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The Shareholder–Manager Relationship and Its Impact on the Likelihood of Firm Bribery

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Abstract We examine the impact on firm bribery of two corporate governance devices heavily studied in corporate governance research—i.e., separation of ownership and control, and equity share of the largest shareholder. In addition, we investigate the impact of the principal–owner's gender on firm bribery. From agency theory, we predict that firms with the owner also acting as a manager (owner–manager) are more likely to engage in bribery compared to their counterparts with separation of ownership and control. We argue that an increase of the equity share of the largest shareholder can either increase or decrease firm bribery likelihood depending on the net cost-benefit effect of such bribery actions. In addition, we predict that bribery is more likely to occur when the principal–owner is male rather than female. Using a rich dataset of the World Bank Enterprise Surveys of 2002–2005, we find that the equity share of the largest shareholder is negatively and male principal–owner is positively associated with the likelihood of firm bribery. Furthermore, we reveal that owner–manager is more likely to bribe when the principal–owner is male rather than female. We also observe that the effect of owner–manager is smaller as the equity share of the largest shareholder increases.

Keywords Separation of ownership and control · Corporate governance · Agency theory · Gender and firm bribery

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Introduction

Conflict of interest between shareholder and manager is the central focus of attention in the corporate governance research domain. According to agency theory, separation of ownership and control produces such conflicts, triggering agency issues that can decrease firm performance (Jensen and Meckling 1976; Fama and Jensen 1983). There are two reasons as to why separation of ownership and control creates agency problems. The first reason is that the owner as a principal and the manager as an agent may well pursue different goals. On the one hand, the aim of the owner is to maximize the value of the firm by attaining outstanding firm performance. On the other hand, the aim of the manager might be to maximize her or his private benefits, which often goes against the objective of the owner. The second reason is asymmetric information between the owner and the manager, and costly monitoring through which the owner seeks to verify what the manager has been doing. As a result, the value of the firm is below the optimum that could be achieved if the owner would act as the manager. Prior empirical study in corporate governance research has confirmed that separation of ownership and control decreases firm performance, as does a smaller percentage of equity held by management (e.g., Mehran 1995; Agrawal

and Knoeber 1996; Core et al. 1999; Anderson and Reeb 2003; Sheu and Yang 2005; Andres 2008).

Jensen and Meckling (1976) argue that managers' natural inclination is to allocate the firm's resources in their own best interest, which may be in conflict with that of the shareholders. So, the key device to solve this agency issue is to align the manager's interests with the shareholder's. If management's equity ownership increases, the interests will converge, implying that the conflicts between managers and shareholders are likely to be resolved (Morck et al. 1988; Mehran 1995; Agrawal and Knoeber 1996). In the extreme case, when the manager has 100% equity ownership, this manager will act as an owner as well, implying the complete absence of manager–owner conflict. Jensen and Meckling's convergence-of-interest hypothesis predicts that firm value increases as management's ownership share goes up. Another key device to solve agency issues is to increase ownership concentration (Morck et al. 1988; Thomsen and Pedersen 2000; De Miguel et al. 2004), as free-riding among dispersed shareholders may frustrate effective monitoring (Shleifer and Vishny 1986). In a corporation with many small shareholders, monitoring is difficult as small shareholders are expecting that other shareholders perform effective monitoring, and as they themselves will not spend much on monitoring. In contrast, in a corporation with a concentrated ownership structure, the larger owners have (a) more power to enforce their interests, (b) a larger ability to absorb monitoring costs, and (c) a stronger incentive to monitor managers.

To date, prior empirical study tended to investigate the impact of corporate governance devices on firm performance by applying mainstream agency theory. Evaluating firm performance is indeed the central concern of corporate governance research (e.g., Black et al. 2006; Perrini et al. 2008; Yeh 2005; Agrawal and Knoeber 1996). This study is different by examining the impact of corporate governance features on firm bribery. Bribery is always intended to acquire privileges from public officials, such as the creation of entry barriers (i.e., monopoly license or import protection) (Krueger 1974), to speed up sluggish bureaucratic administrative procedures (Leys 1965) or just to reduce time spent in queues (Lui 1985). Consequently, these privileges produce benefits for the firm that can increase this firm's value.

In a nutshell, we seek to evaluate the impact of two key devices of corporate governance on the incidence of firm bribery, i.e., the separation of ownership and control, and ownership concentration. First, in line with Jensen and Meckling's convergence-of-interest hypothesis, we predict that separation of ownership and control reduces the likelihood of firm bribery because (a) the benefits of such bribery are not fully internalized by the owners (Jensen and Meckling 1976), and because (b) professional managers avoid being involved in illegal doing, such as bribery activities, to maintain their good reputation as a professional (Kreps 1990). Second, we predict that an increase of the equity share of the largest shareholder could either decrease or increase the likelihood of bribery, depending on whether the benefits or the costs of bribery dominate. In addition, we follow a tradition in the psychology of crime that argues that males are more likely to engage in illegal behavior, including bribery, since males have less self-control than females as a consequence of, e.g., gender-biased treatments in child-rearing processes (Gottfredson and Hirschi 1990; Tittle and Paternoster 2000). From this, we predict that enterprises headed by male principal–owners are more likely to engage in bribery. We test our predictions with a firm-level dataset covering 51 countries from the World Bank Enterprise Surveys of 2002–2005.

