Department of Economics Discussion Papers

ISSN 1473-3307

Are majority-female-owned firms more susceptible to bribery solicitations?

Olayinka Oyekola, Martha A. Omolo, and Olapeju C. Ogunmokun

Paper number 23/11

RePEc page: https://ideas.repec.org/s/exe/wpaper.html

Are majority-female-owned firms more susceptible to bribery solicitations?

Olayinka Oyekola* Martha A. Omolo† Olapeju C. Ogunmokun‡

July 2023

Abstract

The answer is No. Our evidence derives from leveraging international firm-level data to examine the statistical importance of gender composition of ownership as a determinant of bribery solicitations. Our data are for 18,240 firms in 18 industries across 110 countries. For this group of firms, we find that female involvement in ownership is unimportant for explaining which firms are more susceptible to bribery solicitations. However, we find that majority-female-owned firms differ significantly from majority-male-owned firms in terms of their experiences of bribery transactions. Specifically, we establish that firms with majority female ownership are less susceptible to bribery solicitations, when compared to their counterparts with minority female ownership. Additionally, we find that all fifteen sources of business obstacles that we consider are positively related to bribery solicitations. Using an interaction model, we observe that the benefits accruing to majority-female-owned firms in terms of reduced bribery solicitations are diminished in the presence of some perceived business obstacles, namely: corruption, political instability, tax administration, and transportation. Our results, which are robust to several specification checks, including endogeneity tests, add to the gender and corruption literature.

JEL codes: D73; J16; L2; O17

Keywords: Gender; Ownership composition; Female-owned firms; Bribery; Corruption; Business obstacles

*Department of Economics, University of Exeter, Exeter EX4 4PU, UK. Email: o.oyekola@exeter.ac.uk

†Department of Economics, University of Exeter, Exeter EX4 4PU, UK. Email: m.omolo@exeter.ac.uk

‡De Montfort University, The Gateway, Leicester, LE1 9BH, UK. Email: olapeju.ogunmokun@dmu.ac.uk

1 Introduction

Corruption practices have detrimental and pervasive effects on an economy's performance, affecting various segments and "sanding the wheels" of progress (Shleifer and Vishny, 1993; Mauro, 1995; Méon and Sekkat, 2005; Beekman, Bulte, and Nillesen, 2014; Dimant and Tosato, 2018). Related studies have shown that firms facing constraints in terms of accessing financial and vital public services may resort to bribery to overcome these constraints. For instance, Ayyagari, Demirgüç-Kunt, and Maksimovic (2014), Mironov (2015), Webster and Piesse (2018), Wellalage, Fernandez, and Thrikawala (2020), and Gauthier, Goyette, and Kouamé (2021) find ample evidence that, in emerging and developing economies, domestic, foreign, innovative, and both male- and female-owned firms engage in firm- and industry-level bribery. Whilst the myth and long held perception may be that women have greater ethical and moral standards than men (Dollar, Fisman, and Gatti, 2001; Swamy, Knack, Lee, and Azfar, 2001; UNODC, 2020), and thus are less likely to engage in bribery activities, Wellalage et al. (2020) find that female-led or -owned firms equally engage in bribery behaviours as their male counterparts in Latin American countries, with the female-managed firms receiving greater payoffs than the male-managed firms when they bribe. Other studies show that bribery in female-managed or -owned firms is due to existing cultural factors, level of risk involved, available opportunities, social norms, and strength of institutions rather than the female gender (Frank, Lambsdorff, and Boehm, 2011; De Jong, Tu, and van Ees, 2012; Lee and Guven, 2013).

Despite the relationship between female leadership, female ownership, and bribery being long established in the gender and corruption literature with competing views (Dollar et al. (2001); Swamy et al. (2001); Goetz (2007); Hanousek, Shamshur, and Tresl (2019); UNODC (2020); Wellalage et al. (2020)), it is surprising that there is limited exploration on whether majority-female-owned firms are more susceptible than their majority-male-owned counterparts to bribery solicitations from private and public service providers in various countries. The focus in the extant literature is mainly on female-owned or -managed firms and institutions and their association with bribery. Motivated by this gap in the literature, our paper examines how the extent of female ownership in a firm determines whether the firm is more susceptible or not to bribery solicitations from public officials.

Our paper is motivated by the on going debate on whether female management or ownership does indeed reduce incidences of firm-level bribery as a precondition to accessing required public services and overcoming various business obstacles (Armantier and Boly, 2011; Esarey and Chirillo, 2013; Brollo

and Troiano, 2016; Afridi, Iversen, and Sharan, 2017; Breen, Gillanders, McNulty, and Suzuki, 2017; Jha and Sarangi, 2018; Nguyen, Nguyen, and Pham, 2021). Breen et al. (2017), for example, provide evidence that female firm managers and owners are linked with lower bribery cases, but their study does not consider the importance of the degree of female ownership in a firm, which can influence the likelihood of a firm receiving a bribery request. This dimension of gendered ownership is what our paper emphasises. In contrast, Nguyen et al. (2021) find that firms managed by females engage in higher levels of bribery transactions than firms managed by their male counterparts, especially in countries that are notoriously corrupt. Moreover, Armantier and Boly (2011), carrying out a controlled field experiment on corruption, report that gender is not a determinant of corruption. These mixed findings necessitate further explorations of the role that gender plays in firm-level bribery incidences. We contribute to this literature by focusing on female ownership and examining the susceptibility of female-owned firms to bribery solicitations by public officials.

According to the United Nations Office on Drugs and Crime report (UNODC, 2020), women worldwide are more prone to bribery solicitations in the political arena and in the key sectors of of the economy, including education, health, and public service. Consequently, a higher share of women in senior leadership positions in these key sectors make them potentially more susceptible to bribery by officials from both private and public sectors relative to their male peers. While the report holds merit, its focus is limited to the bribery experiences and practices of women in the public sector and not ownership of the firms in the private sector. Yet, the Global Entrepreneurship Monitor (GEM) 2021 report on firm gender ownership shows a significant acceleration in women starting their own firms or managing well-established enterprises globally (GEM, 2022). Hence, a deeper understanding of the vulnerability of female-owned firms to various forms of corruption, such as bribery from both the private and public sectors is vital and warranted.

Indeed, further explorations in this area of research has been gradually increasing in recent years. For instance, Nguyen et al. (2021) observe that, in emerging countries, female entrepreneurs encounter more widespread bribery with government officials than their male counterparts. Therefore, the relationship between female ownership and bribery solicitations at the firm-level is an area worth a more rigorous investigation. To this effect, we investigate whether (i) female-owned firms are more susceptible to higher bribery requests by public officials; (ii) the extent to which female firm ownership matters in determining

bribery solicitations by public officials; and (iii) what types of business obstacles influence the relationship between gender and bribery solicitations. The second investigation (ii) represents the core objective of our paper in which we consider majority-female-owned firms to be firms where women have an ownership share at least sixty percent (>=60%), drawing on the framework of Dutta and Mallick (2023). Hence, the scope of this paper is on the demand-side of the gender-bribery nexus.

Our research is also inspired by the important extensive literature on the relationship between bribery and business obstacles that firms face in their day-to-day operations and business environment, as well as the growing role that gender plays in this relationship (Svensson (2003); Aterido, Beck, and Iacovone (2013); Webster and Piesse (2018); Wellalage et al. (2020); Gauthier et al. (2021); Nguyen et al. (2021)). A myriad of significant business obstacles, such as bureaucracy, inability to obtain essential services, operating licenses and permits, or unclear tax policies, reduce the efficiency and profitability of firms. Besides, a business environment, with cumbersome and severe business obstacles, has the potential to form a good breeding ground for increased bribery behaviours at the firm-level by both the requester and the payer. This is because bribery is employed as a workaround to overcome these obstacles and reduce certain firm-specific costs, a view that leans on the argument that firm-level bribery can be enhancing by potentially improving efficiency, innovation, and fostering growth (Luo (2005); Aidt (2009); Belitski, Chowdhury, and Desai (2016); Webster and Piesse (2018)).

Behavioural differences based on gender may impact how a firm's owners engage in corruption practices to overcome the business obstacles they face in their operating environments (Wellalage et al., 2020). For instance, Nguyen et al. (2021) find that, to overcome the difficulties of obtaining operating licenses and permits, female firm owners in emerging economies engage in higher rates of bribery behaviour with public officials than their male peers, affirming that business obstacles influence the effect of female firm ownership on bribery practices. In the same vein, considering female firm ownership, this paper investigates the effect of business obstacles on bribery solicitations by public officials as a secondary analysis. However, as aforementioned, it is not just female participation in firm ownership that matters, but the degree of female ownership may be more important. Therefore, as part of our analysis, we explore the effect of business obstacles on bribery solicitations by public officials faced by different degrees of female firm ownership in developed, emerging, and developing economies.

To analyse the relations between bribery solicitations by public officials and female participation in

firm ownership, degree of female ownership, and the business obstacles faced by firms in our sample, whilst controlling for observable firm-specific characteristics (in essence: age, size, foreign or domestic ownership, market orientation, type of ownership, international recognition status, and manager's experience) that may affect our hypothesised relationships, we use probit regressions in line with existing literature on corruption at the firm-level (Swamy et al., 2001; Aterido et al., 2013; Webster and Piesse, 2018; Wellalage et al., 2020). Using a pseudo-panel data from the World Bank Enterprise Surveys (WBES) from 2013 to 2022, covering 18,240 firms in 18 industries across 110 countries based in six geographic regions, we find that there is no significant difference in female and male involvement in firm ownership in their susceptibility to bribery solicitations by public officials. This implies that female participation in firm ownership is irrelevant in determining how prone a firm is to more bribery requests from public officials. On the hand, our results show that there is a significant difference between majority-female- and majority-male-owned firms with respect to their experiences of bribery solicitations, with majority-female-owned firms experiencing less bribery solicitations from public officials. The finding on the importance of the degree of female ownership is consistent with that of Dutta and Mallick (2023) in their study of perceived constraints to accessing finance as a business obstacle in India firms. Although our findings contrast those of Nguyen et al. (2021), we consider the degree of female firm ownership, a vital aspect excluded in their study.

Therefore, based on our findings, we emphasise that the impact of female ownership on bribe solicited by public officials at the firm-level is broader than simply considering female involvement as owners of firms, but that the perspective of the extent of female participation in ownership is paramount for a deeper understanding. This can also be mentioned for policy implications on how firms, regardless of their idiosyncrasies, may be affected by a corrupt business and regulatory environment in different countries. Importantly, only majority-female-owned (>=60%) firms are susceptible to less bribery requests by public officials than their male counterparts. We conduct a range of robustness checks, using other regression specifications and our results consistently show a significant negative relationship between majority-female-owned firms and bribery solicitations by public officials. Turning to our secondary analysis on the relationship between gender and bribery solicitations in the presence of business obstacles, we find that considering the extent of female firm ownership, perceived business obstacles to business operations of firms worldwide significantly increases bribery solicitations by public officials, a finding that highlights the

dangers of persistent or significant business obstacles engendering firm-level bribery practices, irrespective of whether a firm is majority- or minority-female-owned.

Our key contribution to the growing literature on gender and bribery association at the firm level is investigating the effect of the degree of gender composition of ownership on bribery solicitations by public officials. Despite the existence of well-established studies on the link between gender and bribery plus other forms of corruption (Dollar et al. (2001); Swamy et al. (2001); Svensson (2003); Goetz (2007); Mironov (2015); Breen et al. (2017); Wellalage, Locke, and Samujh (2019); Wellalage et al. (2020)), there is still limited studies on the connection between female firm ownership and bribery. Seminal studies of Dollar et al. (2001) and Swamy et al. (2001), although provide useful insights on the gender-corruption nexus, have several identified shortcomings (Jha and Sarangi, 2018; Wellalage et al., 2020), including perception biases of women (Svensson, 2003; Reinikka and Svensson, 2005). Other studies, for instance, Hanousek et al. (2019), Wellalage et al. (2020), and Nguyen et al. (2021) explore the effect of female firm ownership and female top management in the private sector on bribery and corruption. However, these studies do not consider the degree of female ownership in determining bribery transactions at the firm level. To the best of our knowledge, our paper is the first to examine how the extent of female firm ownership determines if a firm is more (or less) prone to bribery solicitations by public officials in advanced, emerging and developing countries.

Additionally, our methodology contributes to the huge literature using the World Bank Enterprise Surveys (WBES) and other comprehensive survey data sets (for example, Business Environment and Enterprise Performance Surveys (BEEPS)) on firm-level characteristics, including firm ownership, bribery practices, and perceived business obstacles that firm owners and managers face in their operating environment, as well as the impact of these perceived business obstacles on the performance of firms. Several studies (Swamy et al. (2001); Alm, Martinez-Vazquez, and McClellan (2016); Webster and Piesse (2018); Wellalage et al. (2020); Gauthier et al. (2021); Nguyen et al. (2021)) examine the effects of firms self-disclosing perceived business obstacles in various countries and settings. However, the extent of female ownership on bribery solicitations is beyond the scope of these studies. The combination of examining the degree of female firm ownership and effects of firms perceived business obstacles on bribery requests provides new and useful insights on the influence of the extent of female firm ownership on bribery practices of public officials in different global business environments. To our knowledge, this is the first

study that assesses the impact of the degree of female firm ownership on bribery solicitations by public officials for the various business obstacles that firms encounter in different geographical locations.

The remainder of the paper is structured as follows. Section 2 reviews the background literature to our study and develops the hypotheses. Section 3 elaborates on data sources, sample construction, and measurements of variables used for main analysis first, followed by the presentation of the empirical specifications and baseline estimation methodology. Section 4 provides the quantitative analysis, including summary statistics, benchmark tests of our hypotheses, and robustness checks. We conclude the paper in Section 5, offering the implications of our paper's findings for research and policy, as well as discussing potential limitations and avenues for future research.

2 Related literature and hypotheses

The relationship between gender and bribery continues to draw significant interests from scholars and policy makers (Dollar et al. (2001); Swamy et al. (2001); Goetz (2007); Vijayalakshmi (2008); Alatas, Cameron, Chaudhuri, Erkal, and Gangadharan (2009); Truex (2011); Lee and Guven (2013); Hanousek et al. (2019); UNODC (2020); Wellalage et al. (2020)). In this stream of research, a long held perspective emphasises that women have higher ethical and moral standards than their male counterparts (Feingold (1994); Sung (2003); Buchan, Croson, and Solnick (2008)), which make them to view bribery with disdain (Dollar et al., 2001; Swamy et al., 2001; Dreber and Johannesson, 2008). As a result, females are viewed as placing the pursuit of a greater societal welfare above private gains (Shleifer, 2004; Niederle and Vesterlund, 2007), such that increases in the number of female participation in the economic and political spheres of a country is expected to lead to lower bribery engagements at both private firms and public institutions (Dollar et al., 2001; Swamy et al., 2001; Jha and Sarangi, 2018).

For instance, Breen et al. (2017), using firm-level data from the World Bank Enterprise Surveys (WBES), show that firms that are either managed or owned by females are linked with lower rates and levels of bribery. In the public sector, Dollar et al. (2001) and Swamy et al. (2001) employ macro- and micro-level data, respectively, documenting that women participation in politics, by holding a larger share of parliamentary seats and senior positions in the government bureaucracy, are associated with less bribery and corruption. Swamy et al. (2001) further claim that a larger share of women in the labour force delivers a similar outcome of fewer bribery condonements. Nevertheless, the relationship

between gender and levels of bribery is complex and not just based on perception as these findings reveal. Admittedly, the debates surrounding the plausible explanations on why women, other than their gender, may be associated with lower levels of bribery and corruption practices in their business operations and public institutions rages on (Treisman, 2000; Sung, 2003; Armantier and Boly, 2011; Frank et al., 2011; Jha and Sarangi, 2018).

