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Earlier studies have found women are less likely to tell survey-takers they pay bribes than men. Although men's and women's different answers could reflect differences in how willing they are to pay bribes, their different answers could instead reflect differences in how willing they are to admit to doing so. If women lie about bribing corrupt officials more often than men, they would report fewer payments even if men and women were equally likely to pay bribes. Although identifying dishonest interviewees is difficult, earlier studies have found researchers can use random response questions to find reticent respondents who misreport bribes. This paper uses firm-level data to ask whether women are more reticent than men. We find, on average, they are not. But women working at small firms are more reticent than similar men. Further, respondents working at small female-managed and -owned firms are more reticent than respondents at other small firms.

I. Introduction

Women are less likely to tell researchers they have bribed public officials than men (Justesen and Bjørnskov, 2014; Mocan, 2008).[2] The simplest way to explain why more women tell researchers they have not bribed officials than men is that it is true. Women's lower propensity to bribe officials seems consistent with their lower propensity to commit other crimes, including non-violent crimes like fraud and embezzlement.[3] Women might be less prone to bribe officials and break other laws because they are more law-abiding, ethical, public-minded, or risk-averse than men.[4] Alternatively, they might avoid paying bribes because, on average, women dislike negotiating more than men.[5] Because bribe payers and takers must haggle over what to pay, people who dislike bargaining might be unwilling to negotiate bribe payments.

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[2] They are also more likely to say corruption is unacceptable (Swamy and others 2001; Torgler and Valev 2010).

[3] Women accounted for less than half of U.S. arrests in 27 of the *2019 Uniform Crime Report*'s 28 categories (Federal Bureau of Investigations 2020), with prostitution being the sole exception. The categories include non-violent offenses such as fraud, embezzlement, burglary, driving under the influence, and drug abuse. Warr (2002, 114) notes data from victimization, self-reports, and police reports support the view that women are more law-abiding.

[4] See, for example, O'Fallon and Butterfield (2005) on ethics, Croson and Gneezy (2009) on public mindedness, and Shurchkov and Eckel (2018) or Croson and Gneezy (2009) on risk aversion.

[5] Shurchkov and Eckel (2018) find that experimental and observational studies support the assertion that women dislike negotiating more than men.

A different way to explain why women report paying fewer bribes than men is that they might answer sensitive questions less candidly. Observational studies are accurate only when people answer questions truthfully. Although most corruption surveys encourage candid answers by asking questions indirectly and reassuring interviewees about their anonymity, these approaches are only partly successful (Azfar and Murrell 2009; Clarke and others 2015; Kraay and Murrell 2016).[6] Further, even advanced techniques such as randomized response methods fail to inspire complete honesty to other sensitive questions (John and others 2018; Lensvelt-Mulders and others 2005).[7]

Women might be less candid than men for several reasons. First, as noted above, women are more risk averse than men (Croson and Gneezy 2009; Shurchkov and Eckel 2018). As well as making people less willing to pay bribes, risk aversion might make them less willing to admit to doing so. The risk-averse might misreport bribe payments because they fear what will happen if they answer honestly; people who admit to paying bribes might face legal consequences or lose contracts won through bribery. If women are more risk averse than men, they might be less willing to admit to paying bribes.

Second, women might worry more than men about being judged for paying bribes. If survey participants doubt their answers will remain anonymous, they might deny paying bribes because they worry about the opprobrium an honest answer could generate. Even if they believe their responses will remain confidential, they might care what the interviewer thinks. If women worry about social desirability more than men, women might be less forthcoming when researchers ask about corruption.[8]

Although working out who is misreporting bribes is difficult, Azfar and Murrell (2009) propose one approach. They show respondents who ignore the instructions for forced response questions are also less likely to say they bribe officials. They label these respondents as reticent. They then hypothesize that reticent respondents report paying fewer bribes because they underreport corruption.[9] Later studies have shown that reticent respondents also misreport other information.[10]

This paper asks whether women are more reticent than men. Using data from over 20,000 firms in seven countries, we find women and men are equally reticent. This is consistent with earlier single-country studies (Azfar and Murrell 2009; Clausen and others 2010). We find, however, female interviewees who work for small firms are more reticent than similar male interviewees. One plausible explanation is that women working for small firms worry about anonymity more than women working for larger firms.[11] Alternatively, female respondents might influence firm culture more at small firms with few managers and professionals than they do at large corporations.

We also ask whether respondents working at firms where women have greater influence are more reticent than other respondents. For small firms, we find interviewees, whether men or

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[6] Indirect questions allow respondents to answer without incriminating themselves. These methods include asking interviewees what other people do or whether bribes were requested or expected rather than paid.

[7] Few studies on corruption use these advanced methods, with Oliveros and Gingerich (2020) as a notable exception.

[8] For evidence comparing men's and women's concern about social desirability, see Bernardi and others (2009), Bossuyt and Van Kenhove (2018), and Dalton and Ortegren (2011).

[9] Later studies have confirmed reticent respondents are less likely to pay bribes in many settings (Clarke and others 2015; Clausen and others 2010; Jensen and Rahman 2011; Karalashvili and others 2015; Kraay and Murrell 2016). These studies also interpret their results as showing reticent respondents lie about paying bribes.

[10] Consistent with the idea that reticent respondents lie, Clarke (2019) finds reticent managers claim to pay their workers more than the workers say they receive and do so to a greater degree than non-reticent managers.

[11] Even at small firms, men might be less worried about being identified than women because more men hold managerial and professional positions.

women, are more reticent at both female-managed and female-owned firms. But, once again, we find only weak and inconsistent evidence for medium-sized and large firms.

Reticence is, therefore, unlikely to fully explain earlier results that link gender and self-reported corruption. Female interviewees are no more reticent than male interviewees at medium-sized and large firms. Similarly, interviewees at medium-sized and large female dominated firms are no more reticent than interviewees at other medium-sized and large firms. Given gender is linked to corruption at medium-sized and large firms (Breen and others 2017; Clarke 2021), reticence is unlikely to fully explain why women report paying fewer bribes than men.