We believe that applying agency theory's manager–owner conflict logic to explain firm bribery enriches the corporate governance literature, and provides additional insights in the context of the study of bribery (or corruption). Judge (2008, p. ii), in the Editorial of *Corporate Governance: An International Review*, argues that "corporate governance scholars are still trying to clarify what the specific dependent variable (or variables) should be." Therefore, from the perspective of the corporate governance literature, our first contribution is that we suggest a new dependent variable, i.e., illegal firm behavior, here by taking the example of firm bribery. Undoubtedly, bribery is seen as unlawful behavior around the world. The United Nations Convention Against Corruption (UNCAC)—issued in 2005, and ratified by 94 countries and signed by 140 countries—has identified bribery as an illegal act. Besides, the OECD introduced the Convention on Combating Bribery of Foreign Public Officials in International Business Transactions in September 1997, which has been ratified by 38 countries by 2009 (see OECD 2008; Transparency International 2009).

Our second contribution relates to the bribery (or corruption) literature by studying the effect on the incidence of firm bribery of firm-level corporate governance devices. To the best of our knowledge, this is very rarely studied, to date, in the field of corruption research. So far, we found only one study closely related to the current investigation, from Wu (2009) investigating firm-level corporate governance mechanisms—i.e., international accounting standards and external auditing practices on firm bribery.[1] The

[1] Some other studies that may be related to the current investigation are those that link corporate governance devices such as manager's behavior, outside board of directors, audit committees, managerial incentives and CEO duality to corporate fraud, accounting fraud or financial restatements (e.g., Cohen et al. 2011; Beasley 1996; Abbott et al. 2004; Erickson et al. 2006). However, the separation of ownership and control is still unexplored in relation to both corporate/financial fraud and firm bribery.

corruption research domain is mainly dominated by studies seeking to identify elements in the macrolevel institutional environment that determine firm bribery (e.g., Baughn et al. 2010; Treisman 2000; Khatri et al. 2006; Martin et al. 2007; Chen et al. 2008; Cuervo-Cazurra 2008). Only a few studies focus on firm characteristics, such as firm growth, profit, size, exporting activities, financial constraints, and foreign/government ownership and a written corporate code of ethics to explain firm bribery incidence (e.g., Wu 2009; McKinney and Moore 2008; Svensson 2003; Kuncoro 2004; Martin et al. 2007; Chen et al. 2008), and none have included firm-level corporate governance devices in the way we do.

Literature Review and Hypotheses Development

Prior Work

Jensen and Meckling (1976) argue that if an owner manages her or his own firm, her or his efforts in operating the corporation will be entirely aimed at maximizing the value of the firm, as this is identical to her or his utility as a private benefit-maximizing manager. In this case, the owner's and manager's interests are perfectly aligned. In contrast, if the owner–manager sells a part of the equity claims on the corporation to outside shareholders, a divergence between her or his interest and that of the outside shareholders starts to emerge, producing agency issues. In the extreme case where the manager has no equity claims at all, agency costs will be at their maximum, because this manager has no incentive at all to maximize shareholder value, but instead will be focused on maximizing her or his private benefits. Of course, shareholders can install monitoring devices to ensure that what the manager is doing is in line with the shareholders' interest. However, having monitoring devices in place is costly, implying that shareholders cannot control managerial behavior entirely. Therefore, agency costs cannot be avoided in corporations with separation of ownership and control.

Furthermore, Shleifer and Vishny (1986) argue that only large owners have the power to enforce their interests upon managers, and that only large owners have the incentive to monitor managers. So, having large owners should increase the inclination of managers to maximize shareholder value. In contrast, small owners face a free-rider deadlock in developing effective monitoring devices to control managerial behavior and performance. Clearly, in a corporation with many small owners, none of these owners is willing to spend monitoring costs to resolve agency issues. Developing and maintaining effective monitoring devices are both activities that are very costly for small owners relative to the equity share they have (Downs 1957). Indeed, free-riding behavior creates a standstill in which each and every small owner expects that other small owners will perform monitoring so that he/she can enjoy the increase in value of the firm without bearing any monitoring cost. In a corporation with a large shareholder this is different, as such a large owner has a large enough stake to make investment in the monitoring of management worthwhile from her or his individual perspective. The large shareholder internalizes substantial gains from monitoring through the increase of the value of her or his own shares. When the large shareholder owns more equity, he/she is better able to absorb monitoring costs as this gives, in return, a larger share of the increase in the firm's profits (Alchian and Demsetz 1972).

Prior studies have indeed confirmed Jensen and Meckling's convergence-of-interest hypothesis. For example, Mehran (1995) found that the percentage of equity held by managers is positively related to Tobin's Q and Return on Assets (ROA). Agrawal and Knoeber (1996) revealed that greater insider shareholding improves firm performance measured by Tobin's Q. Sheu and Yang (2005) have shown that higher equity ownership of top executive officers increases technical efficiency in Taiwanese high-tech firms. Andres (2008) reported that a firm with large family ownership performs better than firms with other block-holder ownerships, because agency costs can be reduced as the owner and manager roles are in a single hand (or, at least, on close distance by having family members as managers). Anderson and Reeb (2003), investigating S&P 500 firms, revealed that family firms perform better than non-family firms, and that family firm performance is better with a family member serving as CEO rather than with an outside CEO. Core et al. (1999) reported that CEO entrenchment is reduced if internal board members have substantial equity holdings in the firm. In addition, Andres (2008), De Miguel et al. (2004), Thomsen and Pedersen (2000), and Holderness and Sheehan (1988) have provided evidence as to the importance of the largest shareholders in developing effective monitoring to enhance firm performance.

