Evidence on Gender and Corruption from Firm-Level Panel Data

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Cross-sectional studies have found firms owned and managed by women report paying fewer, and lower, bribes than similar firms owned and managed by men. These studies often suggest the reason firms controlled by women report paying fewer bribes than firms controlled by men is that women discourage their firms from doing so when they can. Unobserved firm characteristics, however, might affect both who runs the firm and the firm's vulnerability to bribe requests. To test whether the earlier cross-sectional results are robust, we estimate firm-level fixed effects regressions using panel data from the World Bank Enterprise Surveys (WBES). We find that although including firm-level fixed effects weakens the results, some continue to suggest gender and corruption are linked. The strongest results, however, are for respondents rather than top managers and owners. This finding is puzzling because owners and top managers should influence firm culture and behavior more than the lower-level managers and professionals who frequently act as respondents. One possible explanation is that women misreport bribes more than men when acting as the respondent.

I. Introduction

Earlier firm-level studies using cross-sectional data have linked gender to corruption, mostly finding that firms controlled by women are less likely to be involved in corruption than other firms. Breen and others (2017) show that firms owned by women report paying lower bribes than firms owned by men. Similarly, Swamy and others (2001) show firms managed and owned by women paid fewer bribes than other firms. Some studies, however, have found conflicting results. Most notably, although Pavlik and Bastos (2023) find firms managed by women pay lower bribes and are less concerned about corruption than other firms, they find the opposite for firms owned by women.[2] Individual-level studies have also linked gender and corruption; Mocan (2008), for example, finds women are less likely to report that officials have asked them for bribes than are men.

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[2] They also disaggregate their sample in various ways, arguing that corruption might affect women-controlled firms differently in different countries. Based on this, they find corruption is more harmful to women in countries that have greater gender inequality. Pavlik and Bastos (2023) use the World Bank Enterprise Surveys, the same data as Breen and others (2017) and this paper. Their sample, however, is larger than Breen and others (2017) because they include surveys conducted after Breen and others' (2017) sample ends. Their sample is also much larger than this paper's sample because they include all firms, not just panel firms.

Firms controlled by women might be less likely to report paying bribes because these firms behave differently than other firms. Probably the most common explanation for the difference between firms controlled by women and men is women disapprove of corruption more strongly than men and, therefore, foster firm cultures opposed to bribery.[3] Consistent with this, fewer women say it is acceptable to pay bribes than men.[4] Women might avoid paying bribes because they are more public-minded, ethical, risk-averse, or law-abiding than men.[5]

Alternatively, women might be less likely to pay bribes because officials treat firms controlled by women differently than firms controlled by men. Officials might treat women differently from men because of cultural norms. For example, if officials believe women are more honest than men, and thus more likely to report them, they might avoid taking bribes from firms controlled by women. Alternatively, officials might demand higher bribes from firms owned by women if they want to discriminate against them.

The preceding two explanations assume people honestly report paying bribes. As with other sensitive survey questions, however, people might not answer questions about corruption truthfully.[6] If women misreport bribe payments more frequently than men, then they would report paying fewer bribes than men even if men and women behave similarly. Women might misreport bribes more frequently if, on average, they worry more about giving socially desirable answers than men.[7]

This paper contributes to the literature on gender and bribe payments in two ways. First, the paper explores whether the relationship between gender and corruption is due to omitted firm characteristics that affect bribes as well as ownership and control. For example, firms facing heavier regulatory burdens and firms that receive government contracts might pay more bribes than other firms because they meet with government officials more frequently. But firms heavily reliant on government agencies might prefer well-connected owners and managers to help them navigate the bureaucracy. If, on average, women in developing countries have less political influence than similar men, they might manage and own these firms less frequently than men.[8] We do this using Chamberlain's (1980) conditional logit model to control for fixed firm-level effects. We find that unobserved firm characteristics do not fully explain the link between gender and corruption. Some coefficients on gender stay negative and statistically significant even after controlling for firm-level fixed effects.

Second, the paper compares how the top manager, owner, and respondent affect reported bribes, possibly giving information about the relationship between gender and corruption. We find that although firms owned and managed by women report paying fewer bribes than other firms, the coefficients become statistically insignificant after including firm-level fixed effects. In contrast, the respondent dummy's coefficient stays negative and statistically significant. Further,

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[3] See, for example, Dollar and others (2001), Swamy and others (2001), or Breen and others (2017).

[4] Using data from the World Values Survey, Swamy and others (2001) and Torgler and Valev (2010) show that women are less likely to say accepting bribes is appropriate.

[5] See Croson and Gneezy (2009) and Shurchkov and Eckel (2018) on the mixed evidence related to public-mindedness. See O'Fallon and Butterfield (2005) on ethics and Shurchkov and Eckel (2018) or Croson and Gneezy (2009) for stronger evidence on risk aversion.

[6] Tourangeau and Yan (2007) discuss misreporting in response to sensitive survey questions in general. Several papers discuss ways of identifying individuals who misreport bribes and ways to mitigate misreporting. See, for example, Iarossi (2006), Recanatini and others (2000), or Azfar and Murrell (2009).

[7] Studies have found social desirability concerns women more than it concerns men in other contexts (Bernardi and others 2009; Bossuyt and Van Kenhove 2018; Dalton and Ortegren 2011).

[8] Although controlling for industry might partly control for these differences, this might do so imperfectly if regulations and opportunities for contracts differ within industries.

the respondent's gender affects bribes more than the manager's and owner's gender whether the regression includes firm-level fixed effects or not.

The stronger results for respondents than for managers and owners would be puzzling if women prevented bribe payments through their effect on firm culture or behavior. Although respondents are usually managers or professionals, they are frequently not the top manager or owner. Top managers and owners should, therefore, affect bribes more than respondents if they affect bribes through firm culture or behavior. On the other hand, if gender affects reported bribe payments because it affects misreporting, we might expect the respondent's gender to affect reported payments more than the manager's or owner's gender.

II. Effect on Gender and Corruption

The idea that women are less prone to give and take bribes than men is not new. Among suffragists' arguments for giving women the right to vote was that doing so would help clean up the notoriously corrupt politics of the late 19th and early 20th century United States (Dumenil 2007; Mintz 2007). Similarly, some people argued that increasing women's participation in government would also reduce corruption. For example, Gordon (2017, 117) writes: "[Daisy Barr] campaigned to have a woman added to the Indianapolis police force—a typical Progressive era cause motivated by the belief that women were less corrupt and harder on moral offenses than men." This belief remains common today. For example, local governments in Lima and Mexico City staffed their traffic police entirely or mostly by women in the late 1990s to reduce corruption (Swamy and others 2001).