II. Background

Empirical evidence on gender and corruption

Earlier studies have found that women are less likely to report that they bribe officials than men. For example, using data from 49 developed and developing countries, Mocan (2008) found women were less likely to report a public official asked them for a bribe than similar men. Similarly, African women were less likely to report paying bribes than African men (Justesen and Bjørnskov 2014). Finally, Costa Rican women were less likely to report paying bribes and less likely to say they were willing to pay bribes than similar men (Oliveros and Gingerich 2020).[12]

Consistent with the self-reported observational studies, women are also less likely to say that giving and receiving bribes is acceptable. Torgler and Valev (2010) find Western European women were less likely to believe corruption was acceptable than similar men. Similarly, Bernardi and others (2009) found Ecuadorian, South African, and US women were less likely to say it was acceptable to bribe police officers to avoid speeding tickets than similar men.[13]

In addition, many people believe that women are less corrupt than men. For example, Colombian taxi drivers say female transit officers are less likely to accept bribes than male officers (Lambsdorff and Fink 2006). Similarly, Rivas (2013) found Spanish students, irrespective of gender, expected women to be less likely to take side payments than men in a corruption game. Finally, the 2017-2020 *World Values Survey* asked participants whether they agreed that "on the whole, women are less corrupt than men." Although only 40 percent of men and 41 percent of women agreed, people who disagreed include people who believe men and women are equally corrupt.[14]

If firms need to pay bribes to compete in corrupt countries, female-owned and managed firms might behave like other firms. But this is not the case; firms run by women report paying fewer bribes than other firms. Using data from 105 low- and middle-income countries, Breen and others (2017) found bribes cost female-owned firms less than similar male-owned firms. Although Clarke (2021) found female-controlled firms are less likely to pay bribes than other firms, they avoid paying them by steering clear of bureaucratic entanglements rather than refusing to pay when they meet with officials.

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[12] Women reported paying fewer bribes in response to direct questions about corruption (Gingerich and others 2016). They also found comparable results for questions designed to protect the respondent.

[13] In contrast, they found no difference between men and women in Colombia. Moreover, they found the differences between men and women in the other three countries became insignificant after controlling for social desirability bias.

[14] Author's calculations based on data from Haerpfer and others (2020).

Some country-level results also support this narrative. Early studies found less corruption in countries where women play more significant roles in government and business (Dollar and others 2001; Swamy and others 2001). Later studies, however, have questioned these results, finding the correlations become insignificant after controlling for democratic rights (Sung 2003) and culture (Debski and others 2018).

Finally, results from experimental studies are also consistent with the view that women are less prone to corruption than men. In these studies, a person playing a firm can offer a side payment to a person playing a public official. The public official can then accept the side payment or refuse to take it. If they take the bribe, it usually imposes a cost on a third party. The games often include twists to capture distinct aspects of corruption. For example, some games randomly penalize both players when they give and receive bribes. Although not all experimental studies find differences between men and women, some find women are less likely to offer side payments or offer lower amounts (Alatas and others 2009; Rivas 2013).[15] In contrast, men and women playing the officials have similar propensities to accept side payments (Frank and others 2011). Consistent with the experimental studies about bribe takers, Aidt and others (2020) find female bureaucrats in China do not, on average, take lower bribes than male bureaucrats.[16]

In summary, observational, country level, and experimental studies support the notion that women are less likely to bribe public officials than men. Although not all studies find statistically significant differences, those that do usually find women are less likely to give and receive bribes than similar men. The evidence on bribe-taking is less strong, with both experimental and observational studies finding less clear differences between men and women (Aidt and others 2020; Frank and others 2011).

Empirical evidence on gender and lying

Although firm- and individual-level studies find women report paying fewer bribes than men, self-reported questions have problems. One grave concern is interviewees might lie about bribing public officials. Because paying bribes is often illegal, the consequences of confessing might worry respondents. Even if giving bribes is legal or they believe their answers will remain confidential, they might feel embarrassed about doing something immoral.[17]

When people lie about paying bribes, it becomes difficult to estimate how firm and individual characteristics affect corruption. Because many people claim they do not pay bribes, the dependent variables, which measure whether interviewees paid bribes or how much they paid, are binary or censored. Most papers, therefore, use probit, Tobit, or other similar models.[18] But even a few

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[15] However, in Alatas and others (2009), the difference is only significant in one of four countries.

[16] However, they find in a selection equation that female bureaucrats are less likely to take bribes.

[17] Using data from the *World Values Survey*, Swamy and others (2001) find 77.3 percent of women and 72.4 percent of men said officials can never justify "accepting a bribe in the course of their duties." The survey covered more than 40 developing and developed economies. Many religions also condemn corruption. In the Hebrew Bible, Exodus 23:8 advises: "And you shall not take a bribe, for a bribe blinds the clear-sighted and subverts the cause of the Just" (Langston 1991, 9). Similarly, in the Christian New Testament, John the Baptist recommends that tax collectors and soldiers not extort money or gifts from others (Luke 3:12-14). Other religions, including Islam, also argue that giving and receiving bribes is wrong (Bougatef 2015; Gokcekus and Ekici 2020; Shadabi 2013).

[18] Papers with dummy dependent variables indicating the firm or individual has paid a bribe usually estimate probit, logit, or linear probability models (see, for example, Mocan (2008)). When the dependent variable is the amount of the bribe, papers often use Heckman (see, for example, Svensson (2003)) or Tobit-type models (see, for example, Clarke and Xu (2004)). When the dependent variable measures whether the person sees corruption as an obstacle, researchers use models like probit, ordered probit, or similar models (see, for example, Breen and others (2017)).

randomly misclassified observations bias these models' coefficients towards zero (Hausman 2001; Meyer and Mittag 2017). Misclassification due to misreporting will, therefore, cause us to underestimate how much gender affects corruption.

Another problem is that studies would overestimate differences between men's and women's behavior if women misreport bribes differently than men. If women falsely deny paying bribes, studies using self-reported data would find women report fewer bribes than they pay. Moreover, if they do so more than men, this misreporting could partly or wholly explain why fewer women claim to pay bribes than men.

The most direct way to resolve whether women lie about corruption more than men would be to compare men's and women's actual and self-reported bribe payments. If we asked people whom we knew had bribed officials about their behavior, we could establish whether women misreport bribes more than men. However, no empirical corruption studies have made these comparisons to our knowledge. Some studies, however, compare actual and self-reported behavior for other crimes. For example, Van Der Heijden and others (2000) found Dutch women convicted of welfare fraud were less likely to admit it than similar men. Preisendörfer and Wolter (2014) got similar results for German women found guilty of minor offenses. However, Johnson and others (2012) found men and women were equally likely to misreport whether they used cocaine.[19]

Another—albeit less direct—way to assess whether women misreport bribe payments more than men is to see whether techniques that reduce misreporting of sensitive information affect women's answers more than men's.[20] Oliveros and Gingerich (2020) compare how men and women answer questions about corruption when asked about it directly and when asked using a sensitive survey technique (SST). Based on these comparisons, they estimate men and women lie to similar degrees when asked survey questions directly. However, their calculations assume people tell the truth when the questions use the SST. If SSTs encourage only some truth telling, interpreting these results is more complicated.[21]

Although the earlier discussion suggests women misreport bribes more than men, the opposite might be true. One reason to believe the opposite is that experimental studies find women are more honest than men. Based on a survey of the experimental literature on honesty, Rosenbaum and others (2014, 192) conclude:

> *The bulk of the evidence from the majority of studies across the various experimental sub-categories which were able to detect significant gender differences suggests that women exhibit greater propensities to tell the truth than their male counterparts.*

They note women are less likely to misrepresent coin tosses, engage in academic cheating, keep excessive change, and overstate the number of correctly completed matrices. If women are also more honest about corruption, studies that regress reported bribe payments on gender will overestimate, not underestimate, how often women pay bribes.

