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Size Matters: Corruption Perceptions versus Corruption Experiences by Firms

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Abstract

This study uses a large firm-level data set covering more than 80 countries to explore the effects of firm-size, city-size, and government-size on perceived and experienced corruption. Four points summarize our main findings, which seem instructive and new. First, there is a broad structural similarity in the major determinants of perceived and experienced corruption. Second, larger firms and larger government size lower corruption perceptions and experience. Third, larger cities raise corruption perceptions and experience. Fourth, when the sample is limited to large cities, the corruption-lowering effect of government size loses significance throughout, while firm size loses significance in experience regressions.

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1. Introduction

This paper adds a new dimension to the empirical determinants of corruption across countries by focusing on selected categories of the "size" of the main determinants. While the literature has considered a number of factors to potentially impact the level and prevalence of corrupt activity and found some of those influences to be more robust than others (see Dimant and Tosato (2018), Seldadyo and de Haan (2006), Serra (2006), Treisman (2000, 2007)), the impact of several major types of the size of these has received scant attention.

In our context, size has different types or categories. It can be related to the size of firms who are asked to pay bribes (see, related, Beck and Maher (1989)), the size of the government where the firms or respondents affected by corruption operate, and the size of localities where firms operate. All these could be potentially related to the prevalence of corrupt activity. The prevalence of corruption is examined for both corruption perceptions and corruption experience.

These categories of size differ along a number of fronts, perhaps most pertinent in the present context is their ability to change in the short term. For instance, while firm size is endogenous to firms, their location would be less so, especially when substantial sunk costs are involved – as is generally the case for firms in the manufacturing sector. On the other hand, government size is largely exogenous for respondents (bribe payers) in the short term, and prone to change even gradually by policymakers.

These qualitative dimensions of size could have different impacts on corruption. Larger firms might be better equipped to negotiate bribe solicitations, but may be "sitting ducks" for corrupt officials with their relative inability to move to less corrupt areas. Large firms may be able to devote greater resources to lobbying, which has nexus with corruption (Campos and Giovannoni (2007)). Further, large firms may be visible targets for rent-seekers, but they might also have greater media focus, which might act as a deterrent (Dutta and Roy (2016)). While large firms have traditionally been targets of antitrust regulations, especially in mergers and acquisitions, their spillovers on corrupt activities do not seem to figure prominently in regulatory considerations.

The role of the government is multifaceted, with implications for various institutions and corruption (Goel et al. (2017)). Government size might be related to bureaucratic rent-seeking on the one hand, and better governance on the other (Rose- Ackerman (1999), Shleifer and Vishny (2002)). Bureaucratic red tape increases corruption, while greater vigilance mitigates it. Large cities might attract corrupt, rent-seeking, bureaucrats to seek postings there due to relatively lower transaction costs of finding sources of rent. There might, however, be some countervailing, corruption-reducing, forces at work in large cities – for instance, there might be greater media scrutiny and disproportionate policing in large cities. Menes (2003) further notes that some forms of government interference such as closing borders and pursuing input-substituting policies are not possible in cities (as opposed to such possibilities in nation-states). On the other hand, patronage politics in cities makes corruption more likely by insulating politicians from voter displeasure, but the ability of the tax base to exit the city provides some

constraints on rent-extraction. We consider whether these different dimensions of size have similar effects on corruption.

Other contributions of this work relate to a comparison of the determinants of corruption perception and corruption experience and using data from a large survey of firm-level respondents. There is some debate about what exactly do the aggregate, country-level corruption indices, such as the Corruption Perceptions Index by the Transparency International, capture (Donchev and Ujhelyi (2014); also see Goel and Nelson (2011)). Our firm-reported indicators of corruption perceptions and corruption experience can be used to shed light on this point. Corruption perceptions can be seen as potential entry barriers for firms (also see Davis and Ruhe (2003)), whereas corruption experience resembles transaction costs (see Belousova et al. (2016), Olken (2009)). Not all respondents who perceive corruption to be high might have had a first-hand experience with it. Furthermore, local and global perceptions of corruption might differ (Liu and Mikesell (2014)), and some scholars have noted the differing impacts of tax administration practices on corruption perceptions and experience (Ponomariov et al. (2018)). Our work measures *both* perceptions and experience using actual responses of the formal sector firms. A number of studies have pointed out the disconnect between perceived and actual business practices (e.g. Besley (2015); Hallward-Driemer and Pritchett (2015)). This study overcomes this weakness by focusing on firm managers for both perceptions and experience. We also consider the role of "size" in affecting corruption perceptions and experience.

The following key questions are addressed in this research, using cross-country survey data at the firm level:

- Are the drivers of corruption perceptions similar to those of corruption experience?
- How do the different dimensions of size, including firm size, city size, and government size, impact corruption perceptions and corruption experience?

Extensive surveys of the causes of corruption literature show that some these questions have not been addressed in the literature, especially with the depth and scale of this study (Dimant and Tosato (2018), Lambsdorff (2006), Treisman (2007)). The structure of the rest of this paper includes the literature and the model in the next section, followed by data and estimation, results, and conclusions.

2. Literature and model

2.1 Literature

A substantial body of empirical work has emerged in recent years, especially on aggregate country-level drivers of corrupt activity (see Dimant and Tosato (2018) for a survey). Various scholars have considered nearly a hundred potential influences on corruption, and about a fifth of those have been found to be statistically robust (see Seldadyo and de Haan (2006), Serra (2006), Treisman (2000)). Yet, given that corruption remains quite prevalent worldwide, the quest for definitive influences on corruption is not over. The present study makes a contribution by focusing on several categories of the "size" of some of these determinants. Although some

aspects of size have been considered in the literature (Amin and Soh (2019), Bai et al. (2017), Beck et al. (2005), Campos and Giovannoni (2007), Knack and Azfar (2003), Menes (2003)), well-defined size categories have not been adequately considered.

The size of the government is related to bureaucratic red tape. Conversely, a larger government size might imply additional resources to monitoring. In other words, government size might have implications for the quality of government (La Porta et al. (1999)). This aspect has received considerable attention, both theoretically and empirically (Goel and Nelson (1998), Magtulis and Poquiz (2017), Nelson (2013), Rose-Ackerman (1999), Shleifer and Vishny (1993), Themudo (2014)). However, the multiple roles that the government performs in an economy make clear inferences about its impact on corruption difficult. Additionally, there is the issue of the state-capture of enterprises in a very corrupt environment (Shleifer and Vishny (2002)).

The size of firms has implications for the structure of markets in which the firms operate, and this could influence corruption, as hypothesized by Shleifer and Vishny (1999).[1] For example, large size confers monopoly power and large firms might have greater bribe negotiation powers or "refusal power", in the parlance of Svensson (2003) in the context of Ugandan firms (also see Kouznetsov et al. (2010)).

A somewhat related stream of the literature considers the differential effects of corruption on different "sizes" of selected determinants. Beck et al. (2005) using firm-level data for about fifty nations find the effect of corruption on firm growth to be dependent on firm size. Notably, it is found that it is the small firms that were more constrained by corruption. The impact of firm size on lobbying and the consequent spillovers on corruption have been noted by Campos and Giovannoni (2007). Whereas the focus of our work is on the causes of corruption, we take account of possible bi-directional causality regarding the causes and effects of corruption in the section on robustness check.

