CEO gender, institutional context and firm exports

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ABSTRACT

To what extent does the gender of Chief Executive Officers (CEOs) matter in the relationship between home country corruption and firm exports? Drawing on post-structural feminist and institutional theories, we employ self-reported micro-level and cross-country data from 4714 firms in 75 countries during 2008-2015 to examine how differences in institutional contexts affect firms exports in men- and women-led firms. We find that pervasive and arbitrary corruption types have different effects on firm exports, and that female CEOs mitigate the effects of corruption in two distinct ways. Our results contribute to institutional and post-structural feminist literature, and are robust when controlling for economic development and the quality of gender institutional characteristics. Our study suggests that female CEOs in developing and emerging economies will be less vulnerable to predictably-corrupt institutions than to uncertain institutions.

1. Introduction

International business research has investigated gender differences related to firm decisions to internationalize and deinternationalize (Fischer, Reuber, & Dyke, 1993; Marques, 2015; Martineau & Pastoriza, 2016; Pergelova, Manolova, Simeonova-Ganeva, & Yordanova, 2019). However, the role of CEO gender—embedded within a specific home country institutional context—in exporting remains underexplored (Love, Roper, & Zhou, 2016; Ramón-Llorens, García-Meca, & Duréndez, 2017) even though it may affect business competitiveness and inclusiveness. In particular, the role of CEO gender in firm performance and internationalization has been underexplored in emerging and developing economies (Cui, Fan, Guo, & Fan, 2018b).

The specifics of corruption's potential direct and indirect effects on firms (Kaufman & Wei, 1999; Charoensukmongkol & Sexton, 2011; Javorcik & Wei, 2009) is important to the study of corruption and firm exports in the management and international business fields (Ahsan, 2017; Cuervo-Cazurra, 2008; Yang, Ma, & Cui, 2021). The decision to internationationalize in women-led firms is also a subject that is beginning to receive greater attention from management scholars

(Ramón-Llorens et al., 2017), in line with the rapidly-growing body of research into differences in firm outcomes between men- and women-led firms (Marques, 2015). Our focus on the influence of CEO gender on the decision to export is motivated by recent findings from political science, governance, and economics (e.g., Rivas, 2013) on the effects of corruption on women-led firms. Marques (2015) and Olney (2016) argue that the effects of home country institutions on firm exports can be particularly strong in developing countries, where research has been particularly scarce. Yang et al. (2021) analysed data on foreign firms operating in China (2011-2013), and demonstrated that the level of subnational corruption is negatively associated with the financial performance of foreign firms. It remains unclear how export-oriented firms can achieve greater internationalization when facing home country corruption.

While corruption exists around the world, it is not homogenous, and its manifestations may affect managers in different ways, including by gender (see Bardhan, 1997; Cuervo-Cazurra, 2008; Lehne, Shapiro, & Eynde, 2018; Liu, Lu, & Ma, 2015). This is because women-led firms may experience and navigate the external environment differently. While the role of CEO gender may be important, its impact on the relationship

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between corruption (particularly different types) and exporting outcomes is not well understood. At the same time, the decision to internationationalize in women-led firms is of interest to management scholars (Ramón-Llorens et al., 2017), in line with the rapidly-growing body of research into differences in firm outcomes between men- and women-led firms (Marques, 2015).

Empirical evidence using firm-level data has demonstrated that women are less involved in bribery (Swamy, Knack, Lee, & Azfar, 2001). In other domains, notably in political science and economics (e.g. Rivas, 2013), studies have led to debate about the ways women perceive, process, and act in corrupt systems. For example, research has found that greater representation of women in government is associated with lower levels of corruption (Dollar, Fisman, & Gatti, 2001). In particular, the question of whether women are simply more moral (fairer sex) or acting on opportunities and constraints in the broader context (fairer system) is highly relevant to management research because of the implications for firm organizing activities. The extent to which women are willing to tolerate and use corruption has been shown to vary between countries, with inconclusive results regarding whether women managers are less corrupt or have different attitudes to corruption (Swamy et al., 2001).