In the early 2000s, two studies using country-level data explored the relationship between gender and corruption (Dollar and others 2001; Swamy and others 2001). Both found corruption was lower in countries where women held greater political or economic power. Although later country-level studies questioned their results, the papers remain influential.[9]

Some experimental studies support the country-level studies' empirical findings.[10] Most experiments involve two players: the first playing a firm and the second playing a public official.[11] Although details vary across experiments, the person playing the firm can usually increase their earnings by offering the person playing the public official a side-payment. If the person playing the firm offers a bribe, the person playing the public official must decide whether to accept it and whether to reward the bribe-giving firm. To discourage bribe-taking and giving, some experiments randomly punish some corrupt firms and officials. Other experiments punish innocent third parties if the corrupt transaction occurs. In a recent literature survey, Chaudhuri (2012, 13) concluded: "across a wide variety of experiments, studying different aspects of corruption, it is either the case that women behave in a more pro-social and less corrupt manner than men or that there were no significant gender differences." Frank and others (2011) find similar results. The experimental evidence, however, does not unambiguously support the hypothesis; differences are often

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[9] According to Google Scholar, both papers have been cited over 1000 times. Recent studies that have questioned the robustness of their results include Sung (2003), which found the correlations become insignificant after controlling for democratic rights, and Debski and others (2018), which found controlling for culture also weakened the relationship.

[10] Chaudhuri (2012) and Frank and others (2011) provide excellent surveys of the experimental literature on corruption and gender. Armantier and Boly (2013) discuss the external validity of these experiments.

[11] In most, but not all, games, the two players are university students rather than actual firm owners and government officials.

statistically insignificant. For example, women were significantly less likely to offer bribes in only two of seven experiments and to take bribes in only two of eight experiments covered in Chaudhuri's (2012) survey.[12]

Micro-level evidence on gender and corruption

Several studies have explored the relationship between gender and corruption using micro-level data, with results that mostly support the country-level and experimental studies.[13] Studies using individual or household-level data have found women are less likely to report paying—or being asked for—bribes than men (Justesen and Bjornskov 2014; Mocan 2008; Oliveros and Gingerich 2020). Similarly, some studies have found firms are less likely to report paying bribes when women own or control them (Breen and others 2017; Clarke 2021; Swamy and others 2001). One notable exception is Pavlik and Bastos (2023), which found that women-owned firms paid higher bribes and were more concerned about corruption than other firms, especially in countries with greater gender inequality. In contrast, they found firms managed by women paid lower bribes and were less concerned about corruption than other firms.

We can explain the micro-level evidence in several ways. First, women might report paying fewer bribes than men because women are less willing to pay bribes than men. They might, therefore, not offer bribes to corrupt officials, refuse to pay bribes when officials demand them, or avoid situations where officials demand bribes. Second, corrupt officials might treat women differently than men, resulting in them demanding fewer bribes from women. Officials might do so if they believe women are more likely to report them. Finally, women might bribe officials as often as men, but deny doing so more frequently during surveys. Women might lie about paying bribes, for example, if they are more sensitive about the social desirability of bribing officials. We discuss the empirical evidence for each explanation in the following sections.

Are women less willing to pay bribes than men?

The simplest way to explain why women are less likely to report paying bribes than men is that women try harder to avoid paying bribes.[14] They might do so by avoiding situations where they need to pay bribes or they might refuse to pay when officials demand bribes.[15] If women take more steps to avoid paying bribes, we might observe women paying fewer and lower bribes than men.

If women try harder to avoid paying bribes than men, an obvious question is why they do. One possibility is women disapprove of corruption more than men. Empirical evidence supports this idea; when asked about corruption, women are more likely to condemn it than men. Using data

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[12] The fifteen experiments were from five studies, most of which contained both bribe givers and bribe takers. One study had experiments in four countries. Chaudhuri (2012) contains only one laboratory experiment where women acted more corruptly than men. Armantier and Boly (2011, 2013) found women in Canada and Burkina Faso were more likely to reciprocate after receiving bribes than men. They also found similar results in a field study. Two other laboratory experiments, however, have found women were less likely to reciprocate than men (Lambsdorff and Frank 2011; Rivas 2013).

[13] Swamy and others (2001) also presented some results from a firm-level survey from Georgia.

[14] Further, it is important to note that even if men and women behave differently, that does not imply any differences are innate. Cultural and societal norms might induce men and women to act differently even if men and women were identical in other ways.

[15] Clarke (2021) finds that firms controlled by women interact with government officials less often than firms controlled by men. In contrast, firms controlled by women do not appear to be any less likely to pay bribes when they do interact with public officials.

from the World Values Survey, Swamy and others (2001) and Torgler and Valev (2010) show women are less likely to say accepting bribes is appropriate. Similarly, Bernardi and others (2009) found fewer women said it was acceptable to bribe police officers to avoid speeding tickets in three of their study's four countries.[16] In contrast, Alhassan-Alolo (2007) found that women working in three public institutions in Ghana had similar views about three hypothetical scenarios involving corruption as men in the same institutions.

A second possibility is that women might avoid paying bribes because they are simply more law-abiding than men. Much evidence supports this assertion. Women accounted for only 27% of arrests in the United States in 2020.[17] As well as committing fewer violent crimes, women also commit fewer non-violent offenses such as writing bad checks, extortion, fraud, burglary, driving under the influence, and drug abuse.[18] Consistent with this, women accounted for only 18% of arrests related to corruption. Similar patterns hold elsewhere; women account for fewer arrests and imprisonments than men in all countries with available data.[19] For example, only 14% of suspected offenders in Europe were women (Aebi and others 2021).[20] Victimization data, self-reports, and police reports show similar patterns as data on arrests and imprisonments (Warr 2002).

A third possibility is that women might avoid paying bribes because the average woman is more risk-averse than the average man.[21] Risk aversion might also explain why women are more law-abiding than men; risk-averse individuals might worry about committing crimes—including bribing public officials—because they fear arrest or imprisonment. Moreover, paying bribes is risky for another reason; bribe-givers cannot be sure bribe-takers will deliver the benefits they promise; and if corrupt officials do not deliver, bribe-givers have little legal recourse. If women are, on average, more risk-averse than men—as observational and experimental studies have found (Croson and Gneezy 2009; Shurchkov and Eckel 2018)—fewer women than men might pay bribes.

A final possibility is women might avoid paying bribes because they have greater public spirit or are more ethical than men. Ethics or public-mindedness might also explain why women commit fewer crimes and condemn corruption more strongly than men. Experimental and empirical studies on public-mindedness and ethics, however, do not strongly support this long-standing belief.[22] Only some studies find women are more public-minded than men (Croson and Gneezy 2009; Shurchkov and Eckel 2018).[23] Similar results hold for ethics; O'Fallon and Butterfield (2005)

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[16] The countries were Ecuador, South Africa, and the United States. In the final country, Colombia, men and women were equally likely to say it was acceptable. They also show that gender differences become insignificant after controlling for social desirability response bias.

[17] Data is from the FBI's Uniform Crime Report website (https://www.fbi.gov/services/cjis/ucr/).

[18] Women accounted for less than half of arrests in 32 of the *Uniform Crime Report*'s 34 categories, with prostitution and embezzlement being the exceptions.

[19] Women make up about 7% of the prison population in countries with available data (Walmsley 2017). In no country did women account for more than 25% of prisoners. For 113 countries with data on arrests, women accounted for only 18.9% of arrests between 2003 and 2020. The highest share was 32%. Data on arrests is based on data from the United Nations Office on Drugs and Crime (https://dataunodc.un.org/). These sources include both developed and developing countries and countries from all regions of the world.