With regard to city size and corruption, Menes (2003) discusses the relationship between American cities and corruption in a historical context. She discusses the opposite influences of patronage and grant of favors in cities, and the potential flight of voters from corrupt cities acting as a check against corruption. Other ties to the literature streams relate to studies based on micro-level data and the measurement of corruption. Typically, micro-level studies, using data from individual respondents about their corruption experience or perceptions, use data from national surveys (Belousova et al. (2016), Olken (2009)).[2] This work, on the other hand, uses data across more than 80 nations.

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[1] In a broader context, Williamson (1967) has noted that there may be an optimal size of firms, after which diminishing returns to scale might set in. Other aspects related to the evolution of firms etc. are reviewed in Williamson (1981).
The possibility of the firm size being endogenous in the context of corruption is addressed in a following section (Section 4.3.3).
[2] A recent study by Gutmann et al. (2020) compares corruption experiences and corruption perceptions using a different sample and an alternative source of the corruption data. The present study uses data on corruption perceptions and experiences from firms' managers and owners and uniquely focuses on the impacts of the different dimensions of size.

Finally, the measurement of corruption continues to be a complex issue (Donchev and Ujhelyi (2014)), with an inability to measure its true extent and the qualitative differences across measures (Goel and Nelson (2011)). Our contribution to the measurement question lies in introducing a distinction between a firm's perception and experience of corruption. As noted above, some perceptions about corruption may be formed (via media reports or social interactions/networking) by those who do not have a first-hand experience with corruption. The related literature considering both corruption perceptions and corruption experience is based on studies of individual nations (Belousova et al. (2016), Olken (2009), Sundström (2019), Svensson (2003)). The formal empirical setup for this study follows.

2.2 Model

Based on the above discussion and to focus on the relative impacts of different size categories, we formulate a basic empirical model. The main focus is on comparing the impacts of different types of size on corruption perceptions and corruption experience.

- What are the relative impacts of the size of firms, size of cities where there are located and the size of governments where the firms operate on corruption?
- Are the determinants, especially along the three size dimensions (i.e., firm size, city size, government size), alike on corruption perceptions and corruption experiences?

With i denoting a firm in country j, and t denoting the year of survey (as the data section notes, not all nations were surveyed in the same year and some nations had surveys in multiple years,[3] the general form of the estimated equation is the following (where subscript m denotes a size variable, k denotes corruption type, and the vector Z (subscript s) denotes country-level controls)

$\text{Corruption}_{ijkt} = f(\text{SIZE}_{ijmt}, \text{Firm age}_{ijt}, \text{Firm ownership}_{ijt}, \text{ServiceIND}_{ijt}, Z_{jst})$ …(1)

$i = 1,\ldots, 73178$

$j = 1,\ldots, 83$

$t = 2006,\ldots, 2018.$

$k = \text{CORRperc}, \text{CORRexp}$

$m = \text{FirmSIZE}, \text{CitySIZE}, \text{GovtSIZE}$

$s = \text{Latitude}, \text{Development}, \text{EcoFreedom}, \text{Democracy}, \text{Island}$

The dependent variable is corruption, and we are able to qualitatively differentiate between corruption perceptions (CORRperc) and corruption experience (CORRexp), with a 0-1 entry for both.[4] Corruption perceptions could very well differ from corruption experience or reality – not all firms/respondents who perceive corruption to be high might have first-hand personal

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[3] https://www.enterprisesurveys.org/content/dam/enterprisesurveys/documents/ES-map-global-coverage.pdf.
[4] The data for corruption perceptions (but not corruption experience) includes multiple response options (see www.enterprisesurveys.org and Table 1 for details). This makes doing a multinomial analysis possible. We restrict our analysis to a 0-1 choice to facilitate comparisons between the two measures of corruption (CORRperc and CORRexp).

experience with corruption. While the present study cannot claim to be unique in its comparison of corruption perception and corruption experience, it appears to be unique in applying this comparison across nearly 100 nations with micro-level data in regard to the impact of size categories.

In the extant literature, studies considering the perception-experience comparison have generally relied on data from individual nations. Besides adding to the literature, the perceptions-experience comparison should provide useful inputs for the design of effective corruption-control policies.

The main variables of interest deal with size, which we consider along three dimensions: (i) FirmSIZE - Larger firms might be lucrative targets for corrupt officials, but larger firms also might have specialized personnel (liaisons or retired government personnel as employees) who might be better able to negotiate or dodge corruption. There is also likely to be a greater media focus on larger firms and that might act as a corruption deterrent. Firm size has implications for market structure, which could have countervailing power on bribe demands (Shleifer and Vishny (1999)); (ii) CitySIZE – we are able to take account of the size of the cities where the responding firms are located. This is tied to information flows, networking, media focus, and possible shaming which could occur in larger population centers. Conversely, the size of the potential rent-seeking pie is bigger in larger cities and this might attract corrupt bureaucrats to seek posting there (often using corrupt means in a largely corrupt system); (iii) GovtSIZE is tied to bureaucratic red tape on the one hand and to better checks and balances with larger governments on the other hand (Rose-Ackerman (1999)). Widely corrupt economies might entail state capture via the "grabbing hand" of the government (Shleifer and Vishny (2002)). Related empirical research has found both positive (Goel and Nelson (1998)) and negative (Goel and Nelson (2005)) effects of government size, depending upon the scope of the data (cross-national or single-nation analysis) and the measure of corruption (corruption perceptions versus corruption prosecutions). Our micro-level analysis will reveal the relative strengths of the two effects and also reveal possible differences between impacts on corruption perceptions and corruption experience.

The detail in the survey data employed enables us to incorporate several firm-level characteristics (beyond firm size) that are likely to affect corruption. These include: (i) the age or vintage of firms; (ii) the ownership structure of firms, captured by the variable, Ownership, that takes the value of 1 if the firm is a sole proprietorship; and (iii) whether the firm operates in the service sector (ServiceIND). Intuitively, older firms could have past experience with corruption and could be more deft at dealing with corrupt officials. Alternately, old firms might view corruption as a cost of doing business and not perceive it to be an obstacle. Further, sole proprietors bear the direct costs and benefits of the firm's actions (as opposed to corporations or limited partnerships), and thus might be more prone to offering bribes when they perceive corruption to act as a grease.

Additionally, the service sector might have different corruption perceptions and/or experience than other (manufacturing) firms. One reason for this might be their relatively greater ability to dodge bribe demand, due to an absence of sunk costs or contestability in many instances.

Anecdotally, the software industry blossomed in India, which generally has a wide prevalence of corruption, partly due to its ability to circumvent regulatory and licensing bottlenecks and transmit its output (software) over the internet.[5]

To account for country-level drivers of corruption and place the analysis within the broader literature on the causes of corruption, we employ Democracy and EcoFreedom, to respectively account for dimensions of political freedom and economic freedom. In general, both democracy and economic freedoms are associated with lower corruption, with greater relative empirical support for the effect of economic freedom (see Goel and Nelson (2005); also, Treisman (2000)). Further, the level of economic development in a nation is generally tied to lower corruption (Gundlach and Paldam (2009)), and we consider this by including a dummy variable (Development) to identify medium and low-income nations in our sample. Such nations formed the majority of our sample (63%, see Table 1a).

Finally, geographic effects are taken into account by including the responding country's latitude and island-nation status. The development economics literature has considered the distance from the equator as a determinant of prosperity and this might also have implications for corruption (Treisman (2000; Table 8)). Island nations are relatively insulated, which might empower rent-seekers on the one hand, and, on the other hand, there might be more limited learning/contagion from neighbors (which would cause corruption to decrease). Next, we turn to a discussion of the data employed and the estimation procedure to estimate variants of equation (1).