Meanwhile, a growing literature, using predominantly micro-level data, is debunking the orthodox empirical evidence that female firm owners and those in senior management positions in private enterprises and public institutions are less corrupt than their male peers (Goetz, 2007; Alatas et al., 2009), with some arguing that the lack of a significant link between women and corruption mainly boils down to a female-male bribery opportunity gap (Sutherland, Cressey, and Luckenbill, 1992; Vijayalakshmi, 2008; Truex, 2011). Moreover, some findings outline a positive association between women and bribery. For example, Nguyen et al. (2021), using firm-level data for 16,560 firms drawn from thirty two emerging economies, find that the occurrences of bribery in female-run firms is significantly higher than firms managed by men, particularly in more corruption prone countries. Similarly, Wellalage et al. (2020) report that both female- and male-owned firms in Latin America engage equally in bribery to facilitate access to important public services and improve their innovation activities. They provide evidence that points to cultural factors and institutions, rather than gender, as the determinants of female involvement in bribery transactions.

In addition, Svensson (2003), using Ugandan firm-level data, argues that a firm's capacity and willingness to pay bribes to public officials, differences in regulations and rules across industries, and cumbersome bureaucracies are the major factors influencing firm-level bribery, and not gender. Despite these outcomes, several plausible reasons have been floated why female-owned/-managed firms experience higher levels of bribery incidences. For instance, female-owned firms are likely to pay more bribes than their male peers for survival, to access public and financial services in their efforts to establish strong relations with designated officials and to improve social capital due to lack of social networks like their male counterparts (Brush, 1992; Boden and Nucci, 2000; Watson, 2003; De Jong et al., 2012; Belitski et al., 2016; Nguyen et al., 2021; Dutta and Mallick, 2023).

The discussion on whether female-managed/-owned firms are more susceptible to bribery solicitations from public officials is yet to deliver a conclusive verdict (Esarey and Chirillo, 2013), and is a topic

attracting increased attention from both academics and practitioners. Recently, Gauthier et al. (2021) suggest that firms bribe to evade taxation and procure government contracts in developing countries, arguing that the outcome is fundamentally driven by a proactive supply-side decision of firms to initiate bribery offers and informal gifts to public officials. Although this study offers an important insight on the supply-side of bribery, it fails to consider the role of gender. Further, their finding of bribery supply to public officials improving firm performance echoes earlier results by De Jong et al. (2012), who find that in Vietnam, firms that initiate bribery transactions with public officials are likely to outperform those firms that wait for public officials to solicit bribes from them (Uhlenbruck, Rodriguez, Doh, and Eden (2006); Fisman and Miguel (2007); Venard (2009); Persson, Rothstein, and Teorell (2013); Sundström (2019)), since this act of "greasing the wheels" often produces different outcomes for payers and non-payers (Bhagwati (1982); Mauro (1998); Argandoña (2005); Bailes (2006); Collins, Uhlenbruck, and Rodriguez (2009); Lee, Oh, and Eden (2010); Dreher and Gassebner (2013); Krammer (2019)).

Moreover, prior studies (Alsos, Isaksen, and Ljunggren, 2006; Dutta and Mallick, 2023) have shown that female firm owners have lower social capital and may face higher constraints in accessing needed services for running their business ventures. Hence, relative to their male peers, public officials may solicit more bribes from female firm owners, suggesting that female firm owners may be an essential part of the story on firm engagement in bribery from both the demand- and supply-side perspectives. In our context, we contribute to the literature on gender and corruption from the demand-side viewpoint, focusing on the relationship between female firm ownership and bribery solicitations by public officials. Hence:

Female Participation Hypothesis (***FPH***). *Female involvement in the ownership of a firm is correlated with greater bribery solicitations by public officials.*

However, as argued by Wellalage et al. (2020) and Dutta and Mallick (2023), it is plausible that bribery solicitations by public officials from a firm is not driven by female participation in an enterprise, but rather by the extent to which women are represented in the firm's ownership. Based on this, our second and primary hypothesis is:

Female Majority Hypothesis (***FMH***). *The relationship between female involvement in the ownership*

of a firm and bribery solicitations by public officials is affected by the extent of female ownership (*i.e., whether a firm is majority- or minority-female-owned*).

Furthermore, increasing female participation in the labour market and business ownership implies that, like their male counterparts, they too are likely to encounter various business obstacles when requiring access to public services, applying for operating licenses and permits, and/or obtaining government contracts in the different cultural contexts and geographical locations they operate in. Therefore, the influence of the gender composition of firm ownership on bribery solicitations experienced by a firm may be exacerbated in a country with many, and more daunting, business obstacles (Nguyen et al., 2021; Wellalage et al., 2020). Hence, in a business environment with significant operational obstacles, corruption practices, such as bribery, have the potential to thrive and perceived business obstacles are more likely to be correlated with actual business obstacles (Mauro, 1995; Svensson, 2003; Alm et al., 2016).

In the existing literature, a consensus on the impact of firm bribery behaviours in an environment with major business obstacles remains elusive. On one hand, firms bribing to overcome business obstacles is viewed as an impediment to development and economic growth by several studies, including Mauro (1995), who finds that corruption hinders GDP growth and investment at the macro level in different countries across the globe. Aidt (2009) critically evaluates the literature on the two competing views on the impact of corruption on growth and economic development, and concludes that, at a micro level, firm bribery is detrimental to development and inhibits growth. Similarly, Alm et al. (2016), using WBES and Business Environment and Enterprise Performance Survey (BEEPS) on 16,000 firms in 32 developed and emerging economies, find that bribery solicitations by tax inspectors reduce sales that firms report for tax purposes by a range of 4-10 percentage points. This evidence shows the negative impact of firm-level bribery on state finances by increasing tax evasion and denying governments the much needed revenues for provision of public goods and meeting their expenses.

Additionally, Webster and Piesse (2018) investigates the effects of foreign owned firms on bribery behaviour in emerging and newly industrialised host nations, reporting that for foreign owned firms to remain competitive and secure government contracts in their host nation, they may have to adapt to local bribing practices in an environment with cumbersome or numerous business obstacles. These findings negate the widely held view that foreign owned firms can help reduce bribery incidences in their host

countries. All these studies suggest that bribery activities negatively impact the performance of firms through increased costs, limited growth, and innovation (Alexeev and Song, 2013; Ayyagari et al., 2014; Bologna, 2017; Wellalage et al., 2019), thereby creating uncertainty around their future survival, as well as hindering economic growth in countries, which largely stem from high business obstacles.

The opposing view on the relationship between bribery and business obstacles is that it promotes private sector efficiency and reduces bureaucratic processes (Luo, 2005; Belitski et al., 2016). Mironov (2015), using data for approximately 60,000 firms in Moscow, examines the relationship between the top management (CEO) of a firm's propensity to corrupt when they violate traffic rules and firm performance, and finds that, for firms, whose CEOs engage in bribery, their revenue growth significantly outperforms that of their rivals, and the returns to their shareholders are higher. As previously discussed, Gauthier et al. (2021) also document that a firm's bribery engagements to secure government contracts is primarily driven by a proactive supply side, with firms initiating bribery offers and informal gifts to public officials to remain competitive. These results demonstrate that firm-level bribery and corruption in the presence of business obstacles enhances efficiency, performance, growth and lessens the bureaucratic burdens on firms. Although these competing views underscore the dangers and benefits of bribery when firms operate in an environment with a myriad of business obstacles, the vital role of gender ownership is overlooked, which our paper considers in line with the growing literature on the influence of gender in the business obstacles-bribery nexus.

Considering gender differences in firm ownership, Wellalage et al. (2020) examine the impact of corruption as an obstacle on innovation of 6091 firms in 11 Latin American countries, finding that, irrespective of the gender of a firm's owner, larger bribery payments are associated with the likelihood of enhanced product innovation, but the impact is higher for female-owned firms. In contrast, Hanousek et al. (2019), analysing a small number of firms from Central and Eastern Europe in the BEEPS database, find that there is no corruption effect for foreign-owned firms led by women. Other studies, for instance, Nguyen et al. (2021), find that the probability of female-led firms obtaining operating licenses or government contracts to be considerably low in emerging economies. Therefore, to overcome the obstacles associated with obtaining operating licenses or permits, it is likely that female-owned firms potentially resort to the difficult position of either paying solicited bribes by public officials or offer bribes to public officials to obtain the necessary operating licenses. Although the findings by Nguyen et al. (2021) highlight the

significance of gender differences in a firm's ownership on the effects of business obstacles on bribery practices, to avoid a gender participation biased perspective, it is essential to also examine the degree of female ownership in a firm and not simply female involvement in a firm, a notable point this paper considers.

In the same vein, it is plausible that differences in the gender of firm owners can potentially influence the impact of business obstacles on bribery solicitations by public officials. Based on the literature on the corruption-business obstacles nexus, and on the influence of a firm's ownership gender composition on bribery solicitations, we seek to test the following two secondary hypotheses:

Business Environment Hypothesis (***BEH***). *The higher the business obstacles that a female-owned firm perceives or experiences in its operations, the more likely it is to face bribery solicitations from public officials.*

Business Obstacle Hypothesis (***BOH***). *The type of business obstacles matter for moderating bribery solicitations faced by female-owned firms relative to their male-owned counterparts.*

Testing these two hypotheses can shed light on whether the impact of potential business obstacles firms encounter on bribery solicitations by public officials is purely female gender biased or the degree of female ownership plays a key role which has policy implications in the fight against corruption and female-male gender gap in access to opportunities.

3 Data and methodology

3.1 Source and sample

The primary data source for our investigation is the World Bank Enterprise Surveys (WBES)[1] released in February, 2023, which contains information on 191,862 unique firms across 154 countries in 6 geographic regions of the world and spans the 2006-2022 period. The WBES questionnaires are administered at ir-

[1]We note that this is a widely used database for firm-level empirical investigations in the existing literature (Hope, Thomas, and Vyas (2011); Ayyagari et al. (2014); Şeker and Yang (2014); Webster and Piesse (2018); Wellalage et al. (2020); Gauthier et al. (2021); Liu, Liu, Ullah, Wei, and Xu (2021); Qi and Nguyen (2021); Fang, Goh, Roberts, Xu, and Zeufack (2022); Dutta and Mallick (2023); Oyekola and Odewunmi (2023); Oyekola, Johan, Sakariyahu, Dosumu, and Amini (2023)), particularly in corporate finance and entrepreneurship streams and the one pertaining to economics of corruption.

regular intervals in the surveyed countries, focusing mostly on developing countries, but are increasingly including developed economies (e.g., Austria, Belgium, Denmark, France, Germany, Ireland, Luxembourg, and Sweden). The objective of this worldwide data gathering exercise by the World Bank is to create a yardstick, within an economy's business environment, against which to gauge factors that may be promoting or undermining growth and performance opportunities of firms in developing countries. To promote the elicitation of detailed and accurate information from owners and managers of businesses, the surveys are carried out by World Bank in collaboration with local private sector organisations (e.g., independent chambers of commerce), which further imbues the sampled businesses with confidence.

Employing a stratified random sampling with replacement based on a firm's size (categorised as small, medium, or large firms), sector of activity (consisting of the entire manufacturing, services, transportation, and construction sectors, whilst excluding public utilities, government services, health care, and financial services), and location within a country, the survey has produced between 65 firms (in Papua New Guinea) and 18,657 firms (in India) of unique data points across the sampled countries, suggesting very high dispersion. Also, because some countries have experienced more than one round of WBES, the data used for analysis follows a pseudo-panel structure.

In this paper, we focus on the relationship between female ownership and bribery solicitations by public officials, such that our baseline analysis can be viewed as a demand-side representation of the gender-corruption nexus (Gauthier et al., 2021). Given this focus, only firms providing answers to the WBES questions on female involvement in ownership of firms and whether they (the owned-firms) have been solicited for bribe payments can come into our empirical consideration. Based on this criterion and particularly in relation to bribery transactions, our primary sample consists of 18,240 firms from 18 industries in 110 countries. A further reason for this vastly reduced sample size is that, although information is available in the WBES database to construct a larger sample for any female involvement in ownership and bribery solicitation, the main crux of our investigation is the bribery effects of the *degree* of female ownership in a firm, for which data only became available in the surveys administered after 2012. Hence, our analysis period covers the years 2013 to 2022.

3.2 Variables

3.2.1 Dependent variables

Our empirical analyses primarily focus on bribery solicitations faced by firms across the world. The main dependent variable in our tests, *Bribery*, is a dummy variable set equal to 1 to reflect cases when a firm responds with an affirmative at least once in answering questions relating to informal payments when dealing with public officials and applying for one of the following public services: electricity connection, water connection, construction-related permits, meetings with tax officials, import license, and operating license. More specifically, *Bribery* is constructed based on the self-reported responses of firms to the following WBES questions: C.5, "In reference to that application for an electrical connection, was an informal gift or payment expected or requested?"; C.14, "In reference to that application for a water connection, was an informal gift or payment expected or requested?"; G.4, "In reference to that application for a construction-related permit, was an informal gift or payment expected or requested?"; J.5, "In any of these inspections or meetings (with tax officials), was a gift or informal payment expected or requested?"; J.12, "In reference to that application for an import license, was an informal gift or payment expected or requested?"; and J.15, "In reference to that application for an operating license, was an informal gift or payment expected or requested?" For each of these questions, the available options to choose from are: Yes, No, Don't know, or Refuse to answer. Like Şeker and Yang (2014) and Webster and Piesse (2018), we treat cases when respondents "Refuse to answer" as a *Yes* and "Don't know" as a *Non-response* (missing observation) in our baseline estimation. Following existing literature, we provide a robustness check utilising an alternative definition of bribery with refusals treated as missing observations and label it, *Bribery_alt*.

3.2.2 Independent variables

Our empirical analyses require us to define two main independent variables. One and following Dutta and Mallick (2023), *Female* is our independent variable for testing *Female Participation Hypothesis* (*FPH*) and *Female Majority Hypothesis* (*FMH*), and is proxied in several ways. First, we use the survey answers to the WBES question B.4, "Amongst the owners of the firm, are there any females?" to construct *FOD*, which is a dummy variable set equal to 1 to indicate female involvement in a firm's ownership. By construct, this measure is dichotomous between female in ownership or not, and, as such, does not allow

for the degree of female involvement, as previously noted. To introduce female ownership thresholds and be able to define majority or minority female ownership variables, we turn to the WBES question B.4a, "What percentage of the firm is owned by females?" Utilising this latter question, we construct *FOS*, the share of female ownership in a firm, and ten additional dummy variables, with each set equal to 1 to represent the following percentages of a firm owned by females: =0%, <20%, <30%, <40%, <50%, >60%, >70%, >80%, >90%, and =100%. Using these thresholds, we use all indicators derived based on 0%−<50% to capture minority female ownership (denoted, respectively, by *FOZ*, *FO2*, *FO3*, *FO4*, and *FO5*), whilst majority female ownership measures are based on >60%−100% (denoted, respectively, by *FO6*, *FO7*, *FO8*, *FO9*, and *FOH*).

Two, we employ responses given by a firm to the perceived difficulties concerning the following business obstacles covered by the WBES questionnaires: access to finance, tax rates, electricity, informal sector practices, political instability, education of workers, labour regulations, transportation infrastructure, customs and trade regulations, access to land, tax administration, business licensing, courts, crime, and corruption. More specifically, each sampled firm is asked, "How much of an obstacle is each of these fifteen business obstacles?," where the answers can be no obstacle = 0, minor obstacle = 1, moderate obstacle = 2, major obstacle = 3, or very severe obstacle = 4. We convert these five-point scale codification [0, 4] to a dummy variable set equal to 1 if the subjective reporting of an obstacle by a firm is major or very severe, and 0 otherwise. We utilise these measures together with the female ownership variables to test *Business Environment Hypothesis* (*BEH*) and *Business Obstacle Hypothesis* (*BOH*).

3.2.3 Control variables

Our empirical analyses control for various firm-specific characteristics that may influence the association between gender, business obstacles, and bribery solicitations, which we have chosen based on prior studies (Swamy et al. (2001); Hansen and Rand (2014); Webster and Piesse (2018); Knack, Biletska, and Kacker (2019)).[2] An important control variable is the age of a firm, measured by the natural logarithm of the years between when the firm first started its operation and the survey year. According to Webster and Piesse (2018), this signifies experience and learning-by-doing, which is crucial for doing business, but perhaps moreso for firms located in a corrupt society. Another control variable that we employ is

[2]We have mainly discussed the variables used in the baseline regressions here, leaving the description of all other variables employed in our study until when they come up in the analyses.

firm size, which is represented by three categorical measures that denote small (<20 full-time equivalent (FTE) employees), medium (20−99 FTE employees), and large (≥100 FTE employees), since differences in size might influence the extent of firms' susceptibility to bribery solicitations, a firm's bargaining power against bribery requests, and/or which firm is selected for bribery transactions (Swamy et al. (2001); Svensson (2003); Chen, Yaşar, and Rejesus (2008); Malesky, Nguyen, Bach, and Ho (2020)).