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[19] Johnson and others (2012) asked people whether they had used cocaine recently and evaluated their hair, saliva, and urine for cocaine metabolites. They then compared people whose reported use and test results matched with people whose reported use and test results did not. They found women were neither more nor less truthful than men.

[20] Fox and Tracy (1986), Lensvelt-Mulders and others (2005), and Coutts and Jann (2011) describe some ways to do this. Section III discusses the forced response approach.

[21] As discussed below, random response models might not always elicit honest answers. See John and others (2018).

Even if women are more truthful than men, they might lie more when asked sensitive questions. Women might do this because they care about social desirability more than men. This concern might encourage women to lie more than men when asked about undesirable acts or thoughts, even if they are usually more honest. Some empirical evidence supports these ideas. First, women appear more sensitive about social desirability than men (Bernardi and others 2009; Bossuyt and Van Kenhove 2018; Dalton and Ortegren 2011). Further, Bernardi and others (2009) find that controlling for social desirability eliminates the difference between women's and men's answers about whether it is wrong to bribe police officers to avoid speeding tickets.[22] Using stepwise regression, they find their social desirability index remains in their final model, although gender does not.

An alternative way to assess whether women lie about paying bribes more frequently than men is to see whether women are more reticent. Azfar and Murrell (2009) show that researchers can identify respondents who misreport sensitive information on surveys using forced response questions. They label these individuals as reticent. Studies have found reticent respondents also misreport bribes—and other information—during surveys (Azfar and Murrell 2009; Clarke 2019; Clarke and others 2015; Clausen and others 2010; Karalashvili and others 2015). If women are more reticent than men, they might misreport bribe payments more than men. Our first hypothesis is:

> **Hypothesis 1:** *Female respondents are more reticent than similar male respondents.*

Gender might affect reticence in other ways. High-level female managers and owners might discourage their subordinates from committing immoral and illegal actions more than similar men do. As well as discouraging their male and female subordinates from performing illegal actions, their disapproval might also discourage their subordinates from admitting they do. Male and female interviewees at female-controlled firms might, therefore, be more reticent. Our second hypothesis is:

> **Hypothesis 2:** *Male and female respondents working for firms controlled by women are more reticent than other respondents.*

III. Data

This paper uses firm-level data from the World Bank Enterprise Surveys (WBES). The WBES covers retail and wholesale trade, manufacturing, and other services. Because the World Bank uses lists provided by government agencies to make the sampling frames, the samples exclude informal firms. The surveys also exclude fully, but not partly, government-owned firms. The firm's manager or their representative answers the questions.

Although the World Bank has conducted surveys in over 100 countries, few include the forced response questions needed to measure reticence. The 2013 Bangladesh; 2014 India; 2007, 2009, and 2014 Nigeria; 2010 Peru; 2011 Sri Lanka; 2013 Turkey; and 2013 Ukraine surveys include these questions. Together, these nine surveys cover 23,000 firms (see Table 1). Some surveys, however, omit questions on gender. The 2007 and 2009 Nigeria surveys do not supply the

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[22] The study covered Colombia, Ecuador, South Africa, and the United States. Women scored higher on the social desirability index than men in all four countries (Bernardi and others 2009).

respondent's gender, while the 2011 Sri Lanka survey does not supply the manager's and owner's gender.

Table 1. Sample by country.

Country	Year	Obs.	Manager	Owner	Respondent
Bangladesh	2013	1,442	Yes	Yes	Yes
India	2014	9,281	Yes	Yes	Yes
Nigeria	2007	2,387	Yes	Yes	No
Nigeria	2009	3,157	Yes	Yes	No
Nigeria	2014	2,676	Yes	Yes	Yes
Peru	2010	1,000	Yes	Yes	Yes
Sri Lanka	2011	588	No	No	Yes
Turkey	2013	1,344	Yes	Yes	Yes
Ukraine	2013	1,002	Yes	Yes	Yes

Source: Author's calculations based upon data from the World Bank Enterprise Surveys.

Identifying reticent respondents

Warner (1965) proposed forced response questions to elicit honest answers about embarrassing, immoral, unacceptable, or illegal behavior.[23] The questions protect participants by introducing a random element. This randomness means researchers—and even the interviewer—do not know whether participants who admit to misbehaving when answering forced response questions have done so.

Forced response questions work in the following way. After the interviewer asks the forced response question, the participant tosses a coin behind the interviewer's back. If the coin shows tails, the participant answers truthfully, but if it shows heads, the participant answers 'yes.' If the participant answers 'yes', it could mean they tossed tails and have acted questionably, but it could also just mean they tossed heads. Although researchers cannot identify guilty parties, they can decide how typical the behavior is. For example, if half of the respondents have performed the unacceptable action, three-quarters should answer 'yes.'[24] Researchers can also calculate how common the behaviors are within sample subgroups.

Although Warner (1965) did not design forced response questions to identify reticent respondents, Azfar and Murrell (2009) propose using these questions to do so.[25] With independent coin tosses, the average person will toss heads—and answer 'yes'—half the time. Few participants who follow the instructions will answer 'no' to all the forced response questions when the survey has multiple questions. For example, with seven forced response questions—the number in the

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[23] The forced response questions used in the Enterprise Surveys ask participants whether they have done illegal or questionable actions such as underpaying taxes or cheating their suppliers or customers (see Appendix, Table A1).

[24] Assuming the coin is fair—and the sample is large—50 percent of the sample will answer 'yes' because the coin shows heads. Another 25 percent (0.50 ×0.50) will answer 'yes' because the coin shows tails and they have done the sensitive act. The remaining 25 percent will answer 'no.' If nobody has performed the sensitive action, half should answer 'yes.'

[25] Several papers, including Azfar and Murrell (2009), Clausen and others (2010), and Clarke (2019), describe how the procedures work in detail. This section draws on these earlier papers' descriptions.

WBES—fewer than one percent of participants should always answer 'no.'[26] Azfar and Murrell (2009) noticed, however, that many participants ignored the instructions and answered 'no' to all seven questions. This is true for more than half of WBES respondents in India, Nigeria, and Turkey (see Table 2).[27] Azfar and Murrell (2009) classify people who answer 'no' seven times as reticent.