3. Data and estimation

3.1 Data

The primary source of data for this study is the Enterprise Surveys conducted by the World Bank and available in the public domain (www.enterprisesurveys.org). The Enterprise Surveys (ES) provide a large data set of firm-level responses covering, in principle, 146000 firms across 143, mostly emerging, economies. Since 2006, the surveys are all administered using a uniform questionnaire based on a global methodology which permits both inter- and intra- country comparisons of indicators.[6] The responses are gathered from firm managers/owners through face-to-face interviews across a range of issues related to firms' operations. The surveys are typically conducted for a few countries every year, and over time some nations have been surveyed more than once.[7] We used all available information in our analysis for nations surveyed between 2006 and 2018.

Due to missing data for some nations, the baseline sample in this study comprises more than 73,000 firm-observations covering 83 countries. A typical country in our sample has 882 firms. The largest firm coverage is for India (which contributes 12.6 percent or 9,238 firms to our baseline sample). The minimum firm coverage is 84 firms for Lesotho which is 0.11 percent of

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[5] https://blogs.worldbank.org/developmenttalk/india-s-it-industry-and-industrial-policy
[6] See https://www.enterprisesurveys.org/en/methodology.
[7] See https://www.enterprisesurveys.org/content/dam/enterprisesurveys/documents/ES-map-global-coverage.pdf.

the sample. In terms of frequency of surveys, 34 percent of countries in our baseline sample have two or more rounds of surveys.

The inherently invisible nature of corruption complicates its measurement. In addition, careful evidence also suggests that inferences derived from perceptions-based measures differ systematically from those based on actual experience (see Hallward-Driemeier and Pritchett (2015), Olken (2009)). Furthermore, the perceptions of corruption might not necessarily be based on respondents' own experience. That is indeed the case in many international corruption indices like the one from the Transparency International, where foreign business leaders are surveyed about their corruption perceptions in a given country (https://www.transparency.org/en/). However, the true impact of corruption control in a nation will only be felt once corruption experiences are reduced.

Therefore, we use two different measures of corruption, focusing on the perceptions of corruption and its experience. The measure of corruption perceptions (CORRperc) is a binary variable following from the survey question regarding whether a firm perceives corruption as either a "major" or a "very severe obstacle (see Table 1b and http://www.enterprisesurveys.org for details), with a mean of 0.36 and a standard deviation of 0.48. It suggests that a sizeable proportion of firms in our analysis perceive corruption as a serious constraint to the operations of their establishments (Table 1b).

The corruption experience question in the underlying survey is related to whether an informal payment or gift is being requested from a respondent firm during an inspection (see Table 1b and http://www.enterprisesurveys.org for details). About 12 percent of the firms have actually experienced corruption (CORRexp) during an inspection by government officials.[8] The correlation between these two indicators of corruption is 0.10, (Table A2), suggesting that the two measures of corruption are indeed picking up different effects reported by the same population. Interestingly, the standard deviation of perceptions is higher compared to the standard deviation of experience suggesting greater volatility in perceptions.

An important element in our empirical analysis is the size of the city in which a firm is located. Large cities offer networking and synergy benefits. On this dimension, 48 percent of firms in our sample are located in cities having more than 1 million population. The correlation between firm size and city size is 0.10 which is positive but not high (Table A2). This low correlation makes sense, since depending on land costs and the nature of business (mining, hog farms, etc.), not all large firms may be located in large urban areas.

The size of the government, the third size dimension in our analysis, measures the ratio of final government consumption expenditure to GDP. On this front, an average country's government consumes 13.2 percent of its GDP. In our sample, Lesotho has the largest government size of more than 34 percent while Bangladesh has the smallest government of 5.1 percent of its GDP.

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[8] As noted in Table 1b, the underlying question relates to corruption experience in dealing with tax officials, although corruption could be more widely prevalent in some nations.

On firm size, a typical firm in our sample is medium-sized having about eighty employees. In terms of firm age, a typical firm in our sample is 19.4 years old. Of course, both size and vintage could vary greatly across nations and industries. Both firm size and age are converted into logs for use in the empirical model.

Speaking of the industry type, following the International Standard Industrial Classification (ISIC), the ES data set identifies 51 different sectors and subsectors. However, the sector-specific distribution is quite uneven, with some sectors (e.g. retail and other services) contributing more than 15 percent to the overall sample while the share of some others (e.g. wood, leather, tobacco, etc.) is less than 0.1 percent. To avoid unnecessary complications, we use the broad classification of manufacturing versus services. With this broad classification, our sample has 40 percent of firms belonging to the service sector.

The self-employed nature of entrepreneurship is evident in our sample as sole proprietors account for 40 percent of firms. The ownership structure of the other 60 percent of firms is categorized as either a partnership or a shareholding company. In terms of the level of economic development, a majority or 63 percent of the firms in our sample are located in low and middle-income countries.

We also include economic freedom (EcoFreedom) and the degree of democracy (Democracy) as macro-level controls. These variables are from reputed international sources that are routinely used in the literature (see Table 1a for related data sources). These influences have been found relevant in the context of corruption (Goel and Nelson (2005)). In our sample, a typical country is not overwhelmingly economically free (with an average economic freedom of 58.2 out of 100), neither completely non-democratic (with an average of 6.3 out of 10).

Complete details about the variables used, including variable definitions, summary statistics and data sources are in Table 1a, with additional details about the corruption measures in Table 1b. Table A2 provides pairwise correlations between the main variables of interest.

3.2 Estimation

The appropriate method to estimate the specification in (1) is logistic regression given the qualitative nature of the dependent variable(s.) The large and diverse sample size allows us to invoke the central limit theorem to derive inference using robust standard errors, clustered at the country level. To account for secular changes, all estimates include year effects. Each specification also includes geographical variables like *Island*, *Latitude*, and *Development* to control for the country-specific influences. Furthermore, potential endogeneity concerns in some cases (e.g., vis a vis FirmSIZE, where corruption could impact firm size (Beck et al. (2005)) are addressed using instrumental variables in a two-stage least squares (2SLS) method.

In addition, we check for the robustness of the baseline findings by augmenting our baseline controls. Because of the large number of regressors and different dependent variables, the sample size varies. Nonetheless, we believe that in all cases the sample size is sufficiently large both in terms of country coverage and firm coverage to allow us to draw reliable inferences. The results section follows.

4. Results

4.1 Dimensions of size and corruption perceptions

As mentioned above, the main focus of this paper is to study the effect of several size-categories on corruption and we consider corruption perceptions first. Table 2 reports results with firm-level corruption perceptions (CORRperc) as the dependent variable. This measure is based on perceptions of firms, rather than outside experts (see https://www.transparency.org.uk/corruption/measuring-corruption/). Given the dichotomous nature of the dependent variable, logit estimation is employed with clustered-robust standard errors. The Wald test is statistically significant in all cases, attesting to the significance of the explanatory variables.

With regard to the impact of size, larger firms and larger governments are associated with (the likelihood of) lower corruption perceptions, while firms based in larger cities are likely to have higher corruption perceptions.[9] The impact of city size is consistent with greater information flows in larger cities (due partly to greater media presence and focus), where one large corruption scandal could enhance corruption perceptions across a large spectrum of the population rather quickly. On the other hand, larger firms and firms in nations with larger governments perceive a lower likelihood of corruption obstacles. Larger firms are likely to have a stronger mechanism to deal with adverse impacts of corruption (see Svensson (2003) for a related angle) and larger governments might be perceived to have strengthened governance mechanisms. Whereas government size-corruption nexus has been considered at length in the literature (Goel and Nelson (1998), Rose-Ackerman (1999), Shleifer and Vishny (2002)), the focus on firm size and city size is new here.