As the existing literature states, global concerns about gender equality mean that the implications of gender in the context of firm internationalization are relevant in international business research (Akter, Rahman, & Radicic, 2019; Pergelova et al., 2019). The impact of gender on the decision to export remains unexplored, and this is therefore our main contribution. To address this important gap, we draw on the post-structural feminist and international business literature to hypothesize about the effects of two types of home country corruption (pervasive and arbitrary) and CEO gender on export intensity. We test our hypotheses using data on 4714 firms in 75 emerging economies during 2008-2015, as well as a reduced sample of 2966 firms from 10 emerging economies in the same time period. Our results demonstrate that pervasive corruption is negatively associated with firm internationalization, while arbitrary corruption may increase firm internationalization. Our results also reveal that a female CEO moderates the relationship between institutional context, measured with the level of pervasive and arbitrary corruption in a country and the firm's export intensity. Related to prior research on gender differences in decision-making under conditions of risk and uncertainty, we found that women-led firms positively moderate the relationship between pervasive corruption and firm exports, and negatively moderate the relationship between arbitrary corruption and firm exports. Our findings remain robust after controlling for year and country fixed effects, as well as country's institutional characteristics.

We contribute to the existing international business and feminist literature in several ways. Firstly, our study provides new evidence that corruption itself is not a homogeneous concept and can vary based on incidence and type, in the same way as many other dimensions in the institutional environment (Cuervo-Cazurra, 2008). We explain how firm managers make export decisions across different institutional contexts (Croson & Gneezy, 2009; Mauro, 1995; Olken & Pande, 2012; Rivas, 2013).

Secondly, drawing on post-structural feminist theory (Henry, Foss, & Ahl, 2016; Jennings & Brush, 2013), we argue that gender differences are constructed in society through history, geography, and culture, and that institutional context, which is place-specific, constantly influences the behavior and performance of women-led firms (Belitski & Desai, 2021; Brush, De Bruin, & Welter, 2009).

Thirdly, we use CEO gender as a theoretical lens in developing testable hypotheses regarding the role of CEO gender in firm's internationalization (Marques, 2015; Trentini & Koparanova, 2017).

The remainder of the paper is organized as follows. In the next section, we discuss the links between corruption, female management, and export intensity. We present our data and method in the third section, followed by our results in the fourth section. Our fifth section offers a discussion and conclusion, and outlines policy implications, limitations, and suggestions for future research.

2. Theoretical background

2.1. Corruption type and firm exports

Institutional theory views informal institutions, such as corruption (Cuervo-Cazurra, 2006), as powerful forces in shaping economic behavior. Corruption is a widespread global phenomenon which warrants scholarly attention across different fields of study (Yang et al., 2021). We use a dominant conceptualization of corruption in the existing research, and consider corruption to be the use of public office for personal gain (Rodriguez, Uhlenbruck, & Eden, 2005; Rose-Ackerman, 2007; Svensson, 2005).

The expectation that corruption can affect firms by shaping costs and perceived returns is largely uncontroversial. Corruption can alter the actual cost structure of a firm by imposing the effect of an irregular tax (Cuervo-Cazurra, 2008), thereby shaping the decision to export (Leonidou, Katsikeas, & Samiee, 2002). It can affect the predictability of costs for a firm because bureaucrats can change the frequency and size of the bribes they demand (Fredriksson, 2014). Corruption thus affects costs both directly and indirectly because of its hidden nature (Belitski, Chowdhury, & Desai, 2016).