Separation of Ownership and Control

Applying the logic of agency theory (Jensen and Meckling 1976; Fama and Jensen 1983, 1985), we argue that corporations without separation of ownership and control are more likely to be involved in bribery than their counterparts with separation of ownership and control. The first reason for this is that the owner–manager internalizes all firm value increases from both legal and illegal strategies, while professional managers enjoy only a small part of such increases. This implies that bribery to enhance firm performance is more likely under the leadership of owner–managers than in the case of professional managers. Assume that the manager is a utility maximizer and that her or his utility is a function of

income (Jensen and Murphy 1990). Moreover, assume also that the manager's income $M = F + \alpha V$, where F is salaries and bonuses, V denotes firm value, and α refers to ownership share ($0 \leq \alpha \leq 1$). With perfect separation of ownership and control—i.e., with the manager having a zero equity share—the manager has no incentive whatsoever to increase the value of the firm through taking either legal or illegal strategies (such as bribery). In contrast, when the manager has an equity share ($\alpha > 0$), her or his incentive to take legal or illegal action is greater as this equity share increases. In particular, in the case where the manager has full ownership of the firm ($\alpha = 1$), he/she absorbs all benefits from any increase of firm value.

A second reason as to why a corporation without separation of ownership and control is more likely to engage in bribery than an enterprise with separation of ownership and control relates to the issue of managerial reputation building. Professional managers working in a corporation with separation of ownership and control have the incentive to ensure that all strategies they take, maintain and increase their reputation in view of future career prospects (Kreps 1990). As a consequence of delegation of authority from shareholders to managers, professional managers are acting as the risk bearers, also in the case of unlawful bribery behavior. Note that our argument is based on the assumption that the manager is undertaking executive roles, implying that he/she is the firm's key decision-maker as to and executor of bribery actions. As a result, as managers are the main risk bearers of bribery actions, they are the ones who most likely suffer from reputation damage. A manager's reputation can be defined as "a perceptual identity of a leader as held by others that serves to reduce the uncertainty regarding the expected future behavior of that leader" (Hall et al. 2004, p. 518). Indeed, reputation is a valuable personal asset for professional managers that should be maintained and accumulated over time.

Consequently, a professional manager does not want to risk damaging her or his reputation by engaging in illegal activities such as bribery (Hall et al. 2004; Ensminger 2001). Note also that shareholders are not taking so much potential risks and bear not such large costs of bribery actions because they are not actively engaged in the bribery behavior. This is as an implication of the delegation of authority from shareholder to manager (Fama and Jensen 1983). The cost of bribery for the shareholders only emerges through the decrease of stock prices following the announcement of corporate illegalities (Davidson and Worrell 1988).

Hypothesis 1 (H1) Firms without separation of ownership and control are more likely to engage in bribery compared to their counterparts with separation of ownership and control.

Equity Share of the Largest Shareholder

The equity share owned by a shareholder determines what proportion of any increase of firm value is to be enjoyed by this shareholder. Shareholders with a larger equity share receive increasing dividend when firm profitability goes up (Paramasivan and Subramanian 2009). As argued above, bribery is always intended to generate benefits for the corporation. These benefits, in the form of increased profits due to illegal activities, are reaped by the firms' residual claimants—i.e., the shareholders. However, bribery as an illegal activity can be associated with costs as well, such as those that follow from being caught by legal authorities (Becker 1968) or stock price falls after the announcement of corporate illegalities (Davidson and Worrell 1988; Karpoff and Lott 1993). Karpoff and Lott (1993), using data on 132 cases of alleged and actual corporate fraud from 1978 to 1987 in the US, find that the decrease of stock value due to corporate fraud announcements is around 1.34–6.5%.

Ownership distribution may affect the likelihood of firm bribery behavior since the distribution of bribery benefits and costs is different for cases with concentrated vis-à-vis widespread ownership. When the equity share of the largest shareholder increases (and hence ownership concentration goes up), this shareholder will not only enjoy the greater benefits of bribery activities (the benefit or push effect), but also has to absorb a larger part of the costs of such activities (the cost or pull effect). The net effect of the push and pull factors determines whether an increase of the equity share of the largest shareholder either decreases or increases the likelihood of bribery, depending whether the benefits or the costs of bribery dominate. If the benefits are greater than the costs, then the likelihood of bribery is larger with an increase of equity share of the largest shareholder, and vice versa if the opposite holds true.

Hypothesis 2a (H2a) The likelihood of firm bribery decreases as the equity share of the largest shareholder increases.

Hypothesis 2b (H2b) The likelihood of firm bribery increases as the equity share of the largest shareholder increases.

Gender of Principal–Owner

Bribery is an illegal act involving potentially high-risk consequences for the offenders, such as destroying a promising career and/or being put in jail. According to literature in the psychology of crime, gender is a robust variable explaining unlawful conduct, due to the difference in self-control of males vis-à-vis females, which implies a dissimilarity in their willingness to act illegally.

Gottfredson and Hirschi (1990, pp. 144–149) argue that males have lower self-control than females, so that males are more likely to commit crime than females. Moreover, Gottfredson and Hirschi (1990, pp. 97–105) explain that males' lower self-control is caused by ineffective child upbringing of boys, and not of girls. That is, self-control differences between males and females are a result of differences in child-rearing processes, particularly regarding socialization as to what is wrong and what is right. Felson and Gottfredson (1984) argue that, in many societies, parents treat boys differently than girls, giving sons more freedom than daughters; generally, a girl is (much) more closely supervised by parents than a boy. This implies that a boy is granted more discretion to make mistakes and to take risks.

For that reason, males are more likely to engage in illegal behavior than females (Tittle and Paternoster 2000; Gottfredson and Hirschi 1990). In line with this, literature in behavioral economics argues that males reveal more risk-taking behavior than females (see Byrnes et al. (1999) for a meta-analysis). Indeed, prior empirical studies have confirmed the behavioral economics argument in different research settings (e.g., Strickland and Haley 1980; Hansemark 2003; Boone et al. 1999; Sexton and Bowman-Upton 1990; DeTienne and Chandler 2007). As we can assume that bribery is an illegal act that is associated with high risk, the behavioral economics argument can support the hypothesis that firms with a male principal–owner are more likely to engage in bribery than enterprises with a female principal–owner.

