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Corruption beyond the glass ceiling: do women entrepreneurs perceive corruption differently?

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Corruption beyond the glass ceiling: do women entrepreneurs perceive corruption differently?

Abstract

Adding to the corruption-gender nexus, this paper contributes across several dimensions: (a) measurement of corruption by studying whether female managers and female owners of firms perceived corruption differently; (b) using survey information at the firm level; and (c) employing a large sample of more than 100 countries. Results show that both female managers and female owners perceived corruption to be lower relative to men. Furthermore, older firms perceived corruption to be a more severe obstacle, while sole proprietorships generally had the opposite view. The advantages of piercing the glass ceiling were undermined in nations with severe gender inequality.

JEL-Codes: K400, L200.

Keywords: corruption perceptions, entrepreneurship, gender, managers, owners.

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1. Introduction

In spite of a large body of empirical research that has emerged on the causes and effects of corruption in recent years (Dimant and Tosato (2018), Treisman (2007)), a persistent and crucial issue entails getting a good handle on the extent or prevalence of corrupt activity. The knotty issue is that corruption occurs in many forms and is hard to detect, especially since the perpetrators have little reason to voluntarily divulge their complicity. Yet, various measures of corruption targeting different jurisdictions and populations have emerged, albeit with some degree of criticism or scrutiny (Donchev and Ujhelyi (2014), Goel and Nelson (2011), Sampford et al. (2006)). Relatively speaking, however, obtaining insights into corruption experience or corruption incidence is more challenging than gathering information into corruption perceptions. This distinction can prove crucial in some cases (Olken (2009)), and the present research adds some new insights in this regard.

This paper brings important new insights into this realm by studying whether perceptions of corruption differ across gender, especially in the case of females who have to some degree broken the glass ceiling to become managers and owners of firms. Whereas the gender and corruption nexus has drawn the attention of some scholars (Debski et al. (2018), Frank et al. (2011), Jha and Sarangi (2018), Sung (2012), Swamy et al. (2001), Wängnerud (2012)), the present research sheds additional insights by:

- focusing on corruption measurement by studying whether female managers and female owners of firms perceived corruption differently (relative to males);
- using survey information at the firm level; and
- employing a large sample of nations covering more than 100 countries.

Women, in general, have been viewed to be less corrupt, partly due to their lack of placement in positions where bribes may be solicited from them and due to their behavioral differences with men (Bordalo et al. (2019)). For instance, many studies have found that women may be less competitive than men (Barner and Odean (2001), Booth and Nolen (2012), Buser et al. (2014), Gneezy et al. (2009), Shurchkov (2012)).¹ This relative lack of competitiveness may also be relevant in the competition for favors in corrupt markets, making women less eager to jump queues via offering/demanding bribes. Furthermore, patriarchal societies tend to put women at a disadvantage as family businesses are handed down to male heirs (Roomi and Parrott (2008)). This discrepancy would lead to fewer women being parties to potential corrupt interactions. Finally, a relative lack of networking would disadvantage women in forming corrupt relations and thereby reduce the number of corrupt transactions they are involved in.²

Female managers and owners of firms are women who have succeeded in being in positions where bribes may be solicited of them (or they might themselves offer bribes to obtain a competitive edge). However, even across managers and owners, there may be differences in the nature and frequency of corrupt interactions. For example, owners may be more likely face

¹ See Niederle and Vesterlund (2007) for an alternate finding.

² Differences in male and female management/entrepreneurial styles, while not considering corruption, have been noted by Mukhtar (2002) and Robb and Wolken (2002).

corruption in the business setup stages (e.g., property registration, etc.) and taxation, while managers likely face corruption related to business operations (e.g., safety inspections, etc.). Whereas their male counterparts might have face similar issues in dealing with corrupt officials, responses and posturing in corrupt interactions by females may be different due to such factors as possible differences in behavioral attitudes (e.g., competitiveness tendencies), lack of networking, relative lack of prior experience with corruption, etc.

With the consideration of female managers and owners and how their business operations are perceived to be impacted by corruption, this research also ties to research on gender and entrepreneurship, another active area of scholarly inquiry in recent years (Brush and Cooper (2012), DiTienne and Chandler (2007), Estrin and Mickiewicz (2011), Foss et al. (2018), Jennings and Brush (2013), Link (2017), Minniti (2009), Stephan and El-Ganainy (2007)).

The above overview underscores the different strands of the literature that intersect with the current research and highlight the potential for the unique contribution. Stated alternatively, the extant literature has examined the gender-corruption nexus mostly at the aggregate level. The present research, besides using firm-level perceptions of corruption, uniquely provides intra-gender (i.e., across female managers and female managers) insights. The behavior of female managers and owners who have in effect broken through the glass ceiling is also considered in the context of societies with varying degrees of gender inequality.