Further, several studies have shown that the shares of a firm owned by foreign entities and government enterprises have strong implications for whether a firm will engage, or not, in corrupt practices like bribery transactions (Swamy et al., 2001; Alm et al., 2016; Webster and Piesse, 2018). As a result, we control for these two ownership statuses by using directly the percentages of each firm that are reported to be owned by foreigners and the state. Similarly to existing studies, we account for the influences of a firm's main sales market by using the percentages of sales meant for the domestic and export markets (Ayyagari et al., 2014; Knack et al., 2019; Gauthier et al., 2021). Like Ayyagari et al. (2014), we include dummy variables to capture various legal ownership statuses, such as publicly listed, privately held, sole proprietorship, partnership, and limited partnership, with the other legal status serving as the reference category. Finally, we control for the experience of a firm's manager in the sector and add dummy variables for employing external auditors, being part of a larger establishment, and having at least one international certificate of recognition, following existing studies (Webster and Piesse, 2018).

3.3 Bribery solicitation model

To test *FPH* and *FMH*, we use the following econometric specification:

$$Bribery_{jcst} = \alpha + \beta Female_{jcst} + \theta_x X'_{jcst} + \theta_c + \theta_s + \theta_t + \varepsilon_{jcst} \quad (1)$$

for firm $j = 1, ..., 18{,}240$, in country $c = 1, ..., 110$, operating in industry $s = 1, ..., 18$, during year $t = 2013, ..., 2022$, where *Bribery* refers to a dummy variable set equal to 1 if a firm has been solicited for informal payments in the last fiscal year (and 0 otherwise) and *Female* refers to the different measures depicting female involvement in a firm's ownership−twelve of which have been constructed as described in a previous subsection (see also Table 1). We also include a vector of controls, X, consisting of firm age, size, percentages of foreign ownership, state ownership, national sales and direct export sales, manager's experience in a firm's sector of business activity, and dummy variables for audited firms, being part of

a larger establishment, possessing international recognition, and legal ownership statuses. As previous studies have shown that bribery solicitations differ across countries and sectors, we account for full sets of country fixed effects (θ_c) and sector fixed effects (θ_s). In addition, we control for year fixed effects (θ_t), which may help to account for temporal effects like the COVID-19 pandemic and the Russian-Ukraine war. In the above model specification, our primary interest lies with the link between female ownership variables and bribery solicitations, as captured by β.

To test *BEH* and *BOH*, we augment the model specification in equation (1) with the inclusion of an interaction term between female ownership measures and sources of business obstacles, *PBO*, which is derived in correspondence with each of the fifteen potential business obstacles self-reported by firms in the WBES; see further descriptions in Section 3.2. The resulting econometric specification used in our analyses is expressed below:

$$Bribery_{jcst} = \alpha + \beta Female_{jcst} + \gamma PBO_{jcst} + \delta Female_{jcst} \times PBO_{jcst} + \theta_x X'_{jcst} + \theta_c + \theta_s + \theta_t + \varepsilon_{jcst} \quad (2)$$

where our primary interest now also includes the effects of business obstacles and the multiplicative variable between female ownership and business obstacle indicators on bribery solicitations, which are represented, respectively, by γ and δ.

Given the discrete nature of the outcome variable, we follow existing firm-level studies (Swamy et al., 2001; Webster and Piesse, 2018; Wellalage et al., 2020; Oyekola and Odewunmi, 2023; Oyekola et al., 2023) in using the following probit model specification:

$$Pr(Bribery = 1|\mathbf{X}_{jcst}) = \Phi(\mathbf{X}'_{jcst}\omega) \quad (3)$$

where $Pr(Bribery = 1)$ represents bribery solicitation probability faced by a firm, $\mathbf{X}$ a vector of control variables (described above inclusive of female ownership variables, perceived business obstacles, and fixed effects), and ω a vector of coefficients we estimate by performing maximum likelihood estimation (MLE) procedures.

4 Quantitative analysis

4.1 Summary statistics

Table 2 reports the summary statistics for all variables described in Section 3 (additional statistics for selected measures of bribery solicitations and female ownership are shown in Appendix Table A1, which includes sample composition and statistics by country, industry, and year). Panel A of Table 2 reports the summary statistics of these variables for the full sample. It indicates that the mean bribery solicitations in the sample are between 15% (*Bribery_alt*) and 17% (*Bribery*). Almost all the firms in our sample (99%) have at least one female involvement in ownership, with the mean share of female ownership standing at 50%. This notwithstanding, the evidence from the remaining female ownership dummy variables suggests that females are in the minority of business owners. To put it more concretely, 51% of sampled firms have minority female ownership (when captured by <50% threshold), albeit the lot of women in firm ownership improved as the threshold is lowered. Regarding majority female ownership, the summary statistics in Table 2 suggest that 32% of firms have female owners. Besides, it is noteworthy that corruption at 31%, along with obtaining electricity connection (31%), political instability (33%), and tax rates (32%), is one of the highest ranked self-reported obstacles to enterprise performance amongst our sample of firms.

Moving on to the control variables, the mean firm age in the full sample is 2.78 in log years and the average (log) years of a firm manager's experience is 2.77. Further, the majority of firms in our sample are either small- (41.75%) or medium-sized (35.75%), with large-sized firms comprising of 22.5% of the sample. In relation to ownership status by nationality, we observe that, on average, only 5.9% of the sampled firms is owned by foreigners and a meagre 0.67% of firms is owned, on average, by the government. We also see that 20% of firms are subsidiaries or part of a larger establishment and 26% of firms have at least one international certificate of recognition. On legal ownership status, panel A of Table 2 also indicates that 46% of firms in our full sample are privately held, 20% are sole proprietors, 16% are limited partnerships, 10% are partnerships, 5.9% are publicly listed, and 2.1% are composed of other legal configurations.

Panel B of Table 2 reports the summary statistics for data disaggregated by gender. It is clear from these statistics that differences arising because of gender are not negligible. Looking at the firm

characteristics, we see that, on average, female-owned firms tend to be younger than male-owned ones (being 2.53 versus 2.88 log years). Moreover, female-owned firms are more likely to have managers with lower sectoral experience than those owned by males (being 2.56 versus 2.85 log years). Compared to the male-owned firms, female-owned businesses are also more ubiquitous in the small-size category and are less likely to receive both foreign and state investment supports, as well as being more (less) prone to sell domestically (abroad). Besides, 43% of female-owned firms reported using external auditors to prepare their financial statements; the corresponding figure for male-owned firms is 67%. Finally, a higher proportion of female-owned firms have the legal status of sole proprietorship (66%), whereas this is only 3.4% for male-owned firms. As shown, all these differences between female-owned and male-owned firms are statistically significant at the 1% level.

4.2 Hypotheses testing - main results

The evidence above may, or may not, lead to differential effects of female-owned firms relative to non-female-owned firms on bribery solicitations. To confirm this, we estimate a series of probit model specifications for whether bribery solicitations are more (less) likely conditional on a firm's gender composition of ownership. The presentation of our baseline estimated results for testing *Female Participation Hypothesis* (*FPH*) and *Female Majority Hypothesis* (*FMH*) are in Table 3. In Tables 4 and 5, we present the estimated results that exploit alternative approaches to confirm findings related to *FMH*. Table 6 then presents the estimated results regarding *Business Environment Hypothesis* (*BEH*) and *Business Obstacle Hypothesis* (*BOH*). In all four tables and for each model specification that we estimate, the dependent variable is the baseline bribery solicitation measure, *Bribery*, whilst *Female* is measured using, amongst the twelve female ownership indicators discussed previously, the most relevant to each of the hypotheses under consideration. We make explicit which measure of female ownership is being considered in the discussions that follow.

Commencing with Table 3, *Model* 1 presents the result from testing *FPH* following the standard practice in the literature by defining *FOD*, which is a dummy variable we created to capture the notion of any female involvement in a firm's ownership (Aterido, Beck, and Iacovone, 2013; Hansen and Rand, 2014; Dutta and Mallick, 2023). As shown, the coefficient on *FOD* ($\beta = -0.1319$, t-statistic $= -0.709$) is negative, but not significant at conventional levels. In *Model* 2, we employ *FOS*, the share of a firm

owned by females, as the independent variable. Again, the coefficient on *FOS* ($\beta = -0.0564$, t-statistic $= -1.178$) is negative and not significant at conventional levels. Our perspective on this is that experiences of bribery solicitations go deeper than just whether a firm has female involvement in ownership or not. Furthermore, the share of ownership in a firm may not accurately reflect the degree of female majority ownership (Dutta and Mallick, 2023) and it is thus plausible that ownership shares are too noisy to elicit the true effects of gender on bribery solicitations. Deriving from our hypotheses development, we already anticipated that the main effects of gender on bribery solicitations may be driven by the extent of female participation, such that these results do not come as a surprise.

In beginning to contemplate our main hypothesis on the bribery effects of female majority ownership, *Models* 3 and 4 of Table 3 use the dummy variables *FOZ* and *FOH* to, respectively, capture two polar ownership scenarios: zero percent (i.e., no female) and one hundred percent (i.e., female only) ownership. As before, the coefficient on *FOZ* ($\beta = -0.0694$, t-statistic $= -0.575$) in *Model* 3 is negative and not significant at conventional levels, which indicates that majority-male-owned firms in our sample are not particularly (dis)advantaged in their bribery encounters with public officials. Turning to *Model* 4, we find the coefficient on *FOH* ($\beta = -0.1298$, t-statistic $= -3.006$) to still be negative, but is now highly statistically significant at conventional levels, with a p-value < 0.01. In summary, the estimated results in Table 3 are consistent with the *FMH*, but *FPH* is not supported.

Having established that any female and no female involvement in ownership are inconsequential for bribery solicitation outcomes in our sample, whilst female only ownership has a significant impact, we further substantiate our results with regards to the *FMH* by additionally evaluating the influence that different thresholds of female ownership have on bribery solicitations. To this end, we construct four more dummy variables to embody different levels of female majority ownership and four more dummy variables to constitute different levels of female minority ownership, as described in Section 3.2. The results in Table 4, which employs the four majority-female-owned dummy indicators, confirm the evidence in support of *FMH* that bribery solicitations by public officials is affected by the extent of female ownership. Specifically, the estimated coefficients for *FO6* ($\beta = -0.1099$, t-statistic $= -2.978$) in *Model* 1, *FO7* ($\beta = -0.1294$, t-statistic $= -3.342$) in *Model* 2, *FO8* ($\beta = -0.1153$, t-statistic $= -2.835$) in *Model* 3, and *FO9* ($\beta = -0.1280$, t-statistic $= -3.040$) in *Model* 4 are all negative and highly statistically significant at conventional levels, with a p-value < 0.01. In Table 5, which instead

employs the four minority-female-owned dummy indicators, we further buttress the validity of our results in terms of *FMH*, given that the estimated coefficients for *FO5* ($\beta = -0.0053$, t-statistic $= -0.178$) in *Model* 1, *FO4* ($\beta = -0.0118$, t-statistic $= -0.407$) in *Model* 2, *FO3* ($\beta = -0.0192$, t-statistic $= -0.678$) in *Model* 3, and *FO2* ($\beta = -0.0454$, t-statistic $= -1.445$) in *Model* 4 are all negative, but none of them is significant at conventional levels.[3]

The included control variables likewise offer some noteworthy results. In all model specifications in Tables 3-5, we find that a firm's age, size (medium and large relative to being small), being foreign owned, being a subsidiary, and employing external auditors to prepare a firm's financial statements are always statistically significant; whereas, manager's experience in the sector, being state-owned, having international recognition, sales (domestic and direct exports), and being publicly listed, privately held, or limited partners are never statistically significant. Meanwhile, being a sole proprietor and a partnership produce inconsistent effects, being sometimes significant and, at other times, not significant, depending on the model. Specifically, the estimated coefficients on firm age are negative and statistically significant, indicating that older firms are less likely to be affected by bribery solicitations of public officials. This may be because the more experienced firms have learnt to cater for this form of market distortions (Şeker and Yang, 2014; Webster and Piesse, 2018). In corroboration of previous findings in the literature (Svensson, 2003; Clarke and Xu, 2004; Webster and Piesse, 2018), medium- and large-sized firms have positive and statistically significant effects on bribery solicitations by public officials, which can be explained by the wealth (bribe affordability) signals that bigger firm sizes reveal (Gauthier et al., 2021). Our results in relation to the effects of foreign ownership, which are positive and statistically significant, are also in line with the conclusion of Webster and Piesse (2018) that foreign owned firms are as likely to pay bribes as domestic ones. The estimated results for auditing are positive and statistically significant, which are consistent with the view that firms with credible financial information are more vulnerable to predatory bribe extraction (Ejiogu, Ejiogu, and Ambituuni (2019); Liu et al. (2021)), reflecting the notion that there is a dark side to transparency.

To test *BEH* and *BOH*, equation (2) is utilised. In this specification, we interact the female ownership variables with indicators capturing a firm's business obstacle perceptions, *PBO*, which is also included separately in our regressions to assess the direct impact of business obstacles on bribery solicitations.

[3]In the Appendix, Table A2 shows that the results are unaffected when we employ our alternative measure of bribery, *Bribery_alt*, as the dependent variable.

According to our hypothesis (BOH), the interaction term (δ) captures the influence of female (majority *vs.* minority) ownership on bribery behaviours of public officials for various types of obstacles to doing business around the world. Using our minimum threshold of 60% for attaining majority ownership, the results are presented in Table 6. As in Table 3, the estimated coefficients on female majority ownership (β) are negative and statistically significant in *Models* 1-15 (p-value < 0.01, except in *Models* 9 and 12: p-value < 0.05). As hypothesised (BEH), the results of the estimated effects of business obstacles (γ) are all positive and highly statistically significant (p-value < 0.01), revealing that all (perceived) business obstacles are harmful to firms, regardless of gender composition of ownership.

The results of the interaction of >60% female majority ownership with each of the following perceived business obstacles, access to finance, access to land, business licensing and permits, courts, crime (theft and disorder), customs and trade regulations, electricity, labour regulations, informal sector practices, and tax rates, are not significant at conventional levels. However, the results from *Model* 4 on corruption ($\delta = 0.1142$, t-statistic $= 2.081$, p-value $= 0.05$), *Model* 11 on political instability ($\delta = 0.1004$, t-statistic $= 1.820$, p-value $= 0.10$), *Model* 13 on tax administration ($\delta = 0.1291$, t-statistic $= 2.153$, p-value $= 0.05$), and *Model* 15 on transport ($\delta = 0.1455$, t-statistic $= 2.296$, p-value $= 0.05$) are all positive and statistically significant. These point estimates indicate that increases in obstacles facing a firm's operations that arise from perceptions in corruption, political instability, tax administration, and transport infrastructure decrease any advantage that majority-female-owned firms may have in terms of bribery solicitations by public officials. Regardless of whether δ is positive or negative and significant or not, we read these outcomes as providing evidence in support of BOH (i.e., the type of business obstacle is important for the effects that gender composition of ownership exerts on bribery solicitations).

4.3 Robustness checks

The estimated results presented so far have supported both our primary and secondary hypotheses. We next perform a series of robustness tests of our results, focusing on our primary hypothesis on the implications of female majority ownership, and where we have used the minimum threshold of >60%,[4] for bribery solicitations. Our results are presented in Tables 7 and 8.

[4]To allay fears that our results may differ for the other thresholds, we confirm that this is not the case and provide some corresponding results to the ones reported here in the Appendix Table A4 for cases when female ownership is =0% (FOD), <50% ($FO5$), and =100% (FOH). The results for other minority and majority female ownership thresholds are available upon request. For these exercises, the model specification being used is *Model* 1 of Table 4.