Hypothesis 3 (H3) Firms with a male principal–owner are more likely to engage in bribery than their counterparts with a female principal–owner.

Moderating Effects

The impact of separation of ownership and control on firm bribery may be moderated by the gender of principal–owner and the size of equity share owned by the largest shareholder. First, as males have less self-control than females, corporations with a male principal–owner are more likely to engage in illegal activities than their counterparts with a female principal–owner (H3). This implies that the effect of separation of ownership and control on the likelihood of firm bribery (H1) may well be depend on whether the principal–owner is male or female. That is, corporations without separation of ownership and control and with a male principal–owner are the most likely to engage in firm bribery, and vice versa for enterprises with separation of ownership and control and a female principal–owner.

Hypothesis 4 (H4) Firms without separation of ownership and control are more likely to engage in bribery compared to their counterparts with separation of ownership and control; this effect is larger if the principal–owner is male than female.

Second, the equity share owned by the largest shareholder may moderate the impact of separation of ownership and control on firm bribery. That is, the extent to which corporations with the owner acting as a manager (H1) are likely to engage in bribery depends on the equity share of the largest shareholder (H2). As above, the direction of this effect depends on whether the benefits or the costs of bribery are dominant. If the costs are larger than the benefits, the increase of total costs of bribery behavior for the largest shareholder (e.g., stock price falls: see, e.g., Davidson and Worrell 1988; Karpoff and Lott 1993) is greater than the increase of the bribery benefits (e.g., a monopoly license or import protection) when the equity share of the largest shareholder increases. This incentivizes the shareholder to prevent the manager from taking illegal actions. On the other hand, if the benefits are larger than the costs, the increase of total costs of bribery behavior for the largest shareholder is smaller than the increase of the bribery benefits when the equity share of the largest shareholder increases. This creates larger incentives for the shareholder to encourage the manager to engage in illegal actions.

Hypothesis 5a (H5a) Firms without separation of ownership and control are more likely to engage in bribery compared to their counterparts with separation of ownership and control; this effect is smaller if the equity share of the largest shareholder increases.

Hypothesis 5b (H5b) Firms without separation of ownership and control are more likely to engage in bribery compared to their counterparts with separation of ownership and control; this effect is larger if the equity share of the largest shareholder decreases.

Methodology and Estimation Strategy

Data

Our study utilizes data from the World Bank Enterprise Surveys, specifically the standardized dataset for the waves of 2002–2005. The World Bank Enterprise Surveys are firm-level questionnaires conducted by the World Bank and its partners around the world. This survey has been conducted since early 2000. The surveys are performed with a standard methodology, and a questionnaire that covers a broad range of business environment topics ranging from access to finance, corruption and infrastructure to crime, competition, and firm performance

measures.[2] In addition, other data sources that we have consulted to collect country-level variables are the World Bank Governance Matters dataset for rule of law quality, and the World Development Indicators (WDI) database for other macroeconomic variables (i.e., economic openness, gross domestic product, and income per capita; see below).

Measures

The dependent variable is from the survey item: "We've heard that establishments are sometimes required to make gifts or informal payments to public officials to 'get things done' with regard to customs, taxes, licenses, regulations, services, etc. On average, what percent of annual sales value would such expenses cost a typical firm like yours?" Based on this question, we generate a dummy variable *Firm bribery* coded 0 if the answer is 0% and 1 if the answer is larger than 0%. On purpose, this questionnaire item is not phrased in direct terms by asking a question such as "how much does your firm spend on bribery of public officials?", but rather probes into the issue indirectly by referring to "gifts or informal payments to public official 'to get things done'". Similarly, this questionnaire item does not refer directly to "your firm", but instead to "a typical firm like yours". This indirect wording is meant to trigger honest answers, as a direct question would often lead to defensive and strategic responses, generating an underestimation of the degree of firm bribery.

The independent variable as to separation of ownership and control is from the survey item: "If the largest shareholder is an individual (or family member), is this principal–owner also the manager/director?" We code *Owner–manager* 1 if the principal–owner is also manager/director, and 0 if the principal–owner is not the firm's manager/director. The second independent variable is from the survey item: "What percentage of your firm is owned by the largest shareholder or owner?" The answer of this item gives a continuous variable, *Equity share of the largest shareholder*, which ranges from just larger than 0–100%. The third independent variable is the gender of principal–owner, captured by a dummy variable *Male principal–owner* that is coded 1 if the principal–owner is male and 0 if this is female. This variable is from the survey item: "The principal–owner is male."

Furthermore, we include a series of control variables at the firm and country level to minimize the omitted variable bias. The firm-level control variables are a dummy variable for whether the firm engages in *Export* (yes = 1; no = 0), a dummy variable indicating whether or not the firm *Operates in foreign countries* (yes = 1; no = 0), *Firm age* (in logarithmic years), a dummy variable for *Listed on a stock exchange* (yes = 1; no = 0), *Capacity utilization* (in percentages), a dummy variable for *Foreign ownership* (coded 1 if foreigners have a an equity stake in the firm, and 0 otherwise). Moreover, we also include dummy variables for firm size, where *Small scale* reflects a firm with less than 20 employees (yes = 1; no = 0), *Medium scale* an enterprise with employment between 20 and 99 (yes = 1; no = 0) and *Large scale* for a corporation with more than 100 employees (yes = 1; no = 0).

In addition, we include a dummy variable for three industrial sectors: *Manufacturing* (yes = 1; no = 0), *Services* (yes = 1; no = 0), and *Construction & others* (yes = 1; no = 0). Finally, we add four country-level control variables: an index of *Rule of law quality*, an index of *Economic openness* (ratio of export and import to GDP), log of *GDP* (at constant 2005 prices; purchasing power parity, or PPP), and log *Income per capita* (at constant 2005 prices; purchasing power parity). All control variables at the country level are a 10-year average by the year of the survey.