To sharpen focus, the reader might keep the following research questions in mind:

- Do female managers of firms perceive corruption differently from males?
- Do female owners of businesses perceive corruption differently from males?
- How significant are firm-specific factors relative to aggregate country-level factors in shaping corruption perceptions?

Besides adding to the literature, the findings of this study have potential value for determining whether and how corruption control policies may be fine-tuned to be applicable across gender. The layout of rest of the paper includes theoretical background and the model in Section 2, followed by data and estimation, results and conclusions.

2. Theoretical background and the model

2.1 Theoretical background

The theoretical foundation to motivate and anchor this research can be tied to several strands of the literature - (a) measurement of corruption; (b) economics of gender; (iii) economics of entrepreneurship; and (iv) cross-country corruption studies of firm behavior.

In regard to measurement, obtaining information about corruption is difficult due to its clandestine nature. Yet, getting a good handle on corruption perceptions is important as perceptions can have important implications on trade and investment (see, for example, Davis and Ruhe (2003)). Related measurement issues have been noted in numerous studies (Donchev and Ujhelyi (2014), Goel and Nelson (2011), Sampford et al. (2006)). It had also been observed

that there might be a difference between corruption perceptions and actual corruption (Olken (2009)). The present research can be seen as somewhat straddling both perceptions and actual corruption - the survey respondents were managers/owners of firms who were asked whether they viewed corruption as a major obstacle - their perceptions might be based on prior personal experience or from the experience of others.

With regard to gender differences and corruption, there is some research on whether females are less corrupt than males (Debski et al. (2018), Frank et al. (2011), Jha and Sarangi (2018), Sung (2012), Swamy et al. (2001), Torgler and Valev (2010), Wängnerud (2012)). This literature mainly considers whether women officials (potential bribe takers) are less corrupt. For instance, Jha and Sarangi (2018) find that women's presence in parliament reduces corruption, while Torgler and Valev (2010) find that, for eight European nations, women were more averse to corruption and tax evasion. The present study, in contrast, considers the perceptions of women as bribe payers, making the distinction between female managers and female owners of firms.

To circumvent data challenges alluded to above, some studies have resorted to data generation using experiments related to corrupt behavior. Frank et al. (2011) summarize related gender differences by stating that corrupt interactions likely fail with female involvement in corrupt transactions. They cite that such failure is not because "women are intrinsically more honest, but that they are more opportunistic when they have the chance to break an implicitly corrupt contract and less engaged in retaliating nonperformance." (p. 59). Again, this underscores the behavioral differences across gender with regard to corruption.

The work contributes to entrepreneurship - corruption literature also. The extant empirical research has mainly examined whether corruption sands or greases the entry of new entrepreneurs (Anokhin and Schulze (2009)). We are, on the other hand, examining perceptions of corruption by entrepreneurs, especially female entrepreneurs who have already entered are in a position of authority, having pierced the glass ceiling to a degree.

Finally, most of the extant empirical literature uses corruption data at some level of aggregation, given the difficulties with obtaining micro-level insights into corruption perceptions and/or experience (see Dimant and Tosato (2018) for a summary). In this study, we are not only able to consider firm-level data on corruption perceptions, but also consider gender and intra-gender (female managers versus female owners) aspects.

2.2 The model

Of interest is to see if women managers/owner perceive corruption as an obstacle to business operations differently than their male counterparts. Accordingly, the dependent variable in our empirical set up [*Corr*] is a binary variable that takes on a value of one if the manager/owner perceives corruption as either a major or very severe to the current operations of their business establishment, and zero otherwise. Equation (1) summarizes the general form of our estimated equations (with subscripts *i*, *j*, and *t* respectively, denoting a firm, country and survey year),

$$Corr_{ijt} = f(\text{Respondent is Female entrepreneur } [female_manager_{ijt} \text{ or } female_owner_{ijt}] \text{ Firm-level controls } (\mathbf{L}_{ijt}), \text{ Macro-level controls } (\mathbf{M}_{jt}), \text{ Year of Survey } (year_t)) \quad \dots(1)$$

where,

$\mathbf{L} = \text{firm}_{size_{ijt}}, \text{firm}_{age_{ijt}}, \text{sole}_{proprietor_{ijt}}, \text{capital city location}_{ijt} (\text{capital})$

$\mathbf{M} = \text{GDP}_{jt}, \text{Economic freedom } (EF_{jt}), \text{political freedom } (PF_{jt}).$

In our sample, firms with female owners and female managers were roughly the same percentage of the total sample- about 16% had female managers and about 15% had at least equal female ownership with men. Later in the paper, we consider a second measure of female ownership, one where women own more than half the firm. We term this “Super Majority Female Ownership” and about 10% of all firms in our sample below fall into that category (Table 1).

