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How robust is the link between gender and corruption: Evidence from firm-level panel data

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Abstract

Cross-sectional firm-level studies have found firms report paying fewer and lower bribes when women hold leadership roles. However, unobserved factors might affect who controls a company and how vulnerable the company is to pressure from corrupt bureaucrats. To evaluate whether earlier findings are robust to controlling for these unobserved factors, we use panel data and include firm-level fixed effects. While doing so weakens the link between gender and corruption, some results stay statistically significant. The study's most robust results, however, are for respondents, an unexpected finding given that managers and owners should have greater influence over corporate conduct.

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1. Introduction

Recent firm-level studies have explored the intriguing connection between corruption, firm control, and gender. Most prior investigations using cross-sectional data have found that firms report paying fewer bribes when women run the firm (Breen *et al.* 2017; Swamy *et al.* 2001). Some recent cross-sectional studies, however, found more nuanced results; Bastos and Pavlik (2025) find that although firms with women managers report that firms like theirs pay lower bribes, firms with women owners report firms like theirs pay higher bribes.

Although these earlier cross-sectional analyses offer valuable insights, omitted factors could influence both corruption and control. Firms facing heavy regulatory burdens or bidding for government contracts may meet with government officials more often than other firms. Such contacts could lead to an increase in bribe demands, prompting these firms to hire well-connected managers to help them navigate corrupt bureaucracies. If women tend to have weaker political connections than their male counterparts, firms that often interact with corrupt officials might be less inclined to have women in leadership roles.

This paper uses panel, rather than cross-sectional, data and includes firm-level fixed effects to control for the omitted firm-level factors that might affect corruption and the owner's or manager's gender. While doing so weakens the association between gender and corruption, it does not eliminate it. Further, an intriguing result emerges; the respondent's gender is more strongly linked to corruption than the manager's or owner's gender. This is puzzling because respondents should influence firm behavior less than managers or owners.

2. Corruption and Gender

Researchers have examined the relationship between gender and corruption in several ways. Some of the best-known evidence uses country level data. Notably, Swamy *et al.* (2001) and Dollar *et al.* (2001) used cross-country data to show corruption is lower in countries where women hold greater political or economic power.

Later cross-country studies, however, questioned the robustness of the early results. For example, Sung (2003) argued liberal democracies promote gender equality more than non-democracies and have stronger institutions to prevent corruption. After controlling for the rule of law, electoral democracy, and press freedom, the coefficients on women's participation in government become statistically insignificant. Later studies by Branisa and Zeigler (2011), Debski *et al.* (2018) and Hazarika (2018) similarly find that adding controls for culture, democracy, religion, and the economy can also render some coefficients insignificant.

Omitted variable bias is only one concern in cross-country studies. Corruption might also shape institutional development and, therefore, women's economic and political roles, resulting in reverse causation. Several papers have tried to use historical or institutional instruments to control for this. Doing so often causes the relationship between women's political and economic power and corruption to become statistically insignificant (Chen 2013; Hazarika 2018; Jha and Sarangi 2018).

Experimental studies offer a second way to evaluate the relationship between gender and corruption. Most experiments involve two players: the first playing a firm and the second playing a public official. Although details vary across experiments, the person playing the firm can usually earn more by offering the public official a side-payment. When firms offer to pay bribes, the person playing the public official must decide both whether to accept it and whether to reward the bribegiver. To discourage bribetaking, experiments often randomly punish corrupt firms and officials or penalize innocent third parties if the corrupt transaction occurs.

A survey of the experimental literature concluded: "it is either the case that women behave in a more pro-social and less corrupt manner than men or that there are no significant gender differences" (Chaudhuri 2012, p. 13). The experimental evidence does not unambiguously support the hypothesis that women are less corrupt; studies often find only insignificant differences between women and men (Chaudhuri 2012; Frank *et al.* 2011).