Estimation Strategy

Our data are of a multi-level nature; individual entities (firms, in our case) interact with their social context (country characteristics, in our case). Hence, individual behavior is determined not only by individual characteristics, but also by features of the context to which they belong (Hox 2002, p. 1). Clearly, our dataset is structured as hierarchical or nested data by including individual firms in different countries. This implies that we have to deal with a multi-level structure of variances: at the firm and country level. To tackle this issue, we employ a hierarchical model for which individual and group-level variations can be generated (see Hox (2002) for a detailed introduction of multi-level analysis). Since, our dependent variable is a yes–no dummy variable, we use a binomial multi-level logit model:

$$b_{ij} = \alpha + u_j + e_{ij}, \tag{1}$$

$$b_{ij} = \alpha + \beta x_{ij} + \delta y_{ij} + \gamma z_{ij} + \mathbf{\Lambda}_{ij}\boldsymbol{\theta} + u_j + e_{ij}, \tag{2}$$

$$b_{ij} = \alpha + \beta x_{ij} + \delta y_{ij} + \gamma z_{ij} + \vartheta(x_{ij} * z_{ij}) + \mathbf{\Lambda}_{ij}\boldsymbol{\theta} + u_j + e_{ij}, \tag{3}$$

$$b_{ij} = \alpha + \beta x_{ij} + \delta y_{ij} + \gamma z_{ij} + \eta(x_{ij} * y_{ij}) + \mathbf{\Lambda}_{ij}\boldsymbol{\theta} + u_j + e_{ij}, \tag{4}$$

where b_{ij} refers to *Firm bribery*, x_{ij} to *Owner–manager*, y_{ij} to *Equity share of the largest shareholder*, z_{ij} to *Male principal–owner*, and $\mathbf{\Lambda}_{ij}$ to a set of control variables, all for firm i in country j. Furthermore, α is the intercept, β, δ, γ, ϑ, and η are the regression coefficients for *Owner–manager*, *Equity share of the largest shareholder*, *Male*

[2] Further information, such as the sampling method and questionnaire items, of the World Bank Enterprise Surveys dataset can be found on and downloaded from the website www.enterprisesurveys.org.

Table 1 Relevant coefficients and hypotheses

	Coefficient regressions	Hypotheses
Main effect of *Owner–manager* (Model 2)	$\delta b/\delta x = \beta$	H1
Main effect of the *Equity share of the largest shareholder* (Model 2)	$\delta b/\delta y = \delta$	H2
Main effect of the *Male principal–owner* (Model 2)	$\delta b/\delta z = \gamma$	H3
Interaction effect of *Owner–manager* and *Male principal–owner* (Model 3)	$\delta b/\delta x = \beta + \vartheta z$	H4a/b
Interaction effect of *Owner–manager* and *Equity share of the largest shareholder* (Model 4)	$\delta b/\delta x = \beta + \eta y$	H5a/b

principal–owner, *Owner–manager* * *Male principal–owner* interaction, and *Owner–manager* * *Equity share of the largest shareholder* interaction, respectively, and $\boldsymbol{\theta}$ is a set of regression coefficients for the control variables. Finally, u_j and e_{ij} are random parts at the group (country) and the individual (firm) level, respectively. We will estimate α, β, δ, γ, ϑ, η, $\boldsymbol{\theta}$, u_j, and e_{ij} through the maximum likelihood method (see, e.g., Hox 2002 and Goldstein 2003 for technical details). We use the *MLwiN* (version 2.18) statistical software to estimate our empirical models.

We estimate a series models to unravel main and interaction effects of our variables of interest. Model 2 is aimed to test the main effect of *Owner–manager* (H1), *Equity share of the largest shareholder* (H2), and *Male principal–owner* (H3). Model 3 includes the interaction effect of *Owner–manager* and *Male principal–owner*, and Model 4 the interaction effect of *Owner–manager* and *Equity share of the largest shareholder*. In addition, Model 1 involves a test as to whether a multi-level model is required. Note that to evaluate the significance of the regression coefficients, we should first take derivative of the relevant model with respect to our variable of interest (see, e.g., Yip and Tsang 2007). Table 1 presents a summary of the relevant regressions coefficients, as well as the hypotheses they relate to.

Empirical Findings

The descriptive statistics and correlation matrix are presented in Table 2, and our empirical findings are reported in Table 3. From the correlation matrix, we learn that multicollinearity is not an issue. Note that we mean-centered our data for ease of interpretation.

Before executing our multi-level regression analyses, we first perform a multi-level ANOVA test to verify whether multi-level analysis is required in this study. We find that the p value of the F-test for the *Firm bribery* dummy is very small ($p < 0.01$). Hence, there is significant variation at the group (country) level, indicating that multi-level analysis is required. Furthermore, we perform a random intercept-only model, which reveals that the overall mean of firm bribery is -0.468 ($p < 0.01$) (Model 1 in Table 3). Note that the coefficients produced in our estimations refer to the underlying distribution established by the logistic link function, and not to the proportions themselves. To determine the predicted probability, we must use the anti-logit transformation—i.e., $\exp(\alpha + \boldsymbol{X\beta})/(1 + \exp(\alpha + \boldsymbol{X\beta}))$. Calculating the expected probability of firm bribery using the anti-logit transformation, we find that the estimated probability of a firm to engage in bribery is, on average, 0.39. The variance components at the firm and country level are estimated to be 0.123 ($p < 0.01$) and 0.639 ($p < 0.01$), respectively. So, the variance partition coefficient (VPC) for the random intercept-only model, which is the proportion of the residual variance attributed to the group level of the total residual variance, is 16.14% (0.123/(0.123 + 0.639)). This means that 16.14% of the residual variance is attributable to differences between countries, and 83.85% of the residual variance is attributable to differences between individual firms.[3] The results of the multi-level ANOVA test together with the 16.14% variation coming from country differences point out that a multi-level analysis is indeed required.