This procedure, however, leads us to misclassify some participants. Fortunately, because fewer than one in a hundred participants toss tails seven times in a row, we will misclassify few non-reticent participants. Even if no one had done any of the sensitive acts, close to 98 percent of participants we classify as reticent are reticent. If about 40 percent have done each act, this is true for 99 percent of respondents we classify as reticent. But we might also misclassify some reticent participants as non-reticent if they sometimes answer 'no' when they should answer 'yes'. One reason to suspect some people selectively disregard the instructions is that too many people answer 'no' six out of seven times (see Table 2). We would expect the two types of misclassification to result in attenuation bias (Meyer and Mittag 2017). Misclassification will, therefore, mean that we will underestimate differences between men and women.

Table 2. Theoretical and actual number of 'no' responses to random response questions.

# of 'no' responses	0	1	2	3	4	5	6	7
Theoretical								
If no one is guilty	0.8	5.5	16.4	27.3	27.3	16.4	5.5	0.8
If 40 percent are guilty	8.2	24.7	31.8	22.7	9.7	2.5	0.4	0.0
Actual								
Bangladesh	0.1	2.7	10.7	21.8	26.6	19.0	10.5	8.7
India	0.4	0.9	2.0	5.9	7.9	22.4	6.5	53.9
Nigeria 2007	2.0	4.2	12.7	20.5	19.9	15.4	12.5	12.9
Nigeria 2009	1.1	3.4	11.6	22.8	22.1	14.5	8.7	15.9
Nigeria 2014	1.2	0.9	3.4	10.6	10.4	10.8	9.8	52.9
Peru	0.8	3.2	10.1	14.8	17.3	17.2	13.3	23.4
Sri Lanka	0.2	2.2	8.7	20.8	25.0	20.8	12.2	10.2
Turkey	0.5	1.3	4.6	7.3	8.7	11.5	15.1	51.1
Ukraine	2.9	6.3	12.0	18.2	20.8	14.3	11.4	14.2

Source: Author's calculations based upon data from the World Bank Enterprise Surveys.

Measuring gender participation

The WBES includes three questions about gender. First, most surveys ask about the person answering the questions. Although the top manager might play this role, they might instead appoint this task to a representative. The question allows for two answers: male and female. We, therefore, construct a dummy equal to one if the respondent answered 'female' and zero if they answered 'male.' Few respondents refused to answer (fewer than 0.01 percent), answered 'does not apply' (fewer than 0.01 percent), or gave an invalid response (fewer than 0.01 percent). We code the

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[26] The probability they will toss tails seven times in a row is $\left(\frac{1}{2}\right)^7 = \frac{1}{128}$. When some participants have performed the sensitive acts, even fewer should always answer 'no.' Table 2 compares the observed number of 'nos' in each country with the predicted number if no one has done any of the acts and if 40 percent of people had.

[27] In the remaining countries, between 8.7 and 23.4 percent always answered 'no.'

dummy as missing and drop the observation in these cases. Because the participant answers the forced response questions, their gender should affect reticence more directly than the manager's or owner's gender.

Second, the WBES asks, 'Is the top manager female?' The interviewee could answer 'yes' or 'no.' We code the manager dummy as one if they answer 'yes' and zero if 'no.' Although few respondents refused to answer (0.01 percent), more answered 'don't know' (0.4 percent). We treat these observations as missing in the main analysis and add an additional dummy for these observations as a robustness check. If the manager's gender affects firm culture, it could affect both male and female respondents' answers. For example, respondents might be unwilling to admit to anti-social acts when their manager is a woman if they believe women disapprove of anti-social behavior more strongly than men do.

Third, the WBES asks, "Amongst the owners of the firm, are there any females?" We code the ownership dummy as one for firms with female owners and zero for firms without female owners. Few participants refused to answer (0.02 percent), answered 'does not apply' (0.01 percent), or gave an invalid code (0.01 percent). More answered 'they did not know' (2 percent). By

Table 3. Correlation between dummies for female owners, managers, and respondents.

	Female owner	Female manager	Female respondent
All Firms			
Female owner	1.00		
Female manager	0.51***	1.00	
	(0.000)		
Female respondent	0.23***	0.38***	1.00
	(0.000)	(0.000)	
Small Firms			
Female owner	1.00		
Female manager	0.70***	1.00	
	(0.000)		
Female respondent	0.39***	0.57***	1.00
	(0.000)	(0.000)	
Medium-Sized Firms			
Female owner	1.00		
Female manager	0.35***	1.00	
	(0.000)		
Female respondent	0.13***	0.30***	1.00
	(0.000)	(0.000)	
Large Firms			
Female owner	1.00		
Female manager	0.25***	1.00	
	(0.000)		
Female respondent	0.11***	0.16***	1.00
	(0.000)	(0.000)	

Source: Author's calculations based upon data from the World Bank Enterprise Surveys.
Note: Small firms have 20 or fewer employees, medium-sized firms have between 21 and 50 workers employees, and large firms have more than 50 employees.

comparison, only 0.4 percent said the same about the top manager. We treat these observations as missing in the main analysis and add an additional dummy for these observations as a robustness check. The owner's gender might also affect the respondent's reticence through its effect on firm culture.

Because female-owned firms are more likely to have female managers and respondents, the three dummies are highly correlated (see Table 3). One reason for this high correlation is many owners and managers answer the survey questions themselves. Similarly, owners often manage their firm. The correlations are particularly high for small firms, probably because they have smaller management and professional staffs. Because multicollinearity makes it difficult to include all three dummies simultaneously, we first include them separately. We include all three together as a robustness check.

IV. Econometric model

We assume the respondent's propensity to be reticent is:

$$Propensity\ to\ be\ reticent_{ij} = \alpha_j + \beta\ Female_{ij} + \gamma x_{ij} + \varepsilon_{ij}$$

Because we do not see this propensity directly, we assume participants always answer 'no' when their propensity exceeds some critical level:

$$Reticent_{ij} = \begin{cases} 1 & if & Propensity_{ij} > 0 \\ 0 & if & Propensity_{ij} \le 0 \end{cases}$$

We assume the error has a normal distribution and, therefore, estimate the model as a probit model.

To test the paper's hypotheses, we include dummies showing the respondent, manager, and owner of firm i in survey j are women $(Female_{ij})$. If women are more reticent than men, the participant dummy's coefficient will be positive. Similarly, if female managers and owners encourage their employees' reticence, these dummies will have positive coefficients.

The model includes several country, firm, and manager controls that might affect reticence. First, we include country-year dummies (α_j) to allow reticence to vary between countries and over time within countries. We do this because the share of reticent respondents varies across countries and within countries over time (see Table 2). Differences between countries might be due to differences in culture or institutions. Changes in political leadership, campaigns against corruption or tax evasion, and economic concerns might mean reticence varies between surveys within countries. Second, we include several firm and manager-level controls (x_{ij}), including size, foreign ownership, government ownership, and export status. These characteristics might affect how often the firm meets with government agencies and, therefore, affect the respondent's willingness to admit to questionable behavior. These controls also include the top manager's experience. Although the top manager does not always complete the survey, the manager might affect firm culture and, therefore, the respondent's reticence.