A third approach uses data from individuals or households. Many of these studies observe women are less likely to report paying or being asked for bribes than men (Justesen and Bjornskov 2014; Mocan 2008; Oliveros and Gingerich 2020). Others find women disapprove of corruption more strongly. For example, Swamy *et al.* (2001) and Torgler and Valev (2010) show women are less likely to say accepting bribes is appropriate. Similarly, Bernardi *et al.* (2009) report fewer women said it was acceptable to bribe police officers to avoid speeding tickets in three of their study's four countries. But again, not all studies support the idea that women are less corrupt. For example, Alhassan-Alolo (2007) found that women and men working in public institutions in Ghana had similar views about hypothetical scenarios concerning corruption. Further, Esarey and Chirillo (2013) argue the gender gap in perceptions appears only in democracies.

The final evidence comes from firm-level studies using cross-sectional data.[1] Many studies have found firms owned or controlled by women are less likely to report being asked for or paying bribes than other firms (Breen *et al.* 2017; Clarke 2021; Swamy *et al.* 2001). Some studies, however, find different results. For example, Wellalage *et al.* (2020) find firms controlled by women and men in Latin America reported similar levels of bribery. More notably, Bastos and Pavlik (2025) find respondents working for women-owned firms reported that firms paid higher bribes and that they were a bigger problem than did respondents at other firms. This was especially true in countries with greater gender inequality.[2]

3. Data

This study uses data from the World Bank Enterprise Surveys (WBES).[3] The WBES covers registered private firms in manufacturing and services with at least five employees. The survey includes questions on firm attributes, performance, and the local business environment. Although the top manager or owner might be the survey respondent, they can appoint representatives such as lower-level managers, other administrative staff, accountants, or lawyers to fulfil this role. The

[1] Firm-level studies looking at gender and corruption fit into a broader firm-level literature on the determinants and consequences of corruptions. See, for example, Svensson (2003), Fisman and Svensson (2007) and Colonnelli and Prem (2022).

[2] In contrast, they found firms managed by women reported firms like their paid lower bribes and were less concerned about corruption than other firms.

[3] The data are available for free at: https://www.enterprisesurveys.org/en/enterprisesurveys

respondent was the owner or among the top management for about half of surveyed firms.[4] Other respondents included accountants (13 percent), chief financial or chief operating officers (10 percent), operational and plant managers (8 percent), and sales and marketing managers (6 percent). The rest were other managers, other administrative officers, lawyers, and other employees.

Although the WBES's primary goal is to produce a representative sample in each survey, later surveys include some panel firms. Unlike a true panel, however, the WBES randomly re-surveys only some firms. Using this data, we construct a panel that includes all firms with multiple observations through 2022. We have only two observations for about 85 percent of firms, although we have three observations for the rest. Our sample is smaller than in cross-sectional analyses because we omit non-panel firms.

The respondent answers questions about the top manager's, owner's, and respondent's gender.[5] About 1.8 percent, 3.0 percent, and 0.3 percent of managers, owners, and respondents did not answer either male or female; most omitted answers were refusals or do not know. Although we omit these observations, including separate dummies for the other responses does not change the main results (see Table 1 in online appendix).

4. Econometric methodology

If women disapprove of corruption more than men (Dollar *et al.* 2001; Swamy *et al.* 2001), firms controlled by women might pay fewer bribes. Our first hypothesis is:

> *Hypothesis 1: Firms owned and managed by women will be less likely to report that firms like theirs pay bribes than other firms.*

Because respondents should influence firm behavior less than top managers and owners, the respondent's gender should affect corruption less intensely. Our second hypothesis is:

> *Hypothesis 2: The respondent's gender will affect reported bribes less strongly than the top manager's and owner's genders.*

We assume the likelihood the firm reports that firms like theirs pay bribes depends on the top manager's, interviewee's, and owner's gender and other firm-level variables. Firm i in country c at time t's propensity to pay bribes is therefore:

$$Bribe_{ict} = \alpha_i + \lambda_t + \beta \text{Gender}_{ict} + \gamma \text{FC}_{ict} + \varepsilon_{ict} \quad (1)$$

The dependent variable, $Bribe_{ict}$, is a dummy showing the respondent reported that firms like theirs paid bribes. Because we assume the error term, ε_{ict}, is distributed logistically, we estimate the model as a logit model.

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[4] About 33 percent of the respondents were the owner and 17 percent were the CEO, Executive Director, or President. Data are for surveys conducted between 2018 and 2020. We focus on these surveys because they are the only surveys that classify respondents' positions systematically.