Four firm-specific variables that capture individual aspects of firms are included in the model setup. These include the size, age (vintage), ownership structure, and whether or not the firm has a capital city location. Firm size (*firm_{size}*) and ownership structure (*sole_{proprietor}*) are associated with the number of potential opportunities for corrupt behavior and potential payoffs; however, larger firms may be tempered by increased scrutiny by government enforcement officials. Age (*firm_{age}*) is associated with learning and inertia (which may have negative effects on flexibility). Firms located in capital cities (*capital*), especially those isolated geographically, may be associated greater corrupt activity due to reduced accountability from the media (Campante and Do (2014), Goel and Nelson (2011)).

We also include three macroeconomic controls), including average per capita income (*GDP*), the degree of economic freedom (*EF*), and an indicator of the political rights and civil liberties enjoyed by the citizens of the country under observation (*PF*). Greater economic prosperity is associated with better institutions that would serve as a deterrent to corrupt activity and has been well documented in the literature (Gundlach and Paldam (2009), Serra (2006)). Economic freedom is associated with less intrusive government (e.g., lower taxes and reduced regulatory impediments) and this would reduce opportunities to engage in corrupt activity (Goel and Nelson (2005)). Finally, countries with stronger democratic institutions have been identified as an important factor that is associated with reduced corruption in many past empirical studies (for a review of the extant literature on the linkage between institutional factors and corruption, including democracy, see Jetter and Parmeter (2018)).

The setup of equation (1) places the key determinants of corruption along with gender and firm-level details from our large cross-country dataset to flesh out the key influences on corruption perceptions. Next, we discuss the data and estimation procedure used to estimate equation (1).

3. Data and estimation

3.1 Data

The main source of firm-level cross-country data for this study is the Enterprise Surveys (<http://www.enterprisesurveys.org>) from The World Bank. These surveys of thousands of firms for more than 100 primarily emerging nations one or more times over the 2006 – 2016 time period. Data for this study were taken for all available years during this time period (with some

nations surveyed more than once - see the Appendix) where the survey was conducted using the Enterprise Surveys Global Methodology.³ A maximum of 85,452 observations were available for 119 countries; however, the actual number of observations/countries varies due to missing data for one or more of the variables in a particular model. Details about the countries covered are in the Appendix.

The rich detail of this dataset comes at the cost of the formal analysis being limited to a cross-section of nations. The other variables are from reputed international sources that are routinely used in the literature. Details about the data, including variable definitions, summary statistics, and sources are in Table 1 and Table 2 provides the correlations between key variables. In our sample, nearly a third of firms/respondents overall viewed corruption as a major or very severe (Table 1). The correlation between perceived corruption and top female manager was -0.06, for the female ownership variables, the negative correlation was slightly less (Table 2). Next, we outline our estimation strategy.

3.2 Estimation

Since our dependent variable (*Corr*) is dichotomous, all models are estimated via logistic regression and z-statistics based on country-level clustered standard errors and LR χ^2 are reported to denote the relative significance of estimated coefficients and the estimated models, respectively. With the properties of the logistic regression, the estimated coefficients represent the corresponding likelihoods. The statistical significance of LR χ^2 s in all cases suggests that the setup of estimated models is good.

Finally, the firm-level and cross-sectional nature of our micro data alleviates concerns about reverse feedbacks (i.e., it is less likely that corruption being perceived as a major obstacle would result in firms having female managers or female owners). The estimation results follow.

4. Results

4.1 Baseline models

Table 3 reports models with variations of equation (1), with the main focus being on how female managers and female managers perceived corruption.

Turning first to the main variables of interest, i.e., female managers and female owners, we find that both female owners and female managers of firms perceived corruption to be a lower obstacle than for men. The resulting coefficient is statistically significant in all cases (Models 3.1-3.4). Recall that the nature and frequency of exposure to corruption would likely vary across female managers and female owners. However, when both female managers and female owners are included together in Model 3.5, female ownership loses statistical significance at the conventional levels. This is likely due to the nature of corrupt interactions that female owners

³ <http://www.enterprisesurveys.org/methodology>

face and with the internal delegation of responsibilities within firms (something that is nearly impossible to get an external handle on and is also challenging to quantify).

In terms of marginal effects, using Model 3.1 results, the estimated probability that a male top manager sees corruption as either a major or very severe obstacle to current business operations is 33.5%, when all other variables in the model are evaluated at their sample means. The corresponding probability for a female manager is 29.1%, or 4.4% less than their male counterpart. That difference is over 5% (30.2% dropping to 24.9%) using Model 3.2 results.

In the case of firm ownership, the results of Model 3.3 indicate that the probability that a male majority owner evaluates corruption as a major obstacle is 33.6% (again, evaluated at sample means), in contrast to 29.7% for firms with at least a split female ownership with men. A similar conclusion is drawn using Model 3.4 results (32.2% dropping to 28.1%), approximately a 4% difference.