Table 4. Effect of gender on reticence, all firms.

Column	(1)	(2)	(3)
Dependent Variable	**Respondent was reticent**		
Gender			
Owner is female (dummy)	0.054**		
	(2.00)		
Top Manager is female (dummy)		0.010	
		(0.29)	
Respondent is female (dummy)			0.060
			(1.25)
Firm and manager controls			
Top Manager's Experience (years, nat. log)	0.081***	0.084***	0.071***
	(5.13)	(5.33)	(4.18)
Number of workers (nat. log)	-0.012	-0.012	-0.016*
	(-1.34)	(-1.34)	(-1.69)
Age of firm (nat. log)	0.020	0.020	0.046***
	(1.30)	(1.30)	(2.74)
Firm is foreign owned (dummy)	0.120*	0.117*	0.136**
	(1.76)	(1.73)	(1.97)
Firm is government owned (dummy)	0.110	0.101	0.120
	(1.25)	(1.15)	(1.35)
Firm exports (dummy)	0.022	0.026	0.024
	(0.70)	(0.85)	(0.77)
Constant	-0.113**	-0.116**	-0.140**
	(-2.23)	(-2.27)	(-2.49)
Observations	17,690	17,742	12,894
Country Dummies	Yes	Yes	Yes
Pseudo R-Squared	0.136	0.136	0.0937

Source: Author's calculations based upon data from the World Bank Enterprise Surveys.
Note: T-statistics in parentheses. All regressions include country dummies. The dependent variable is a dummy variable showing that the respondent was reticent. Because the dependent variable is a dummy variable, we estimate the model as a probit model. Surveys from Nigeria in 2007 and 2009 are excluded from regressions that include gender of recipient. Survey from Sri Lanka is excluded from regressions that include gender of owner or top manager. These exclusions are due to unavailability of information in the relevant surveys. ***, **, and * statistically significant at the 1%, 5%, and 10% significance levels, respectively.

V. Econometric results

Table 4 displays estimates from models with samples that include all firms. The dependent variable is a dummy showing the respondent is reticent. A positive coefficient, therefore, means increasing the independent variable increases the likelihood of the person being reticent. For example, a positive coefficient on the female respondent dummy would mean women are more reticent than men, on average.

Because female respondents are more common among firms owned and managed by women, especially for small firms, it is difficult to show the three dummies' distinct effects. We, therefore, first include the three dummies separately and then include them simultaneously as a robustness check.

Main results

Effect of gender on reticence
The manager, owner, and respondent dummies have positive coefficients, suggesting women and people working for female-managed and -owned firms are more reticent than others (see Table 4). However, only the ownership dummy's coefficient is statistically significant. Moreover, the differences between female- and male-owned firms are modest. The average likelihood the respondent is reticent is 38.1 percent for female-owned firms compared with 36.3 percent for male-owned firms.[28] For female- and male-managed firms, the average estimated likelihoods are 36.9 and 36.6 percent. For female and male respondents, they are 46.8 and 44.7 percent.[29]

Effect by firm size
We next analyze small, medium-sized, and large firms separately. Female owners and managers might influence firm culture more in small, tightly held firms than in large firms with diverse ownership and large management teams. Female respondents might also, on average, be more influential in small firms. For example, managers of small firms might be less likely to appoint alternate respondents than managers of large firms with many professional staff and mid-level managers reporting to them. Consistent with this, female interviewees were more common in small female-managed and -owned firms than in comparable large firms. Similarly, small female-owned firms were more likely to have women as their top managers.

The results are more robust for small firms; all three dummies' coefficients are positive and significant. The estimated average likelihood the respondent would be reticent was 35.7 percent for small female-owned firms, but only 32.1 percent for small male-owned firms. For female- and male-managed small firms, the average estimated likelihoods were 35.1 percent and 32.4 percent. For female and male respondents, they were 49.2 percent and 44.8 percent.

In contrast, the dummies' coefficients were often negative and usually insignificant for medium-sized and large firms. Only one coefficient was significant for medium-sized firms; respondents were more reticent when their firm's top manager was a woman. For large firms, the only significant coefficient was negative. Overall, the results do not support the idea that people working for medium-sized and large firms with women in positions of power are more reticent than those working for other firms.

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[28] We first set the female-ownership dummy to one for all respondents, and then we calculate the estimated probability that each respondent is reticent using the estimated coefficients. To calculate the average, we take a simple mean across all respondents. We then repeat the procedure assuming all firms are male-owned by setting the ownership dummy to zero for all firms.

[29] The higher likelihood for female and male respondents than for female- and male-managed firms and female- and male-owned firms is due to different samples in these regressions. The samples differ because we must omit countries where the surveys did not collect information on female owners, managers, and respondents in the respective regressions (see Table 1).

Robustness checks

Because most of the gender dummies' coefficients are insignificant for medium-sized and large firms (see Table 5), we focus on small firms when checking robustness. The Appendix includes comparable results for medium-sized and large firms for completeness.

Regression including all three dummies
As discussed earlier, the high correlation between the three dummies makes it challenging to include all three in one regression. The main results, therefore, include separate regressions for each dummy. Including the dummies separately, however, makes it hard to work out their distinct effects. Therefore, we present a single regression that includes all three dummies as a robustness check (see Column 1 in Table 6). We focus on small firms because the main results were significant and consistent for only these firms.[30]

Only the ownership dummy's coefficient is significant when we include all three.[31] Although the results suggest interviewees at small firms are more reticent when the owners include women, they also imply women and men are similarly reticent and the manager's gender is unimportant. The more robust results for ownership are consistent with the earlier analysis. The ownership dummy has the only significant coefficient for the full sample and the most significant coefficient for small firms. However, this result is puzzling; although the interviewee's gender affects reticence directly, the owner's gender does so only indirectly.

Regressions including 'do not knows'
Some respondents refused to answer, said they did not know, or gave invalid responses to questions about gender. We drop these observations in the main analysis. In this section, we check robustness for small firms by adding dummies showing the respondent gave an alternate response. Because all respondents at small firms answered 'male' or 'female' when asked about their gender, we cannot include the extra dummy in the respondent regression (see Column 4 in Table 6).[32]

Including these dummies does not affect the earlier results (see Columns 2 through 4 in Table 6); the gender dummies' coefficients remain positive and significant. In contrast, the extra dummies' coefficients are insignificant. These results, therefore, support the main results.

Regressions interacting the respondent dummy with other dummies
As an extra robustness check, we interact the respondent dummy with the manager and owner dummies. We want to see whether the owners' and managers' gender affect male and female respondents differently.