[20] Data are for 2015. In no European country with available data did women account for more than 30% of offenders. Once again, this was also true for non-violent crimes: on average, women made up 21.7% of fraud offenders, 20.6% of forgery offenders, 18.8% of money laundering offenders, and 16.7% of corruption offenders.

[21] Of course, they might be more law abiding because, on average, they are more risk-averse than men. But this is not the only possible explanation.

[22] See above for a discussion of this belief.

[23] For example, experimental studies on cooperation, trust, and public goods give mixed results (Croson and Gneezy 2009; Shurchkov and Eckel 2018).

concluded only about half of empirical studies find significant ethical differences between men and women.[24]

In summary, women might report paying fewer bribes than men because they avoid paying bribes. They might do this because they are more averse to corruption, law-abiding, risk-averse, ethical, or public-minded than men.

Do corrupt officials treat women differently than men?

Although women might report paying fewer bribes than men because they are more averse to corruption, other explanations are possible. Corruption involves two parties—the person paying the bribe and the official taking it. Even if women and men were equally willing to pay bribes, corrupt officials might treat women and men differently, leading to different outcomes.

When thinking about how corrupt officials treat bribe payers, it is useful to distinguish between bribery and extortion.[25] Some people might offer bribes to officials in return for favors. For example, they might offer a bribe to avoid following government regulations, avoid paying taxes, get permits quicker, or win government contracts. We will refer to these cases as bribery. For example, a restaurant might bribe a health inspector to avoid upgrading their facilities. Similarly, a reckless truck driver might bribe a police officer to escape a speeding ticket. In other cases, firms might pay bribes even though they are following relevant rules. We refer to these cases as extortion. For example, the same restaurant might bribe an official who threatens to temporarily shut them down for a non-existent health violation. Similarly, the truck driver might bribe the police officer to avoid made-up charges and long delays at illegal traffic stops.[26]

One reason officials might treat women differently from men is that women might know fewer high-level officials and powerful individuals than men. In countries where discrimination is common, women might find themselves especially disadvantaged. Social connections, however, might affect bribes differently in cases related to bribery and extortion.

People with weak social networks might find it harder to bribe officials to get favorable treatment than people with stronger networks. To mitigate the risks associated with giving and receiving bribes, corrupt officials might only accept bribes from people they know and trust.[27] Although people with access to corruption networks might pay more bribes, they will benefit from improved access to government contracts and fewer bureaucratic entanglements. If women in developing countries, on average, have weaker networks than men, this might limit their opportunities to bribe officials to obtain special favors (Goetz 2007).

Although people who lack social connections to powerful individuals might be unable to access corruption networks, they might face frequent extortionary bribe demands. Although police

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[24] They note, however, that when studies find differences, women are usually more ethical than men.

[25] Several papers discuss the distinction between bribery and extortion. See, for example, Mendez (2014) or Mendez and Sepulveda (2007). This distinction is also related to the distinction between corruption that greases the wheels of bureaucracy rather than puts sand in the wheels. See, for example, Bardhan (1997) or Méon and Sekkat (2005).

[26] The Economist (2002) gives an example of this, describing traveling from Douala to Bertoua in Cameroon in a delivery truck. During the 313-mile trip, police stopped the truck the journalist was traveling in 47 times. Police would often request bribes on made up charges. For example, at one roadblock "[the police officer] invented a new law about carrying passengers in trucks, found the driver guilty of breaking it, and confiscated his license." When the driver objected, the officer responded, "Do you have a gun? I have a gun, so I know the rules."

[27] Consistent with this, Ufere and others (2012) discuss how connectors, often former generals, set up meetings between entrepreneurs and public officials. Similarly, Bertrand and others (2007) discuss how facilitators help people get driving licenses in India.

officers and low-level officials might worry about demanding bribes from well-connected individuals who could complain to the corrupt official's superior, they might worry less about people with weaker networks. If women's social networks are weaker than men's, they might face extortionary demands more frequently than men.

Corrupt officials might also treat women differently from men because they believe men and women are different. Their beliefs could reflect social norms, animus, or their opinions about men's and women's relative willingness to pay bribes.

Unfortunately, little direct evidence on how corrupt officials treat men and women exists. One piece, however, comes from the World Bank Enterprise Surveys (WBES). The WBES asks several questions about bribes during transactions such as tax inspections and license applications. The interviewer first asks whether the firm has recently engaged in the transaction and then asks firms that answer 'yes' whether the official expected or requested a bribe. Because the question asks whether the official expected or requested a bribe, not whether the firm paid a bribe, it should capture the official's behavior if respondents interpret the question as asked. If respondents interpret the question broadly to include cases where the firm offers bribes, the firm's behavior might affect the answer. Based on this question, Clarke (2021) finds firms owned and managed by men and women were equally likely to say officials expected or requested bribes. This might suggest corrupt officials treat firms controlled by men and women similarly.

Although there is little direct information on whether corrupt officials treat men and women differently, other evidence shows people treat men and women differently in situations unrelated to corruption. For example, when people play ultimatum games in laboratory experiments, some players treat men and women differently.[28] Most notably, the first player, whether a man or woman, offers less to the second player when the second player is a woman (Eckel and Grossman 2001; Solnick 2001).[29]

People also treat men and women differently during negotiations over prices and wages. Ayres and Siegelman (1995) ran a field experiment where they sent customers to car dealers to negotiate new car purchases using identical negotiating techniques. They found dealers proposed higher starting prices and gave higher final offers to women and African American customers than they did to white men. Similarly, economists and psychologists suggest negotiations over starting wages might partly explain gaps between men's and women's wages (Bertrand 2011; Mazei and others 2015; Säve-Söderbergh 2019).

Although the evidence related to car sales and starting wages suggests public officials might treat women less favorably than men during negotiations over bribes, the reverse is also possible. One reason they might do so is that they might believe women are less likely to pay bribes than men and more likely to report them. They might believe this if they think that women are more honest than men.[30]

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[28] Ultimatum games are games where two players divide a set amount of money between themselves. Player one offers player two a split, and then player two accepts or rejects the bid. If player two rejects the offer, neither player gets anything. The sub-game perfect Nash equilibrium is for player one to offer the smallest amount possible and player two to accept. Thaler (1988) describes the game and the experimental evidence on how people play the game in laboratory settings.

[29] Although Eckel and Grossman (2001) found women received smaller offers, the difference was statistically insignificant.

[30] For example, both men and women in Spain agreed that public officials who are women are less likely to take bribes (Rivas 2013). In addition, taxi drivers in Colombia reported transit officers who are women were less likely to accept bribes than officers who are men (Lambsdorff and Fink 2006).

Do women misreport bribe payments more often than men?

The earlier explanations assume women report paying fewer bribes than men because they pay fewer bribes. However, women might report paying fewer bribes because they are less truthful about paying them during interviews than men. During surveys, people tend to underreport illegal, immoral, and embarrassing behaviors. For example, studies have found that people lie about having high interest loans, using alcohol and illegal drugs, using birth control, having had an abortion, having gastrointestinal problems, committing crimes, and even listening to soft-rock (Clausen and others 2010; Karlan and Zinman 2008; Preisendörfer and Wolter 2014; Tourangeau and Smith 1996).