Firm-level attributes seem relevant in shaping perceptions, with age or vintage and ownership having opposite impacts. Older firms perceived a greater likelihood of corruption, whereas sole proprietorships felt otherwise. Older firms might be using past exposures of corruption history to form opinions, whereas sole proprietors might feel greater empowerment to deal with corrupt officials and thus view corruption as less of an obstacle.

Turning to macro-level influences, firms in the service sector viewed corruption as less of an obstacle (likely due to their greater relative contestability vis a vis manufacturing firms), whereas firms in nations farther from the equator (Latitude) perceived corruption to be higher.[10] Furthermore, firms in less-developed nations (Development) viewed corruption to be a more severe constraint. This finding is consistent with the notion that greater prosperity increases the opportunity costs of illegal acts (Gundlach and Paldam (2009), Serra (2006)).

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[9] The coefficient on CitySIZE is statistically significant in only two of the four models in Table 2.

[10] Firms located in nations away from the equator had higher perceptions, although the nations included in this survey (see the Appendix) mostly included emerging nations (and not less (perceived) corrupt nations like Finland, Denmark, etc.).

Along a geographic dimension, firms in island nations faced lower corruption perceptions, likely due to a lack of contagion from bordering nations. Finally, both greater economic freedom and greater democracy are associated with lower corruption perceptions, consistent with the idea that economic freedom reduces rent-seeking opportunities, and democracy is associated with better checks and balances (Goel and Nelson (2005)).

In sum, we see that dimensions of size do not impact corruption perceptions in a similar manner, with firms located in larger cities having different perceptions than larger firms and firms in nations with larger governments. The perceptions of firms in larger cities might be shaped in part by greater networking and by greater media focus on such jurisdictions. Next, we consider the determinants of corruption experience.

4.2 Dimensions of size and corruption experience

Complementary to corruption perceptions and focusing on a different dimension, Table 3 considers the drivers of corruption experience. The perceptions of corruption might be based on views of those who do not have first-hand experience with it. Only a handful of studies in the literature formally compared the differences between corruption perceptions and corruption experience (Babos (2015), Belousova et al. (2016), Gillanders and Parviainen (2018), Olken (2009)). For ease of comparison and consistency, the format of the models in Table 3 is similar to those in Table 2.

The results with respect to the influences of size on corruption experience are qualitatively similar to those for corruption perceptions in Table 2 – firms in larger cities had a greater likelihood of corruption experience, while larger firms and firms in nations with bigger governments had the opposite experience. However, the estimates for city-size and government-size are much stronger in Table 3, and statistical support for the positive effect of CitySIZE is much greater in Table 3 than in Table 2. Thus, firms in larger cities experience more corruption than is their perception.[11]

Greater variation is seen in the results with regard to firm-level and country-level influences. In particular, the corruption experience of older firms was no different from other firms and sole proprietorships reduced the likelihood of corruption experience. Thus, while older firms perceived corruption to be higher, their experiences did not bear this out. On the other hand, both perceptions and experience of sole proprietors were lower.

The results with regard to Development and Latitude were similar to Table 2, with a relatively weaker statistical support. Further, the results for EcoFreedom, and Island were similar to those in Table 2, with both firms in nations with greater economic freedom and in island nations having lower corruption experience. Interestingly, however, the corruption experience of firms

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[11] The impact of city size provides an interesting contrast from earlier findings of Mocan (2008), where, based on data from individual respondents about their being asked for a bribe, he found that individuals in small and medium-sized cities were less likely to be asked for bribes. A key qualitative difference between firms versus individuals relating to bribe demands would be their relative mobility - an aspect noted by Menes (2003). Other things being the same, individuals in many instances might be more adept (relative to firms) at switching locations to dodge rent-seeking officials.

in more democratic nations was no different from other firms. In other words, firms in dictatorships and in democracies in our sample were equally likely to experience corruption.[12] Thus, while firms in more democratic nations perceived corruption to be lower (Table 2), their experiences did not back up their perceptions.

In sum, while we see similarities between drivers of corruption perception and corruption experience with regard to the main size categories, there are notable differences in some other respects, both at the micro- and macro-levels. Therefore, the consideration of both corruption perceptions and corruption experience is instructive, especially because perceptions address expected transaction costs (which can act as entry barriers) and experience captures actual transaction costs. To gain further insights, we consider the relative magnitudes of the impacts of size.

4.2.1 Comparing the relative magnitudes of the impacts of size

To gain additional insights, it seems useful to compare the relative magnitudes of effects. The marginal effects of the size variables are reported at the bottom of Tables 2 and 3, respectively.

The (negative) marginal effect of FirmSIZE is greater on corruption perceptions than on corruption experience, while the (positive) marginal effect of CitySIZE on corruption experience is greater (along with greater statistical significance). However, the (negative) marginal impact of government size is relatively similar on corruption perceptions and experience.[13]

4.2.2 Considering identical samples of corruption perceptions and experience

As the reader would notice, the number of observations varies considerably in Tables 2 and 3, with corruption perceptions having more responses. As a check of the sensitivity of our findings to sample size, Models A3.1 and A3.2 in Table A3 in the Appendix replicate Models 2.1 and 3.1, respectively, using identical samples.[14]

The results with regard to the three size categories support earlier findings: both FirmSIZE and GovtSIZE negatively impact corruption perceptions and experience, while CitySIZE has the opposite effect.

4.2.3 Using EcoFreedom and dropping GovtSIZE

To account for the possibility that some aspects of the size of the government might impact the degree of economic freedom, in Table A3 (Models A3.3-A3.4), we re-estimate Models 2.2 and 3.2, respectively, by dropping GovtSIZE as a regressor.

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[12] This has, however, to be tempered by the fact that we do not control for quality of the government, as noted in the seminal work by La Porta et al. (1999).

[13] This pattern for the marginal effects for firm size and government size persists in Table 4 when endogeneity of these variables is considered.

[14] Notably, the developed nation of Sweden is dropped in this subsample.

The results for the remaining two size variables – FirmSIZE and CitySIZE – support the earlier findings in Tables 2 and 3. Specifically, larger firms perceive and experience lower corruption, but firms located in larger cities have the opposite perceptions and experience.

4.2.4 Using foreign ownership, GovtSIZEpc, and fixed effects

Another set of considerations was undertaken by including foreign ownership (ForeignOWN), government size per capita (GovtSIZEpc), and country- and sector effects. These additions are performed for Models 2.1 and 3.1, respectively.

Firms with foreign ownerships might have different corruption perceptions and/or experience. In our sample, about 11 percent of firms had a positive foreign ownership stake (Table 1a). Furthermore, the alternative weighting of the size of the government provides another look at the effect of government size on corruption. The correlation between GovtSIZEpc and GovtSIZE was 0.56. Finally, the country- and sector controls account for differences in country and sector characteristics (where the firms operate) that might impact corruption perceptions and/or corruption experience.

The results showed that firms with foreign ownership have lower corruption perceptions, but not necessarily different corruption experiences. On the other hand, the results with GovtSIZEpc are qualitatively similar to those with GovtSIZE - i.e., in both instances, a larger government lowers corruption perceptions and experiences.

The main results with regard to size remain robust to controlling for country and sector effects. These results are not reported but are available from the authors.

