahlstrom, D., Bruton, G. D., and Jiang, Y., 2008. Corporate governance in emerging economies: A review of the principal–principal perspective. Journal of Management Studies. 45, 196-220. https://doi.org/10.1111/j.1467-6486.2007.00752.x.

Appendix

Table 1. Descriptive statistics (N = 2,621)

	Mean	SD	Median	Min.	Max.	Skewness	Kurtosis
ROA	0.062	0.081	0.048	−0.657	0.588	−0.065	13.496
WOCB	0.134	0.155	0.125	0.000	0.800	0.938	3.145
SOE	0.307	0.462	0.000	0.000	1.000	0.832	1.693
HoSE	0.436	0.496	0.000	0.000	1.000	0.258	1.066
Firm size	16.768	1.452	16.645	13.045	21.468	0.272	3.130
Leverage	0.509	0.216	0.535	0.002	0.967	−0.201	2.060
Firm age	23.665	14.323	21.000	0.000	106	0.864	4.271
Board size	1.685	0.185	1.609	0.000	2.398	0.700	7.227
Board indep.	0.575	0.199	0.600	0.000	1.000	−0.203	2.869
Duality	0.365	0.482	0.000	0.000	1.000	0.560	1.314

Table 2. Correlation matrix

	1	2	3	4	5	6
1. ROA	1.000					
2. WOCB	**0.072**	1.000				
3. SOE	0.016	**−0.169**	1.000			
4. HoSE	**0.089**	**0.110**	**−0.057**	1.000		
5. Firm size	−0.030	**−0.042**	**0.117**	**0.493**	1.000	
6. Leverage	**−0.424**	**−0.171**	**0.186**	**−0.123**	**0.358**	1.000
7. Firm age	**0.092**	−0.017	**0.176**	**0.042**	**0.063**	**0.065**
8. Board size	**0.045**	0.032	**−0.165**	**0.199**	**0.268**	−0.033
9. Board indep.	0.004	−0.015	**−0.127**	**0.142**	**0.082**	**−0.162**
10. Duality	0.010	**0.071**	**−0.156**	0.009	**−0.080**	−0.004

	7	8	9	10
7. Firm age	1.000			
8. Board size	**−0.041**	1.000		
9. Board indep.	**−0.152**	**0.146**	1.000	
10. Duality	0.002	0.013	**−0.330**	1.000

	1	2	3	4	5	6	7	8	9	10
VIF	1.28	1.07	1.18	1.57	1.06	1.41	1.15	1.89	1.25	1.19

Boldface indicates statistical significance at the 5% level (or below).

Table 3. Estimates of Eq. (1)