Gender differences in reporting also exist. For example, women consistently report fewer opposite-sex partners than men.[31] If women misreport bribes more frequently than men, women would report paying fewer bribes even if they bribed officials as frequently as men. A significant negative coefficient might mean women pay bribes less often than men but might also mean women are more honest about paying them.

The surest way to know whether men and women are equally honest about paying bribes would be to compare what they report paying with what they actually pay. Given corruption's clandestine nature, however, measuring actual bribes is difficult. Unsurprisingly, therefore, we do not know of any studies that have directly compared actual and reported bribes. We must, therefore, rely on indirect evidence.

Although no studies directly compare actual with self-reported corruption, some studies have compared actual and self-reported behavior for other crimes. Using a sample of Dutch men and women convicted of welfare fraud, Van Der Heijden and others (2000) found women were more likely to deny being convicted than men. Similarly, Preisendörfer and Wolter (2014) found German women who had been convicted of minor offenses denied it more often than similar German men. In contrast, Johnson and others (2012) found American women and men were equally likely to misreport cocaine use.[32]

The broad literature on honesty provides additional indirect evidence on whether men and women might answer questions about bribes equally truthfully. 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.*

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[31] Since each sexual encounter between opposite-sex partners involves one man and one woman, we would expect men and women to report similar numbers in a closed population. But this is not the case. For example, based on a sample of UK residents, men reported an average of 14.1 opposite sex partners, while women reported 7.1 (Mitchell and others 2019). Differences in how frequently men and women purchase sex from sex workers—who might be excluded from samples—or how men and women define sexual encounters only partly explain the difference (Wiederman 1997).

[32] Johnson and others (2012) asked people whether they had used cocaine recently. They then tested the respondents' hair, saliva, and urine for recent cocaine use. Their results were based on comparisons between people whose reported use differed from their test results with people whose reported use and test results matched. They found women were neither more nor less truthful than men.

The authors note women are less likely to misrepresent coin tosses, engage in academic dishonesty, keep excessive change, or overstate how many times they solved mathematical problems. Although this evidence does not directly relate to misreporting bribes, women might also be more honest than men when asked whether they pay bribes. If women are more honest, studies using reported bribe payments will over- not underestimate women's relative propensity to pay bribes.

Although the experimental literature on honesty suggests women might answer questions about corruption more honestly than men, indirect evidence about social desirability suggests the opposite. Some studies have found that women are more concerned about giving socially desirable answers to sensitive questions than men (Bernardi and others 2009; Bossuyt and Van Kenhove 2018; Dalton and Ortegren 2011). Concerns about social desirability might cause women to misreport corrupt activities more often than men. Consistent with this, although women were more likely than men to say bribing police officers is wrong, the difference becomes statistically insignificant after controlling for social desirability bias (Bernardi and others 2009).[33]

The literature on reticence supplies more indirect evidence related to misreporting. Although identifying people who misreport bribe payments is difficult, Azfar and Murrell (2009) show how researchers can use forced response questions to identify some of these people. They ask respondents a series of forced response questions and label those who do not follow the instructions as reticent. They then show that reticent respondents are less likely to report paying bribes than other people.[34] They—and later researchers who have used similar methods—interpret their results as suggesting reticent respondents misreport corruption.[35]

If women were more reticent than men—and reticent interviewees underreport bribes—this could explain why women report paying fewer bribes than men. Single country studies, however, found women were no more reticent than men (Azfar and Murrell 2009; Clausen and others 2010). Moreover, Clarke (2020) confirmed this in a larger cross-country study. Clarke (2020) did, however, find interviewees who were women or who worked at small firms managed or owned by women were more reticent than other respondents at small firms. He notes, however, that because women also report paying bribes at large firms, reticence alone is unlikely to explain why women report paying fewer bribes.

A final indirect way to assess whether women misreport bribes more often than men is to see whether techniques that reduce misreporting affect women's answers more than men's.[36] Oliveros and Gingerich (2020) compare how men and women answer direct questions about corruption and similar questions using sensitive survey techniques (SSTs). Based on these comparisons, they estimate men and women lie to similar degrees when asked survey questions directly.[37]

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[33] 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). Using stepwise regression, they find their social desirability index is still in their final model, although gender is not.

[34] Azfar and Murrell (2009) use a sample of individuals from Romania. Other studies have confirmed that reticent people appear to misreport corruption in other countries as well (Clarke and others 2015; Clausen and others 2010; Jensen and Rahman 2011; Karalashvili and others 2015; Kraay and Murrell 2016).

[35] Also consistent with the idea that reticent managers misreport information during surveys, Clarke (2019) attempted to cross-check the managers' answers with other information. The results showed the difference between how much the manager reported paying employees and how much the employees report being paid was larger when the manager was reticent.

[36] Fox and Tracy (1986), Lensvelt-Mulders and others (2005), and Coutts and Jann (2011) describe ways to do this.

[37] Their calculations assume people tell the truth when answering questions that use SSTs. In practice, however, SSTs are only partly effective (John and others 2018). Indeed, the literature on reticence relies on random response models failing to honest answers. If SSTs encourage only some truth telling, interpreting these results is more complicated.

In summary, gender might affect survey respondents' answers in several ways. First, gender might affect how frequently people offer bribes to corrupt officials. Because women disapprove of corruption more than men, they might pay fewer or lower bribes. Second, corrupt officials might treat women differently than men. If they believe women are more honest than men, they might demand fewer bribes from women. Third, even if men and women are equally likely to pay bribes, women might admit doing so less frequently than men. Although the evidence is inconclusive, some studies find women are less candid than men.

III. Data

This study uses data from the World Bank Enterprise Surveys (WBES).[38] The World Bank has used a uniform sampling methodology in over 150 countries since 2006.[39] The central WBES team also standardized the questionnaire in 2006, which meant all countries used the same core survey.[40] Since 2006, the central WBES team has modified the survey several times, mostly by adding and dropping questions on individual topics. Because the questions on gender were not added to the core survey until 2008, we only include surveys conducted after this time.[41]

The WBES covers registered private firms in manufacturing, services, and retail and wholesale trade with at least five employees.[42] Firms are asked questions about their performance and the local business environment, including several questions about corruption.

Although the WBES's main goal is to produce a representative sample of the private sector for each survey, repeated surveys in the same country include panel firms from earlier samples. Unlike a true panel, which would survey the same firms every survey, the WBES randomly re-surveys only some panel firms.[43] Using this data, we put together all possible panels for WBES countries through 2022. Because we want to include firm-level fixed effects, we have to exclude non-panel firms from the analysis. As a result, our sample is far smaller than cross-sectional analyses using the same data, such as Pavlik and Bastos (2023). Because our sample is small, we do not try to disaggregate our results further.[44] Table A1 in the Appendix provides a list of the countries and surveys.