4.3 Robustness check1: Accounting for potential endogeneity of firm size, city size, and government size

The multi-faceted nature of corruption engenders reverse-causality concerns and we try to address these relative to firm size, city size, and government size. Corruption could impact firm size (Beck et al. (2005)), change the size of cities via migration (Dimant et al. (2013)), and corruption could lead to a larger government (Rose-Ackerman (1999)).

4.3.1 Considering endogeneity of firm size

With regard to firm size, to authenticate the direction of our hypothesized link we adopt the instrumental variable approach and estimate our core models (i.e. Models 2.1 and 3.1), using two-stage least squares (2SLS). The results are shown in Table 4 Models 4.1 and 4.3. The instruments for firm size are the managerial experience of top managers in firms (ManExp), and the firm's sales per worker (SalesPW), in 2009 US dollars, (see Table 1a).

To justify the use of ManExp as an instrument for FirmSIZE, we can invoke the classic argument by Lucas (1978) that firm size is a function of managerial ability. Arguably, a cogent indicator of managerial ability is the relevant experience. Thus, ManExp as a measure of sector-specific experience of the top manager provides an appropriate instrument. Similarly, one can argue that changes in sales per worker can cause changes in a firm's size (and a firm's sales does not cause

changes in the level of corruption because they are caused by factors external to the firm - market forces and overall economic conditions).

Using these two instruments, the baseline results seem to agree with our earlier findings, especially for corruption perceptions (Model 4.1) – corruption perceptions are decreasing with increases in firm size and government size, while increasing with city size.[15] On the other hand, with endogenous firm size, the impacts on corruption experience (Model 4.3), while maintaining the signs, lose statistical significance in most cases (the exception being the (marginal) significance of GovtSIZE in Model 4.3).

Perhaps more important for inference are diagnostics related to instruments. Thus, as reported at the bottom of the table, the first-stage F-statistic is well above the benchmark value of 10. Further, the overidentifying restrictions test is insignificant, suggesting no evidence against the validity of the instruments.[16]

4.3.2 Considering the endogeneity of government size

As noted above, the size of the government could very well be impacted by the prevalence of corrupt activity – bureaucrats might create more regulations/structures to solicit more bribes (Shleifer and Vishny (2002); also see Arvate et al. (2010), Azpitarte (2011)). Models 4.2 and 4.4 in Table 4 estimate the same baseline models as above assuming GovtSIZE to be endogenous. To this end, we use the square of the country area and the percentage of government ownership in a firm (GovtOwn) to instrument GovtSIZE.[17], [18] Larger nations and nations with government's involvement in production, would, ceteris paribus, have a bigger government.

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[15] One can observe the lack of significance of the FirmSIZE coefficient in Model 4.3. However, the endogeneity test, in this case, is not rejecting the null hypothesis that FirmSIZE can be treated as exogenous.

[16] Since finding good instruments in corruption studies is difficult, given its multi-dimensional nature, we considered another set of instruments. We alternatively used the deviations of a firm's manager's experience from the sector average experience and its squared term as two instruments (e.g. see Bun and Harrison (2019) on using different functional forms of the same variable as instruments). We can argue that this scheme satisfies the exclusion condition. Assuming that the link between corruption and managerial experience is linear, we can conclude that the deviations of managerial experience and its squared function do not directly cause changes in corruption. In other words, the deviations of the manager's experience from sector averages is correlated with firm size (through managerial experience) but is unlikely to determine corruption perception or experience at the individual firm level. Using these two instruments, the pattern of findings for the three size variables (including the signs and statistical significance) was similar to what is reported in Table 4. Furthermore, these IV results satisfied the statistical conditions for IV inference in the case of CORRperc; whereas in the case of CORRexp we could not reject the null hypothesis that CORRexp is exogenous. Complete details are available from the authors upon request.

[17] Krieger and Meierrieks (2020) find that country size (in terms of population) affects government size.

[18] We recognize that the instruments may not seem perfect even though they largely satisfy the usual criteria. However, we explored several other sets of instruments (e.g., whether a firm had a savings account and maintained a website for firm size; access of the population to safe drinking water and land area for government size), but most of these did not appear stronger than what we have used. While managerial experience and sales might have some influence on corruption, the usual tests seem to indicate the influence may not be significant. Similarly, while the extent of government-ownership in the firm could possibly affect corruption, the magnitude of the effect might be small. Some caution may, however, be appropriate while interpreting the estimates for firm-size and government-size regression estimates. Given the multi-faceted nature of corruption, with numerous causes and effects, finding good instruments is especially challenging in this case.

The main interest lies in the coefficient on GovtSIZE which is negative and significant. More to the point, the instruments are satisfying the crucial conditions: the first-stage F-statistics exceed the value of 10 while the overidentifying restrictions test is insignificant at the conventional level. Importantly, with corruption experience (Model 4.4) we cannot reject the hypothesis that GovtSIZE is, in fact, exogenous to our analysis.

When government size is taken to be endogenous, the results for size-categories find statistical support for both corruption perceptions and corruption experience (Models 4.2 and 4.4, respectively), with relatively less consistent results for city-size. [19] The coefficients for other regressors are in line with our previous results. Overall, the results of the endogeneity analysis are largely supportive of our earlier findings.

4.3.3 Considering the endogeneity of city size

Although the size of cities tends of change more gradually than firm size or government size, we recognize the possibility of the city-size being endogenous. For example, besides other scholars, Dimant et al. (2013) have shown that corruption induces emigration which may affect city-size. The more corruption is experienced or perceived in a city, the more emigration might occur which reduces city-size. However, it was found difficult to find good instruments for the city-size models, and the several sets of instruments (e.g., urbanization rate, forest cover, etc.) explored by us did not work well despite satisfying the usual criteria.[20] Although our belief is that the endogeneity of city-size is relatively minor and does not affect the estimates to a significant extent, some caution is appropriate in interpreting the city-size regression estimates.

4.4 Additional consideration1: Corruption perceptions and experience of firms located in large cities

As an alternative model, we consider the subsample of survey respondents located in large metropolitan areas – specifically, respondents located in cities with populations of one million or more. Are determinants of corruption perceptions or corruption experience of firms located in large cities different from others?

The estimation results, using the format of Tables 2 and 3, are reported in Table 5. While the findings are generally supportive of what was found earlier, the statistical support for drivers of corruption perceptions is relatively greater than that for drivers of corruption experience. With regard to the influence of size – the main focus here – large firms had lower corruption perceptions, but their corruption experience was no different from others. This is unlike the findings in Tables 3 and 4, where, when city size was included as a regressor in the full sample, large firms had lower perceptions and lower corruption experience. The size of the government failed to have a statistically significant impact on corruption perceptions or corruption experience in the subsample of firms located in large cities. In fact, the corruption experience of large firms and firms in nations with larger governments were no different from other firms. At the macro level, greater economic freedom lowers corruption perceptions and experience, but democracy

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[19] One exception is the negative sign on CitySIZE in Model 4.3. However, the main variable of interest here is GovtSIZE and signs of other coefficients can be biased (Stock and Watson (2015)).
[20] Additional details are available upon request.

and island nations do not matter,[21] whereas the Development variable has relatively greater support with regard to CORRexp (Models 5.5-5.8).

Furthermore, Age, Ownership, and Latitude (somewhat) mattered for perceptions, but not for experience in this subsample, while service-sector firms had lower corruption experience but no difference in perceptions. Thus, while the results across corruption perceptions and corruption experience were largely similar in Tables 2 and 3, the perceptions-experience comparison in the large city subsample brings them in sharper focus.