With respect to firm level influences, only the age or vintage of firms was mostly significant - older firms had a higher perception of corruption, *ceteris paribus*. This may be due to greater exposure to corruption (via own dealings or information on others) or stronger networks/collaborations with government officials that are established over time. On the other hand, the effects of size, location, and ownership structure were largely statistically insignificant.

More prosperous nations had lower perceived corruption, reinforcing the established result in the literature (Serra (2006)). Interestingly, greater economic and greater political freedom did not significantly influence corruption perceptions. This contrasts with findings with aggregate indices of corruption perceptions, where economic freedom was especially found to lower corruption perceptions (Goel and Nelson (2005)).

Finally, when we accounted for the year of the survey, since all nations in the sample were not surveyed in the same year, the year of survey (*year*) had a negative and significant coefficient (in three out of five models) coefficient, i.e., more recent years had lower corruption perceptions. This might be the result of the increased attention that corruption has received in recent years by policymakers and more proactive steps taken to combat it.⁴ Overall, we see that some of both firm-level and country-wide factors influence corruption perceptions and that our use of micro-data adds some additional insights. Next, we consider some additional dimensions to examine other aspects to check the robustness of our results.

4.2 Additional considerations 1: Influence of social factors

Whereas the baseline models in Table 3 have considered economic, political and locational issues relevant to corruption both from firm-level and country-level perspectives, social/cultural factors have also shown to be relevant in forming corrupt interactions and expectations about corrupt exchanges (see Paldam (2002); and Dimant and Tosato (2018) for a broader literature perspective). For instance, bribes may be culturally more accepted in certain societies when they are viewed as a normal part of doing business. Furthermore, with ethnic, religious or linguistic

⁴ See, for example, <http://www.worldbank.org/en/topic/governance/brief/anti-corruption>.

differences (see Alesina et al. (2003)), bribes may be a means to build trust in commercial transactions.

To account for the influence on social factors in forming corruption perceptions, we include four variables: (i) gender inequality; (ii) ethnic fractionalization; (iii) language fractionalization; and (iv) religious fractionalization. The corresponding results are in Tables 4A and 4B (respectively, considering female managers and female owners). Other than the inclusion of these social variables, the format of the models is similar to Table 3.

With regard to gender inequality (Models 4A.1 and 4B.1), the resulting coefficient is positive and statistically significant for both female managers and female owners, implying that, *ceteris paribus*, greater gender inequality would result in higher (more likely) perceptions of corruption. In these instances, the coefficients on *female_manager* and *female_owner1*, respectively, are statistically insignificant (as is also the case with regard to economic prosperity). This suggests that any advantages/exposure/bargaining powers that female managers and female owners might have garnered by piercing the glass ceiling at firms are undermined in nations with heightened levels of gender inequality. It could be the case that nations with high gender inequality have fewer females as managers and owners in the first place, and when they do achieve such positions, they face additional challenges/bottlenecks due to a lack of other females to network with or other institutional constraints. Alternately, one could argue that in countries with gender equality women are more correct (and similar to their male counterparts) in assessing the significance of corruption on the operation of business enterprises. In sum, the interface of overall gender inequality and corruption perceptions at the intragender level opens some intriguing and important aspects that merit more detailed analyses.

Interestingly, sole proprietors would be less likely to perceive corruption as an obstacle when gender inequality is taken into account and this is true for both Table 4A and 4B. Being sole proprietors seems to mitigate some of the challenges with respect to corruption posed by overall gender inequality in societies.

Regarding the three fractionalization measures - ethnic, religious, and language – we find that they failed to significantly influence corruption perceptions (Models 4A.2 - 4A.4 and 4B.2 – 4B.4). This contrasts with results with aggregate indices of country-wide corruption perceptions where ethnolinguistic fractionalization was sometimes found to increase corruption perceptions (Treisman (2000)).

4.3 Additional considerations 2: An alternate dimension of female ownership

Our main female ownership measure, *female_owner1*, includes firms where females owned at least 50% of the business (Majority Female Ownership). To examine another related dimension to female ownership and to check the robustness of our earlier results, we created a new variable, *female_owner2*, where females held more than 50% ownership and called it “Super Majority Female Ownership”. The correlation between *female_owner1* and *female_owner2* was 0.82 (Table 2), implying that the two ownership measures are capturing somewhat different dimensions.

Table 5 reports results from variants of baseline models by including *female_owner2* in place of *female_owner1*. The main findings remain robust - both female owners and female managers have a lower perception of corruption. Interestingly, when both female ownership and female management variables are included together in Model 5.2, both are negative and significant (at the 10% level). In contrast, in corresponding Model 3.5 in Table 3, the female ownership variable (*female_owner1*) was statistically insignificant. The reason for the difference is likely that with Super Female Majority Female Ownership, female owners likely have greater exposure to corrupt transactions, while with weaker ownership (i.e., at least 50% ownership) they might have had to defer to their male counterparts sometimes. The results with regard to the other controls are similar to what was reported earlier.