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[38] The data are available for free after registration at the following website:
https://www.enterprisesurveys.org/en/enterprisesurveys
[39] See World Bank (2021) for a description of the methodology. Although Enterprise Surveys were conducted before 2005, the questionnaire and sampling methodology were not standardized until 2006.
[40] In addition to the core survey questions, country and regional teams at the World Bank can add a limited number of unique questions to address specific country or regional concerns. Country and regional teams, however, cannot alter or drop core survey questions without permission from the central WBES team.
[41] All Enterprise Surveys completed since 2008 contain the three questions that were added to the core survey in 2008. In addition, the question on the respondent's gender was included in the 2007 Croatia survey. Finally, surveys in 2006 and 2007 included the question: "Are any of the owners female?" They do not, however, include information on whether women have full, majority, or minority ownership. As a result, we exclude these surveys from the main analysis.
[42] Although the government can partly own the enterprises, the survey is meant to exclude fully-owned government firms (European Bank for Reconstruction and Development and World Bank 2013). In practice, more than 98% of the firms are fully private and a few (less than 0.05% of firms) are fully government owned.
[43] The World Bank (2021, 2022) describes the sampling methodology for panel firms in detail.
[44] Pavlik and Bastos (2023) find that corruption is more harmful to women in countries where gender inequality is greater.

Question on corruption

The main WBES question on corruption, and the one this paper focuses on, is:

> *(j.7) 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 total annual sales, or estimated total annual value, do establishments like this one pay in informal payments or gifts to public officials for this purpose?*

This question has advantages over other WBES questions about corruption. First, it measures corruption quantitatively. Quantitative questions are easier to interpret than perception-based measures.[45] Second, all sample firms answered this question. In contrast, the survey's other quantitative questions only covered firms engaged in specific transactions. For example, the question about bribes during tax inspections was asked only to inspected firms.

The question has two notable features. First, participants can answer as a percent of sales or in local currency. We, therefore, must use a separate question on sales to calculate firms' bribes identically. Although the response method should not affect how much firms report paying, it does. Firms that answer as percentages report paying far higher bribes than firms that answer in local currency. Moreover, this is not due to either observed or unobserved differences between firms (Clarke 2011b). To avoid problems associated with this misreporting, we use a dummy variable indicating whether the firm said firms pay bribes instead of using the amount of the bribe.

Second, the question is indirect, asking what the interviewee believes other firms do. Indirect questions allow respondents to answer without admitting to breaking laws or social norms, possibly making them more candid.[46] Most studies, however, either implicitly or explicitly assume the interviewee answers thinking about their firm.[47] For brevity, we will use the same convention when discussing results. For example, if the exporter dummy's coefficient is positive, we will write 'exporters are more likely to report paying bribes' rather than 'exporters are more likely to report firms like theirs pay bribes.'

Questions on gender

The enterprise survey includes three questions on gender. The survey asks about the top manager's, owners', and respondents' gender. For questions about whether the manager and owner were women, the three valid answers were 'yes,' 'no,' and 'don't know.' The question about the respondent had two valid answers: 'male' and 'female.' Although interviewees could also refuse to answer, few interviewees did.

The first question asks about the owner's gender: "Amongst the owners of the firm, are there any females?" The possible responses are 'yes,' 'no,' and 'don't know.' If the respondent answers

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[45] See, for example, Bertrand and Mullainathan (2001) for a general discussion about problems with subjective data. Razafindrakoto and Roubaud (2010) discuss problems associated with subjective data on corruption. Clarke (2011a), Recanatini and others (2000), and Kaplan and Pathania (2010) discuss problems with the WBES subjective data.

[46] The evidence on how successful this is, however, is mixed. Studies suggest that people continue to underreport corruption even with indirect questions (Clarke and others 2015; Clausen and others 2010; Kraay and Murrell 2016).

[47] That is, papers often regress bribes on the firm's own characteristics and divide bribes by the firm's own sales to get bribes as a percent of sales. Discussing this issue, Treisman (2007, 214) writes: "it is hoped and assumed that respondents reply based on their own experience."

'yes,' they answer a second question: "What percentage of the firm is owned by females?"[48] They can either give the percentage or answer 'don't know.' Using these questions, we calculate three separate dummies indicating women partly, majority, and fully own the firm. We focus on majority-owned firms because women owners are more likely to influence firm culture when they have greater control. As robustness checks, we include separate regressions for firms that women partly and fully own.

Only 1.8% of respondents answered 'don't know' or gave an invalid code in response to the first question.[49] More people, however, answered 'don't know' to the second question (5.7%). In the main analysis, we treat these observations as missing and drop them from the regression. As a robustness check, we include an extra dummy for firms where the respondent answered 'don't know' or gave an invalid code.[50]

The second question asks: "Is the top manager female?" The valid answers are 'yes,' 'no,' and 'don't know.' We calculate a single dummy indicating the top manager is a woman using this question. About 0.3% of respondents answered 'don't know' and an added 0.01% refused to answer.[51] We treat these observations as missing. In the robustness checks, we include a dummy for these answers rather than dropping the observations.

The final question asks about the respondent's gender. The person answering the survey is not necessarily the owner or top manager; respondents include accountants, lower-level managers, other administrative staff, and lawyers. After finishing the interview, the interviewer fills in a table indicating the respondent's position, tenure, and gender. The valid codes for gender correspond to 'male,' 'female,' and 'refusal.' Although interviewers must explicitly ask about tenure and position during the interview, they might sometimes avoid asking the respondent's gender.[52] We use this question to make a dummy for the respondent's gender. About 0.04% of respondents refused to answer, and 0.00003% of answers had invalid codes. We treat these observations as missing in the main analysis.[53]

IV. Methodology

Hypotheses

The first two questions ask about the top manager's and owner's gender. If women disapprove of corruption more than men or officials treat women more favorably, firms controlled by women should pay fewer bribes than other firms. This leads to our first hypothesis.

> *Hypothesis 1: Firms that women own and manage are less likely to pay bribes than other firms.*

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[48] For sole proprietorships, the interviewer enters 100% for the second question rather than asking it.

[49] An added 0.04% gave a different, but invalid, response code. Almost all of these gave codes that often meant either 'refused to answer' or 'does not apply,' although these were not valid codes for this question.

[50] Because of the way the question is phrased, people who do not identify as women would be implicitly grouped with men whether they identify as men or not. It is, however, possible the person might answer 'don't know.'

[51] Although 'refused to answer' was not a valid code for this question, the code is often used in other questions.

[52] They would, however, have to ask the respondent about their position and years with the establishment at some point in the interview, and so they might ask the respondent's gender at the same time.

[53] In the robustness checks, we instead include an additional dummy for these observations.

The third question asks about the interviewee's gender. Because interviewees should affect firm culture and behavior less than the top manager or owner, we expect their gender to affect bribe payments less than the top manager's or owner's gender. This leads to our second hypothesis.

> *Hypothesis 2. The respondent's gender will affect corruption less than the manager's and owner's gender.*

However, the interviewee's gender might affect misreporting more than the manager's or owner's gender does. If women report paying fewer bribes because they lie about paying bribes, then the interviewee's gender might be more strongly linked with corruption than the top manager's or owner's gender.