[5] Respondents self-report gender. Top managers and owners only self-report when the relevant person is the respondent.

Based on the cross-sectional literature, we expect firms controlled by women to be less likely to say that firms like theirs pay bribes than other firms. The gender dummies, therefore, should have negative coefficients (*hypotheses 1 and 2*).

The regression includes firm-level controls (FC_{ict}) including number of workers, an exporter dummy, ownership shares for foreign and government owners, and dummies indicating sector.[6] Finally, the regression also includes fixed effects to control for omitted firm- (α_i) and year-level (λ_t) variables that might affect the firm's propensity to pay bribes.

Because it is technically difficult to include fixed effects in non-linear regressions and because of the incidental parameters problem, we estimate the quasi-maximum likelihood conditional Logit model proposed by Chamberlain (1980). When logit models include fixed effects, the model drops firms that always or never say that firms like theirs pay bribes; the firm-level fixed effects fully explain their decisions.

5. Summary Statistics

Table 1 shows means and other summary statistics for the sample used in the regressions. About 48 percent of observations report that firms like theirs pay bribes. This is higher than in the full sample, where only 16 percent of respondents reported that firms like theirs paid bribes. This difference is because the fixed effects regressions must exclude firms that never and always pay bribes—the fixed effects fully explain the omitted firms' decisions.[7]

Men control most firms in the sample. Fewer than half have any women owners (33 percent), women respondents (22 percent), or women as top managers (15 percent). These percentages are close to the percentages for the full sample. In the full sample, about 35 percent had any women owners, 25 percent had women respondents, and 16 percent had women as top managers.[8]

[6] We include these variables because Breen *et al.* (2017) include similar variables. We cannot include country-level fixed effects because they would be collinear with the firm fixed effects.

[7] Because we only have two observations for about 85 percent of firms, most firms in the regressions have one observation where they report paying bribes and one where they do not. As a result, respondents report paying bribes for close to half of the observations.

[8] Sample means for the other control variables are also close to the sample means for the full sample.

Table 1: Summary statistics for dependent and independent variables

	Obs.	Mean	Std. dev.	Min	Max
Respondent said firms like their pay bribes	6,946	0.48	0.50	0	1
Respondent is a woman (dummy)	5,362	0.22	0.42	0	1
Women partly own firm (dummy)	6,891	0.33	0.47	0	1
Top manager is a woman (dummy)	5,765	0.15	0.36	0	1
Foreign ownership share (percent)	6,946	7.40	24.06	0	100
Government ownership share (percent)	6,946	0.81	6.65	0	99
Number of workers (nat. log)	6,946	3.22	1.39	0	11.07
Firm is an exporter	6,946	0.23	0.42	0	1
Manufacturing enterprise	6,946	0.53	0.50	0	1
Retail or wholesale trade enterprise	6,946	0.27	0.44	0	1
Other service enterprise	6,946	0.20	0.40	0	1

Note: Sample includes all panel observations in any of the regressions shown in Table 2.

6. Empirical Results

Table 2 shows the base results. Because the gender dummies are highly correlated, we include them separately before including them together. All regressions include firm- and year-fixed effects. Hausman tests favor Chamberlain (1980)'s conditional logit model with firm-level fixed effects over a simple logit model with country-level fixed effects (see final row of Table 2). These tests support including firm-level fixed effects. Fewer women respondents said firms like theirs must pay bribes to get things done than similar men (see column 1 in Table 2). The difference is considerable; women respondents are about 5.0 percentage points less likely to say firms like theirs pay bribes than similar men. The respondent dummy's coefficient also stays significant and negative after including all three gender dummies simultaneously (see column 4).

Surprisingly, results are weaker for managers and owners, which is inconsistent with the second hypothesis. First, the manager dummy's coefficient is small and insignificant, suggesting firms are equally likely to report firms like theirs pay bribes whether the top manager is a man or woman. Second, firms partly owned by women say firms like theirs pay higher, not lower, bribes than firms wholly owned by men. Although this result contradicts our first hypothesis, Bastos and Pavlik (2025) find similar results using a larger cross-sectional sample.