Sample composition and subgroup analysis. First, we attempt to limit the effects that sample composition and outliers may be imposing on our results by creating sub-groups of firms and countries. *Models* 1-4 of Table 7 show the different approaches that we use. In *Model* 1 of Table 7, we exclude all large firms (i.e., firms that have more than 100 full-time employees). In *Model* 2, we rerun our model specification for firms in the service sector only. In *Model* 3, we exclude all countries where the number of sampled firms are below 100. In *Model* 4, we exclude the countries in our sample that have more than 1000 firms surveyed. In all four regressions, we find that female-majority-owned firms continue to experience, relative to female-minority-owned ones, lower bribery solicitations.

Location effects. Second, we introduce additional factors that may potentially confound the relationship between female majority ownership and bribery solicitation. In *Model* 5 of Table 7, we follow a specification from Ayyagari et al. (2014) in controlling for the impact of a firm's location on whether it will be solicited for bribe, or not. It may be that majority-female-owned firms are less common in bigger cities, where one would expect greater reach of public officials. We try to eliminate this as a reason why firms with majority female ownership are less likely to face bribery solicitations in our analysis. Our measure to capture the location effects is constructed from variable A.3 on the size of locality in the WBES, using five dummy variables to categorise a firm's location as either a Capital city, Other city of over 1 million population, City of between 250,000 and 1 million population, City of between 50,000 and 250,000 population, or Town/location with less than 50,000 population. Capital city is taken to be the reference category, and as shown, our results are not altered after we account for these location effects.

Additional controls. Third, although we have controlled for several key factors associated with bribery solicitations in presenting our main results, it is often possible that there remains some omitted (and correlated) variables. Not accounting for such may result in omitted variable bias. Hence, we show in the rest of Table 7 that our baseline results are robust to the inclusion of several additional control variables. In *Models* 6−10, we attempt to deal with these plausible alternative explanations of our results by sequentially including the following additional firm-level controls: female top manager (a dummy variable that is equal to 1 if a firm is managed by a female), product innovation (a dummy variable that is equal to 1 if a firm has introduced a new product or significantly improved one during the last three years), process innovation (a dummy variable that is equal to 1 if a firm has introduced a new process or significantly improved one during the last three years), research and development (a

dummy variable that is equal to 1 if a firm has spent money on R&D, excluding market research, during the last fiscal year), and labour productivity (the natural logarithm of the ratio of sales to the number of full-time equivalent employees). Adding these additional firm-level controls have not changed our main results.

Then, in *Models* 11 and 12, we employ country-level additional controls. Specifically, we augment our baseline specification with the following controls from the World Development Indicators (WDI): GDP (the natural logarithm of gross domestic product per capita in constant 2017 US$), GDP's growth rate, inflation (annual percentage growth in consumer price index), business density (new business registrations per 1,000 people ages 15-64), oil rents (% of GDP), and trade openness (% of GDP) in *Model* 11. We then control for institutional quality (obtained as the average of Control of Corruption, Government Effectiveness, Political Stability and Absence of Violence/Terrorism, Rule of Law, Regulatory Quality, and Voice and Accountability[5] from the World Bank Governance Indicators) in *Model* 12. To avoid contemporaneous correlation, we lag all time-varying control variables by one year. Again, our results remain robust to accounting for all these factors. Put together, the results in *Models* 6-12 help to alleviate concerns that our results are driven by omitted variables.

Further results. In untabulated results, we have also divided the countries in our sample by level of development and time of survey. First, to investigate whether our results are driven by the increasing inclusion of developed countries in the WBES, we split our sample into developed and less developed countries, using the classification of the World Economic Situation and Prospects by the United Nations Department of Economic and Social Affairs (UNDESA, 2023). The results show that running separate regressions for these groups of countries do not change our baseline results. Specifically, we estimate the effects of female majority ownership on bribery solicitation to be negative and significant for both groups ($\beta = -0.2545$, t-statistic $= -2.331$ for developed countries and $\beta = -0.0915$, t-statistic $= -2.317$ for less developed countries, with a p-value < 0.05 in both instances). Second, we divide our sample into two periods (pre-2017 and post-2017), resulting in equal number of years in each period. The number of firms in the pre-2017 period is 11,883, whilst the number in the post-2017 period is 6,013. We have

[5]The individual components are: (i) control of corruption—an index capturing perceptions of the degree to which state power is exercised to obtain private gains; (ii) government effectiveness—an index capturing perceptions of the quality of the provided public services, policy formulation, and implementation; (iii) political stability—an index capturing perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism, that may destabilise or topple a government; (iv) rule of law—an index capturing perceptions of the extent to which agents have confidence in and abide by the rules of a state; (v) regulatory quality—an index capturing perceptions of the incidence of unfriendly market policies; and (vi) voice and accountability—an index capturing the degree to which citizens of a country are able to participate in the selection of their government.

done this as a way to test whether the gender advantage of lower bribery requests being experienced by majority-female-owned firms has changed with time. This is indeed what we found, with the coefficient on *Female* ($\beta = -0.0702$, t-statistic $= -1.577$) still negative, but not significant, for the pre-2017 period; whereas, the estimated effect of *Female* ($\beta = -0.1894$, t-statistic $= -2.724$) on bribery solicitation in the post-2017 period is both negative and statistically significant, with a p-value < 0.01. This suggests that this may be one example of gender gap closing over the 10-year period in our sample. In a further untabulated result, we have utilised a sample consisting of only the latest survey in each country, with our results remaining unchanged relative to the baseline findings.

Addressing potential endogeneity. We acknowledge that there may be concerns that our results could be suffering from endogeneity, despite the inclusion of several firm-level controls and country, industry, and year fixed effects, as well as accounting for various country-level control variables. This is because applying fixed effects and increasing elements of the vector of controls mainly help with reducing omitted variables bias, with issues relating to potential reverse causality in the female ownership-bribery solicitations nexus and measurement error in the responses provided to WBES questions that we employ in constructing our key indicators, remaining largely unresolved (Fisman and Svensson, 2007; Olney, 2016). To address the endogeneity of female ownership, we utilise an instrumental variables (IV) probit estimation technique to re-estimate equation (1) for *Model* 1 of Table 4 (i.e., we focus on the minimum threshold of 60% for female majority ownership, *FO6*).

Our identification strategy is predicated on an instrument constructed by following Chan (2019). More specifically, the instrument that we employ is the weighted average level of *FO6* of other firms within the same country, region, and year, $MeanFemale_{-jcst}$. According to Fisman and Svensson (2007) and Olney (2016), this leave-firm j-out instrumental variable is appropriate for tackling reverse causality and measurement error because it identifies variations in firm-level majority female ownership that is due to factors that are common to other firms, firm$_{-j}$, within firm j's specific market. Hence, the key identification assumption is that $MeanFemale_{-jcst}$, which reflects the majority female ownership in firm j's business environment, should positively affect its gender ownership composition status (thereby satisfying the condition for relevance), but should not have any direct effects on its bribery solicitations by public officials (thereby satisfying the condition for exclusion); see also Liu et al. (2021).

Using this instrument, our first-stage model specification is:

$$Female_{jcst} = \alpha^{'} + \beta^{'} MeanFemale_{-jcst} + \theta_{x}^{'} X_{jcst} + \theta_{c}^{'} + \theta_{s}^{'} + \theta_{t}^{'} + \varepsilon_{jcst}^{'} \quad (4)$$

In the second-stage, we estimate the following model specification:

$$Bribery_{jcst} = \alpha + \beta PredictedFemale_{jcst} + \theta_{x} X_{jcst}^{'} + \theta_{c} + \theta_{s} + \theta_{t} + \varepsilon_{jcst} \quad (5)$$

where $PredictedFemale_{jcst}$ is the fitted value of $Female_{jcst}$ from the first-stage regression.

In Table 8, we present our IV estimation results. In the second-stage results (*Model* 1 of Table 8), the coefficient on *PredictedFemale* enters the bribery solicitation regression negatively ($\beta = -2.0243$, t-statistic $= -4.075$) and significantly (p-value < 0.01). This finding is consistent with the view that an exogenous increase in female majority ownership for a typical firm in our sample is associated with a reduction in the firm's experiences of bribery solicitation. In *Model* 2 of Table 8, we present the first-stage results from estimating equation (4). This shows that the relationship between our instrument, *MeanFemale*, and *Female* (represented by *FO6*) is positive ($\beta = 0.3583$, t-statistic $= 3.986$) and significant (p-value < 0.01). The F-stat, obtained from a linear IV regression model, is reassuring. In *Model* 3 of Table 8, we examine the reduced-form association between bribery solicitation and *MeanFemale*. As shown, the estimated coefficient is negative and statistically significant. Overall, we find no evidence of endogeneity bias in our results.

5 Conclusions

Corruption behaviours have been documented to be a significant barrier to the growth of an economy, particularly in developing countries. Undoubtedly, one of the ways through which this effect permeates a country is corruption's impact on the performance of firms. In this paper, we contribute to the literature seeking to understand the role that gender plays in the corruption experiences of firms. Whilst the relationship between gender (male *vs.* female) and corruption has long been established in the existing literature, albeit with mixed findings, what remains unaddressed is whether the gender composition of ownership has a material effect on how susceptible to bribery requests a firm would be. Thus, the key question that we assess in this paper is whether majority-female-owned firms are more susceptible to bribery solicitations. Our answer is No.

Our results, based on the WBES data for 18,240 firms in 18 industries across 110 countries from 2013 to 2022, offer a new insight into the debate on gender and corruption, which we measure by the incidence of bribery solicitations from public officials. We find that, in explaining which firms are more susceptible to bribery solicitations, any female involvement in the ownership of a firm do not play an important role, which perhaps may be due to the possibility of noisy effects of ownership shares. This implies that the susceptibility of firms to bribery solicitations goes beyond the issues of whether female or male are involved in the ownership of a firm. On the other hand, we uncover that firms that are majority-female-owned differ significantly from minority-female-owned or male-owned firms in their experiences of bribery transactions. We attain these results by constructing ten indicators of minority and majority female ownership, finding that our five measures of majority female ownership are all negative and highly significant; however, the five measures of minority female ownership produce inconsistent signs and are insignificant. These results hold after several robustness checks, including endogeneity tests. Besides, our results also accentuate the critical indirect role of business obstacles on a firm's susceptibility to bribery solicitations, such that increasing gender representation in firm ownership is not enough to curb susceptibility to bribery demands from public officials.

In addition, we report that there are key differences between female-owned and male-owned firms in terms of age, size, experience, business entity type, etc. and buttressing existing studies, we find that older, larger, and foreign firms are less likely to be affected by bribery solicitations of public officials. We also suggest from our findings, and with regards to more recent times, that gender gap may have begun to close, at least as it relates to a society's corruption practices. This is because we find that the advantages of lower bribery solicitations experienced by majority-female-owned firms have been largely realised in the second half of the ten-year period in our sample. Our results thus exhibit time heterogeneity. To the best of our knowledge, this is the first study to provide empirical evidence, demonstrating that the extent of female participation in a firm's ownership matters for its bribery susceptibility. Thus, our findings provide a fresh perspective that may help to clarify some of the mixed results from existing studies, thereby opening up avenues for further research for scholars seeking to understand the association between female-owned firms and the incidences of bribery solicitations.

More specifically, we foresee at least two important ways by which future research can build on our findings to better advance our understanding of the effects of gender composition of a firm's ownership

on its experience of corruption behaviours by public officials, and to identify the specific economic mechanisms through which female majority ownership works. First, our paper's findings mainly speak to the demand-side representation of the gender-corruption nexus, which leaves unanswered questions relating to whether there are differential bribery effects of female participation in ownership from supply-side considerations. It is our belief that a promising avenue in this regard could be marrying our focus on majority female ownership with not only demand-side dependent variable, as we have done in this paper, but also assess its impacts on supply-side outcome variables.

Second, we think that it is crucially important for future studies to revisit our empirical investigation in light of more data becoming available, especially firm-level panel data, which should help to further deal with potential gender endogeneity and evaluate additional firm-level heterogeneity. We believe that the availability of firm-level panel data will avail future scholars a greater resource to ascertain whether female-majority-owned firms act differently to their female-minority-owned or male-owned counterparts with regards to bribery transactions as ownership structure changes overtime. Moreover, further surveys of firm owners and entrepreneurs can be carried out, which experimental designs can help to shed more light on the mechanisms at play in female ownership-bribery solicitation relationship. In particular, such surveys can be exploited to deal with the limitation that WBES has in terms of demographic information of firm owners, including age, career history, educational background, ethnicity, marital status, etc., which should lead to a more nuanced examination of the role that attributes of owners may be playing in our hypothesised relationships.

Finally, we provide the implications that our findings offer for policymakers and practitioners. Our paper has established that firms with majority female ownership are less susceptible to bribery solicitations, when compared to their counterparts with minority female or male ownership, and this result is consistent in both the developed and developing countries' contexts and regardless of the location of firms within a country. Business obstacles are, however, found to be harmful to firms, regardless of their gender composition of ownership. Moreover, some obstacles to doing business act to eliminate the benefits accruing to majority-female-owned firms. Hence, our results show that, whilst the promotion of female involvement in a firm's ownership may reduce bribery solicitations, it is not enough to curb susceptibility to corruption practices from public officials. Thus, an important implication of our results is that policies which promote female ownership of a firm, on the basis that majority-female-owned firms

are less susceptible to bribery solicitations from public officials, may be less effective if the obstacles that firms face in the day-to-day running of their business operations remain prevalent. Therefore, it is critical for policymakers to understand the relationship between the critical concern of business obstacles and the susceptibility to bribery of firms, even in the face of gender neutralisation of bribery solicitations. This implies that governments seeking to address corruption being perpetrated by their public officials on private firms must also focus on eliminating potential business obstacles, which could be a driver of firm's susceptibility to bribery, even as they enact policies to promote opportunities for wider women participation in private firms and public institutions.

References

F. Afridi, V. Iversen, and M. R. Sharan. Women political leaders, corruption, and learning: Evidence from a large public program in india. *Economic Development and Cultural Change*, 66(1):1–30, 2017.

T. S. Aidt. Corruption, institutions, and economic development. *Oxford Review of Economic Policy*, 25 (2):271–291, 2009.

V. Alatas, L. Cameron, A. Chaudhuri, N. Erkal, and L. Gangadharan. Gender, culture, and corruption: Insights from an experimental analysis. *Southern Economic Journal*, 75(3):663–680, 2009.

M. Alexeev and Y. Song. Corruption and product market competition: An empirical investigation. *Journal of Development Economics*, 103:154–166, 2013.

J. Alm, J. Martinez-Vazquez, and C. McClellan. Corruption and firm tax evasion. *Journal of Economic Behavior & Organization*, 124:146–163, 2016.

G. A. Alsos, E. J. Isaksen, and E. Ljunggren. New venture financing and subsequent business growth in men–and women–led businesses. *Entrepreneurship Theory and Practice*, 30(5):667–686, 2006.

A. Argandoña. Corruption and companies: The use of facilitating payments. *Journal of Business Ethics*, 60:251–264, 2005.

O. Armantier and A. Boly. A controlled field experiment on corruption. *European Economic Review*, 55 (8):1072–1082, 2011.

R. Aterido, T. Beck, and L. Iacovone. Access to finance in sub-saharan africa: is there a gender gap? *World Development*, 47:102–120, 2013.

M. Ayyagari, A. Demirgüç-Kunt, and V. Maksimovic. Bribe payments and innovation in developing countries: Are innovating firms disproportionately affected? *Journal of Financial and Quantitative Analysis*, 49(1):51–75, 2014.

R. Bailes. Facilitation payments: culturally acceptable or unacceptably corrupt? *Business Ethics: A European Review*, 15(3):293–298, 2006.

G. Beekman, E. Bulte, and E. Nillesen. Corruption, investments and contributions to public goods: Experimental evidence from rural liberia. *Journal of Public Economics*, 115:37–47, 2014.

M. Belitski, F. Chowdhury, and S. Desai. Taxes, corruption, and entry. *Small Business Economics*, 47: 201–216, 2016.

J. N. Bhagwati. Directly unproductive, profit-seeking (dup) activities. *Journal of Political Economy*, 90 (5):988–1002, 1982.