Econometric methodology

We assume the firm's propensity to report paying bribes depends on the top manager's, interviewee's, and owner's gender, firm characteristics, the country where it runs, and time. That is, firm i operating in country c at time t's propensity to pay bribes is:

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

Because we only observe whether the firm reported paying a bribe, not its propensity to report paying bribes, we cannot estimate Equation (1) directly. Instead, we observe a dummy, B_{isct}, which equals one if its propensity exceeds an arbitrary level and zero if not.

$$Reticent_{ict} = \begin{cases} 1 & if \quad Propensity_{ict} > 0 \\ 0 & if \quad Propensity_{sct} \leq 0 \end{cases}$$

We assume the error term, ε_{ict}, has a logistic distribution, and so we estimate a logit model.

We are most interested in the three dummies representing firms managed and owned by women and women interviewees (Gender_{ict}). We expect the first two dummies to have negative coefficients (*Hypothesis 1*), which would suggest firms that women control are less likely to pay bribes than other firms. We also expect the coefficient on the dummy representing women interviewees to be negative (*Hypothesis 2*).

The regression also includes some firm-level controls (FC_{ict}). These include number of workers, an exporter dummy, ownership shares for foreign and government owners, and dummies indicating manufacturing, retail trade, and other service firms.[54] We include these controls because they might affect how vulnerable the firm is to bribe demands. For example, large firms might find it harder to avoid regulators' and tax inspectors' attention than smaller firms. Exporters might have similar problems, especially because they must deal with customs and trade regulations that domestic firms avoid. Finally private firms, especially foreign-owned private firms, might be more vulnerable to bribe demands than well-connected government-owned firms.

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[54] See, for example, Breen and others (2017). The main differences between the control variable in this paper and in Breen and others (2017) are that we use number of workers rather than sales as a measure of firm size and omit per capita GDP. The reason we use workers rather than sales is to preserve sample size; data on workers are available for more firms than data on sales, resulting in fewer dropped observations. We omit per capita GDP because it would be colinear with the country and firm fixed effects we include in our model.

Finally, the regression also includes fixed effects to control for omitted firm- (α_i), country- (δ_c), and year-level (λ_t) variables that might affect the firm's propensity to pay bribes. When we include firm fixed effects, the country fixed effects drop out due to collinearity.

Including firm-level fixed effects in non-linear regressions is difficult. The first problem is that including fixed effects is computationally burdensome in many non-linear maximum likelihood models. Unlike ordinary least squares regressions, we cannot control for fixed effects by simply subtracting group means from the dependent and independent variables. The second problem is that including fixed effects in logit and probit models leads to an incidental parameters problem (Greene 2004). To ensure consistency, each group must contain many observations.

These problems are not overwhelming in the models that include country and time fixed effects. Because the regressions contain fewer than 100 countries and 16 years, including dummies does not result in serious computational problems. Further, with tens of thousands of observations, most countries and years contain hundreds of observations. We can, therefore, directly include country and time dummies.

The problems, however, become more severe when we include firm-level fixed effects. The regression would include about 19,000 firm-level fixed effects and would have only two or three annual observations for most firms. The large number of dummies would make the model computationally burdensome and would lead to an incidental parameter problem. We, therefore, adopt a different approach. Rather than including firm-level dummies directly, we estimate the quasi-maximum likelihood conditional logit model proposed by Chamberlain (1980). When using this model, firms that always or never paid bribes are dropped; the firm-level fixed effects fully explain their decisions.

V. Empirical Results

Table 1 shows the base results. We first run separate regressions for each gender dummy and then estimate a model that includes all three. As discussed above, the gender dummies are highly correlated; firms owned by women are more likely to have women as managers and respondents. We run two regressions for each dummy: one including country and year fixed effects and one including firm and year fixed effects. The models cannot include both country and firm fixed effects because the dummies would be perfectly collinear. Including firm fixed effects reduces the sample size; the conditional logit model automatically drops firms that always and never reported paying bribes. The model drops them because the dummy fully predicts these firm's responses.

Hypothesis tests favor the models with firm-level fixed effects over the models with country-level fixed effects. Hausman tests consistently reject the logit model with country-level fixed effects in favor of Chamberlain's (1980) conditional logit model with firm-level fixed effects (see Table 3).

Main results

Respondent is a woman. Fewer women than men said firms like theirs must pay bribes to get things done (see Columns 1 and 2 in Table 1). The respondent dummy's coefficient is significantly negative in the regressions with both firm- and country-level fixed effects. When controlling for country-level fixed effects, women are about 2.6 percentage points less likely to say firms must

pay bribes than men (see Table 2). In contrast, after controlling for firm-level effects, the difference is 5.0 percentage points.[55]

Firms majority owned by women. The point estimate of the coefficient on the owner dummy suggests firms majority owned by women are less likely to report paying bribes than other firms.[56] However, the coefficients are statistically insignificant whether we include country-level or firm-level fixed effects. Although the difference is larger (3.3 percentage points) when we include firm-level rather than country-level fixed effects (0.1 percentage points), the coefficients are statistically insignificant in both cases.

Top manager is a woman. We next compare firms whose top manager is a woman with firms whose top manager is a man. When we include country-level fixed effects, the manager dummy has a negative and statistically significant coefficient. This suggests that firms managed by women are about 1.3 percentage points less likely to report paying bribes than firms managed by men. Once we include firm-level fixed effects, however, the dummy's coefficient becomes smaller and statistically insignificant.

Regressions containing all three dummies. Because of multicollinearity, the results for managers, owners, and respondents discussed above come from three separate regressions. To check robustness, we next include all three dummies simultaneously (see Columns 7 and 8 in Table 1). When we do so, the respondent dummy has the only significant coefficient. This new result also suggests the respondent's gender is more robustly linked with reported bribe payments than the manager's or owner's gender.

In summary, when we use firm-level panel data, we find that gender is linked with reported corruption (see Hypotheses 1 and 2). These results are broadly consistent with results from earlier cross-sectional studies, especially when we include only country-level fixed effects. Our results are, however, different from earlier cross-sectional results in some ways. Most notably, after controlling for firm-level fixed effects, only the respondent dummy's coefficient remains significant. The respondent dummy's negative coefficient suggests women are less likely to report their firm pays bribes than are men. The stronger results for respondents hold whether we include the dummies separately or together.

Given that hypothesis tests favor the models with firm-level fixed effects over the models with country-level fixed effects (see Table 1), this suggests the respondent's gender is more robustly linked with corruption than the manager's or owner's gender. But this stronger link is puzzling; we would expect the top manager or owner to affect firm behavior more than the respondent (see Hypothesis 2). We discuss this further in the conclusions.

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[55] It is difficult to compare the raw percentage estimates across the regressions with and without firm fixed effects. First, the samples are different. Panel firms that always said bribes were needed or always said they were not needed are dropped when we control for firm effects. Since this is more likely in countries with little corruption—fewer than half of firms said bribes were needed in most countries—this biases the sample towards high corruption countries. Second, we do not estimate the individual fixed effect effects in the conditional logit model. The fixed effects are, therefore, set equal to zero when calculating marginal effect in this model.

[56] In the robustness checks, we look at firms partly and fully owned by women.