4.4.1 Checking for the robustness of city size

Since the size of cities might have different qualitative socio-economic-government implications in populous (India, China) and other nations (Nepal, Panama, etc.), we re-computed the standard errors in Models 2.1 and 3.1 to allow for multi-level clustering, allowing for the clustering effects of country-, sector- and firm-size aspects. The main findings remained robust.

4.5 Additional consideration3: Employing a dummy variable regression

To focus on the influence of size categories and move away from the consideration of country-level macro variables (i.e., Latitude, Development, EcoFreedom, Democracy, and Island), we dropped the macro-level controls and introduces country dummies variables instead (replicating variations of Models 2.1 and 3.1, respectively).

The results, available upon request, for FirmSIZE and CitySIZE were qualitatively similar to those in Tables 2 and 3. However, the effect of government size is now positive and statistically significant only with respect to corruption experience. This is consistent with a larger government leading to greater red tape and, consequently, more corruption (Goel and Nelson (1998), Rose-Ackerman (1999)).[22] The concluding section follows.

5. Concluding remarks

A substantial body of empirical research has emerged in recent years on the causes and effects of corruption (see Dimant and Tosato (2018)). Yet, definitive recommendations on corruption control have failed to emerge and, given the wide prevalence of corruption the world over, the topic remains of active scholarly and academic interest. A key reason for the lack of convergence on robust corruption-control recommendations is the inherent inability to accurately measure the true extent of corruption. That shortcoming, coupled with the qualitative distinction between corruption perceptions and corruption experience, has made most findings on the drivers of corrupt activity somewhat sensitive to the measure of corruption used, size and scope of the

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[21] This research, however, does not consider the qualitative dimensions of democracy, which may be relevant in the context of corruption (Halim (2008)).

[22] A possible explanation for the reversal of the sign on GovtSIZE in the dummy variable regression might be that the multi-faceted role of government is somewhat less perfectly controlled for by the inclusion of country-level dummy variables.

underlying sample, and to the set of factors considered (Dimant and Tosato (2018), Goel and Nelson (2011), Seldadyo and de Haan (2006), Serra (2006)).

The present research tries to contribute to this body of work along a number of dimensions: (i) comparing the drivers of corruption perceptions and corruption experience; (ii) using a large sample of self-reported perceptions/experience of firms dealing with corruption (as opposed to views of foreign experts, without first-hand dealing with corruption); and considering selected categories of the size of major determinants of corruption, including firm size, city size, and government size, in terms of their relative impacts on corruption perceptions and corruption experience. While the literature has focused on the role of government size in impacting corruption (Goel and Nelson (1998), Rose-Ackerman (1999), Shleifer and Vishny (2003)), our consideration of other size-categories is new and relevant.

The results show that both larger firms and bigger governments lead to lower corruption perceptions and corruption experience, while firms located in larger cities experience higher corruption (perceptions as well as experience). These main findings are robust to consideration of endogeneity.[23]

Turning to the questions posed in the Introduction, we can provide the following answers:

- Are the drivers of corruption perceptions similar to those of corruption experience?
  No. We find some differences in the drivers of corruption perceptions and corruption experience. This underscores the need for corruption-control policies to be cognizant of how corruption is measured.

- How do the different dimensions of size, including firm size, city size, and government size, impact corruption perceptions and corruption experience?
  Larger firms and nations with larger governments perceive and experience lower corruption, while firms based in larger cities generally have the opposite perceptions and experience. So, corruption-control policies should be sensitive to the size of firms and where they are located. Along another policy dimension, while government spending is amenable to change over time, and firm size can be subjected to antitrust regulations, the size of cities is less prone to change (at least in short term).

Among firm-specific factors, sole proprietors perceived corruption to be lower, and this is in line with their experience. This finding has implications for the internal budgeting of firms – how much "slush funds" firms keep aside to meet potential bribe demands. Conversely, older firms had higher corruption perceptions, but their experience did not bear this out.

Limiting the sample to large cities, it is noted that large firms located in large cities experienced lower corruption perceptions, but their corruption experience was not significantly different from

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[23] Future extensions to this work could examine additional aspects, including alternative dimensions of firms' characteristics and the impact of interaction terms. Further, with availability of related time series data, the system-GMM estimation may be employed to address some endogeneity concerns.

other firms. This finding suggests that surveys of corruption focusing on large firms in metropolitan areas might yield different results than more general surveys.

Our novel analysis has important policy implications and insights. First, it is difficult to dismiss the difference between perception and experience as merely a psychological issue. The factors driving corruption perceptions and experience can vary quantitatively and qualitatively (Tables 2-4).

Second, from a purely economic point of view, one can categorize corruption into two broad forms: One affecting fixed costs of businesses and the other that is affecting variable costs. Fixed costs being one-time payments (e.g. bribing to get an operating license or import license etc.,) may not affect long term perceptions. While the impact of small but variable bribery costs may be negligible in terms of experience, these may have a significant effect on perceptions.

Third, industrial policies to combat corruption across sectors might should also be cognizant of the perceptions-experience difference. For instance, we find that firms in service industries perceive corruption to be lower, but their experiences do not bear this out (Table 2-3). Thus, experienced corruption in the service sector is not appreciably different from other sectors.

Fourth, the consideration of firm-level characteristics can be important when antitrust policies are considered along with their potential corruption implications. In our findings, older firms perceive corruption to be higher but do not experience higher corruption, while sole proprietors had both lower perceptions and experience. These findings point to the importance of firm vintage and ownership structure.

Overall, this paper adds new insights to the crowded field of empirical drivers of corruption, with additional contributions lying in the consideration of firm-level data and the comparison of the determinants of corruption experience and corruption perceptions for different categories of the size of the major determinants.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the author upon reasonable request.

Table 1a. Variable definitions, summary statistics, and sources

Variable	Definition [source]	Obs.	Mean (SD)
CORRperc	Enterprise perceives corruption as either a "major" or a "very severe obstacle" (1 = yes; 0 = no) – see Table 1b. A value of 0 means corruption is "no", "minor", or "moderate" obstacle. [1]	73178	0.36 (0.48)
CORRexp	An informal payment or gift is being requested during an inspection (1 = yes; 0 = no) – see Table 1b. [1]	40248	0.12 (0.33)
FirmSIZE	Number of the establishment's permanent employees (in logs). [1]	73178	3.44 (1.30)
CitySIZE	Enterprise is in a city with more than 1 million population (1 = yes; 0 = no). [1]	73178	0.48 (0.50)
GovtSIZE	Government's final consumption expenditures, as a percentage of GDP. [2]	73178	13.21 (4.23)
GovtSIZEpc	Government's consumption expenditures in constant 2010 US dollars, divided by the population of the country, (in logs). [2]	68493	5.91 (1.09)
ServiceIND	Enterprise is a part of the service sector (1 = yes; 0 = no). [1]	73178	0.39 (0.49)
Development	Country belongs to the medium or low-income category in the World Bank's income classification (1 = yes; 0 = no). [2]	73178	0.63 (0.48)
Age	Number of years since the establishment's registration as a formal business, (in logs). [1]	73178	2.77 (0.72)
Ownership	Establishment has a legal status of sole proprietorship (1 = yes, 0 = no). [1]	73178	0.40 (0.49)
ForeignOWN	A positive percentage of establishment is owned by private foreign individuals, companies, or organizations (1 = yes, 0 = no). [1]	68493	0.11 (0.31)
Latitude	Distance from the equator as the value of latitude in degrees. [4]	73178	13.04 (21.03)
Democracy	Index of democracy on a scale from 0 to 10, with higher values representing greater democracy. [5]	70511	6.27 (3.30)
EcoFreedom	Index of economic freedom from 0 to 100, with higher values representing greater economic freedom. [6]	71814	58.16 (6.70)
CountryAreaSIZE	Total area of the country, square kilometers (in logs). [2]	72540	13.27 (1.54)
SalesPW	Sales per worker in 2009 USD, (in logs). [1]	62231	9.80 (1.69)
GovtOwn	Percentage of the firm owned by the government or state. [1]	71950	0.48 (5.29)
Island	Country is an island nation (1= yes; 0 = no). [3]	73178	0.11 (0.31)
ManExp	Years of experience of the top manager working in the firm's sector. [1]	71778	17.94 (11.21)

Sources: All data sources were accessed during October-November 2019 and September 2020.