R. J. Boden and A. R. Nucci. On the survival prospects of men's and women's new business ventures. *Journal of Business Venturing*, 15(4):347–362, 2000.

J. Bologna. Corruption, product market competition, and institutional quality: empirical evidence from the us states. *Economic Inquiry*, 55(1):137–159, 2017.

M. Breen, R. Gillanders, G. McNulty, and A. Suzuki. Gender and corruption in business. *Journal of Development Studies*, 53(9):1486–1501, 2017.

F. Brollo and U. Troiano. What happens when a woman wins an election? evidence from close races in brazil. *Journal of Development Economics*, 122:28–45, 2016.

C. G. Brush. Research on women business owners: Past trends, a new perspective and future directions. *Entrepreneurship Theory and Practice*, 16(4):5–30, 1992.

N. R. Buchan, R. T. Croson, and S. Solnick. Trust and gender: An examination of behavior and beliefs in the investment game. *Journal of Economic Behavior & Organization*, 68(3-4):466–476, 2008.

J. M. Chan. Financial frictions and trade intermediation: Theory and evidence. *European Economic Review*, 119:567–593, 2019.

Y. Chen, M. Yaşar, and R. M. Rejesus. Factors influencing the incidence of bribery payouts by firms: A cross-country analysis. *Journal of Business Ethics*, 77:231–244, 2008.

G. R. Clarke and L. C. Xu. Privatization, competition, and corruption: how characteristics of bribe takers and payers affect bribes to utilities. *Journal of Public Economics*, 88(9-10):2067–2097, 2004.

J. D. Collins, K. Uhlenbruck, and P. Rodriguez. Why firms engage in corruption: A top management perspective. *Journal of Business Ethics*, 87:89–108, 2009.

G. De Jong, P. A. Tu, and H. van Ees. Which entrepreneurs bribe and what do they get from it? exploratory evidence from vietnam. *Entrepreneurship Theory and Practice*, 36(2):323–345, 2012.

E. Dimant and G. Tosato. Causes and effects of corruption: what has past decade's empirical research taught us? a survey. *Journal of Economic Surveys*, 32(2):335–356, 2018.

D. Dollar, R. Fisman, and R. Gatti. Are women really the "fairer" sex? corruption and women in government. *Journal of Economic Behavior & Organization*, 46(4):423–429, 2001.

A. Dreber and M. Johannesson. Gender differences in deception. *Economics Letters*, 99(1):197–199, 2008.

A. Dreher and M. Gassebner. Greasing the wheels? the impact of regulations and corruption on firm entry. *Public Choice*, 155:413–432, 2013.

N. Dutta and S. Mallick. Gender and access to finance: Perceived constraints of majority-female-owned indian firms. *British Journal of Management*, 34(2):973–996, 2023.

A. Ejiogu, C. Ejiogu, and A. Ambituuni. The dark side of transparency: Does the nigeria extractive industries transparency initiative help or hinder accountability and corruption control? *The British Accounting Review*, 51(5):100811, 2019.

J. Esarey and G. Chirillo. "fairer sex" or purity myth? corruption, gender, and institutional context. *Politics & Gender*, 9(4):361–389, 2013.

S. Fang, C. Goh, M. Roberts, L. C. Xu, and A. Zeufack. Female entrepreneurs and productivity around the world: Rule of law, network, culture, and gender equality. *World Development*, 154:105846, 2022.

A. Feingold. Gender differences in personality: a meta-analysis. *Psychological Bulletin*, 116(3):429, 1994.

R. Fisman and E. Miguel. Corruption, norms, and legal enforcement: Evidence from diplomatic parking tickets. *Journal of Political Economy*, 115(6):1020–1048, 2007.

R. Fisman and J. Svensson. Are corruption and taxation really harmful to growth? firm level evidence. *Journal of Development Economics*, 83(1):63–75, 2007.

B. Frank, J. G. Lambsdorff, and F. Boehm. Gender and corruption: Lessons from laboratory corruption experiments. *European Journal of Development Research*, 23:59–71, 2011.

B. Gauthier, J. Goyette, and W. A. Kouamé. Why do firms pay bribes? evidence on the demand and supply sides of corruption in developing countries. *Journal of Economic Behavior & Organization*, 190:463–479, 2021.

GEM. Global entrepreneurship monitor 2021/22 women's entrepreneurship report: From crisis to opportunity. Technical report, London: GEM, 2022.

A. M. Goetz. Political cleaners: Women as the new anti-corruption force? *Development and Change*, 38 (1):87–105, 2007.

J. Hanousek, A. Shamshur, and J. Tresl. Firm efficiency, foreign ownership and ceo gender in corrupt environments. *Journal of Corporate Finance*, 59:344–360, 2019.

H. Hansen and J. Rand. Estimates of gender differences in firm's access to credit in sub-saharan africa. *Economics Letters*, 123(3):374–377, 2014.

O.-K. Hope, W. Thomas, and D. Vyas. Financial credibility, ownership, and financing constraints in private firms. *Journal of International Business Studies*, 42:935–957, 2011.

C. K. Jha and S. Sarangi. Women and corruption: What positions must they hold to make a difference? *Journal of Economic Behavior & Organization*, 151:219–233, 2018.

S. Knack, N. Biletska, and K. Kacker. Deterring kickbacks and encouraging entry in public procurement markets: Evidence from firm surveys in 90 developing countries. *The World Bank Economic Review*, 33(2):287–309, 2019.

S. M. Krammer. Greasing the wheels of change: Bribery, institutions, and new product introductions in emerging markets. *Journal of Management*, 45(5):1889–1926, 2019.

S.-H. Lee, K. Oh, and L. Eden. Why do firms bribe? insights from residual control theory into firms' exposure and vulnerability to corruption. *Management International Review*, 50:775–796, 2010.

W.-S. Lee and C. Guven. Engaging in corruption: The influence of cultural values and contagion effects at the microlevel. *Journal of Economic Psychology*, 39:287–300, 2013.

T. Liu, Y. Liu, B. Ullah, Z. Wei, and L. C. Xu. The dark side of transparency in developing countries: The link between financial reporting practices and corruption. *Journal of Corporate Finance*, 66: 101829, 2021.

Y. Luo. An organizational perspective of corruption1. *Management and Organization Review*, 1(1): 119–154, 2005.

E. J. Malesky, T. V. Nguyen, T. N. Bach, and B. D. Ho. The effect of market competition on bribery in emerging economies: An empirical analysis of vietnamese firms. *World Development*, 131:104957, 2020.

P. Mauro. Corruption and growth. *The Quarterly Journal of Economics*, 110(3):681–712, 1995.

P. Mauro. Corruption and the composition of government expenditure. *Journal of Public Economics*, 69(2):263–279, 1998.

P.-G. Méon and K. Sekkat. Does corruption grease or sand the wheels of growth? *Public Choice*, 122: 69–97, 2005.

M. Mironov. Should one hire a corrupt ceo in a corrupt country? *Journal of Financial Economics*, 117 (1):29–42, 2015.

L. T. Nguyen, H. T. Nguyen, and M. H. Pham. Bribe or die: gender differences in entrepreneurship in emerging markets. *Applied Economics*, 53(19):2170–2191, 2021.

M. Niederle and L. Vesterlund. Do women shy away from competition? do men compete too much? *The Quarterly Journal of Economics*, 122(3):1067–1101, 2007.

W. W. Olney. Impact of corruption on firm-level export decisions. *Economic Inquiry*, 54(2):1105–1127, 2016.

O. Oyekola and S. Odewunmi. The consequence of societal secrecy for the financial constraints faced by firms. *Economics Letters*, page 111182, 2023.

O. Oyekola, S. Johan, R. Sakariyahu, O. E. Dosumu, and S. Amini. Political institutions, financial liberalisation, and access to finance: firm-level empirical evidence. Technical report, 2023.

A. Persson, B. Rothstein, and J. Teorell. Why anticorruption reforms fail—systemic corruption as a collective action problem. *Governance*, 26(3):449–471, 2013.

S. Qi and D. D. Nguyen. Government connections and credit access around the world: Evidence from discouraged borrowers. *Journal of International Business Studies*, 52:321–333, 2021.

R. Reinikka and J. Svensson. Fighting corruption to improve schooling: Evidence from a newspaper campaign in uganda. *Journal of the European Economic Association*, 3(2-3):259–267, 2005.

M. Şeker and J. S. Yang. Bribery solicitations and firm performance in the latin america and caribbean region. *Journal of Comparative Economics*, 42(1):246–264, 2014.

A. Shleifer. Does competition destroy ethical behavior? *American Economic Review*, 94(2):414–418, 2004.

A. Shleifer and R. W. Vishny. Corruption. *The Quarterly Journal of Economics*, 108(3):599–617, 1993.

A. Sundström. Why do people pay bribes? a survey experiment with resource users. *Social Science Quarterly*, 100(3):725–735, 2019.

H.-E. Sung. Fairer sex or fairer system? gender and corruption revisited. *Social Forces*, 82(2):703–723, 2003.

E. H. Sutherland, D. R. Cressey, and D. F. Luckenbill. *Principles of criminology*. Altamira Press, 1992.

J. Svensson. Who must pay bribes and how much? evidence from a cross section of firms. *The Quarterly Journal of Economics*, 118(1):207–230, 2003.

A. Swamy, S. Knack, Y. Lee, and O. Azfar. Gender and corruption. *Journal of Development Economics*, 64(1):25–55, 2001.

D. Treisman. The causes of corruption: a cross-national study. *Journal of Public Economics*, 76(3): 399–457, 2000.

R. Truex. Corruption, attitudes, and education: Survey evidence from nepal. *World Development*, 39 (7):1133–1142, 2011.

K. Uhlenbruck, P. Rodriguez, J. Doh, and L. Eden. The impact of corruption on entry strategy: Evidence from telecommunication projects in emerging economies. *Organization Science*, 17(3):402–414, 2006.

UNDESA. Content type. *World Economic Situation and Prospects*, 2023, 2023.

UNODC. The time is now: Adressing the gender dimensions of corruption. *Sharing Electronic Resources and Laws on Crime*, 2020.

B. Venard. Organizational isomorphism and corruption: An empirical research in russia. *Journal of Business Ethics*, 89:59–76, 2009.

V. Vijayalakshmi. Rent-seeking and gender in local governance. *Journal of Development Studies*, 44(9): 1262–1288, 2008.

J. Watson. Failure rates for female-controlled businesses: Are they any different? *Journal of Small Business Management*, 41(3):262–277, 2003.

A. Webster and J. Piesse. Are foreign-owned firms more likely to pay bribes than domestic ones? evidence from emerging markets. *World Development*, 101:142–161, 2018.

N. H. Wellalage, S. Locke, and H. Samujh. Corruption, gender and credit constraints: Evidence from south asian smes. *Journal of Business Ethics*, 159:267–280, 2019.

N. H. Wellalage, V. Fernandez, and S. Thrikawala. Corruption and innovation in private firms: Does gender matter? *International Review of Financial Analysis*, 70:101500, 2020.

Table 1: Definitions of variables and data sources

Variable	Description and data sources
	Panel A: Dependent variables
Bribery	A dummy variable set equal to 1 to reflect the incidence of bribe requests from firms by public officials, which is constructed based on a set of survey questions. In summary, each firm is asked, "Was a gift or informal payment expected or requested when dealing with public officials and applying for one of the following public services?: (i) electricity connection; (ii) water connection; (iii) construction-related permits; (iv) meetings with tax officials; (v) import license; and (vi) operating license." The available options for the sampled firms to choose from are: Yes, No, Don't know, or Refuse to answer. Our measure of bribery takes the value 1 if a firm's response is Yes or Refuse to answer, and 0 otherwise.
Bribery_alt	A dummy variable constructed similarly to *Bribery*, except that we treat Refuse to answer responses as missing observations.
	Panel B: Independent variables
Female	A proxy for female participation in a firm's ownership, of which we constructed twelve variants. First, we define *FOD* as a dummy variable set equal to 1 to indicate female involvement in a firm's ownership based on responses to the WBES question, "Amongst the owners of the firm, are there any females?" Second, we construct *FOS* as the share of female ownership in a firm based on the following WBES question, "What percentage of the firm is owned by females?" Continuing to utilise the latter question, we construct the following ten additional dummy variables: *FOZ* = 1 if *FOS* =0%, *FO2* = 1 if *FOS* =<20%, *FO3* = 1 if *FOS* =<30%, *FO4* = 1 if *FOS* =<40%, *FO5* = 1 if *FOS* =<50%, *FO6* = 1 if *FOS* =>60%, *FO7* = 1 if *FOS* =>70%, *FO8* = 1 if *FOS* =>80%, *FO9* = 1 if *FOS* =>90%, and *FOH* = 1 if *FOS* =100%, and, in each case, 0 otherwise.
Business obstacles, PBO	A proxy capturing a firm's perception of the difficulties it faces concerning: access to finance, tax rates, electricity, informal sector practices, political instability, education of workers, labour regulations, transportation infrastructure, customs and trade regulations, access to land, tax administration, business licensing, courts, crime, and corruption. More specifically, each sampled firm is asked, "How much of an obstacle is each of the above fifteen business obstacles?," where the answers can be no obstacle = 0, minor obstacle = 1, moderate obstacle = 2, major obstacle = 3, or very severe obstacle = 4. We convert these five-point scale codification [0, 4] to a dummy variable set equal to 1 if the subjective reporting of an obstacle is major or very severe, and 0 otherwise.
	Panel C: Control variables
Firm age	Natural logarithm of firm age in years.
Firm size - small	A dummy variable set equal to 1 if a firm has 1–19 full-time equivalent employees, and 0 otherwise.
Firm size - medium	A dummy variable set equal to 1 if a firm has 20–99 full-time equivalent employees, and 0 otherwise.
Firm size - large	A dummy variable set equal to 1 if a firm has 100 or more full-time equivalent employees, and 0 otherwise.
Manager's Experience	Log of the number of years the top manager has been working in the firm's sector.
Foreign owned firm	The percentage of a firm owned by a foreign entity.
State-owned firm	The percentage of a firm owned by the government.
Subsidiary	A dummy variable set equal to 1 if a firm is part of a larger establishment, and 0 otherwise.
International recognition	A dummy variable set equal to 1 if a firm holds at least one internationally recognised quality certification, and 0 otherwise.
Sales - domestic	The percentage of a firm's sales that are sold domestically.
Sales - direct exports	The percentage of a firm's sales that are sold by direct exports.

Variable	Description and data sources
Audited	A dummy variable set equal to 1 if the annual financial statement of a firm is checked and certified by an external auditor, and 0 otherwise.
Publicly Listed	A dummy variable set equal to 1 if a firm has the legal status of publicly listed company, and 0 otherwise.
Privately Held	A dummy variable set equal to 1 if a firm has the legal status of privately held limited liability company, and 0 otherwise.
Sole Proprietorship	A dummy variable set equal to 1 if a firm has the legal status of sole proprietorship, and 0 otherwise.
Partnership	A dummy variable set equal to one if a firm has the legal status of partnership, and 0 otherwise.
Limited partnership	A dummy variable set equal to one if a firm has the legal status of limited partnership, and 0 otherwise.

All data are from the World Bank Enterprise Surveys (WBES).