Table 1. Likelihood the respondent reported that bribes are needed to get things done.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable	**Respondent reported firms like theirs have to pay bribes to get things done**							
Gender								
Respondent is a woman	-0.247***	-0.214**					-0.273***	-0.443***
	(-5.20)	(-2.15)					(-4.01)	(-2.66)
Women own more than half of firm			-0.014	-0.147			0.081	-0.269
			(-0.20)	(-0.81)			(0.97)	(-1.20)
Top manager is a woman					-0.133***	-0.050	0.022	0.330
					(-2.60)	(-0.44)	(0.27)	(1.62)
Firm Characteristics								
Foreign ownership share	-0.003***	-0.003	-0.003***	-0.004*	-0.003***	-0.002	-0.003***	-0.002
	(-3.81)	(-1.52)	(-3.03)	(-1.88)	(-3.60)	(-0.98)	(-2.69)	(-0.84)
Government ownership share	-0.002	-0.002	-0.001	0.014	0.000	0.002	-0.001	0.015
	(-0.60)	(-0.27)	(-0.31)	(0.82)	(0.07)	(0.30)	(-0.35)	(0.84)
Number of workers [nat.log]	0.025*	0.110**	0.039**	0.132**	0.010	0.128***	0.035*	0.121*
	(1.69)	(2.18)	(2.20)	(1.98)	(0.68)	(2.60)	(1.94)	(1.73)
Firm is an exporter	0.279***	0.344***	0.177***	0.101	0.258***	0.407***	0.169***	0.080
	(5.82)	(3.16)	(3.11)	(0.73)	(5.57)	(3.87)	(2.93)	(0.53)
Firm is in retail or wholesale trade [a]	0.010	0.221	-0.016	0.220	0.008	0.184	-0.005	0.354
	(0.22)	(1.37)	(-0.29)	(1.10)	(0.18)	(1.15)	(-0.09)	(1.61)
Firm is in other services [a]	0.181***	0.239	0.167***	0.132	0.160***	0.189	0.178***	0.455
	(3.53)	(1.28)	(2.84)	(0.52)	(3.19)	(1.01)	(2.97)	(1.59)
Observations	26,948	4,320	20,948	2,442	29,916	4,610	19,876	2,094
Number of Countries	88	65	87	53	91	75	86	51
Number of Panel Individuals	---	2,052	---	1,180	---	2,190	---	1,006
Firm Dummies	No	Yes	No	Yes	No	Yes	No	Yes
Country Dummies	Yes	No [b]	Yes	No [b]	Yes	No [b]	Yes	No [b]
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R-Squared	0.157	0.0842	0.188	0.0990	0.151	0.0899	0.188	0.0874
H0: Fixed firm effects not needed (χ^2)		50.3		50.1		38.7		51.31
(p-value)		0.000***		0.000***		0.000***		0.000***

Source: Author's calculations based upon data from the World Bank Enterprise Survey.
Note: All regressions are logit regressions. Non-panel firms are excluded from the sample in the regressions that omit firm dummies. The regressions with firm dummies are conditional logit models (Chamberlain 1980). Note that firms that reported paying bribes in all periods or reported not paying bribes in any period are automatically dropped in the conditional logit model. ***, **, and * statistically significant at the 1%, 5%, and 10% significance levels. [a] Omitted sector is manufacturing. [b] Country dummies are omitted from the regressions with firm dummies since they are colinear with the firm dummies in regressions with firm dummies.

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Table 2. Marginal effects for firms with men and women as respondents, owners, and managers.

	Panel Firms with no fixed effects			Panel controlling for firm effects		
	Women	Men	Difference	Women	Men	Difference
Respondent	13.3%	15.9%	-2.6%	51.2%	46.1%	-5.0%
Owners	14.6%	14.5%	-0.1%	51.4%	54.8%	-3.3%
Manager	13.3%	14.6%	-1.3%	50.2%	51.4%	-1.2%

Source: Author's calculations based upon data from the World Bank Enterprise Survey.
Note: Average marginal probabilities are calculated by calculating the predicted probabilities for each firm assuming that the firm had a man as respondent/owner/manager and averaging over all observations. The same is then done assuming the firm had a woman as respondent/owner/manager.

Table 3. Likelihood the respondent reported that bribes are needed for firms fully and partly owned by women.

	(1)	(2)	(3)	(4)
	Respondent reported firms like theirs have to pay bribes to get things done			
Dependent Variable				
Gender				
Firm has some women among owners	0.021	0.153**		
	(0.60)	(2.25)		
All owners are women			0.002	-0.226
			(0.02)	(-1.16)
Firm Characteristics				
Foreign ownership share	-0.003***	-0.001	-0.003***	-0.004*
	(-4.00)	(-0.36)	(-3.02)	(-1.89)
Government ownership share	-0.001	0.006	-0.001	0.014
	(-0.32)	(1.17)	(-0.31)	(0.82)
Number of workers [nat.log]	0.010	0.138***	0.039**	0.129*
	(0.73)	(3.28)	(2.22)	(1.94)
Firm is an exporter	0.259***	0.397***	0.176***	0.102
	(6.14)	(4.50)	(3.10)	(0.73)
Firm is in retail or wholesale trade [a]	-0.029	0.236*	-0.016	0.225
	(-0.70)	(1.86)	(-0.29)	(1.13)
Firm is in other services [a]	0.125***	0.103	0.166***	0.136
	(2.83)	(0.70)	(2.84)	(0.54)
Observations	34,414	6,844	20,948	2,442
Number of Countries	91	89	87	53
Number of Panel Individuals		3,194		1,180
Firm Dummies	No	Yes	No	Yes
Country Dummies	Yes	No [b]	Yes	No [b]
Year Dummies	Yes	Yes	Yes	Yes
Pseudo R-Squared	0.160	0.109	0.188	0.0994

Source: Author's calculations based upon data from the World Bank Enterprise Survey.
Notes: All regressions are logit regressions. Non-panel firms are excluded from the sample in the regressions that omit firm dummies. The regressions with firm dummies are conditional logit models (Chamberlain 1980). Note that firms that reported paying bribes in all periods or reported not paying bribes in any period are automatically dropped in the conditional logit model. ***, **, and * statistically significant at the 1%, 5%, and 10% significance levels. [a] Omitted sector is manufacturing. [b] Country dummies are omitted from the regressions with firm dummies since they are colinear with the firm dummies in regressions with firm dummies.

Robustness checks

Alternative measures of ownership by women. The results for majority women-owned firms are weaker than the other results. In contrast to the respondent and top manager dummies' coefficients, the majority ownership dummy's coefficient is statistically insignificant whether we include country- or firm-level fixed effects. Previous studies, however, have often found that firms owned by women report paying significantly lower bribes than other firms.[57] Because this paper's weaker results might reflect how we define firms owned by women, we check their robustness using different definitions of ownership.

We redefine the ownership dummy in two ways to check robustness. First, we count firms as owned by women when women even partly own the firm. We do this because women might influence firm culture even when they have minority shares. Second, we only count firms as owned by women when all owners are women. We do this because part ownership might influence firm culture less than full ownership. Table 3 shows the results from these robustness checks.

For firms partly owned by women, the coefficient is statistically insignificant when we include country-level fixed effects. However, the coefficient becomes positive and statistically significant once we include firm-level fixed effects. This suggests that firms partly owned by women are more likely to report paying bribes than other firms (see Column 2 in Table 3). Although this result might be puzzling, it is consistent with cross-sectional results in Pavlik and Bastos (2023) that found that firms partly owned by women paid higher bribes and were more concerned about corruption than other firms.