Model 2 in Table 3 gives the results of a multi-level logit regression that aims to test the main effect of our variables of interest. The estimates show that *Owner–manager* is insignificantly associated with the likelihood of firm bribery, which implies that we have to reject H1. Moreover, *Equity share of the largest shareholder* is negatively and significantly associated with the likelihood of firm bribery (-0.303, with $p < 0.01$), providing support for H2a and going against H2b. Finally, *Male principal–owner* is positively and significantly related to the likelihood of firm bribery (0.130, with $p < 0.01$), which is in line with H3. Calculating the expected probability of firm bribery through the anti-logit transformation reveals that the estimated probability of a firm with a male principal–owner to engage in bribery is, on average, 0.03 higher than of an enterprise with a female principal–owner.

In Model 3, we find that the interaction variable of *Owner–manager* and *Male principal–owner* is positively

[3] Note that, in discrete response models, the individual-level variance is a function of the mean of the fitted value of the dependent variable, which depends on the values of explanatory variables in the model (see Goldstein 2003 and Rasbash et al. 2009 for technical details).

Table 2 Statistical descriptives and correlations ($N = 12{,}222$)

No.	Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Firm bribery	0.34	0.47													
2	Owner–manager	0.89	0.31	−0.01												
3	Equity share of the largest shareholder	0.77	0.28	−0.02	0.09											
4	Male principal–owner	0.75	0.43	0.05	−0.02	0.01										
5	Export	0.18	0.38	0.01	−0.06	−0.17	0.08									
6	Operates in other countries	0.06	0.23	0.02	−0.03	−0.09	0.06	0.27								
7	Firm age	1.15	0.27	−0.09	−0.04	−0.15	0.05	0.15	0.09							
8	Listed on a stock exchange	0.01	0.12	0.03	−0.02	−0.05	0.04	0.03	0.06	0.08						
9	Capacity utilization	0.80	0.20	−0.07	0.03	0.06	−0.07	−0.04	−0.01	−0.10	−0.07					
10	Foreign ownership	0.06	0.24	0.04	−0.13	−0.08	0.06	0.17	0.24	−0.04	0.00	0.02				
11	Economic openness	0.80	0.31	0.04	−0.04	0.01	−0.09	−0.05	−0.02	−0.14	−0.09	0.05	0.02			
12	GDP	11.14	0.75	−0.12	0.11	−0.06	−0.02	0.03	−0.03	0.11	−0.02	0.10	−0.08	−0.44		
13	Income per capita	3.88	0.42	−0.22	0.09	−0.06	−0.07	0.00	−0.02	0.15	−0.02	0.15	−0.09	−0.11	0.74	
14	Rules of law quality	0.09	0.88	−0.24	0.12	−0.04	−0.07	0.00	−0.01	0.19	−0.08	0.15	−0.08	0.00	0.59	0.83

Correlation coefficient is calculated using Pearson formula

SD standard deviation

significant (0.251, with $p < 0.10$), indicating that we cannot reject H4. Thus, the predicted firm bribery probability for enterprises without separation of ownership and control and headed by a male manager–owner is 0.06 higher, on average, than that for other corporations. This result is based on 8,200 observations of firms with a male owner–manager, 2,705 observations of enterprises with a female owner–manager, 1,027 observations of corporations with a male principal–owner who is not the manager, and 290 observations of cases with a female principal–owner who is not the manager. In addition, in Model 4, we find that the interaction variable of *Owner–manager* and *Equity share of the largest shareholder* is negatively significant (−0.004, with $p < 0.05$), implying support for H5a and not for H5b.

Discussion and Conclusion

Our study's aim is to examine the impact of elements of corporate governance, particularly separation of ownership and control, and equity share of the largest shareholder, on the likelihood of firm bribery. The study also explores whether male principal–owners are more likely to engage in firm bribery than their female counterparts. Our hypotheses are derived from agency theory, a well-established logic frequently applied in the study of corporate governance. We use the argument as to the conflict of interest between shareholders and managers, and test the convergence-of-interest hypothesis (Jensen and Meckling 1976) in a firm bribery context. We argue that the separation of ownership and control reduces the likelihood of firm bribery because the benefits of such bribery acts are not fully internalized by the owners. Another reason follows from the managerial reputation-building argument, claiming that professional managers seek to preserve their good reputation, and hence future career prospects, by avoiding to engage in illegal acts (Kreps 1990).

Moreover, we argue that a larger equity share of the largest shareholder could either decrease the likelihood of firm bribery since this shareholder's position as the risk bearer of such illegal acts is greater, or increase the likelihood of firm bribery because this shareholder's position