	Pooled	Fixed-effects	System	Panel quantile regression								
	OLS		GMM	10th	20th	30th	40th	50th	60th	70th	80th	90th
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
ROA$_{t-1}$	0.595***	-0.011	0.506***	0.437***	0.493***	0.540***	0.466***	0.704***	0.576***	0.209***	0.385***	0.181***
	(11.27)	(-0.19)	(6.24)	(39.30)	(12.61)	(74.16)	(2.53)	(17.93)	(16.70)	(3.20)	(54.11)	(3.89)
WOCB	-0.001	0.004	-0.019	-0.036***	0.003	-0.015***	0.055	-0.011***	0.005***	0.164***	0.017***	-0.094***
	(0.07)	(0.20)	(-0.45)	(-6.07)	(0.73)	(-11.94)	(1.39)	(-5.46)	(11.75)	(7.96)	(16.49)	(-3.13)
SOE	0.004	-0.004	-0.003	0.024***	0.005***	0.021***	0.009	0.005***	-0.019***	0.033***	0.012***	0.025***
	(1.39)	(-0.33)	(-0.27)	(15.51)	(17.61)	(19.41)	(1.39)	(9.16)	(-48.27)	(7.85)	(12.63)	(3.52)
Firm size	0.003***	0.079***	-0.001	0.005***	0.002***	0.008***	0.003	0.000***	0.002***	-0.002***	0.009***	-0.002
	(2.92)	(4.59)	(-0.13)	(7.82)	(6.26)	(15.65)	(0.80)	(3.04)	(42.73)	(-4.72)	(28.98)	(-1.42)
Leverage	-0.073***	-0.325***	-0.037	-0.064***	-0.044***	-0.073***	-0.099*	-0.039***	-0.095***	-0.150***	-0.198***	-0.193***
	(-6.16)	(-6.55)	(-0.78)	(-10.90)	(-3.72)	(-20.98)	(-1.72)	(-4.75)	(-6.73)	(-12.93)	(-77.32)	(-20.07)
Firm age	0.000***	-0.007	0.000	0.000***	0.000	-0.000***	0.001*	-0.000	0.000***	0.000***	0.001***	-0.001***
	(3.21)	(-6.30)	(0.59)	(4.66)	(0.92)	(-11.99)	(1.68)	(-0.03)	(-2.66)	(11.72)	(22.62)	(-3.72)
Board indep.	-0.009	-0.016	-0.043*	-0.007	0.004***	-0.027***	0.010*	0.008***	-0.020***	-0.007***	0.046***	-0.038**
	(-1.27)	(-1.30)	(-1.81)	(-1.21)	(2.32)	(-17.05)	(1.78)	(4.64)	(-33.22)	(-5.11)	(23.78)	(-2.06)
Board size	0.006	-0.006	-0.022	-0.057***	0.026***	0.029***	0.031	-0.004***	0.002***	0.034***	0.020***	-0.002
	(0.83)	(-0.51)	(-0.51)	(11.63)	(-3.00)	(19.64)	(-1.46)	(-4.98)	(3.42)	(7.93)	(-13.77)	(-0.15)
Duality	-0.002	-0.002	-0.001	-0.009***	-0.006***	0.001	0.000	-0.001***	0.002***	-0.015***	0.001***	-0.016***
	(-0.59)	(-0.29)	(-0.64)	(-3.41)	(-4.07)	(12.87)	-(-0.12)	(-3.65)	(16.31)	(-7.13)	-2.57	(-2.73)
Constant	-0.005	-0.915***	0.123									
	(0.29)	(-3.67)	(1.55)									
Industry dummies	Yes	No	No									
Firm fixed-effects	No	Yes	Yes									
Year dummies	Yes	Yes	Yes									
Number of observations	2,118	2,118	2,118	2,118	2,118	2,118	2,118	2,118	2,118	2,118	2,118	2,118
R^2	0.513	0.212										
F statistic	85.80***	21.47***										
Hansen test (*p*-value)			0.143									
AR(1) (*p*-value)			0.003									
AR(2) (*p*-value)			0.223									

This table reports empirical results from estimating Eq. (1). Specifically, column 2 reports the results obtained from the OLS method with clustering at the firm level. Column 3 presents the results obtained from the FE (within-groups estimator) method. Estimations gained from a two-step system GMM approach are reported in column 4. *t*-Statistics of OLS and FE estimators are reported in parentheses. *z*-Statistics of system GMM—based on Windmeijer's (2005) corrected standard errors—and panel quantile regression are reported in parenthesis. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 4. Estimates of Eq. (2)