[1] Enterprise Surveys, http://www.enterprisesurveys.org, The World Bank. The survey years vary from 2006 to 2018. The surveys were conducted using the Enterprise Surveys Global Methodology and are comparable across/within countries.
[2] World Bank Development Indicators online database http://datatopics.worldbank.org/world-development-indicators/
[3] Wikipedia https://en.wikipedia.org/wiki/List_of_island_countries.
[4] Hall and Jones (1999) https://web.stanford.edu/~chadj/datasets.html.
[5] Center for Systemic Peace, Polity IV https://www.systemicpeace.org/polityproject.html.
[6] Heritage Foundation, Economic Freedom Index https://www.heritage.org/index/

Table 1b: The survey questions related to corruption variables[24]

CORRperc – corruption perceptions: "As I list some factors that can affect the current operations of a business, please look at this card and tell me the degree to which you think each factor is an obstacle to the current operations of this establishment."

	No obstacle	Minor obstacle	Moderate obstacle	Major obstacle	Very severe obstacle	Do not know	Do not apply
Corruption	0	1	2	3	4	-9	-7

In the analysis, we recoded CORRperc, such that CORRperc = 0 when the response was "no obstacle", and = 1 otherwise.

CORRexp – corruption experience: "In any of these (tax officials') inspections or meetings was a gift or informal payments expected or requested? (1 = yes; 2 = no)."

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[24] These descriptions are extracted from the *Enterprise Surveys Indicator Descriptions* (September 2017 version) and *World Bank Group's Enterprise Survey: Understanding the questionnaire.* Both the documents are available at https://www.enterprisesurveys.org/. Table 1a explains the way we transform and employ the variables in our analysis.

Table 2. Dimensions of size and corruption perceptions

Dep. variable: CORRperc

	(2.1)	(2.2)	(2.3)	(2.4)
FirmSIZE	**-0.036***	**-0.030***	**-0.030***	**-0.033***
	(0.007)	**(0.007)**	**(0.007)**	**(0.007)**
CitySIZE	**0.058***	**0.032***	**0.020**	**0.008**
	(0.016)	**(0.017)**	**(0.017)**	**(0.017)**
GovtSIZE	**-0.014***	**-0.023***	**-0.011***	**-0.027***
	(0.002)	**(0.002)**	**(0.002)**	**(0.002)**
Age	0.035***	0.040***	0.042***	0.043***
	(0.011)	(0.012)	(0.012)	(0.012)
ServiceIND	-0.074***	-0.087***	-0.108***	-0.077***
	(0.017)	(0.017)	(0.017)	(0.017)
Ownership	-0.216***	-0.266***	-0.200***	-0.206***
	(0.018)	(0.019)	(0.019)	(0.019)
Latitude	0.003***	0.002***	0.004***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
Development	0.538***	0.304***	0.462***	0.555***
	(0.022)	(0.026)	(0.023)	(0.022)
EcoFreedom		-0.028***		
		(0.002)		
Democracy			-0.057***	
			(0.003)	
Island				-0.795***
				(0.033)
Marginal effects				
FirmSIZE		-0.008***	-0.006***	-0.007***	-0.007***
		(0.001)	(0.001)	(0.001)	(0.001)
GovtSIZE		-0.003***	-0.005***	-0.002***	-0.006***
		(0.000)	(0.000)	(0.000)	(0.000)
CitySIZE		0.013***	0.007*	0.004	0.002
		(0.004)	(0.004)	(0.004)	(0.004)
Observations	73,178	71,814	70,511	73,178
Countries	83	81	76	83
Year effects	Yes	Yes	Yes	Yes
Wald-test	[0.000]	[0.000]	[0.000]	[0.000]

Notes: See Table 1a for variable definitions. Constant is included but not reported in these Logit regressions. Standard errors in parentheses are adjusted for the clustering effects at the country level; square brackets include probability values. Each specification includes survey weights (given in ES data) to account for the item-nonresponse and missing observations, the estimated coefficient of survey weight is not reported. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 3. Dimensions of size and corruption experience

Dep. variable: CORRexp

	(3.1)	(3.2)	(3.3)	(3.4)
FirmSIZE	**-0.027****	**-0.028****	**-0.043*****	**-0.026****
	(0.012)	**(0.012)**	**(0.013)**	**(0.012)**
CitySIZE	**0.258*****	**0.182*****	**0.250*****	**0.246*****
	(0.032)	**(0.033)**	**(0.034)**	**(0.033)**
GovtSIZE	**-0.030*****	**-0.057*****	**-0.041*****	**-0.033*****
	(0.005)	**(0.005)**	**(0.005)**	**(0.005)**
Age	0.010	0.009	0.014	0.013
	(0.022)	(0.023)	(0.023)	(0.022)
ServiceIND	0.902***	0.511***	0.845***	0.917***
	(0.054)	(0.058)	(0.057)	(0.054)
Ownership	-0.242***	-0.187***	-0.169***	-0.250***
	(0.033)	(0.034)	(0.034)	(0.033)
Latitude	0.077**	0.035	0.054	0.072**
	(0.034)	(0.035)	(0.035)	(0.035)
Development	0.002*	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
EcoFreedom		-0.048***		
		(0.003)		
Democracy			0.004	
			(0.006)	
Island				-0.200***
				(0.072)
Marginal effects				
FirmSIZE	-0.003**	-0.003**	-0.004***	-0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
GovtSIZE	-0.003***	-0.006***	-0.004***	-0.003***
	(0.000)	(0.001)	(0.001)	(0.001)
CitySIZE	0.027***	0.019***	0.026***	0.025***
	(0.003)	(0.003)	(0.003)	(0.003)
Observations	41,358	40,453	39,540	41,358
Countries	83	81	76	83
Year effects	Yes	Yes	Yes	Yes
Wald-test	[0.000]	[0.000]	[0.000]	[0.000]

Notes: See Table 2.