Table 3 Regression results for binomial multilevel logit model

	Model 1			Model 2			Model 3			Model 4		
	Coef.	SE	*t*	Coef.	SE	*t*	Coef.	SE	*t*	Coef.	SE	*t*
Constant	−0.468***	0.113	−39.54	−0.987***	0.137	−7.20	−0.811***	0.173	−4.69	−0.968**	0.138	−7.01
Independent variables												
Owner–manager				0.080	0.065	1.23	−0.117	0.135	−0.87	0.359**	0.166	2.16
Equity share of the largest shareholder				−0.303***	0.078	−3.88	−0.302***	0.078	−3.87	0.040	0.202	0.20
Male principal–owner				0.130***	0.049	2.65	−0.093	0.144	−0.65	0.130***	0.049	2.65
Control variables												
Export				0.140**	0.059	2.37	0.140**	0.059	2.37	0.140**	0.059	2.37
Operates in foreign country				0.111	0.092	1.21	0.109	0.092	1.18	0.110	0.092	1.20
Firm age				−0.329***	0.086	−3.83	−0.330***	0.086	−3.84	−0.326***	0.086	−3.79
Listed on a stock exchange				−0.237	0.194	−1.22	−0.240	0.194	−1.24	−0.234	0.194	−1.21
Capacity utilization				−0.004***	0.001	−4.00	−0.004***	0.001	−4.00	−0.004***	0.001	−4.00
Foreign ownership				0.012	0.088	0.14	0.017**	0.008	2.13	0.012	0.088	0.14
Firm size dummy (Small scale)												
Medium scale				0.323***	0.050	6.46	0.322***	0.050	6.44	0.320***	0.050	6.40
Large scale				0.148**	0.072	2.06	0.148**	0.072	2.06	0.145**	0.072	2.01
Sectoral dummy (Manufacturing)												
Services				0.269***	0.054	4.98	0.270***	0.054	5.00	0.270***	0.054	5.00
Construction and others				0.582***	0.075	7.76	0.581***	0.075	7.75	0.582***	0.075	7.76
Rules of law quality				−0.593***	0.173	−3.43	−0.593***	0.173	−3.43	−0.592***	0.173	−3.42
Economic openness				0.287	0.332	0.86	0.290	0.332	0.87	0.285	0.333	0.86
GDP (PPP)				0.197	0.193	1.02	0.199	0.193	1.03	0.194	0.193	1.01
Income per capita (PPP)				−0.354	0.363	−0.98	−0.357	0.363	−0.98	−0.335	0.363	−0.92
Interaction variables												
Owner–manager * Male principal–owner							0.251*	0.153	1.64			
Owner–manager * Equity share of the largest shareholder										−0.004**	0.002	−2.00
Country-level variation	0.639***	0.132	4.84	0.367***	0.080	4.59	0.367***	0.080	4.59	0.368***	0.081	4.54
# of firms	12,222			12,222			12,222			12,222		
# of countries	51			51			51			51		

Individual-level variation is a function of the mean of the fitted values of the dependent variable (see footnote 3)

PPP purchasing power parity, *Coef.* regression coefficient, *SE* standard error, *t* *t*-value

*, ** and *** denote the levels of statistical significance at 10, 5 and 1%, respectively

as the beneficiary of such illegal acts is larger. In addition, we argue that male principal–owners are more likely to engage in bribery than their female counterparts since males are known to have less self-control than females (Gottfredson and Hirschi 1990). We test our hypotheses with information from a firm-level dataset of the World Bank Enterprise Surveys of 2002–2005.

Our empirical findings show that the main effect of separation of ownership and control on the likelihood of bribery is insignificant, but that the main effects of the principal–owner's gender and the equity share of the largest shareholder are significant. We find that a firm with a male principal–owner is more likely to engage in bribery compared to enterprises with a female principal–owner, as expected. This evidence is consistent with earlier study on the impact of gender on corruption. For example, Swamy et al. (2001) find for a Georgian firm sample that woman managers are less involved in bribery, and for a macro cross-country dataset that higher proportions of women in parliament, government, and the labor force are associated with a lower level of corruption. Hirschi and Gottfredson (1987), using U.S. Department of Justice data, report that the arrest rates for embezzlement per 100,000 white-collar workers are higher for men than for women in each age group. Husted (1999) and Davis and Ruhe (2003) investigate macrolevel data, and show that countries with a more masculine culture have a higher level of corruption.[4] According to Gottfredson and Hirschi (1990, pp. 97–108), the variation of male–female propensity to commit crimes, including white-collar crimes and bribery, is due to differences in self-control. Males reveal lower self-control than females as a result of different child-rearing processes, where girls and women are more closely supervised than boys and men. Similarly, schools and other community institutions are associated with tighter control over females than over males (Felson and Gottfredson 1984).

Moreover, our empirical results show that an increase of the equity share of the largest shareholder decreases the bribery likelihood. This evidence supports our hypothesis that a larger equity share of the largest shareholders decreases the bribery likelihood provided that the costs of firm bribery are greater than the benefits from the perspective of the owner. This may be so because of decreased total value of equity share owned by the largest shareholder (Davidson and Worrell 1988) and of increased clarity as to who is the risk bearer of a firm when the equity share of the largest shareholder is larger. In contrast, as Shleifer and Vishny (1986) argue, in a firm with many small shareholders free-riding behavior will emerge because each and every small shareholder expects that other shareholders will monitor management. In this bribery study, free-riding behavior could imply that each and every small shareholder blames to other small shareholders of neglect when the real risk of the unlawful act materialize. Indeed, who is the risk bearer in an enterprise with many small shareholders is less clear than in a corporation with large shareholders. Prior studies have confirmed free-riding in firms with many small shareholders, showing that large shareholders play an important role in monitoring management to boost firm performance (Andres 2008; De Miguel et al. 2004; Thomsen and Pedersen 2000; Holderness and Sheehan 1988).

In addition, we find that the effect of separation of ownership and control is moderated by the gender of the principal–owner. This suggests that firms with the principal–owner acting as the manager are more likely to engage in bribery than firms without separation ownership and control, but particularly so when the helm is in the hands of a male principal–owner. Moreover, we reveal that the impact of separation of ownership and control on the likelihood of bribery is negatively moderated by the equity share of the largest shareholder. This finding indicates that enterprises with the principal–owner acting as the manager are more likely to engage in bribery than ones with principal–owner not acting as the manager, but that the magnitude of this likelihood is smaller with an increasing equity share of the largest shareholder. We plot the moderation effect of equity share of the largest shareholder in Fig. 1.