4.4 Additional considerations 3: Considering the impact of institutional inertia via the stock of democracy

Institutional inertia shapes norms of both legal and illegal transactions over time. We accounted for this aspect by including a measure of the “stock” of democracy. The calculation of a country’s democracy stock measure follows the methodology introduced by Gerring, et al. (2005) and used by others (e.g., Beer (2009)) in analyzing gender equity issues.⁵ Nations with a long history of democracy would have set policies and procedures for dealing with different issues (e.g., constitutional crises, etc.). The consideration of democracy stock also provides a useful robustness check, given that our political freedom variable was largely statistically insignificant in Tables 3-5.

We reran the baseline models from Table 3 by including democracy stock in place of political freedom (PF). The results were quite similar with democracy stock being mostly insignificant and female managers and female owners having a lower perception of corruption. Additional details are not reported but are available upon request. The concluding section follows.

5. Concluding remarks

This paper uses firm-level data on more than 100 nations and adds to the research on corruption and gender nexus across several dimensions, including (a) measurement of corruption by studying whether female managers and female owners of firms perceived corruption differently; (b) using survey information at the firm level; and (c) employing a large sample of nations. The measure of corruption perceptions at the firm level used in this study to our knowledge has not been used in the literature, and most definitely not in the context considered in this paper.

Results show that both female managers and female owners, or more generally, those who had broken through the glass ceiling perceived corruption to be lower relative to men. With regard to

⁵ Specifically, the Polity 2 democracy rating score for each country in the Polity IV data set (<http://www.systemicpeace.org/polity/polity4.htm>) is summed from 1900 (or first year the country came into existence if that year was after 1900) with a one percent annual depreciation rate. Annual Polity 2 scores range from -10 to +10, with higher values implying greater democracy.

firms' characteristics, owners and managers of both genders perceived corruption to be a more severe obstacle in older firms, while sole proprietorships generally had the opposite view. The advantages of piercing the glass ceiling were undermined in nations with relatively ~~severe~~ greater gender inequality.

Turning to the questions posed in the Introduction, we are now able to provide some answers:

• **Do female managers of firms perceive corruption differently from males?**

Yes, female managers were found to be less likely to perceive corruption as a major obstacle.

• **Do female owners of businesses perceive corruption differently from males?**

Yes, female owners were found to be less likely to perceive corruption as a major obstacle. This finding holds across two different measures of female ownership.

• **How significant are firm-specific factors relative to aggregate country-level factors in shaping corruption perceptions?**

We find that a few of both firm-level and country-level factors significantly impact corruption perceptions.

In terms of policy relevance, whereas perceptions of corruption and related policies are based on aggregate indices, even when they account for gender differences, our findings suggest that attention should be paid to differences in overall corruption perceptions and perceptions in subgroups - in our case, females who had broken the glass ceiling somewhat perceived corruption to be lower.

Finally, as is true with all survey-based studies, one is limited in terms of the variables one can include by the detail in the underlying survey. This is especially challenging in the case of an issue like corruption that has numerous potential causes and effects. Nevertheless, we hope to have added some new insights into a very active of recent empirical inquiry.

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Table 1
Variable definitions, summary statistics and data sources

Variable	Mean (standard deviation)	Source
Corruption is perceived as a major or very severe obstacle to the current operations of the establishment, (1=yes, 0=no), [<i>Corr</i>]	0.334 (0.472)	[1]
Top manager is female, (1=yes, 0=no), [<i>female_manager</i>]	0.160 (0.366)	[1]
Majority female ownership, 50% or more of establishment ownership by women, female ownership $\geq 50\%$, (1=yes, 0=no), [<i>female_owner1</i>]	0.148 (0.355)	[1]
Super majority female ownership, A majority of establishment ownership by women, female ownership $> 50\%$, (1=yes, 0=no), [<i>female_owner2</i>]	0.103 (0.305)	[1]
Gender inequality index, (0–1, higher values imply more inequality), [<i>GII</i>]	0.413 (0.147)	[2]
Establishment size category measured by full-time equivalent workers (in logs), [<i>firmsize</i>]	3.345 (1.406)	[1]
Age of the establishment (years), [<i>firmage</i>]	21.565 (14.696)	[1]
Establishment legal status is sole proprietorship, (1=yes, 0=no), [<i>soleproprietor</i>]	0.331 (0.471)	[1]
Establishment is located in the official capital city, (1=yes, 0=no), [<i>capital</i>]	0.269 (0.444)	[1]
Index of ethnic fractionalization, (0 – 1, higher values imply greater fractionalization), [<i>ethnic_frac</i>]	0.447 (0.224)	[3]
Index of language fractionalization, (0 – 1, higher values imply greater fractionalization), [<i>lang_frac</i>]	0.450 (0.302)	[3]
Index of religious fractionalization, (0 – 1, higher values imply greater fractionalization), [<i>religion_frac</i>]	0.413 (0.217)	[3]
GDP per capita (thousands), in PPP, (constant 2011 international \$), lagged one year (in logs), [<i>GDP</i>]	10.450 (7.733)	[4]
Economic Freedom Index, (0 – 100, higher values imply more freedom), [<i>EF</i>]	57.393 (7.762)	[5]
Political Freedom, Sum of political rights and civil liberties index, (0 – 14, higher values imply less freedom), [<i>PF</i>]	7.409 (3.317)	[6]
Year survey was taken, [<i>year</i>]	2012 (2.240)	[1]