	Pooled	Fixed-effects	System	Panel quantile regression								
	OLS		GMM	10th	20th	30th	40th	50th	60th	70th	80th	90th
	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
ROA$_{t-1}$	0.595***	-0.011	0.504**	0.546***	0.265***	0.635***	0.311	0.712***	0.711	0.007***	0.606***	0.234***
	(11.27)	(-0.19)	(6.25)	(20.61)	(5.14)	(46.91)	(1.17)	(67.38)	(5.64)	(3.23)	(25.74)	(13.52)
WOCB	0.003	0.003	0.006	-0.027	0.128***	0.008***	-0.095	0.004***	0.019***	0.681***	0.023***	0.020***
	(0.23)	(0.14)	(0.12)	(-1.29)	(6.00)	(4.23)	(-1.35)	(6.77)	(3.51)	(6.48)	(13.50)	(3.27)
SOE	0.005*	-0.005	0.001	0.019***	0.046***	0.007***	-0.034	0.002***	0.012***	0.004***	-0.003***	-0.019***
	(1.75)	(-0.34)	(0.04)	(18.99)	(6.23)	(11.02)	(-1.32)	(5.65)	(4.01)	(3.34)	(-3.32)	(-10.90)
WOCB*SOE	-0.013	0.003	-0.092	0.043	-0.101***	-0.005*	0.074	-0.010***	-0.053***	-0.036***	-0.033***	0.111***
	(-0.59)	(0.10)	(-1.24)	(1.29)	(-5.46)	(-1.92)	(1.44)	(-6.30)	(-3.59)	(-3.64)	(-8.53)	(10.41)
Firm size	0.003***	0.079***	-0.001	0.005**	0.004***	0.000	0.009	0.002***	-0.001	0.001***	0.002***	0.007***
	(2.93)	(4.60)	(-0.23)	(2.49)	(7.37)	(0.92)	(1.38)	(17.40)	(-1.64)	-6.69)	(18.93)	(10.15)
Leverage	-0.073***	-0.325***	-0.041	-0.005	-0.216***	-0.031***	-0.1.39*	-0.035***	-0.052	-0.065***	-0.124***	-0.153***
	(-6.18)	(-6.54)	(-0.91)	(-0.70)	(-6.26)	(-15.17)	(-1.83)	(-92.50)	(-15.12)	(-15.76)	(-48.24)	(-60.76)
Firm age	0.000***	-0.007	0.000	-0.000	0.000***	0.000***	0.001	0.000***	0.000***	0.000***	0.000***	-0.000***
	(3.18)	(-6.30)	(0.56)	(-0.73)	(13.21)	(16.47)	(1.50)	(4.67)	(6.25)	(3.68)	(30.42)	(-5.05)
Board indep.	-0.009	-0.016	-0.038*	-0.046**	-0.027***	-0.004***	0.027	-0.004***	-0.005**	-0.001	0.010***	-0.006
	(-1.25)	(-1.30)	(-1.62)	(-2.38)	(-6.41)	(-6.82)	(1.45)	(-8.11)	(-2.43)	(-0.89)	(5.15)	(-1.60)
Board size	0.005	-0.006	-0.022	0.037**	0.051***	0.010***	0.033	-0.000	-0.001	0.008***	-0.024***	0.003
	(0.80)	(-0.49)	(-0.53)	(2.17)	(5.74)	(6.78)	(1.61)	(-1.14)	(-0.83)	(3.52)	(-13.76)	(1.11)
Duality	-0.002	-0.002	-0.004	-0.017***	-0.006***	0.001	0.016	-0.002***	-0.002***	-0.001	-0.002***	-0.011***
	(-0.62)	(-0.29)	(-0.36)	(-5.01)	(-10.21)	(1.24)	(1.44)	(-7.87)	(-2.92)	(-1.16)	(-3.09)	(-9.35)
Constant	-0.005	-0.915***										
	(-0.28)	(-3.67)										
Industry dummies	Yes	No	No									
Firm fixed-effects	No	Yes	Yes									
Year dummies	Yes	Yes	Yes									
Number of observations	2,118	2,118	2,118	2,118	2,118	2,118	2,118	2,118	2,118	2,118	2,118	2,118
R^2	0.513	0.212										
F statistic	80.74***	19.82***										
Hansen test (*p*-value)			0.246									
AR(1) (*p*-value)			0.003									
AR(2) (*p*-value)			0.229									

***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.