For firms fully owned by women, the results are similar to the results for firms majority owned by women. The coefficients are statistically insignificant whether we include country- or firm-level fixed effects. Overall, these robustness checks do not support the idea that the weak results for ownership are due to how we define ownership.

VI. Conclusions and Discussion

Earlier studies using cross-sectional data have found that firms owned or managed by women pay fewer bribes than other firms (Breen and others 2017; Swamy and others 2001). In this paper, we check whether these earlier results are robust to controlling for fixed firm-level differences that might affect whether firms pay bribes and whether women control the firm. We do this using Chamberlain's (1980) conditional fixed effects logit model.

Our results mostly support the earlier cross-sectional studies; the point estimates suggest firms owned and managed by women and with women respondents pay fewer bribes than other firms. However, the ownership and management dummies' coefficients become statistically insignificant once we control for firm-level fixed effects. Only the respondent dummy's coefficient remains negative and statistically significant after we include fixed effects.

It is puzzling that the respondent's gender affects reported bribes most strongly and robustly. Most earlier papers argue that gender affects firm-level corruption because women discourage firms from paying bribes. But women will only prevent bribes when they affect firm behavior or

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[57] See, for example, Breen and others (2017) and Clarke (2021). In contrast, Pavlik and Bastos (2023) find the opposite.

culture. Because the owner and top manager have greater influence than lower-level managers and professionals, we would expect the owner's and top manager's gender to be most important.[58]

The more robust results for respondents might reflect the respondent dummy's greater within-firm variation. Whereas 23% of firms had respondents of different genders across surveys, only 15 and 11% of firms had managers and owners of different genders. Although within-firm variation might explain the respondent dummy's coefficient's higher significance, it cannot explain its greater magnitude.

One explanation for the stronger results for respondents might be that gender differences in reported bribes reflect differences in misreporting rather than differences in actual bribes. Because the respondent answers the survey questions, their concerns about social desirability affect misreporting directly. In contrast, managers' and owners' concerns affect misreporting only indirectly.[59] If gender differences in reported bribes mostly reflect misreporting, the respondent's gender should be more important than the manager's or owner's gender.

Other evidence, however, fails to support the proposal that the respondents' gender affects underreporting more than the manager's or owner's gender. Studies on reticence provide the strongest evidence about the underreporting of corruption. Azfar and Murrell (2009) found people who ignore the instructions for sensitive forced response questions are less likely to report paying bribes than others. They claim these respondents, who they label as reticent, report paying fewer bribes because they underreport corruption.[60] Although Azfar and Murrell (2009) find women and men are equally reticent, Clarke (2020) found links between gender and reticence using a larger sample. But Clarke (2020) found the owner's, not the respondent's, gender affects the respondent's reticence most. Clarke's (2020) results, therefore, do not support the idea that the respondent's gender affects underreporting more strongly than the manager's or owner's gender.

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[58] As discussed above, although the top manager or owner is sometimes the respondent, they often designate someone else to answer on their behalf. Respondents include lower-level managers, accountants, and other employees.

[59] This should not imply that the manager and owner's gender will have no effect. The manager and owner affect firm culture and, therefore, might indirectly affect how comfortable the respondent is talking about corruption.

[60] Clarke (2019) finds the difference between the wages that the manager claims to pay workers and the wages that the workers claim to receive is greater when the manager is reticent. This is consistent with the idea that reticent respondents misreport sensitive information.

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Appendix

Table A1. List of countries in panel.

Country Name	Years for panel	Country Name	Years for panel	Country Name	Years for panel
Afghanistan	2008,2014.	Guatemala	2006,2010,2017.	Peru	2006,2010,2017,
Albania	2013,2019.	Honduras	2006,2010,2016.	Philippines	2009,2015,
Angola	2006,2010.	Hungary	2009,2013,2019.	Poland	2009,2013,2019,
Argentina	2006,2010,2017.	Indonesia	2009,2015.	Romania	2009,2013,2019,
Armenia	2009,2013,2019.	Jordan	2013,2019.	Russian Federation	2009,2012,2019,
Azerbaijan	2009,2013,2019.	Kazakhstan	2009,2013,2019.	Rwanda	2006,2011,2019,
Bangladesh	2007,2013.	Kenya	2007,2013,2018.	Senegal	2007,2014,
Belarus	2008,2013,2018.	Kosovo	2009,2013,2019.	Serbia	2009,2013,2019,
Benin	2009,2016.	Kyrgyz Republic	2009,2013,2019.	Sierra Leone	2009,2017,
Bhutan	2009,2015.	Lao PDR	2009,2012,2016,2018.	Slovak Republic	2009,2013,2019,
Bolivia	2006,2010,2017.	Latvia	2009,2013,2019.	Slovenia	2009,2013,2019,
Bosnia and Herzegovina	2009,2013,2019.	Lebanon	2013,2019.	South Africa	2007,2020,
Botswana	2006,2010.	Lesotho	2009,2016.	Suriname	2010,2018,
Bulgaria	2009,2013,2019.	Liberia	2009,2017.	Tajikistan	2008,2013,2019,
Cambodia	2013,2016.	Lithuania	2009,2013,2019.	Tanzania	2006,2013,
Cameroon	2009,2016.	Malawi	2009,2014.	Timor-Leste	2009,2015,2021,
Chad	2009,2018.	Mali	2007,2010,2016.	Togo	2009,2016,
Chile	2006,2010.	Mexico	2006,2010.	Tunisia	2013,2020,
Colombia	2006,2010,2017.	Moldova	2009,2013,2019.	Turkey	2008,2013,2019,
Congo, Dem. Rep.	2006,2010,2013.	Mongolia	2009,2013,2019.	Uganda	2006,2013,
Cote d'Ivoire	2009,2016.	Montenegro	2009,2013,2019.	Ukraine	2008,2013,2019,
Croatia	2013,2019.	Morocco	2013,2019.	Uruguay	2006,2010,2017,
Czech Republic	2009,2013,2019.	Myanmar	2014,2016.	Uzbekistan	2008,2013,2019,
Dominican Republic	2010,2016.	Nepal	2009,2013.	Venezuela, RB	2006,2010,
Ecuador	2006,2010,2017.	Nicaragua	2006,2010,2016.	Vietnam	2009,2015,
Egypt, Arab Rep.	2013,2016,2020.	Niger	2009,2017,	West Bank and Gaza	2013,2019,
El Salvador	2006,2010,2016.	Nigeria	2007,2014,	Yemen, Rep.	2010,2013,
Estonia	2009,2013,2019.	North Macedonia	2009,2013,2019,	Zambia	2007,2013,2019,
Ethiopia	2011,2015.	Pakistan	2007,2013,	Zimbabwe	2011,2016,
Georgia	2008,2013,2019.	Panama	2006,2010,		
Ghana	2007,2013.	Paraguay	2006,2010,2017,		

Note: Data are from the World Bank's Enterprise Surveys. Table lists the years that make up the panel for each country. Not all observations will have panel data available for all years. Data for 2006 and 2007 are excluded from base regressions for respondents, majority owners, and managers, but are included for the regressions for any women owners.