Notes: Statistics pertain to observations used in the first model that the variable appears.

Sources:

- [1]. Enterprise Surveys (<http://www.enterprisesurveys.org>), The World Bank. Data were taken for all available years between 2006 and 2016 where the survey was conducted the Enterprise Surveys Global Methodology (accessed July, 2017). The list of countries included in the data set and survey years can be found in the Appendix.
- [2]. United Nations Development Programme, Human Development Reports, <http://hdr.undp.org/en/content/gender-inequality-index-gii> (accessed June 2018). Data were not available for all years in data set.
- [3]. Alesina et al. (2003).
- [4]. World Development Indicators, The World Bank (accessed July, 2017).
- [5]. Heritage Foundation Index of Economic Freedom, overall score. <http://www.heritage.org/index/explore?view=by-region-country-year> (accessed August, 2017).
- [6]. Freedom House, Freedom in the World, <https://freedomhouse.org/content/freedom-world-data-and-resources>. (accessed November, 2018)

Table 2
Correlation matrix of key variables

	Perceived Corruption [<i>Corr</i>]	Female Top Manager [<i>female_manager</i>]	Majority Female Ownership [<i>female_owner1</i>]	Super Majority Female Ownership [<i>female_owner2</i>]
Perceived Corruption [<i>Corr</i>]	1.00			
Female Top Manager [<i>female_manager</i>]	-0.06	1.00		
Majority Female Ownership [<i>female_owner1</i>]	-0.04	0.51	1.00	
Super Majority Female Ownership [<i>female_owner2</i>]	-0.05	0.52	0.82	1.00

Notes; Number of observations = 51,954. All correlations are statistically significant at better than the 99 percent level.

Table 3					
Female management/ownership and perceived corruption: Baseline models					
(Dependent variable: <i>Perceived corruption [Corr]</i>)					
Model →	3.1	3.2	3.3	3.4	3.5
Top manager is female [<i>female_manager</i>]	-0.205** (3.1)	-0.270** (2.6)			-0.212** (2.4)
Majority female ownership [<i>female_owner1</i>]			-0.183** (2.6)	-0.194** (2.5)	-0.079 (1.5)
Firm size [<i>firmsize</i>]	-0.047* (1.8)	-0.040 (1.2)	-0.016 (0.8)	-0.016 (0.8)	-0.015 (0.7)
Age of the establishment [<i>firmage</i>]	0.005** (2.2)	0.005 (1.5)	0.006** (2.5)	0.007** (2.4)	0.007** (2.5)
Legal status of firm is sole proprietorship [<i>soleproprietor</i>]	-0.138 (1.6)	-0.167 (1.6)	-0.044 (0.5)	-0.066 (0.7)	-0.050 (0.6)
Establishment located in capital city [<i>capital</i>]		-0.079 (0.7)		-0.006 (0.1)	
<i>Country-level control variables</i>					
Lagged GDP per capita [<i>GDP</i>]	-0.042** (3.0)	-0.051** (2.8)	-0.049** (2.9)	-0.050** (2.8)	-0.049** (2.8)
Economic freedom [<i>EF</i>]	-0.015 (1.4)	-0.014 (1.0)	-0.020 (1.5)	-0.022 (1.6)	-0.021 (1.6)
Political freedom [<i>PF</i>]	-0.048 (1.3)	-0.057 (1.3)	-0.037 (0.9)	-0.050 (1.1)	-0.040 (0.9)
Year of survey [<i>year</i>]	-0.083** (3.0)	-0.033 (0.4)	-0.138** (3.5)	-0.105 (1.1)	-0.132** (3.0)
LR χ^2	53.2**	50.6**	73.0**	69.4**	77.0**
Observations	85,452	54,402	50,137	45,429	49,255
<p><i>Notes: Variable definitions are provided in Table 1. All models are estimated via logistic regression and include a constant term (not reported). The numbers in parentheses are (absolute value) z-statistics based on country-level clustered standard errors.</i></p> <p><i>* denotes statistical significance at the 10% level, and ** denotes significance at the 5% level (or better).</i></p>					