The results are ambiguous when we interact the female owner and respondent dummies. The only significant coefficient is for female respondents at female-owned firms (see Column 5 in Table 6). Because the omitted category is male interviewees at male-owned firms, this means female interviewees at female-owned firms are more reticent than male interviewees at male-owned firms. We do not, however, find significant differences between male and female respondents at male-owned firms.[33] Similarly, we do not find significant differences between male

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[30] Answers for medium-sized and large firms are available in the Appendix.

[31] As shown in the Appendix, the results for medium-sized and large firms are also mixed.

[32] Although some respondents gave other answers (see Section III), none remained after we dropped observations for other reasons.

[33] That is, we cannot reject the null hypothesis that male and female respondents at male-owned firms are equally reticent. The $\chi^2(1) = 0.12$ with a p-value of 0.72.

Table 5. Effect of gender on reticence by firm size.

Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Small (20 or fewer workers)			**Medium-sized (21 to 50 workers)**			**Large (More than 50 workers)**		
Dependent Variable	**Respondent was reticent**								
Gender									
Owner is female (dummy)	0.119***			0.029			-0.057		
	(3.09)			(0.50)			(-1.09)		
Top manager is female (dummy)		0.088**			0.160**			-0.245***	
		(1.97)			(2.10)			(-3.72)	
Respondent is female (dummy)			0.125*			-0.020			0.007
			(1.80)			(-0.19)			(0.08)
Firm and manager controls									
Manager's experience (years, nat. log)	0.088***	0.092***	0.086***	0.022	0.026	-0.025	0.154***	0.147***	0.143***
	(3.87)	(4.04)	(3.35)	(0.72)	(0.84)	(-0.75)	(4.84)	(4.65)	(4.51)
Number of workers (nat. log)	0.008	0.007	-0.021	0.025	0.024	0.017	0.043*	0.046**	0.046**
	(0.31)	(0.28)	(-0.58)	(0.31)	(0.29)	(0.19)	(1.84)	(1.98)	(1.99)
Age of firm (nat. log)	-0.014	-0.015	0.016	-0.004	-0.004	0.026	0.095***	0.096***	0.092***
	(-0.61)	(-0.65)	(0.64)	(-0.14)	(-0.12)	(0.77)	(3.18)	(3.23)	(3.09)
Firm is foreign owned (dummy)	0.188	0.185	0.167	-0.010	-0.016	-0.017	0.156	0.148	0.198**
	(1.49)	(1.48)	(1.30)	(-0.06)	(-0.11)	(-0.11)	(1.58)	(1.51)	(2.01)
Firm is government-owned (dummy)	0.044	0.047	0.059	-0.065	-0.031	-0.030	0.324**	0.251	0.344**
	(0.33)	(0.35)	(0.44)	(-0.30)	(-0.14)	(-0.14)	(2.02)	(1.63)	(2.09)
Firm exports (dummy)	0.034	0.042	0.053	-0.130**	-0.139**	-0.138**	0.063	0.067	0.052
	(0.61)	(0.75)	(0.93)	(-2.00)	(-2.13)	(-2.10)	(1.34)	(1.42)	(1.11)
Constant	-0.087	-0.083	-0.082	0.022	0.010	0.078	-0.815***	-0.797***	-0.809***
	(-1.06)	(-1.02)	(-0.74)	(0.07)	(0.03)	(0.24)	(-5.75)	(-5.64)	(-5.71)
Observations	9,532	9,536	5,671	4,098	4,107	3,283	4,060	4,099	3,940
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R-Squared	0.153	0.152	0.101	0.129	0.130	0.0987	0.101	0.103	0.0931

Source: Author's calculations based upon data from the World Bank Enterprise Surveys.

Note: T-statistics in parentheses. All regressions include country dummies. Small firms have 20 or fewer employees, medium-sized firms have between 21 and 50 workers employees, and large firms have more than 50 employees. The dependent variable is the number of 'no' responses, with higher values showing that the respondent was reticent. Although the dependent variable is a count variable, we estimate the model as an ordered probit model. Surveys from Nigeria in 2007 and 2009 are excluded from regressions that include gender of recipient. Survey from Sri Lanka is excluded from regressions that include gender of owner or top manager. These exclusions are due to unavailability of information in the relevant surveys. ***, **, and * statistically significant at the 1%, 5%, and 10% significance levels, respectively.

Table 6. Robustness checks for small firms only.

Column Number	1	2	3	4	5	6
Regression	All 3 Dummies	Don't knows included			Owner interactions	Manager interactions
Gender						
Owner is female (dummy)	0.110*	0.119***				
	(1.95)	(3.10)				
Top manager is female (dummy)	-0.100		0.088**			
	(-1.21)		(1.97)			
Respondent is female (dummy)	0.120			0.125*		
	(1.43)			(1.80)		
Don't know gender of owner (dummy) [a]		-0.053				
		(-0.37)				
Don't know gender of manager (dummy) [a]			-0.039			
			(-0.27)			
Don't know gender of respondent (dummy) [a][b]				---		
				(---)		
Interactions [c]						
Male manager/owner and female respondent					0.036	0.084
					(0.35)	(0.80)
Female manager/owner and male respondent					0.072	-0.081
					(1.24)	(-0.83)
Female manager/owner and female respondent					0.188**	0.116
					(2.11)	(1.32)
Observations	5,399	9,655	9,655	5,671	5,408	5,412
Firm and manager controls	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R-Squared	0.0839	0.153	0.153	0.101	0.0835	0.0834

Source: Author's calculations based upon data from the World Bank Enterprise Surveys.

Note: T-statistics in parentheses. All regressions include country dummies and controls from Table 4. Small firms have 20 or fewer employees. The dependent variable is the number of 'no' responses, with higher values showing that the respondent was reticent. Don't know includes invalid codes, 'don't know', 'refused to answer', and other responses other than male or female. Surveys from Nigeria in 2007 and 2009 are excluded from regressions that include gender of recipient. Survey from Sri Lanka is excluded from regressions that include gender of owner or top manager. These exclusions are due to unavailability of information in the relevant surveys. [a] Don't know includes answers of 'don't know', 'refused to answer', not applicable, and other missing codes. [b] There was no missing data for respondents' gender for small firms. [c] Missing category is male manager or owner and male respondent. ***, **, and * statistically significant at the 1%, 5%, and 10% significance levels, respectively.

and female respondents at female-owned firms.[34] We also do not find significant differences between female respondents at male- and female-owned firms or between male respondents at male- and female-owned firms.[35] Thus, although these results suggest differences between men and women, we cannot attribute these differences unambiguously to the owners' or respondents' gender.