However, the nature of the impact on specific firm activities has been the subject of debate. It has been theorized to both facilitate ("grease") or harm ("sand") transactions and in turn firm performance, depending on how a firm interacts with it (see Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2002; Kaufmann & Wei, 1999; Meon & Sekkat, 2005; Shleifer & Vishny, 1993). Previous empirical research has shown that corruption largely produces negative effects on firms, but that effects can be heterogeneous on different firm activities and outcomes. For example, Audretsch, Belitski, Caiazza, and Desai (2022) find that corruption harms potential future new firms as well as young firms, and that the effect is not homogeneous. The extant literature classifies corruption into two types: pervasive or arbitrary. Pervasive corruption is often associated with some degree of "known cost" (Cuervo-Cazurra, 2008, p. 16), while arbitrary corruption is associated with uncertainty (Cuervo-Cazurra, 2008). This distinction is important, because knowing that corruption exists in a country does not clarify how often, how much, when, to whom, or how risky it is to pay bribes. While both types of corruption can create costs, they may differ in regularity and predictability, which could affect how managers anticipate and plan for encountering corruption and how they decide on firm internationalization. Managers may more confidently expect to face a certain level of corruption when it is pervasive (Belitski et al., 2016; Estrin, Korosteleva, & Mickiewicz, 2013; Lehne et al., 2018), and thus not change their behavior. However, when corruption is arbitrary, they may not be able to make confident assumptions about when, if, or how much corruption they will encounter, reflecting the higher risks and greater unpredictability and uncertainty of this type of corruption (see Cuervo-Cazurra & Genc 2008; Cuervo-Cazurra, 2008). If bureaucrats have ample opportunity to exercise discretion in enforcing regulations[1] (Belitski et al., 2016) and the ability to modify bribe-seeking behavior (Kaufmann & Wei, 1999), then

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[1] For example, Galtung, Shacklock, Connors, and Sampford (2013: 210) identified 15 high-risk public activities with significant discretion: inspection / regulation / monitoring premises, businesses, equipment or products; services to new immigrants; giving qualifications or licenses that designate proficiency or permission for specific activities; services in communities experiencing inadequate supply; determining public funds allocations; managing fines and penalties; managing payments; services to the vulnerable or disabled; services including financial assistance to groups in need; managing disputes; testing bodily samples; zoning and development applications; ticket sales; construction; and regular interactions with the private sector besides what would be considered routine purchasing of goods and services.

corruption may increase costs by adding bribe fees, raise risks by increasing the unpredictability and volatility of transactions, or both.

Arbitrary and pervasive corruption should impede firm exports, as both will divert resources away from investment in firm activities and consume resources that could otherwise be used to support export-oriented activities. Firms will use financial resources when corruption is pervasive, and also when it occurs in the form of one-off payments to obtain specific permits or licenses for export (arbitrary). In addition to financial resources, both types of corruption require nonfinancial resources, such as manager's time, which can increase transaction costs for the exporting firm while also imposing additional indirect costs associated with coordinating and maintaining relationships with bureaucrats, accessing information, and so on. Based on the above, we hypothesize that:

H1a. : Pervasive corruption will negatively affect firm exports.

H1b. : Arbitrary corruption will negatively affect firm exports.

While both types of corruption are expected to negatively affect firm exports, we argue that arbitrary corruption will have a greater negative effect. Pervasive corruption means that a manager knows with some certainty that they are expected to pay a bribe during each transaction involving the government. Where bribery practices and expectations for bribes are well-defined and predictable (Meon & Sekkat, 2005), there may be a relatively clear understanding between firms and bureaucrats about the size of bribes (see Cuervo-Cazurra, 2006). Managers may factor in the financial and time costs related to navigating corruption when they make financial projections about the "cost" of doing business. If the cost of corruption is known in advance— when it is pervasive—then an exporting firm may adapt, for example by passing on the cost of paying bribes in the home country to customers abroad.