Table 4A				
Female management and perceived corruption: Additional considerations				
(Dependent variable: <i>Perceived corruption [Corr]</i>)				
Model →	4A.1	4A.2	4A.3	4A.4
Top manager is female [<i>female_manager</i>]	-0.087 (1.4)	-0.182** (2.8)	-0.202** (3.2)	-0.194** (2.7)
Firm size [<i>firmsize</i>]	-0.050** (2.4)	-0.042* (1.7)	-0.050* (1.8)	-0.052** (2.0)
Age of the establishment [<i>firmage</i>]	0.002 (1.5)	0.004** (2.0)	0.004* (1.7)	0.004** (2.1)
Legal status of firm is sole proprietorship [<i>soleproprietor</i>]	-0.268** (3.6)	-0.154* (1.9)	-0.109 (1.2)	-0.131 (1.5)
<i>Country-level control variables</i>				
Gender inequality [<i>GII</i>]	4.735** (5.5)			
Lagged GDP per capita [<i>GDP</i>]	0.018 (1.2)	-0.037** (2.6)	-0.051** (3.1)	-0.042** (3.1)
Economic freedom [<i>EF</i>]	-0.009 (0.9)	-0.018* (1.7)	-0.018* (1.7)	-0.017* (1.7)
Political freedom [PF]	-0.042 (1.6)	-0.061* (1.6)	-0.062* (1.8)	-0.052 (1.4)
Ethnic fractionalization [<i>ethnic_frac</i>]		0.216 (0.5)		
Language fractionalization [<i>lang_frac</i>]			-0.463 (1.2)	
Religious fractionalization [<i>religion_frac</i>]				-0.323 (0.8)
Year of survey [<i>year</i>]	-0.130** (5.3)	-0.080** (3.0)	-0.080** (2.6)	-0.084** (3.1)
LR χ^2	103.0**	53.2**	54.5**	51.4**
Observations	81,265	84,099	82,556	84,096
<p><i>Notes: Variable definitions are provided in Table 1. All models are estimated via logistic regression and include a constant term (not reported). The numbers in parentheses are (absolute value) z-statistics based on country-level clustered standard errors.</i></p> <p><i>* denotes statistical significance at the 10% level, and ** denotes significance at the 5% level (or better).</i></p>				

Table 4B				
Female ownership and perceived corruption: Additional considerations				
(Dependent variable: <i>Perceived corruption [Corr]</i>)				
Model →	4B.1	4B.2	4B.3	4B.4
Majority female ownership [<i>female_owner1</i>]	-0.029 (0.4)	-0.140** (2.1)	-0.177** (2.6)	-0.162** (2.2)
Firm size [<i>firmsize</i>]	-0.033* (1.7)	-0.023 (1.1)	-0.018 (0.8)	-0.020 (1.0)
Age of the establishment [<i>firmage</i>]	0.005** (2.0)	0.006** (2.3)	0.006** (2.4)	0.006** (2.4)
Legal status of firm is sole proprietorship [<i>soleproprietor</i>]	-0.216** (3.0)	-0.034 (0.4)	-0.033 (0.4)	-0.052 (0.6)
<i>Country-level control variables</i>				
Gender inequality [<i>GII</i>]	4.837** (4.9)			
Lagged GDP per capita [<i>GDP</i>]	0.025 (1.0)	-0.055** (3.9)	-0.056** (3.8)	-0.048** (3.0)
Economic freedom [<i>EF</i>]	-0.020 (1.5)	-0.021* (1.6)	-0.026* (1.9)	-0.022* (1.6)
Political freedom [<i>PF</i>]	-0.046 (1.6)	-0.043 (1.0)	-0.052 (1.4)	-0.041 (1.0)
Ethnic fractionalization [<i>ethnic_frac</i>]		-0.506 (1.0)		
Language fractionalization [<i>lang_frac</i>]			-0.376 (0.9)	
Religious fractionalization [<i>religion_frac</i>]				-0.074 (0.2)
Year of survey [<i>year</i>]	-0.126** (3.1)	-0.150** (3.4)	-0.157** (3.9)	-0.139** (3.4)
LR χ^2	128.9**	76.9**	75.9**	71.9**
Observations	46,117	49,568	48,537	49,542
<p><i>Notes: Variable definitions are provided in Table 1. All models are estimated via logistic regression and include a constant term (not reported). The numbers in parentheses are (absolute value) z-statistics based on country-level clustered standard errors.</i></p> <p><i>* denotes statistical significance at the 10% level, and ** denotes significance at the 5% level (or better).</i></p>				