We also find ambiguous results when we interact the manager and respondent dummies (see Column 6 in Table 6). All coefficients are insignificant, suggesting the other groups act like male interviewees at male-owned firms. In fact, we do not find any differences across the various groups.[36] These results, therefore, do not resolve whether the manager's or respondent's gender affects reticence more.

VI. Conclusions and discussion

Consistent with single-country studies (Azfar and Murrell 2009; Clausen and others 2010), we find women and men are equally reticent in the full sample. Moreover, we find interviewees were no more reticent when they had a female manager than when they had a male manager. The only gender-related difference we find is between male- and female-owned firms; interviewees were more reticent at female-owned firms than male-owned firms.

Although we did not find consistent differences between men and women in the full sample, there were differences at small firms. Women were more reticent than men at small firms, and interviewees were more reticent in female-managed and -owned small firms than other small firms. In contrast, we do not find consistent gender-related differences at medium-sized and large enterprises. The different results could reflect that female managers and owners—and possibly female participants—influence firm culture more at small firms than at big corporations. In addition, women working at small firms might worry more about anonymity than women at large firms.

Overall, the results suggest reticence cannot fully explain why more women deny paying bribes than men. Although women are no more reticent than men at medium-sized and large firms, they claim their firms pay fewer bribes.[37] The same holds for respondents at medium-sized and large female-owned and -managed firms. The non-result for larger firms suggests reticence does not fully account for past results linking gender and corruption.[38]

Although the results link reticence to gender at small firms, they do not clearly show how they are linked. As noted, the three gender dummies are strongly correlated at small firms. When the regression includes a single gender dummy, the dummy's coefficient is always significant whether

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[34] Similarly, we cannot reject the null hypothesis that male and female respondents at female-owned firms are equally reticent. The $\chi^2(1) = 1.30$ with a p-value of 0.25.

[35] We cannot reject the null hypothesis that female respondents are equally reticent at male- and female-owned firms ($\chi^2(1) = 1.41$ with a p-value of 0.23). Similarly, we cannot reject the null hypothesis that male respondents are equally reticent at male- and female-owned firms ($\chi^2(1) = 1.55$ with a p-value of 0.21).

[36] For female managers, we cannot reject the null hypothesis that male and female respondents are equally reticent ($\chi^2(1) = 2.86$ with a p-value of 0.13). The results are similar for male and female respondents at firms with male managers ($\chi^2(1) = 0.63$ with a p-value of 0.43). The results are similar for female respondents at male and female managed firms ($\chi^2(1) = 0.06$ with a p-value of 0.80) and male respondents at male and female managed firms ($\chi^2(1) = 0.69$ with a p-value of 0.41).

[37] See Breen and others (2017) and Clarke (2021) for corruption and gender within firms.

[38] Further, reticence cannot account for country-level and experimental results linking corruption and gender.

it stands for female owners, managers, or interviewees. When the regression includes all dummies simultaneously, only the owner dummy's coefficient is significant.[39] These results suggest female owners are more strongly linked with reticence than female managers or interviewees.

It is unclear why the owner's gender affects reticence more than the participant's or top manager's. Whereas the participant's gender affects their response directly, the owner's gender does so indirectly. Further, it is unclear why owners affect firm culture more than managers. Further research on how owners, managers, and interviewees affect reticence would be helpful.

One drawback of using reticence to proxy for misreporting is that it does not measure misreporting directly. Although female and male interviewees at medium-sized and large firms are equally reticent, they might misreport bribes for reasons other than reticence. We cannot know that reticent men and women misreport bribes to the same degree. Similarly, non-reticent men and women might also misreport bribe payments to different degrees. Future research could focus on different measures of misreporting.

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[39] Similarly, when we interact the ownership and manager dummies with the respondent dummies, the main difference is between firms with female owners and respondents and firms with male owners and respondents.

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Appendix

Table A1. Sensitive questions used to find reticent respondents.

Question	Random response questions
1	Have you ever paid less in personal taxes than you should have under the law?
2	Have you ever paid less in business taxes than you should have under the law?
3	Have you ever made a misstatement on a job application?
4	Have you ever inappropriately promoted an employee for personal reasons?
5	Have you ever deliberately not given your suppliers or clients what was due to them?
6	Have you ever inappropriately hired a staff member for personal reasons?
7	Have you ever unfairly dismissed an employee for personal reasons?

Source: Questionnaire for the World Bank Enterprise Survey.

Table A2. Effect of gender on number of responses of 'no', all firms.

Column	(1)	(2)	(3)
Dependent Variable	**Number of no responses (more means more reticent)**		
Observations	17,690	17,742	12,894
Country Dummies	Yes	Yes	Yes
Gender			
Owner is female (dummy)	0.075***		
	(3.47)		
Top manager is female (dummy)		0.047*	
		(1.87)	
Respondent is female (dummy)			0.055
			(1.39)
Firm and manager controls			
Top manager's experience (years, nat. log)	0.041***	0.044***	0.032**
	(3.20)	(3.45)	(2.24)
Number of workers (nat. log)	-0.006	-0.006	-0.012
	(-0.78)	(-0.81)	(-1.56)
Age of firm (nat. log)	0.025**	0.025*	0.051***
	(1.97)	(1.95)	(3.60)
Firm is foreign owned (dummy)	0.074	0.076	0.079
	(1.31)	(1.37)	(1.39)
Firm is government owned (dummy)	0.187**	0.181**	0.183**
	(2.42)	(2.39)	(2.32)
Firm exports (dummy)	-0.013	-0.007	0.004
	(-0.51)	(-0.26)	(0.17)
Pseudo R-Squared	0.0597	0.0596	0.0431

Source: Author's calculations based upon data from the World Bank Enterprise Surveys.
Note: T-statistics in parentheses. All regressions include country dummies. The dependent variable is a dummy variable showing that the respondent was reticent. Because the dependent variable is a dummy variable, we estimate the model as a probit model. Surveys from Nigeria in 2007 and 2009 are excluded from regressions that include gender of recipient. Survey from Sri Lanka is excluded from regressions that include gender of owner or top manager. These exclusions are due to unavailability of information in the relevant surveys. ***, **, and * statistically significant at the 1%, 5%, and 10% significance levels, respectively.

Table A3. Effect of gender on number of responses of 'no' by firm size.

Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Small (20 or fewer workers)			**Medium-sized (21 to 50 workers)**			**Large (More than 50 workers)**		
Dependent Variable	**Number of no responses (more means more reticent)**								
Observations	9,532	9,536	5,671	4,098	4,107	3,283	4,060	4,099	3,940
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gender									
Owner is female (dummy)	0.145***			0.007			-0.027		
	(4.93)			(0.15)			(-0.62)		
Top manager is female (dummy)		0.147***			0.035			-0.200***	
		(4.48)			(0.56)			(-3.77)	
Respondent is female (dummy)			0.118**			-0.027			0.003
			(2.07)			(-0.31)			(0.04)
Firm and manager controls									
Manager's experience (years, nat. log)	0.046**	0.051***	0.041*	-0.008	-0.008	-0.044	0.097***	0.093***	0.088***
	(2.56)	(2.79)	(1.87)	(-0.32)	(-0.30)	(-1.56)	(3.76)	(3.61)	(3.36)
Number of workers (nat. log)	0.021	0.022	0.002	0.017	0.010	0.034	0.022	0.025	0.025
	(1.16)	(1.21)	(0.06)	(0.25)	(0.15)	(0.45)	(1.13)	(1.28)	(1.28)
Age of firm (nat. log)	0.003	0.001	0.043*	0.017	0.018	0.033	0.082***	0.080***	0.080***
	(0.14)	(0.08)	(1.95)	(0.63)	(0.67)	(1.12)	(3.29)	(3.26)	(3.21)
Firm is foreign owned (dummy)	0.243**	0.230**	0.211*	-0.020	0.008	-0.047	0.059	0.059	0.099
	(2.23)	(2.12)	(1.89)	(-0.16)	(0.07)	(-0.37)	(0.74)	(0.74)	(1.24)
Firm is government owned (dummy)	0.019	0.028	0.019	0.184	0.175	0.210	0.315**	0.279**	0.334**
	(0.16)	(0.23)	(0.16)	(1.01)	(0.97)	(1.12)	(2.26)	(2.13)	(2.28)
Firm exports (dummy)	0.059	0.070	0.095*	-0.093*	-0.097*	-0.097*	-0.031	-0.025	-0.029
	(1.22)	(1.47)	(1.94)	(-1.73)	(-1.80)	(-1.80)	(-0.80)	(-0.64)	(-0.75)
Pseudo R-Squared	0.0603	0.0601	0.0440	0.0566	0.0571	0.0425	0.0526	0.0534	0.0477

Source: Author's calculations based upon data from the World Bank Enterprise Surveys.

Note: T-statistics in parentheses. All regressions include country dummies. Small firms have 20 or fewer employees, medium-sized firms have between 21 and 50 workers employees, and large firms have more than 50 employees. The dependent variable is the number of 'no' responses, with higher values showing that the respondent was reticent. Although the dependent variable is a count variable, we estimate the model as an ordered probit model. Surveys from Nigeria in 2007 and 2009 are excluded from regressions that include gender of recipient. Survey from Sri Lanka is excluded from regressions that include gender of owner or top manager. These exclusions are due to unavailability of information in the relevant surveys. ***, **, and * statistically significant at the 1%, 5%, and 10% significance levels, respectively.

Table A4. Robustness checks for medium-sized firms.

Column Number	1	2	3	4	5	6
Regression	All 3 Dummies	Don't knows included			Owner interactions	Manager interactions
Gender						
Owner is female (dummy)	-0.042	0.029				
	(-0.63)	(0.49)				
Top manager is female (dummy)	0.169*		0.159**			
	(1.76)		(2.08)			
Respondent is female (dummy)	-0.057			-0.020		
	(-0.51)			(-0.19)		
Don't know gender of owner (dummy) [a]		0.168				
		(1.02)				
Don't know gender of manager (dummy) [a]			0.303*			
			(1.76)			
Don't know gender of respondent (dummy) [a][b]				1.179		
				(1.55)		
Interactions [c]						
Male manager/owner and female respondent					0.015	-0.121
					(0.12)	(-0.92)
Female manager/owner and male respondent					-0.011	0.111
					(-0.16)	(1.04)
Female manager/owner and female respondent					-0.052	0.166
					(-0.29)	(1.04)
Observations	3,192	4,180	4,180	3,286	3,194	3,201
Firm and manager controls	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R-Squared	0.0902	0.128	0.129	0.0987	0.0895	0.0905

Source: Author's calculations based upon data from the World Bank Enterprise Surveys.
Note: T-statistics in parentheses. All regressions include country dummies and controls from Table 4. Regressions include only medium-sized firms with between 21 and 50 workers. The dependent variable is the number of 'no' responses, with higher values showing that the respondent was reticent. Don't know includes invalid codes, 'don't know', 'refused to answer', and other responses other than male or female. Surveys from Nigeria in 2007 and 2009 are excluded from regressions that include gender of recipient. Survey from Sri Lanka is excluded from regressions that include gender of owner or top manager. These exclusions are due to unavailability of information in the relevant surveys. [a] Don't know includes answers of 'don't know', 'refused to answer', not applicable, and other missing codes. [b] There was no missing data for respondents' gender for small firms. [c] Missing category is male manager or owner and male respondent. ***, **, and * statistically significant at the 1%, 5%, and 10% significance levels, respectively.

Table A5. Robustness checks for large firms.

Column Number	1	2	3	4	5	6
Regression	All 3 Dummies	Don't knows included			Owner interactions	Manager interactions
Gender						
Owner is female (dummy)	-0.009	-0.057				
	(-0.16)	(-1.08)				
Top manager is female (dummy)	-0.238***		-0.245***			
	(-3.39)		(-3.71)			
Respondent is female (dummy)	0.071			0.007		
	(0.76)			(0.08)		
Don't know gender of owner (dummy) [a]		-0.205				
		(-1.27)				
Don't know gender of manager (dummy) [a]			-0.267			
			(-1.13)			
Don't know gender of respondent (dummy) [a][b]				---		
				(---)		
Interactions [c]						
Male manager/owner and female respondent					0.046	0.076
					(0.43)	(0.70)
Female manager/owner and male respondent					-0.048	-0.246***
					(-0.86)	(-3.41)
Female manager/owner and female respondent					-0.083	-0.222
					(-0.54)	(-1.38)
Observations	3,792	4,151	4,151	3,940	3,793	3,827
Firm and manager controls	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R-Squared	0.0906	0.103	0.105	0.0931	0.0883	0.0903

Source: Author's calculations based upon data from the World Bank Enterprise Surveys.
Note: T-statistics in parentheses. All regressions include country dummies and controls from Table 4. Regressions include only large firms with more than 50 workers. The dependent variable is the number of 'no' responses, with higher values showing that the respondent was reticent. Don't know includes invalid codes, 'don't know', 'refused to answer', and other responses other than male or female. Surveys from Nigeria in 2007 and 2009 are excluded from regressions that include gender of recipient. Survey from Sri Lanka is excluded from regressions that include gender of owner or top manager. These exclusions are due to unavailability of information in the relevant surveys. [a] Don't know includes answers of 'don't know', 'refused to answer', not applicable, and other missing codes. [b] There was no missing data for respondents' gender for small firms. [c] Missing category is male manager or owner and male respondent. ***, **, and * statistically significant at the 1%, 5%, and 10% significance levels, respectively.