On the other hand, arbitrary corruption means that managers may have to set aside resources for a "just in case" scenario because they are unsure—and there may not be clear norms—about when they will be asked for a bribe and how much it will cost. This unpredictability prevents exporters (and potential exporters) from making accurate calculations about costs and benefits, and forces them to reduce the export intensity (or even to reconsider whether they will be able to secure enough profits from exporting to make it worthwhile). An exporting firm may then be making decisions about the process of exporting (such as pricing, scheduling, distribution, selection of partners, entering into contracts, and regulatory compliance) without knowing if their costs will change in the future once they have committed to (for example) pricing. This may mean the firm has to reserve more resources to deal with potential surprises in the future, diverting resources that could be used for exporting. If arbitrary corruption results in a very large bribe request, the firm may be forced to significantly delay or even terminate the export activity and pursue other firm activities with less visibility.

In addition, a firm may experience greater vulnerability when undertaking transactions under arbitrary corruption and seek additional intermediaries and guarantors, further raising the costs of export and possibly reducing its intensity. Negotiating bribes between exporters and intermediary firms takes time and increases the requirements necessary to resolve insolvency, enforce contracts, register property and obtain export or operating licenses, while adding to operational costs and the complexity and uncertainty of exporting.

When compared to pervasive corruption, arbitrary corruption is thus more volatile and more uncertain for exporters, making it even more difficult to allocate resources and bear the additional managerial costs of avoiding regulation or obtaining a specific outcome or treatment. For example, if a manager knows that each transaction at a port will be accompanied by a flat informal payment (pervasive corruption), they can factor this into their cost predictions. However, if there is a chance that some transactions will occur without payments, but others may require payments of varying amounts (arbitrary corruption), this can affect (among other things) cash flow, planning, scheduling, inventory

management, and export transactions. It may also raise pressure on managers to come up with cash at short notice without being able to predict the amount and frequency of a bribe, hurting cash flow in the firm. The payment of a bribe may or may not even necessarily result in the promised services being delivered (Cuervo-Cazurra & Genc, 2008), as there may be a lack of understanding, reliability, and trust between parties and difficulty in "tracking" the deal when corruption is arbitrary. Although we expect both types of corruption to hurt exporting firms, arbitrary corruption will therefore have a greater negative effect:

H1c. : Arbitrary corruption will have a greater negative effect on firm exports than pervasive corruption.

2.2. CEO gender, institutional context and exports

The process of internationalization critically depends on the personal traits and attitudes of firm managers and owners (Akter et al., 2019; Marques, 2015), as well as the institutional context that may either facilitate or impede exports (e.g., Brush et al., 2009; Dezsö & Ross, 2012; Lee & James, 2007; Richter et al. 2016). Balanced gender representation in top management teams can bring new ideas (Greene, Brush, & Gatewood, 2006), information and a greater diversity of opinions to firms (see Smith, Smith, & Verner, 2006; Van Knippenberg, De Dreu, & Homan, 2004), and contribute to problem-solving and the introduction of new and innovative ways of approaching firm organizing activities (Sung, 2003).

Post-structural feminist theory is useful to understand how societal expectations affect the engagement of female business leaders with international customers and home country bureaucrats, eventually affecting export propensity (Akter et al., 2019; Henry et al., 2016; Pergelova, Angulo-Ruiz, & Yordanova, 2018). Chell and Baines (1998) noted that society manifests itself through the informal institutions (e.g., culture, traditions, practices) that influence the roles ascribed to women and men. "Socially and culturally constituted" (see Henry et al., 2016, p. 221) conditions are influenced by bias towards masculinity and reinforcing language which has in turn been shaped by men. Similarities and differences between men and women can thus be the result of upbringing, social interactions, and the institutional context where managers work (Ahl, 2006; Fischer et al., 1993).