Table 2: Summary statistics

Panel A: Summary statistics for the full sample							*Panel B: Summary statistics for majority female ownership vs. majority male ownership*				
							Female-owned firms		Male-owned firms		t-test p-value of
	N	Mean	SD	Min	Median	Max	N	Mean (1)	N	Mean (2)	diff. (2)-(1)
Panel A: Dependent variables											
Bribery	18,240	0.17	0.38	0	0	1	4,872	0.18	13,368	0.17	0.0721
Bribery_alt	17,662	0.15	0.35	0	0	1	4,707	0.15	12,955	0.14	0.1278
Panel B: Independent variables											
Female											
FOD	18,069	0.99	0.11	0	0	1	4,856	1	13,213	0.98	0.0000
FOS	18,240	0.50	0.36	0	0	1	4,872	1	13,368	0.32	0.0000
FOZ	18,240	0.020	0.14	0	0	1	4,872	0	13,368	0.027	0.0000
FO2	18,240	0.22	0.42	0	0	1	4,872	0	13,368	0.30	0.0000
FO3	18,240	0.35	0.48	0	0	1	4,872	0	13,368	0.48	0.0000
FO4	18,240	0.45	0.50	0	0	1	4,872	0	13,368	0.61	0.0000
FO5	18,240	0.51	0.50	0	0	1	4,872	0	13,368	0.69	0.0000
FO6	18,240	0.32	0.47	0	0	1	4,872	1	13,368	0.078	0.0000
FO7	18,240	0.30	0.46	0	0	1	4,872	1	13,368	0.050	0.0000
FO8	18,240	0.28	0.45	0	0	1	4,872	1	13,368	0.024	0.0000
FO9	18,240	0.27	0.45	0	0	1	4,872	1	13,368	0.010	0.0000
Business obstacles, PBO											
Finance	18,026	0.21	0.41	0	0	1	4,801	0.23	13,225	0.20	0.0001
Land	17,697	0.16	0.37	0	0	1	4,712	0.17	12,985	0.16	0.0078
Licensing	17,697	0.14	0.35	0	0	1	4,704	0.13	12,993	0.15	0.0000
Corruption	17,516	0.31	0.46	0	0	1	4,670	0.27	12,846	0.33	0.0000
Courts	16,858	0.13	0.34	0	0	1	4,461	0.12	12,397	0.14	0.0008
Crime	17,900	0.14	0.35	0	0	1	4,818	0.14	13,082	0.14	0.7203
Customs	16,826	0.16	0.36	0	0	1	4,443	0.14	12,383	0.16	0.0000
Electricity	18,184	0.31	0.46	0	0	1	4,858	0.32	13,326	0.31	0.5322
Worker education	18,011	0.21	0.41	0	0	1	4,792	0.19	13,219	0.22	0.0015
Labour	18,097	0.13	0.34	0	0	1	4,830	0.10	13,267	0.14	0.0000
Political instability	17,758	0.33	0.47	0	0	1	4,726	0.28	13,032	0.35	0.0000
Informal sector	17,414	0.26	0.44	0	0	1	4,712	0.27	12,702	0.25	0.0438
Tax administration	17,855	0.21	0.41	0	0	1	4,750	0.20	13,105	0.22	0.0002
Tax rate	18,081	0.32	0.47	0	0	1	4,825	0.30	13,256	0.33	0.0000
Transportation	17,936	0.18	0.39	0	0	1	4,764	0.16	13,172	0.19	0.0004

Panel C: Control variables											
Firm age	18,240	2.78	0.81	0	0	5.40	4,872	2.53	13,368	2.88	0.0000
Firm size - small	18,240	0.4175	0.49	0	0	1	4,872	0.65	13,368	0.33	0.0000
Firm size - medium	18,240	0.3575	0.48	0	0	1	4,872	0.27	13,368	0.39	0.0000
Firm size - large	18,240	0.2250	0.42	0	0	1	4,872	0.080	13,368	0.28	0.0000
Manager's experience	18,240	2.77	0.75	0	0	4.25	4,872	2.56	13,368	2.85	0.0000
Foreign ownership share	18,240	0.059	0.21	0	0	1	4,872	0.027	13,368	0.071	0.0000
State ownership share	18,240	0.0067	0.063	0	0	0.99	4,872	0.0014	13,368	0.0087	0.0000
Subsidiary	18,240	0.20	0.40	0	0	1	4,872	0.12	13,368	0.23	0.0000
International recognition	18,240	0.26	0.44	0	0	1	4,872	0.12	13,368	0.32	0.0000
Sales - domestic	18,240	0.86	0.29	0	0	1	4,872	0.91	13,368	0.84	0.0000
Sales - direct exports	18,240	0.098	0.24	0	0	1	4,872	0.055	13,368	0.11	0.0000
Audited	18,240	0.61	0.49	0	0	1	4,872	0.43	13,368	0.67	0.0000
Publicly listed	18,240	0.059	0.23	0	0	1	4,872	0.011	13,368	0.076	0.0000
Privately held	18,240	0.46	0.50	0	0	1	4,872	0.27	13,368	0.53	0.0000
Sole proprietorship	18,240	0.20	0.40	0	0	1	4,872	0.66	13,368	0.034	0.0000
Partnership	18,240	0.10	0.30	0	0	1	4,872	0.014	13,368	0.13	0.0000
Limited partnership	18,240	0.16	0.37	0	0	1	4,872	0.039	13,368	0.21	0.0000
Other legal statuses	18,240	0.021	0.14	0	0	1	4,872	0.012	13,368	0.024	0.0000

Panel A reports the summary statistics for all variables used in obtaining the baseline results, including the mean, standard deviation (SD), minimum (Min), median, and maximum (Max). Panel B reports the summary statistics by gender, focusing on majority-female-owned versus majority-male-owned firms. The last column reports the p-values from two-sample t-tests that compare the difference between the mean values of variables of the majority-female-owned firms to their majority-male-owned counterparts. N: Number of firms; *FOD*: Female involvement in ownership dummy; *FOS*: Female ownership share; *FOZ*: Female involvement in ownership dummy if *FOS* =0%; *FO2*: Female involvement in ownership dummy if *FOS* <20%; *FO3*: Female involvement in ownership dummy if *FOS* <30%; *FO4*: Female involvement in ownership dummy if *FOS* <40%; *FO5*: Female involvement in ownership dummy if *FOS* <50%; *FO6*: Female involvement in ownership dummy if *FOS* >60%; *FO7*: Female involvement in ownership dummy if *FOS* >70%; *FO8*: Female involvement in ownership dummy if *FOS* >80%; *FO9*: Female involvement in ownership dummy if *FOS* >90%; *FOH*: Female involvement in ownership dummy if *FOS* =100%, which is our proxy for female-owned firms in panel B. See Table 1 and the text for variable definitions and data sources.

Table 3: Female and bribery solicitations - Testing *FPH* and *FMH*

	Model 1 *FOD*	*Model* 2 *FOS*	*Model* 3 *FOZ*	*Model* 4 *FOH*
Female	-0.1319 (-0.709)	-0.0564 (-1.178)	-0.0694 (-0.575)	-0.1298*** (-3.006)
Firm age	-0.0477*** (-2.642)	-0.0440** (-2.449)	-0.0430** (-2.397)	-0.0451** (-2.508)
Firm size - medium	0.0607** (2.047)	0.0573* (1.936)	0.0603** (2.044)	0.0531* (1.797)
Firm size - large	0.0994*** (2.588)	0.0891** (2.315)	0.0943** (2.471)	0.0848** (2.215)
Manager's experience	0.0251 (1.347)	0.0271 (1.463)	0.0274 (1.477)	0.0270 (1.457)
Foreign owned firm	0.1141* (1.910)	0.1154** (1.969)	0.1201** (2.053)	0.1144* (1.955)
State-owned firm	-0.2291 (-1.080)	-0.2446 (-1.158)	-0.2277 (-1.079)	-0.2425 (-1.148)
Subsidiary	0.0782** (2.436)	0.0775** (2.426)	0.0784** (2.457)	0.0772** (2.419)
International recognition	0.0385 (1.212)	0.0391 (1.240)	0.0399 (1.264)	0.0390 (1.236)
Sales - domestic	-0.0569 (-0.798)	-0.0492 (-0.692)	-0.0500 (-0.705)	-0.0475 (-0.667)
Sales - direct exports	-0.0889 (-1.048)	-0.0872 (-1.032)	-0.0875 (-1.037)	-0.0870 (-1.030)
Audited	0.0604** (2.076)	0.0585** (2.024)	0.0594** (2.058)	0.0569** (1.966)
Publicly listed	0.0135 (0.138)	0.0257 (0.264)	0.0323 (0.333)	0.0204 (0.210)
Privately held	0.0995 (1.164)	0.0942 (1.110)	0.0963 (1.135)	0.0927 (1.090)
Sole proprietorship	0.1561* (1.775)	0.1743* (1.939)	0.1497* (1.715)	0.2377** (2.560)
Partners	0.1644* (1.826)	0.1580* (1.765)	0.1602* (1.791)	0.1493* (1.666)
Limited partners	0.1058 (1.210)	0.1014 (1.167)	0.1046 (1.204)	0.0964 (1.108)
Number of firms	18,069	18,240	18,240	18,240
Pseudo-R2	0.143	0.144	0.143	0.144

Probit estimates of: $Bribery_{jcst} = \alpha + \beta\ Female_{jcst} + \theta_x\ X'_{jcst} + \theta_c + \theta_s + \theta_t + \varepsilon_{jcst}$. The dependent variable is the baseline measure of *Bribery*. The independent variable is *Female* measured using *FOD*: Female involvement in ownership dummy, *FOS*: Female ownership share, *FOZ*: Female involvement in ownership dummy if *FOS* = 0%, and *FOH*: Female involvement in ownership dummy if *FOS* = 100% in *Models* 1, 2, 3, and 4, respectively, where (*FOS*) is Female ownership share. All models include country, industry, and year fixed effects, as well as a constant. Standard errors are clustered at the firm level, with the corresponding *t*-statistics reported in parentheses. *FPH*: Female Participation Hypothesis; *FMH*: Female Majority Hypothesis. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. See Table 1 and the text for variable definitions and data sources.

Table 4: Female and bribery solicitations - Confirming *FMH* using majority female ownership indicators

	Model 1 *FO6*	*Model* 2 *FO7*	*Model* 3 *FO8*	*Model* 4 *FO9*
Female	-0.1099*** (-2.978)	-0.1294*** (-3.342)	-0.1153*** (-2.835)	-0.1280*** (-3.040)
Firm age	-0.0445** (-2.475)	-0.0451** (-2.509)	-0.0452** (-2.514)	-0.0453** (-2.519)
Firm size - medium	0.0539* (1.825)	0.0527* (1.782)	0.0539* (1.822)	0.0531* (1.795)
Firm size - large	0.0844** (2.201)	0.0829** (2.163)	0.0853** (2.225)	0.0847** (2.210)
Manager's experience	0.0263 (1.419)	0.0265 (1.432)	0.0271 (1.466)	0.0273 (1.476)
Foreign owned firm	0.1133* (1.935)	0.1127* (1.924)	0.1146* (1.958)	0.1142* (1.950)
State-owned firm	-0.2458 (-1.162)	-0.2473 (-1.170)	-0.2429 (-1.150)	-0.2442 (-1.156)
Subsidiary	0.0770** (2.412)	0.0773** (2.421)	0.0779** (2.440)	0.0775** (2.426)
International recognition	0.0391 (1.238)	0.0389 (1.232)	0.0393 (1.245)	0.0391 (1.239)
Sales - domestic	-0.0457 (-0.642)	-0.0467 (-0.657)	-0.0477 (-0.671)	-0.0467 (-0.657)
Sales - direct exports	-0.0826 (-0.977)	-0.0843 (-0.997)	-0.0873 (-1.034)	-0.0865 (-1.024)
Audited	0.0577** (1.995)	0.0577** (1.997)	0.0577** (1.996)	0.0569** (1.969)
Publicly listed	0.0214 (0.220)	0.0198 (0.204)	0.0211 (0.217)	0.0204 (0.210)
Privately held	0.0927 (1.091)	0.0918 (1.080)	0.0929 (1.092)	0.0924 (1.087)
Sole proprietorship	0.2180** (2.405)	0.2329** (2.550)	0.2261** (2.463)	0.2355** (2.550)
Partners	0.1486* (1.658)	0.1473 (1.643)	0.1499* (1.673)	0.1488* (1.660)
Limited partners	0.0983 (1.130)	0.0971 (1.116)	0.0974 (1.119)	0.0964 (1.108)
Number of firms	18,240	18,240	18,240	18,240
Pseudo-R2	0.144	0.144	0.144	0.144

Probit estimates of: $Bribery_{jcst} = \alpha + \beta\ Female_{jcst} + \theta_x\ X'_{jcst} + \theta_c + \theta_s + \theta_t + \varepsilon_{jcst}$. The dependent variable is the baseline measure of *Bribery*. The independent variable is *Female* measured using *FO6*: Female involvement in ownership dummy if $FOS > 60\%$, *FO7*: Female involvement in ownership dummy if $FOS > 70\%$, *FO8*: Female involvement in ownership dummy if $FOS > 80\%$, and *FO9*: Female involvement in ownership dummy if $FOS > 90\%$ in *Models* 1, 2, 3, and 4, respectively, where *FOS* is Female ownership share. All models include country, industry, and year fixed effects, as well as a constant. Standard errors are clustered at the firm level, with the corresponding *t*-statistics reported in parentheses. *FMH*: Female Majority Hypothesis. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. See Table 1 and the text for variable definitions and data sources.

Table 5: Female and bribery solicitations - Confirming *FMH* using minority female ownership indicators

	Model 1 *FO5*	*Model* 2 *FO4*	*Model* 3 *FO3*	*Model* 4 *FO2*
Female	-0.0053 (-0.178)	-0.0118 (-0.407)	-0.0192 (-0.678)	-0.0454 (-1.445)
Firm age	-0.0431** (-2.396)	-0.0429** (-2.390)	-0.0429** (-2.387)	-0.0426** (-2.369)
Firm size - medium	0.0607** (2.052)	0.0611** (2.069)	0.0615** (2.081)	0.0622** (2.109)
Firm size - large	0.0952** (2.477)	0.0962** (2.503)	0.0969** (2.527)	0.0991*** (2.585)
Manager's experience	0.0274 (1.479)	0.0275 (1.483)	0.0274 (1.478)	0.0272 (1.468)
Foreign owned firm	0.1193** (2.040)	0.1199** (2.049)	0.1208** (2.062)	0.1224** (2.091)
State-owned firm	-0.2282 (-1.081)	-0.2258 (-1.069)	-0.2218 (-1.049)	-0.2068 (-0.975)
Subsidiary	0.0783** (2.453)	0.0784** (2.456)	0.0784** (2.458)	0.0792** (2.481)
International recognition	0.0400 (1.266)	0.0402 (1.273)	0.0403 (1.276)	0.0408 (1.293)
Sales - domestic	-0.0516 (-0.726)	-0.0519 (-0.730)	-0.0515 (-0.724)	-0.0514 (-0.723)
Sales - direct exports	-0.0889 (-1.052)	-0.0890 (-1.054)	-0.0883 (-1.046)	-0.0879 (-1.042)
Audited	0.0594** (2.054)	0.0594** (2.057)	0.0595** (2.060)	0.0595** (2.060)
Publicly listed	0.0324 (0.334)	0.0331 (0.341)	0.0346 (0.356)	0.0396 (0.407)
Privately held	0.0960 (1.131)	0.0961 (1.132)	0.0962 (1.134)	0.0981 (1.155)
Sole proprietorship	0.1463* (1.655)	0.1439 (1.635)	0.1428 (1.631)	0.1432 (1.640)
Partners	0.1596* (1.784)	0.1592* (1.779)	0.1590* (1.778)	0.1593* (1.781)
Limited partners	0.1039 (1.196)	0.1039 (1.196)	0.1043 (1.200)	0.1067 (1.227)
Number of firms	18,240	18,240	18,240	18,240
Pseudo-R2	0.143	0.143	0.143	0.144

Probit estimates of: $Bribery_{jcst} = \alpha + \beta\ Female_{jcst} + \theta_x\ X^{'}_{jcst} + \theta_c + \theta_s + \theta_t + \varepsilon_{jcst}$. The dependent variable is the baseline measure of *Bribery*. The independent variable is *Female* measured using *FO5*: Female involvement in ownership dummy if $FOS < 50\%$, *FO4*: Female involvement in ownership dummy if $FOS < 40\%$, *FO3*: Female involvement in ownership dummy if $FOS < 30\%$, and *FO2*: Female involvement in ownership dummy if $FOS < 20\%$ in *Models* 1, 2, 3, and 4, respectively, where *FOS* is Female ownership share. All models include country, industry, and year fixed effects, as well as a constant. Standard errors are clustered at the firm level, with the corresponding t-statistics reported in parentheses. *FMH*: Female Majority Hypothesis. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. See Table 1 and the text for variable definitions and data sources.