Table 4. Robustness check1: Accounting for potential endogeneity of firm size and government size (instrument-variable 2SLS estimates)

	(4.1)	(4.2)	(4.3)	(4.4)
Dep. variables →	**CORRperc**		**CORRexp**	
(endogenous variable→)	**(FirmSIZE)**	**(GovtSIZE)**	**(FirmSIZE)**	**(GovtSIZE)**
FirmSIZE	**-0.44*****	**-0.02*****	**-0.27**	**-0.00****
	(0.10)	**(0.00)**	**(0.31)**	**(0.00)**
CitySIZE	**0.05*****	**-0.04*****	**0.06**	**0.02*****
	(0.01)	**(0.00)**	**(0.04)**	**(0.00)**
GovtSIZE	**-0.01*****	**-0.07*****	**-0.01***	**-0.01*****
	(0.00)	**(0.00)**	**(0.00)**	**(0.00)**
Age	0.15***	0.00	0.10	-0.00
	(0.03)	(0.00)	(0.11)	(0.00)
ServiceIND	-0.20***	0.04***	-0.14	-0.02***
	(0.04)	(0.00)	(0.15)	(0.00)
Ownership	-0.44***	-0.05***	-0.23	0.01***
	(0.09)	(0.00)	(0.28)	(0.00)
Latitude	0.00***	0.00***	0.00	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Development	0.09***	-0.17***	0.02	0.06***
	(0.01)	(0.01)	(0.07)	(0.01)
Marginal effects				
FirmSIZE	-0.44***	-0.02***	-0.27	-0.00**
	(0.10)	(0.00)	(0.31)	(0.00)
GovtSIZE	-0.01***	-0.07***	-0.01*	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)
CitySIZE	0.05***	-0.04***	0.06	0.02***
	(0.01)	(0.00)	(0.04)	(0.00)
Countries	83	83	82	82
Year effects	Yes	Yes	Yes	Yes
First stage F-test	101.95***	704.43***	276.59***	147.35***
Overidentification test	[0.816]	[0.737]	[0.065]	[0.560]
Endogeneity test	[0.000]	[0.344]	[0.000]	[0.368]

Notes: See Table 2.
This table implements the IV 2SLS estimator. Models 4.1 and 4.3 use the predicted values of FirmSIZE in the baseline Models 2.1 and 3.1. Stage 1 regression predicts FirmSIZE, using manager experience (ManExp) and sales per worker (SalesPW) as instruments.
Models 4.2 and 4.4 redo the analysis, assuming GovtSIZE as endogenous. Stage 1 regression predicts GovtSIZE, using country area squared (CountryAreaSIZE^2) and the percentage of the government ownership (GovtOwn) as instruments.

Table 5. Additional consideration1: Corruption perceptions and corruption experience of firms located in cities with populations of 1 million or more

Dep. variables: →	CORRperc				CORRexp			
	(5.1)	(5.2)	(5.3)	(5.4)	(5.5)	(5.6)	(5.7)	(5.8)
FirmSIZE	**-0.047*****	**-0.037****	**-0.043****	**-0.045*****	**-0.023**	**-0.016**	**-0.023**	**-0.022**
	(0.017)	**(0.016)**	**(0.019)**	**(0.017)**	**(0.034)**	**(0.029)**	**(0.034)**	**(0.034)**
GovtSIZE	**-0.006**	**-0.019**	**-0.002**	**-0.024**	**-0.020**	**-0.045**	**-0.023**	**-0.022**
	(0.031)	**(0.031)**	**(0.031)**	**(0.025)**	**(0.042)**	**(0.034)**	**(0.043)**	**(0.046)**
Age	0.075**	0.064**	0.088**	0.075**	-0.013	-0.031	-0.017	-0.012
	(0.036)	(0.031)	(0.035)	(0.035)	(0.055)	(0.052)	(0.054)	(0.056)
ServiceIND	0.007	-0.003	-0.032	-0.006	-0.211***	-0.202***	-0.191***	-0.214***
	(0.080)	(0.082)	(0.078)	(0.076)	(0.076)	(0.075)	(0.073)	(0.077)
Ownership	-0.151*	-0.201**	-0.143	-0.136*	-0.007	-0.068	0.007	-0.007
	(0.085)	(0.085)	(0.088)	(0.079)	(0.102)	(0.102)	(0.104)	(0.103)
Latitude	0.010*	0.008	0.009*	0.009	0.004	0.002	0.004	0.004
	(0.006)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
Development	0.538*	0.331	0.507	0.584**	0.963***	0.654**	0.946***	0.973***
	(0.298)	(0.314)	(0.310)	(0.273)	(0.289)	(0.276)	(0.281)	(0.285)
EcoFreedom		-0.027*				-0.056***		
		(0.014)				(0.016)		
Democracy			-0.043				0.002	
			(0.031)				(0.037)	
Island				-0.860				-0.089
				(0.537)				(0.399)
Observations	35,132	34,522	34,744	35,132	19,192	18,855	18,961	19,192
Countries	68	66	68	68	67	65	64	67
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald test	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]

Notes: See Table 2.

Appendix

Table A1. Baseline sample of countries

N = 83

Angola; Argentina; Bahamas; Bangladesh; Barbados; Belize; Benin; Bhutan; Bolivia; Botswana; Brazil; Bulgaria; Burkina Faso; Burundi; Cameroon; Chile; China; Colombia; Costa Rica; Czech Republic; Djibouti; Dominican Republic; Ecuador; Egypt; El Salvador; Ethiopia; Ghana; Guatemala; Guinea; Guyana; Honduras; Hungary; India; Indonesia; Iraq; Israel; Jamaica; Jordan; Kenya; Laos PDR; Lesotho; Liberia; Madagascar; Malawi; Malaysia; Mali; Mauritania; Mauritius; Mexico; Mongolia; Morocco; Mozambique; Myanmar; Namibia; Nepal; Nicaragua; Niger; Nigeria; Pakistan; Panama; Paraguay; Peru; Philippines; Poland; Romania; Senegal; Sierra Leone; South Africa; Sri Lanka; St. Lucia; Sudan; Suriname; Sweden; Tanzania; Thailand; Togo; Tunisia; Turkey; Uganda; Uruguay; Venezuela; Zambia; Zimbabwe.

Notes: Sample of countries as per the specification in Table 2, Model 2.1.

Table A2. Correlation matrix of key variables

(Obs.= 38,176)

	(1)	(2)	(3)	(4)	(5)
(1) CORRperc	1.00				
(2) CORRexp	0.10	1.00			
(3) FirmSIZE	-0.02	-0.03	1.00		
(4) CitySIZE	0.03	0.02	0.10	1.00	
(5) GovtSIZE	-0.02	-0.10	-0.02	-0.11	1.00

Table A3. Reconsideration of baseline models

Dep. variable: →	CORRperc	CORRexp	CORRperc	CORRexp
	(A3.1)	(A3.2)	(A3.3)	(A3.4)
	Identical samples		Dropping GovtSIZE	
FirmSIZE	-0.046***	-0.045***	-0.027***	-0.039***
	(0.009)	(0.013)	(0.007)	(0.012)
CitySIZE	0.075***	0.236***	0.067***	0.270***
	(0.023)	(0.034)	(0.016)	(0.031)
GovtSIZE	-0.011***	-0.050***		
	(0.003)	(0.005)		
Age	0.073***	0.010	0.048***	0.020
	(0.016)	(0.023)	(0.012)	(0.022)
ServiceIND	-0.038	-0.174***	-0.094***	-0.192***
	(0.024)	(0.035)	(0.017)	(0.032)
Ownership	-0.157***	0.031	-0.247***	0.092***
	(0.026)	(0.036)	(0.018)	(0.033)
Latitude	0.002***	0.000	0.002***	0.004***
	(0.001)	(0.001)	(0.000)	(0.001)
Development	0.436***	0.799***	0.432***	0.911***
	(0.031)	(0.057)	(0.023)	(0.050)
EcoFreedom			-0.029***	-0.046***
			(0.002)	(0.003)
Observations	38,176	38,176	73,954	41,952
Countries	75	75	81	81
Year effects	Yes	Yes	Yes	Yes
Wald test	[0.000]	[0.000]	[0.000]	[0.000]

Notes: See Table 2. Models A3.1 and A32.2 replicate Models 2.1 and 3.1, and Models A3.3 and A3.4 replicate Models 2.2 and 3.2, respectively. The sample of countries is reported in Table A2.