The power of social context and the underlying discourse that shapes it are strong, given that experimental research conducted in laboratories and in the field indicates that "women are not necessarily more intrinsically honest or averse to corruption than men" (Frank, Lambsdorff, & Boehm, 2011: 68). Rather, they may be responding to different constraints and opportunities imposed by the power relationships relevant to gender (Alatas, Cameron, Chaudhuri, Erkal, & Gangadharan, 2009; Alhassan-Alolo, 2007; Armantier & Boly 2008; Schulze & Frank 2003). The post-structuralist feminist approach counters assumptions that women are innately more honest than men (e.g. "fairer gender" and "purity myth" debates) and instead prioritizes the role of norms and language in shaping what is seen as socially acceptable. We might observe gender differences in how women engage with corruption if the broader context imposes constraints (see Welter, Baker, & Wirsching, 2019) or does not alleviate them. A discourse dominated by men will favor men, shaping social norms and the actions that are informed by these norms, including policies and laws (Barker, 2004). These ideas translate into real differences in the conditions that managers face. As of 2021, women around the world had on average three-quarters of the rights of men (World Bank, 2021: vii), reflecting priorities in the social,

historic and political context which shape economic and business opportunities and scope.[2]

Lack of equal protections in the law, as well as social norms that favor men (Belitski & Desai, 2021), could limit business opportunities by affecting the relationships that women managers establish with their customers, bureaucrats, suppliers, and others (Meagher, 2013). Given the evolution of gender inequality in economic participation, which remains unalleviated through either norms (Belitski & Desai, 2021) or legal protections (World Bank, 2021), managing uncertainty may be particularly difficult for women managers. They may have fewer points of contact with bureaucrats, less information if there are longstanding networks or associations among established male business owners, and fewer resources due to systematic differences in access to capital. In some countries, differences in personal and physical safety may increase the risk for women managers wishing to travel, visit business locations, and have meetings in the same way that men can—and these constraints may persist due to sociocultural context even if legal protections exist. For example, even if women have legal protections to travel in the same way as men, the presence of a high level of violence against women may restrict who women managers can meet with, where they can hold meetings, and how much one-on-one interaction they have with bureaucrats—and these activities can determine how they engage with corruption. To the extent that pervasive corruption is predictable, women managers may be able to find coping strategies, even if they are costly. They may see no reason to avoid corruption when it is pervasive and everybody is expected to engage in this manner, and where the action of not being corrupt may result in market exit, prosecution, and failure (Esarey & Chirillo, 2013). The cost of corruption so may be higher because of systems that favor men. For example, women managers who face gender discrimination when interacting with bureaucrats might hire within the firm or find an agent or partner to take over these interactions, which raises their costs. However, the nature of pervasive corruption means these costs should be predictable, allowing them to make calculations, commitments, and organize export activities.

We thus consider that a woman CEO under pervasive corruption will be better able to manage conditions and make more informed decisions, reducing to some extent the punitive effects of corruption on exporting:

H2a. *Female CEOs will positively moderate the relationship between pervasive corruption and firm exports.*

In contrast, arbitrary corruption is associated with more uncertainty since decision-makers cannot predict when and how much they will be expected to pay. Managers may have to pay multiple bribes for the same service without any guarantee that they will receive the services they need and were promised (Esarey & Chirillo, 2003).

Arbitrary corruption opens up an additional avenue for gender discrimination through corruption. The same argument about the uncertainty of arbitrary corruption that applies to all firms is amplified for women-led firms, who may not exhibit the opportunistic behavior of managers who compete in bribing bureaucrats and will miss out on situational opportunities to bribe due to gender discrimination. Without being able to anticipate when, where, or how a bribe may be solicited—and with the added condition in many countries of being kept out of men-favouring spaces—women managers can face particularly difficult consequences of arbitrary corruption on firm activities. Prior research has argued that female CEOs are less corrupt because they have fewer opportunities to bribe due to discriminatory institutional contexts and limited access to authorities (Dollar et al., 2001). In many developing countries where corruption is institutionalized (Cuervo-Cazurra,