Table 6: Female, perceived business obstacles, and bribery solicitations - Testing *BEH* and *BOH*

	Model 1	*Model* 2	*Model* 3	*Model* 4	*Model* 5
			Business licensing		
	Finance	Land	& permits	Corruption	Courts
Female	-0.1232*** (-3.095)	-0.1105*** (-2.767)	-0.1151*** (-2.884)	-0.1508*** (-3.499)	-0.1205*** (-2.954)
PBO	0.1699*** (4.777)	0.2429*** (6.317)	0.4431*** (11.256)	0.3975*** (12.411)	0.3917*** (9.269)
Female × *PBO*	0.0744 (1.258)	0.0020 (0.030)	0.0389 (0.561)	0.1142** (2.081)	0.0495 (0.682)
Number of firms	18,026	17,601	17,697	17,516	16,848
Pseudo-R2	0.148	0.149	0.157	0.160	0.159
	Model 6	*Model* 7	*Model* 8	*Model* 9	*Model* 10
	Crime, theft, &	Customs & trade		Inadequately educated	
	disorder	regulations	Electricity	workforce	Labour regulations
Female	-0.1052*** (-2.666)	-0.1281*** (-3.134)	-0.1340*** (-3.236)	-0.1030** (-2.554)	-0.1170*** (-3.000)
PBO	0.2615*** (6.389)	0.3086*** (7.992)	0.1634*** (5.044)	0.2730*** (7.557)	0.3577*** (8.480)
Female × *PBO*	-0.0712 (-1.020)	0.1032 (1.515)	0.0477 (0.881)	-0.0229 (-0.370)	0.0284 (0.381)
Number of firms	17,900	16,826	18,184	18,011	18,097
Pseudo-R2	0.148	0.156	0.147	0.149	0.151
	Model 11	*Model* 12	*Model* 13	*Model* 14	*Model* 15
	Political instability	Informal economy	Tax administration	Tax rates	Transport
Female	-0.1557*** (-3.642)	-0.0968** (-2.338)	-0.1467*** (-3.605)	-0.1336*** (-3.166)	-0.1396*** (-3.508)
PBO	0.1871*** (5.573)	0.2349*** (6.894)	0.3278*** (9.322)	0.2461*** (7.593)	0.1922*** (5.207)
Female × *PBO*	0.1004* (1.820)	-0.0672 (-1.173)	0.1291** (2.153)	0.0703 (1.287)	0.1455** (2.296)
Number of firms	17,758	17,414	17,855	18,081	17,904
Pseudo-R2	0.148	0.147	0.155	0.150	0.148

Probit estimates of: $Bribery_{jcst} = \alpha + \beta\ Female_{jcst} + \gamma PBO_{jcst} + \delta Female_{jcst} \times PBO_{jcst} + \theta_x\ X'_{jcst} + \theta_c + \theta_s + \theta_t + \varepsilon_{jcst}$. The dependent variable is the baseline measure of *Bribery*. The independent variables are *Female* measured using *FO6*: Female involvement in ownership dummy if $FOS > 60\%$ in *Models* 1-15, where *FOS* is Female ownership share, *PBO* measured using self-reported perception of business obstacles by firms in relation to the dimensions stated at the top of each regression model, and the interaction between *Female* and *PBO* indicators. All models include country, industry, and year fixed effects, as well as a constant and all the controls in Tables 3-5. Standard errors are clustered at the firm level, with the corresponding *t*-statistics reported in parentheses. *BEH*: Business Environment Hypothesis; *BOH*: Business Obstacle Hypothesis. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. See Table 1 and the text for variable definitions and data sources.

Table 7: Female and bribery solicitations - Robustness checks

	Model 1	*Model* 2	*Model* 3	*Model* 4
	Panel A: Sample composition: subgroups of countries and firms			
	Excluding large firms	Excluding manufacturing firms	Excluding countries with <100 firms	Excluding countries with >1000 firms
Female	-0.1465*** (-3.586)	-0.1373*** (-2.632)	-0.1012*** (-2.607)	-0.1155*** (-3.063)
Number of firms	14,086	8,503	16,227	17,081
Pseudo-R2	0.145	0.152	0.135	0.152
	Model 5	*Model* 6	*Model* 7	*Model* 8
	Panel B: Location effects and additional controls			
	Location of firms	Top manager is female	Product innovation	Process innovation
Female	-0.1339*** (-3.433)	-0.1273*** (-3.132)	-0.1054*** (-2.852)	-0.0977*** (-2.630)
Number of firms	17,164	18,224	18,173	18,023
Pseudo-R2	0.142	0.144	0.146	0.149
	Model 9	*Model* 10	*Model* 11	*Model* 12
	Panel C: Additional controls			
	Research & development	Labour productivity	Macro indicators	Institutional quality
Female	-0.1066*** (-2.832)	-0.1023*** (-2.611)	-0.1434*** (-3.191)	-0.1135*** (-3.046)
Number of firms	17,981	16,504	13,574	17,987
Pseudo-R2	0.149	0.144	0.145	0.145

Probit estimates of: $Bribery_{jcst} = \alpha + \beta\ Female_{jcst} + \theta_x\ X'_{jcst} + \theta_c + \theta_s + \theta_t + \varepsilon_{jcst}$. The dependent variable is the baseline measure of *Bribery*. The independent variable is *Female* measured using *FO6*: Female involvement in ownership dummy if $FOS > 60\%$, where *FOS* is Female ownership share. All models include country, industry, and year fixed effects, as well as a constant and all the controls in Tables 3-5. Standard errors are clustered at the firm level, with the corresponding t-statistics reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. See Table 1 and the text for variable definitions and data sources.

Table 8: Female and bribery solicitations - IV analysis

	Model 1 Second stage *Bribery*	*Model* 2 First stage *Female*	*Model* 3 Reduced form *Bribery*
PredictedFemale	-2.0243*** (-4.075)		
MeanFemale		0.3583*** (3.986)	-0.2107** (-2.507)
Firm age	-0.0550*** (-3.535)	-0.0496*** (-2.582)	-0.0440** (-2.451)
Firm size - medium	-0.0625 (-1.439)	-0.2144*** (-7.315)	0.0605** (2.052)
Firm size - large	-0.1133* (-1.674)	-0.4319*** (-10.530)	0.0958** (2.509)
Manager's experience	-0.0078 (-0.399)	-0.0756*** (-3.892)	0.0270 (1.458)
Foreign owned firm	-0.0371 (-0.529)	-0.3366*** (-4.815)	0.1191** (2.037)
State-owned firm	-0.5347*** (-2.930)	-0.9379*** (-2.975)	-0.2213 (-1.050)
Subsidiary	0.0267 (0.793)	-0.1040*** (-2.898)	0.0775** (2.429)
International recognition	0.0318 (1.128)	0.0067 (0.197)	0.0400 (1.268)
Sales - domestic	0.0561 (0.823)	0.2601*** (3.149)	-0.0488 (-0.687)
Sales - direct exports	0.0179 (0.223)	0.2527*** (2.606)	-0.0877 (-1.039)
Audited	0.0060 (0.194)	-0.0711** (-2.425)	0.0572** (1.981)
Publicly listed	-0.2011* (-1.909)	-0.5137*** (-5.155)	0.0315 (0.325)
Privately held	-0.0246 (-0.287)	-0.1890** (-2.286)	0.0970 (1.143)
Sole proprietorship	1.3454*** (4.644)	2.2022*** (24.304)	0.1579* (1.808)
Partners	-0.1180 (-1.022)	-0.5503*** (-5.633)	0.1608* (1.798)
Limited partners	-0.0525 (-0.572)	-0.2404*** (-2.767)	0.1050 (1.208)
F-stat		19.61	
Number of firms	18,233	18,233	18,233
Pseudo-R2		0.431	0.144

IV probit estimates of: $Bribery_{jcst} = \alpha + \beta PredictedFemale_{jcst} + \theta_x X'_{jcst} + \theta_c + \theta_s + \theta_t + \varepsilon_{jcst}$ (second stage) and $Female_{jcst} = \alpha' + \beta' MeanFemale_{-jcst} + \theta'_x X_{jcst} + \theta'_c + \theta'_s + \theta'_t + \varepsilon'_{jcst}$ (first stage). The dependent variable in *Models* 1 and 3 is the baseline measure of *Bribery*. The dependent variable in *Model* 2 is *Female* measured using *FO6*: Female involvement in ownership dummy if $FOS > 60\%$, where *FOS* is Female ownership share. All models include country, industry, and year fixed effects, as well as a constant. The first stage F-stat is from a linear IV estimation, since this is not normally reported in an IV probit regression. Standard errors are clustered at the firm level, with the corresponding t-statistics reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. See Table 1 and the text for variable definitions and data sources.

Table A1: Sample and descriptive statistics for selected variables by country, industry, and year

Country	*N*	*Bribery*	*FOZ*	*FOH*
Panel A: Number of firms and mean values of Bribery, FOZ, and FOH by country				
Afghanistan	10	0.500	0.000	0.100
Albania	112	0.232	0.000	0.598
Argentina	325	0.095	0.000	0.022
Armenia	134	0.060	0.007	0.448
Austria	98	0.010	0.000	0.184
Azerbaijan	33	0.121	0.000	0.576
Bangladesh	253	0.498	0.000	0.067
Belarus	177	0.051	0.000	0.243
Belgium	115	0.017	0.000	0.130
Benin	33	0.303	0.000	0.303
Bhutan	104	0.058	0.000	0.587
Bolivia	175	0.080	0.000	0.366
Bosnia and Herzegovina	134	0.090	0.000	0.291
Bulgaria	241	0.133	0.000	0.274
Burundi	51	0.235	0.000	0.235
Cambodia	95	0.600	0.000	0.905
Cameroon	90	0.322	0.000	0.722
Chad	15	0.267	0.000	0.400
Colombia	365	0.077	0.000	0.712
Congo, Democratic Republic of	65	0.507	0.015	0.508
Croatia	119	0.034	0.025	0.437
Czech Republic	145	0.021	0.000	0.186
Côte d'Ivoire	60	0.267	0.000	0.417
Denmark	117	0.017	0.017	0.171
Djibouti	39	0.256	0.000	0.205
Dominican Republic	41	0.146	0.000	0.220
Ecuador	172	0.064	0.000	0.052
Egypt, Arab Rep.	968	0.130	0.003	0.101
El Salvador	142	0.042	0.000	0.296
Eswatini	39	0.103	0.000	0.410
Ethiopia	209	0.254	0.000	0.215
Finland	110	0.018	0.027	0.064
France	185	0.022	0.000	0.162
Gambia	28	0.214	0.000	0.500
Georgia	126	0.032	0.000	0.405
Germany	212	0.005	0.000	0.198
Ghana	173	0.173	0.000	0.457
Greece	157	0.045	0.000	0.172
Guatemala	58	0.069	0.000	0.397
Honduras	133	0.120	0.000	0.271
Hungary	298	0.027	0.000	0.114
India	1,159	0.286	0.000	0.110
Indonesia	116	0.302	0.000	0.276
Iraq	23	0.391	0.000	0.696
Israel	66	0.015	0.000	0.136
Italy	27	0.148	0.000	0.185
Jordan	153	0.039	0.000	0.366
Kazakhstan	282	0.156	0.000	0.543
Kenya	664	0.273	0.003	0.160
Kosovo	36	0.083	0.000	0.472
Kyrgyz Republic	239	0.368	0.000	0.305
Lao People's Democratic Republic	204	0.201	0.000	0.926
Latvia	189	0.021	0.397	0.217
Lebanon	154	0.325	0.000	0.039

Table A1 Cont'd

Lesotho	40	0.100	0.000	0.675
Liberia	43	0.581	0.000	0.372
Lithuania	116	0.043	0.009	0.336
Macedonia	162	0.086	0.000	0.469
Madagascar	197	0.223	0.487	0.234
Malawi	81	0.235	0.012	0.321
Malaysia	427	0.150	0.000	0.159
Mali	16	0.375	0.000	0.500
Malta	45	0.022	0.000	0.022
Mauritania	15	0.400	0.000	0.133
Moldova	281	0.157	0.000	0.299
Mongolia	267	0.176	0.000	0.536
Montenegro	58	0.121	0.017	0.362
Morocco	126	0.230	0.071	0.111
Mozambique	145	0.234	0.000	0.531
Myanmar	254	0.311	0.000	0.795
Namibia	145	0.069	0.014	0.483
Nepal	83	0.253	0.000	0.361
Nicaragua	97	0.155	0.000	0.433
Niger	13	0.077	0.000	0.538
Nigeria	278	0.284	0.014	0.759
Pakistan	48	0.438	0.000	0.500
Papua New Guinea	19	0.053	0.000	0.105
Paraguay	165	0.158	0.000	0.079
Peru	391	0.164	0.000	0.143
Philippines	543	0.215	0.000	0.339
Poland	200	0.025	0.005	0.300
Portugal	146	0.021	0.000	0.082
Romania	327	0.080	0.006	0.217
Russian Federation	124	0.153	0.000	0.468
Senegal	51	0.078	0.000	0.373
Serbia	141	0.064	0.007	0.340
Sierra Leone	25	0.560	0.000	0.640
Slovak Republic	101	0.079	0.000	0.228
Solomon Islands	58	0.431	0.000	0.069
South Africa	37	0.027	0.000	0.865
South Sudan	137	0.664	0.000	0.277
Spain	211	0.024	0.000	0.043
Sudan	47	0.191	0.000	0.298
Suriname	35	0.114	0.000	0.229
Tajikistan	118	0.271	0.025	0.195
Tanzania	90	0.211	0.011	0.333
Thailand	114	0.096	0.000	0.368
Timor-Leste	95	0.326	0.000	0.916
Togo	33	0.030	0.000	0.303
Tunisia	201	0.119	0.000	0.090
Turkey	452	0.051	0.312	0.071
Uganda	160	0.250	0.006	0.269
Ukraine	479	0.453	0.000	0.315
Uruguay	101	0.050	0.000	0.099
Uzbekistan	277	0.072	0.014	0.242
Vietnam	285	0.211	0.000	0.235
West Bank and Gaza	55	0.073	0.000	0.055
Yemen	22	0.864	0.000	0.045
Zambia	412	0.124	0.007	0.231
Zimbabwe	183	0.158	0.000	0.284
Total	18,240			

Table A1 Cont'd

Industry	*N*	*Bribery*	*FOZ*	*FOH*
Panel B: Number of firms and mean values of Bribery, FOZ, and FOH by industry				
Chemicals, plastics, rubber, and petroleum products	690	0.283	0.012	0.183
Construction	139	0.158	0.007	0.086
Electronics	174	0.211	0.000	0.125
Food and beverages	1,749	0.080	0.007	0.487
Hospitality and tourism	229	0.109	0.009	0.402
Hotels and restaurants	140	0.116	0.000	0.293
IT and IT Services	66	0.030	0.000	0.061
Machinery and equipment	324	0.188	0.000	0.148
Manufacturing	2,110	0.174	0.015	0.331
Motor vehicles and transport equipment	72	0.212	0.000	0.122
Non-metallic mineral products, basic metals, and fabricated metals	883	0.161	0.020	0.140
Other manufacturing	2,077	0.200	0.198	0.310
Pharmaceuticals and medical products	7	0.000	0.000	0.143
Printing and publishing	19	0.158	0.000	0.474
Textiles, garments and leather	1,362	0.187	0.050	0.176
Transport, storage, and communications	141	0.158	0.000	0.087
Wholesale and retail trade	7,920	0.200	0.007	0.369
Wood products and furniture	138	0.095	0.018	0.135
Total	18,240			
Year	*N*	*Bribery*	*FOZ*	*FOH*
Panel C: Number of firms and mean values of Bribery, FOZ, and FOH by year				
2013	4,950	0.195	0.071	0.211
2014	1,870	0.296	0.004	0.302
2015	1,572	0.242	0.000	0.307
2016	1,747	0.186	0.000	0.419
2017	1,833	0.122	0.000	0.135
2018	936	0.191	0.000	0.324
2019	3,569	0.117	0.000	0.312
2020	688	0.031	0.007	0.240
2021	736	0.020	0.000	0.167
2022	339	0.248	0.000	0.289
Total	18,240			

N: Number of firms; *FOZ*: Female involvement in ownership dummy if $FOS = 0\%$; *FOH*: Female involvement in ownership dummy if $FOS = 100\%$, where *FOS* is Female ownership share. See Table 1 and the text for variable definitions and data sources.