Table 5		
Super majority female ownership and perceived corruption		
(Dependent variable: <i>Perceived corruption [Corr]</i>)		
Model →	5.1	5.2
Super majority female ownership [<i>female_owner2</i>]	-0.273** (3.7)	-0.172* (1.9)
Top manager is female [<i>female_manager</i>]		-0.177* (1.7)
Firm size [<i>firmsize</i>]	-0.017 (0.8)	-0.016 (0.8)
Age of the establishment [<i>firmage</i>]	0.006** (2.5)	0.007** (2.5)
Legal status of firm is sole proprietorship [<i>soleproprietor</i>]	-0.029 (0.4)	-0.041 (0.5)
<i>Country-level control variables</i>		
Lagged GDP per capita [<i>GDP</i>]	-0.049** (2.8)	-0.049** (2.8)
Economic freedom [<i>EF</i>]	-0.020 (1.5)	-0.021 (1.6)
Political freedom [<i>PF</i>]	-0.036 (0.9)	-0.039 (0.9)
Year of survey [<i>year</i>]	-0.135** (3.4)	-0.131** (2.9)
LR χ^2	79.6**	83.7**
Observations	50,137	49,255
<p><i>Notes: Variable definitions are provided in Table 1. All models are estimated via logistic regression and include a constant term (not reported). The numbers in parentheses are (absolute value) z-statistics based on country-level clustered standard errors.</i></p> <p><i>* denotes statistical significance at the 10% level, and ** denotes significance at the 5% level (or better).</i></p>		

Appendix

Countries included in the data set

Albania (2013), Angola (2010), Argentina (2010), Armenia (2009, 2013), Azerbaijan (2009, 2013), Bahamas (2010), Bangladesh (2013), Barbados (2010), Belarus (2008, 2013), Belize (2010), Benin (2009, 2016), Bhutan (2015), Bolivia (2010), Bosnia and Herzegovina (2013), Botswana (2010), Brazil (2009), Bulgaria (2009, 2013), Burkina Faso (2009), Burundi (2014), Cambodia (2016), Cameroon (2009, 2016), Cape Verde (2009), Central African Republic (2011), Chad (2009), Chile (2010), China (2012), Colombia (2010), Congo (2009), Costa Rica (2010), Croatia (2013), Czech Republic (2009, 2013), Côte d'Ivoire (2009, 2016), Democratic Republic Congo (2010, 2013), Djibouti (2013), Dominica (2010), Dominican Republic (2010, 2016), Ecuador (2010), Egypt (2013), El Salvador (2010, 2016), Eritrea (2009), Estonia (2009, 2013), Ethiopia (2011, 2015), FRY Macedonia (2009, 2013), Gabon (2009), Georgia (2008, 2013), Ghana (2013), Guatemala (2010), Guinea (2016), Guyana (2010), Honduras (2010), Hungary (2009, 2013), India (2014), Indonesia (2009, 2015), Israel (2013), Jamaica (2010), Jordan (2013), Kazakhstan (2009, 2013), Kenya (2013), Kyrgyz Republic (2009, 2013), Laos PDR (2012, 2016), Latvia (2009, 2013), Lebanon (2013), Lesotho (2009, 2016), Liberia (2009), Lithuania (2009, 2013), Madagascar (2009, 2013), Malawi (2009, 2014), Malaysia (2015), Mali (2010, 2016), Mauritania (2014), Mauritius (2009), Mexico (2010), Moldova (2009, 2013), Mongolia (2009, 2013), Montenegro (2009, 2013), Morocco (2013), Myanmar (2014, 2016), Namibia (2014), Nepal (2009, 2013), Niger (2009), Nigeria (2014), Pakistan (2013), Panama (2010), Papua New Guinea (2015), Paraguay (2010), Peru (2010), Philippines (2009, 2015), Poland (2009, 2013), Romania (2009, 2013), Russia (2009, 2012), Rwanda (2011), Senegal (2014), Serbia (2009, 2013), Sierra Leone (2009), Slovak Republic (2009, 2013), Slovenia (2009, 2013), Solomon Islands (2015), Sri Lanka (2011), St. Lucia (2010), St. Vincent and Grenadines (2010), Suriname (2010), Swaziland (2016), Tajikistan (2008, 2013), Tanzania (2013), Thailand (2016), Timor-Leste (2015), Togo (2009, 2016), Trinidad and Tobago (2010), Tunisia (2013), Turkey (2008, 2013), Uganda (2013), Ukraine (2008, 2013), Uruguay (2010), Uzbekistan (2008, 2013), Venezuela (2010), Vietnam (2009, 2015), Yemen (2010, 2013), Zambia (2013), Zimbabwe (2011, 2016).

Note: N = 119 (46 countries surveyed twice)