We plot the predicted probability of firm bribery along the vertical axis and the equity share of the largest shareholder along the horizontal axis. The solid line gives the predicted probability of bribery for enterprises without separation of ownership and control when the equity share of the largest shareholder increases. Similarly, the broken line is the predicted probability of bribery for firms with separation of ownership and control when the equity share of the largest shareholder increases. Firms without separation of ownership and control are more likely to engage in bribery than firms with separation, as revealed by the curve shifting from the solid to broken line. Corporations

[4] Moreover, Alatas et al. (2009), using an experimental design in four countries, find evidence that women are less likely to offer bribes and more likely to punish corrupt behavior in Australia, but not in India, Indonesia, and Singapore. They argue that the differential effect of gender on corrupt behavior may be culture specific. In this study, we estimated the interaction effect of the principal–owner's gender and the masculinity index from Hofstede's cultural dimensions. We find that the sign of this interaction effect is positive but insignificant. The positive sign means that the effect of a male principal–owner on the likelihood of bribery is greater in countries with a more masculine culture, as expected. Similarly, when we estimate the interaction effect for a manager–owner and the individualism index, we find a negative but insignificant coefficient. The negative sign means that the effect of a manager–owner on the likelihood of bribery is smaller in countries with a more individualistic culture. We speculate that the insignificance is due to our small sample size, dropped to only 34 countries because of missing culture data.

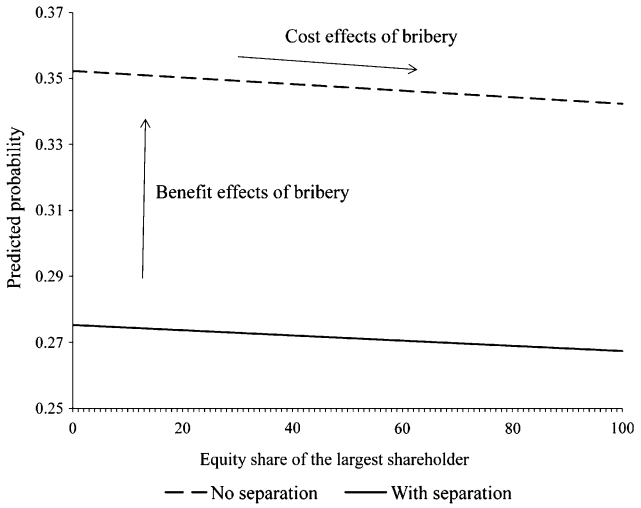

Fig. 1 The moderating effect of equity share of the largest shareholder on the impact of separation of ownership and control on firm bribery

without separation of ownership and control are more likely to engage in bribery than their counterparts with separation because in the former case the owner internalizes the benefits of bribery entirely. However, the predicted probability for both firms with and without separation of ownership and control decreases if the equity share of the largest shareholder increases. This suggests that the costs (and real risks) of illegal activities faced by an owner increase since her or his position as a risk bearer is greater when her or his ownership share is larger.

In our view, the findings in this study have implications for both the academic and policy analyses of firm bribery. For academic analyses, our study demonstrates that the study of unlawful firm behavior—i.e., firm bribery, in this study—in relation to corporate governance devices can enrich the corporate governance literature. That is, unlawful firm behavior can be an interesting dependent variable in the corporate governance domain, which is traditionally predominantly occupied with investigating the impact of corporate governance practices on firm performance. Future study could focus on the impact of corporate governance devices on other types of illegal firm behavior, such as environmental violations, consumer mistreatments, tax fraud, hidden collusion, or trade restraints.

Moreover, from the lens of policy analyses, the findings from this type of study will increase our understanding of the determinants of firm bribery, particularly, and illegal firm behavior, generally, which offer opportunities for evidence-based policies. For example, our evidence underscores that a few simple aspects of an enterprise's corporate governance structure explain additional variance in firm bribery. Accordingly, corporate governance devices can be introduced as a policy variable to combat bribery and corruption. For instance, our empirical findings suggest that female participation in corporate ownership can help to reduce firm bribery, implying that government authorities might consider to stimulate female entrepreneurship and ownership. In addition, our results imply that stimulating the separation of ownership and control may well be an effective instrument in the fight against bribery and corruption.

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Appendix

See Table 4.

Table 4 List of countries and number of respondents

No.	Country	*N*
1	Albania	157
2	Armenia	308
3	Azerbaijan	175
4	Belarus	190
5	Bosnia and Herzegovina	128
6	Bulgaria	180
7	Cambodia	227
8	Croatia	131
9	Czech	229
10	Ecuador	261
11	El Salvador	248
12	Estonia	96
13	Republic of Macedonia	137
14	Georgia	108
15	Germany	896
16	Greece	440
17	Guatemala	179
18	Honduras	190
19	Hungary	349
20	Indonesia	17
21	Ireland	390
22	Kazakhstan	412
23	Kenya	28
24	Kyrgyzstan	137
25	Latvia	109
26	Lithuania	162
27	Madagascar	46

Table 4 continued

No.	Country	*N*
28	Mauritius	38
29	Moldova	182
30	Montenegro	32
31	Nicaragua	188
32	Oman	41
33	Poland	741
34	Portugal	317
35	Romania	345
36	Russia	386
37	Senegal	14
38	Serbia	133
39	Slovakia	84
40	Slovenia	134
41	South Africa	286
42	South Korea	325
43	Spain	499
44	Tajikistan	162
45	Tanzania	19
46	Turkey	1157
47	Uganda	30
48	Ukraine	341
49	Uzbekistan	194
50	Vietnam	342
51	Zambia	102
	Total	12,222

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