Table A2: Female and bribery solicitations - Alternative dependent variable

	Model 1	*Model* 2	*Model* 3	*Model* 4
	FOD	*FOS*	*FOZ*	*FOH*
Female	-0.2650 (-1.373)	-0.0557 (-1.077)	-0.0251 (-0.198)	-0.1705*** (-3.596)
Number of firms	17,254	17,415	17,415	17,415
Pseudo-R2	0.142	0.143	0.143	0.144
	Model 5	*Model* 6	*Model* 7	*Model* 8
	FO6	*FO7*	*FO8*	*FO9*
Female	-0.1131*** (-2.810)	-0.1476*** (-3.485)	-0.1463*** (-3.278)	-0.1605*** (-3.474)
Number of firms	17,415	17,415	17,415	17,415
Pseudo-R2	0.144	0.144	0.144	0.144
	Model 9	*Model* 10	*Model* 11	*Model* 12
	FO5	*FO4*	*FO3*	*FO2*
Female	-0.0227 (-0.708)	-0.0210 (-0.679)	-0.0291 (-0.960)	-0.0518 (-1.548)
Number of firms	17,415	17,415	17,415	17,415
Pseudo-R2	0.143	0.143	0.143	0.143

Probit estimates of: $Bribery\_alt_{jcst} = \alpha + \beta\ Female_{jcst} + \theta_x^{'}\ X_{jcst} + \theta_c + \theta_s + \theta_t + \varepsilon_{jcst}$. The dependent variable is the alternative measure of *Bribery_alt*. The independent variable is *Female* measured using *FOD*: Female involvement in ownership dummy, *FOS*: Female ownership share, *FOZ*: Female involvement in ownership dummy if $FOS = 0\%$, *FOH*: Female involvement in ownership dummy if $FOS = 100\%$, *FO2*: Female involvement in ownership dummy if $FOS < 20\%$, *FO3*: Female involvement in ownership dummy if $FOS < 30\%$, *FO4*: Female involvement in ownership dummy if $FOS < 40\%$, *FO5*: Female involvement in ownership dummy if $FOS < 50\%$, *FO6*: Female involvement in ownership dummy if $FOS > 60\%$, *FO7*: Female involvement in ownership dummy if $FOS > 70\%$, *FO8*: Female involvement in ownership dummy if $FOS > 80\%$, and *FO9*: Female involvement in ownership dummy if $FOS > 90\%$ in *Models* 1-12, respectively, where *FOS* is Female ownership share. All models include country, industry, and year fixed effects, as well as a constant and all the controls in Tables 3-5. Standard errors are clustered at the firm level, with the corresponding *t*-statistics reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. See Table 1 and the text for variable definitions and data sources.

Table A3: Female, perceived business obstacles, and bribery solicitations - Testing *BEH* and *BOH* using alternative ownership thresholds

			Panel A: Female is FOD		
	Model 1	*Model* 2	*Model* 3	*Model* 4	*Model* 5
	Finance	Land	Business licensing & permits	Corruption	Courts
Female	0.0041 (0.032)	-0.1057 (-0.778)	-0.0520 (-0.398)	0.1125 (0.839)	-0.0087 (-0.061)
PBO	0.1985*** (6.744)	0.2393*** (7.509)	0.4544*** (13.677)	0.4421*** (16.097)	0.4132*** (11.580)
Female × *PBO*	-0.3078 (-0.960)	0.2401 (0.886)	0.0786 (0.223)	-0.5454** (-2.361)	-0.7247* (-1.724)
Number of firms	18,026	17,601	17,697	17,516	16,848
Pseudo-R2	0.147	0.149	0.156	0.160	0.159
	Model 6	*Model* 7	*Model* 8	*Model* 9	*Model* 10
	Crime, theft, & disorder	Customs & trade regulations	Electricity	Inadequately educated workforce	Labour regulations
Female	0.0513 (0.339)	0.1091 (0.864)	0.0130 (0.095)	-0.0219 (-0.165)	-0.0403 (-0.317)
PBO	0.2402*** (7.022)	0.3451*** (10.594)	0.1807*** (6.613)	0.2678*** (8.839)	0.3648*** (10.113)
Female × *PBO*	-0.7082 (-1.319)	-0.8257 (-1.555)	-0.1964 (-0.933)	-0.1947 (-0.742)	0.0405 (0.111)
Number of firms	17,900	16,826	18,184	18,011	18,097
Pseudo-R2	0.148	0.156	0.146	0.148	0.150
	Model 11	*Model* 12	*Model* 13	*Model* 14	*Model* 15
	Political instability	Informal economy	Tax administration	Tax rates	Transport
Female	0.0869 (0.603)	-0.0779 (-0.543)	0.0735 (0.574)	0.0240 (0.173)	-0.0743 (-0.544)
PBO	0.2264*** (7.891)	0.2128*** (7.498)	0.3752*** (12.630)	0.2696*** (9.831)	0.2384*** (7.772)
Female × *PBO*	-0.3385* (-1.667)	-0.0647 (-0.306)	-0.5655** (-1.987)	-0.1006 (-0.456)	0.0233 (0.076)
Number of firms	17,758	17,414	17,855	18,081	17,904
Pseudo-R2	0.148	0.147	0.154	0.149	0.147
			Panel B: Female is FO5		
	Model 1	*Model* 2	*Model* 3	*Model* 4	*Model* 5
	Finance	Land	Business licensing & permits	Corruption	Courts
Female	0.0047 (0.142)	-0.0034 (-0.103)	0.0067 (0.204)	0.0301 (0.807)	0.0156 (0.468)
PBO	0.2111*** (5.259)	0.2357*** (5.458)	0.4671*** (9.982)	0.4662*** (12.357)	0.4295*** (8.803)
Female × *PBO*	-0.0317 (-0.567)	0.0141 (0.232)	-0.0223 (-0.349)	-0.0627 (-1.242)	-0.0436 (-0.648)

Number of firms	18,026	17,601	17,697	17,516	16,848
Pseudo-R2	0.147	0.149	0.156	0.159	0.159
	Model 6 Crime, theft, & disorder	*Model* 7 Customs & trade regulations	*Model* 8 Electricity	*Model* 9 Inadequately educated workforce	*Model* 10 Labour regulations
Female	-0.0122 (-0.378)	0.0260 (0.771)	0.0186 (0.537)	-0.0052 (-0.156)	-0.0020 (-0.064)
PBO	0.1915*** (4.043)	0.3956*** (8.616)	0.2021*** (5.463)	0.2601*** (6.236)	0.3819*** (7.540)
Female × *PBO*	0.0903 (1.384)	-0.1044* (-1.667)	-0.0493 (-0.972)	0.0093 (0.162)	-0.0304 (-0.450)
Number of firms	17,900	16,826	18,184	18,011	18,097
Pseudo-R2	0.148	0.156	0.146	0.148	0.150
	Model 11 Political instability	*Model* 12 Informal economy	*Model* 13 Tax administration	*Model* 14 Tax rates	*Model* 15 Transport
Female	0.0213 (0.590)	-0.0222 (-0.645)	0.0340 (1.005)	0.0343 (0.968)	-0.0001 (-0.003)
PBO	0.2507*** (6.557)	0.1803*** (4.696)	0.4270*** (10.500)	0.3171*** (8.491)	0.2631*** (6.133)
Female x *PBO*	-0.0614 (-1.209)	0.0628 (1.162)	-0.1151** (-2.058)	-0.0959* (-1.887)	-0.0462 (-0.780)
Number of firms	17,758	17,414	17,855	18,081	17,904
Pseudo-R2	0.148	0.147	0.154	0.149	0.147
			Panel C: Female is FOH		
	Model 1 Finance	*Model* 2 Land	*Model* 3 Business licensing & permits	*Model* 4 Corruption	*Model* 5 Courts
Female	-0.1427*** (-3.098)	-0.1262*** (-2.725)	-0.1377*** (-2.991)	-0.1565*** (-3.211)	-0.1365*** (-2.880)
PBO	0.1754*** (5.092)	0.2416*** (6.517)	0.4425*** (11.672)	0.4068*** (13.092)	0.4108*** (10.096)
Female x *PBO*	0.0688 (1.113)	0.0035 (0.052)	0.0502 (0.672)	0.1008* (1.729)	-0.0184 (-0.236)
Number of firms	18,026	17,601	17,697	17,516	16,848
Pseudo-R2	0.148	0.149	0.157	0.160	0.160
	Model 6 Crime, theft, & disorder	*Model* 7 Customs & trade regulations	*Model* 8 Electricity	*Model* 9 Inadequately educated workforce	*Model* 10 Labour regulations
Female	-0.1228*** (-2.671)	-0.1463*** (-3.103)	-0.1520*** (-3.198)	-0.1079** (-2.332)	-0.1242*** (-2.768)
PBO	0.2717*** (6.914)	0.3070*** (8.210)	0.1656*** (5.281)	0.2819*** (8.123)	0.3732*** (9.181)
Female × *PBO*	-0.1299* (-1.743)	0.1295* (1.794)	0.0499 (0.877)	-0.0663 (-1.002)	-0.0345 (-0.426)

Number of firms	17,900	16,826	18,184	18,011	18,097
Pseudo-R2	0.148	0.156	0.147	0.149	0.151
	Model 11 Political instability	*Model* 12 Informal economy	*Model* 13 Tax administration	*Model* 14 Tax rates	*Model* 15 Transport
Female	-0.1607*** (-3.318)	-0.1142** (-2.410)	-0.1613*** (-3.447)	-0.1540*** (-3.201)	-0.1519*** (-3.315)
PBO	0.2001*** (6.145)	0.2332*** (7.103)	0.3399*** (10.001)	0.2522*** (8.030)	0.2085*** (5.856)
Female × *PBO*	0.0712 (1.215)	-0.0775 (-1.286)	0.1104* (1.738)	0.0622(1.077)	0.1135* (1.689)
Number of firms	17,758	17,414	17,855	18,081	17,904
Pseudo-R2	0.148	0.147	0.155	0.150	0.148

Probit estimates of: $Bribery_{jcst} = \alpha + \beta\ Female_{jcst} + \gamma PBO_{jcst} + \delta Female_{jcst} \times PBO_{jcst} + \theta_x^{'}\ X_{jcst} + \theta_c + \theta_s + \theta_t + \varepsilon_{jcst}$. The dependent variable is the baseline measure of *Bribery*. The independent variables are *Female* measured using *FOD*: Female involvement in ownership dummy, *FO5*: Female involvement in ownership dummy if $FOS < 50\%$, and *FOH*: Female involvement in ownership dummy if $FOS = 100\%$ in panels A, B, and C, respectively, where *FOS* is Female ownership share, and *PBO* measured using self-reported perception of business obstacles by firms in relation to the dimensions stated at the top of each regression model, and the interaction between *Female* and *PBO* indicators. All models include country, industry, and year fixed effects, as well as a constant and all the controls in Tables 3-5. Standard errors are clustered at the firm level, with the corresponding *t*-statistics reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. See Table 1 and the text for variable definitions and data sources.

Table A4: Female and bribery solicitations - Robustness checks using alternative thresholds

	Model 1	*Model* 2	*Model* 3	*Model* 4
		Panel A: Female is FOD		
		Sample composition: subgroups of countries and firms		
	Excluding large firms	Excluding manufacturing firms	Excluding countries with <100 firms	Excluding countries with >1000 firms
Female	-0.0596 (-0.259)	-0.2601 (-0.614)	-0.1330 (-0.714)	-0.1427 (-0.768)
Number of firms	13,964	8,439	16,072	16,910
Pseudo-R2	0.144	0.147	0.136	0.151
	Model 5	*Model* 6	*Model* 7	*Model* 8
		Location effects and additional controls		
	Location of firms	Top manager is female	Product innovation	Process innovation
Female	-0.1178 (-0.591)	-0.1223 (-0.656)	-0.1436 (-0.768)	-0.1539 (-0.827)
Number of firms	16,993	18,053	18,002	17,853
Pseudo-R2	0.141	0.143	0.145	0.148
	Model 9	*Model* 10	*Model* 11	*Model* 12
		Additional controls		
	Research & development	Labour productivity	Macro indicators	Institutional quality
Female	-0.1502 (-0.806)	-0.1533 (-0.788)	-0.1540 (-0.356)	-0.1832 (-0.957)
Number of firms	17,962	16,360	13,570	17,816
Pseudo-R2	0.146	0.143	0.144	0.144
	Model 1	*Model* 2	*Model* 3	*Model* 4
		Panel B: Female is FO5		
		Sample composition: subgroups of countries and firms		
	Excluding large firms	Excluding manufacturing firms	Excluding countries with <100 firms	Excluding countries with >1000 firms
Female	0.0402 (1.188)	0.0237 (0.527)	-0.0066 (-0.208)	0.0131 (0.416)
Number of firms	14,086	8,503	16,227	17,081
Pseudo-R2	0.144	0.151	0.135	0.151
	Model 5	*Model* 6	*Model* 7	*Model* 8
		Location effects and additional controls		
	Location of firms	Top manager is female	Product innovation	Process innovation
Female	-0.0032 (-0.105)	-0.0151 (-0.485)	-0.0068 (-0.228)	-0.0081 (-0.269)
Number of firms	17,164	18,224	18,173	18,023
Pseudo-R2	0.141	0.144	0.146	0.149
	Model 9	*Model* 10	*Model* 11	*Model* 12
		Additional controls		
	Research & development	Labour productivity	Macro indicators	Institutional quality
Female	-0.0002 (-0.006)	-0.0152 (-0.485)	-0.0214 (-0.593)	-0.0084 (-0.279)
Number of firms	17,981	16,504	13,574	17,987
Pseudo-R2	0.149	0.143	0.144	0.144
	Model 1	*Model* 2	*Model* 3	*Model* 4
		Panel C: Female is FOH		
		Sample composition: subgroups of countries and firms		
	Excluding large firms	Excluding manufacturing firms	Excluding countries with <100 firms	Excluding countries with >1000 firms
Female	-0.1609*** (-3.430)	-0.1424** (-2.356)	-0.1287*** (-2.815)	-0.1314*** (-2.977)
Number of firms	14,086	8,503	16,227	17,081
Pseudo-R2	0.145	0.152	0.135	0.152
	Model 5	*Model* 6	*Model* 7	*Model* 8

	Location effects and additional controls			
	Location of firms	Top manager is female	Product innovation	Process innovation
Female	-0.1563*** (-3.400)	-0.1254*** (-2.796)	-0.1256*** (-2.903)	-0.1118** (-2.568)
Number of firms	17,164	18,224	18,173	18,023
Pseudo-R2	0.142	0.144	0.146	0.149
	Model 9	*Model* 10	*Model* 11	*Model* 12
	Additional controls			
	Research & development	Labour productivity	Macro indicators	Institutional quality
Female	-0.1329*** (-2.993)	-0.1146** (-2.490)	-0.1563*** (-2.991)	-0.1361*** (-3.119)
Number of firms	17,981	16,504	13,574	17,987
Pseudo-R2	0.149	0.144	0.145	0.145

Probit estimates of: $Bribery_{jcst} = \alpha + \beta\ Female_{jcst} + \theta_x^{'}\ X_{jcst} + \theta_c + \theta_s + \theta_t + \varepsilon_{jcst}$. The dependent variable is the baseline measure of *Bribery*. The independent variable is *Female* measured using *FOD*: Female involvement in ownership dummy, *FO5*: Female involvement in ownership dummy if *FOS* <50%, and *FOH*: Female involvement in ownership dummy if *FOS* = 100% in panels A, B, and C, respectively, where *FOS* is Female ownership share. All models include country, industry, and year fixed effects, as well as a constant and all the controls in Tables 3-5. Standard errors are clustered at the firm level, with the corresponding *t*-statistics reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. See Table 1 and the text for variable definitions and data sources.