Because the survey asks about the extent of women's ownership, we can create dummies for firms that are majority- and wholly owned by women. Although the coefficients on the majority and full ownership dummies are negative when included instead of the partial ownership dummy, they are statistically insignificant (see Table 2 in online appendix).

Table 2: Likelihood that respondent reported that firms like theirs must pay bribes to get things done

Dependent Variable	Respondent reported firms like theirs must pay bribes to get things done			
Gender				
Respondent is a woman	-0.214**			-0.298***
	(-2.15)			(-2.68)
Top manager is a woman		-0.050		0.049
		(-0.44)		(0.37)
Women partly own firm			0.153**	0.184**
			(2.25)	(2.00)
Firm Characteristics				
Foreign ownership share	-0.003	-0.002	-0.001	-0.001
	(-1.52)	(-0.98)	(-0.36)	(-0.75)
Government ownership share	-0.002	0.002	0.006	-0.002
	(-0.27)	(0.30)	(1.17)	(-0.31)
Number of workers [nat.log]	0.110**	0.128***	0.138***	0.114**
	(2.18)	(2.60)	(3.28)	(2.16)
Firm is an exporter	0.344***	0.407***	0.397***	0.306***
	(3.16)	(3.87)	(4.50)	(2.68)
Retail or wholesale trade enterprise [a]	0.221	0.184	0.236*	0.249
	(1.37)	(1.15)	(1.86)	(1.44)
Other service enterprise [a]	0.239	0.189	0.103	0.356*
	(1.28)	(1.01)	(0.70)	(1.75)
Observations	4,320	4,610	6,844	3,943
Number of Countries	65	75	89	64
Number of Panel Individuals	2,052	2,190	3,194	1,869
Pseudo R-Squared	0.0842	0.0899	0.109	
H0: Fixed firm effects not needed (χ^2)	50.3	38.7	55.3	49.6
(p-value)	0.000***	0.000***	0.000***	0.000***

Note: All regressions are conditional logit regression (Chamberlain, 1980) and include firm and year fixed effects. ***, **, * Statistically significant at 1,5 and 10 percent significance levels. [a] Omitted sector is manufacturing.

7. Conclusions and Discussion

Cross-sectional research on gender and corruption has found firms tend to pay fewer bribes when women have greater influence (Breen *et al.* 2017; Swamy *et al.* 2001). Our most robust result reinforces this proposition; the respondent dummy's coefficient stays negative and significant when using panel data and including firm-level fixed effects. However, we also find firms that women partly own claim that firms like theirs pay more, not fewer, bribes than other firms. Although this finding aligns with cross-sectional results in Bastos and Pavlik (2025), it contradicts earlier cross-sectional studies.

Interestingly, our results suggest respondents affect answers about corruption more than owners or managers. This finding is puzzling because earlier studies have argued women reduce bribery by discouraging corrupt behavior where they work. But the top manager and owner should exercise greater influence over firm behavior than the lower-level managers and professionals who are sometimes respondents. We would, therefore, expect the owner's and top manager's gender to be most important.

One plausible reason for this counterintuitive result is the respondent dummy varies more than the manager and owner dummies. Whereas 23 percent of firms had respondents of different

genders across surveys, the same was true for only 15 and 11 percent of firms for managers and owners. The manager and owner dummies' modest within-firm variation might make it difficult to find significant results for managers and owners after including firm-level fixed effects. However, although greater variation might explain the respondent dummy's higher significance, it cannot explain its larger size.

Another possibility is gender differences in reported bribes might reflect differences in reporting rather than in actual payments. Because the respondent is the person answering the questions, they directly affect misreporting. In contrast, managers and owners influence misreporting only indirectly. If gender differences in reported bribes reflect gender differences in misreporting, the respondent's gender might be more important than the manager's or owner's gender.

More direct evidence on under-reporting, however, only weakly supports the hypothesis that women misreport corruption more than men. Azfar and Murrell (2009) identify reticent respondents who misreport corruption using forced response questions. Using a large cross-sectional sample, Clarke (2024) found some evidence that gender affects reticence. However, Clarke (2024) also found the owner's gender is more important than the respondent's gender. These results, therefore, do not unequivocally support the idea that underreporting could explain the respondent dummy's significance.

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