2008), the action of not being corrupt may result in market exit, prosecution and failure, while this may not be the case with arbitrary corruption. While women may take advantage of the predictability of pervasive corruption more effectively than men, female CEOs would comply with social norms in countries with institutionalized corruption where it is unreasonable to avoid bribery. There are no social norms associated with an arbitrary corrupt environment with which female CEOs would be required to comply. In addition to the absence of societal expectations of bribing authorities to provide their services to facilitate exports (e.g., export licenses, taxes, lobbying, and so on), arbitrary corruption increases uncertainty and risk, and can be gender-biased in decision-making (Croson & Gneezy, 2009; Eckel & Grossman, 1998; Furst & Reeves, 2008). In institutional contexts characterized by high levels of arbitrary corruption, women CEOs are expected to withdraw from business activities related to corrupt behavior. We hypothesize:

H2b. *Female CEOs will negatively moderate the relationship between arbitrary corruption and firm exports.*

3. Method

3.1. Sample

We combine firm-level and country-level data for our sample. Our source for firm-level data is the World Bank Enterprise Survey (WBES) for 75 countries (World Bank, 2015). Each country survey may cover either one or two waves during 2008-2015. The survey rounds and the number of interviews per country are conditional on the size of the economy (World Bank, 2021). Firms in larger countries such as India, Russia, Argentina and Turkey were surveyed twice during 2008-2015. The survey is not country-specific and respondents in different countries are asked the same questions. The sample is not repeated (World Bank, 2015), meaning that different firms were surveyed during the two periods. The survey is anonymous and information on firm name and zip code is not available. Each firm has a numerical identifier and variables describing the industry, number of employees and turnover. Anonymity of the survey is important as it covers a wide range of sensitive topics, including leadership and ownership, performance, human capital, perceptions about formal and informal institutions, and more. Self-reported data from firms is useful because "experience-based" information (Gonzalez, Lopez-Cordova, & Valladares, 2007) is likely to be more accurate than objective data, especially as managers may underreport on accounting measures.

The sampling methodology for WBES is stratified random sampling by firm size, business sector, and geographic region within a country. This means that all population units are placed within homogeneous groups, and simple random samples are selected within each group. The sampling weights take care of the varying probabilities of selection across different strata. Under certain conditions, the precision of estimates under stratified random sampling will be higher than under simple random sampling (World Bank, 2021).

In order to test for the differences in two samples, we performed additional t-tests for difference between two waves for countries which were surveyed twice. We used our dependent and explanatory variables to calculate the t-test for differences in the groups. The differences between the two waves were identified for corruption types and export intensity for India and Russia. As part of the robustness check we included wave fixed effect in estimation (6) to control for potential differences between two periods. The coefficient of the year fixed effect variable was insignificant in all specifications.

We cleaned the data for outliers and used the maximum number of observations available for non-missing values for our model (6), and replaced non-responses or all non-applicable answers with missing values, creating two distinct samples. The composition of industries and firm size in the sample is reported in Table A1 in the Appendix. Industries including food, metals and machinery, chemicals and

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[2] In addition, 108 economies did not prohibit gender-based discrimination in access to finance, and 75 economies did not have equal rights for men and women to manage and inherit property (World Bank, 2021). Extensive research has demonstrated that access to capital and secure property rights are important pre-conditions to starting and growing a business.

Table 1
Descriptive statistics.

Variables	Description	Sample (4714 obs.)			
		Mean	St. dev	Min	Max
Exports Intensity	Share of direct exports in total sales (exports intensity)	12.90	26.66	0.00	100.00
Foreign Technology	Technology licensed from a foreign-owned company	0.80	0.40	0.00	1.00
Firm age	Age of firm, years	20.81	15.04	0.00	72.00
Female CEO	Top manager female 1=yes, 0=no	0.11	0.31	0.00	1.00
Female high skill	Proportion of female in non-production activities (high-skilled)	9.08	11.41	0.00	100.00
Female low skill	Proportion of female in production activities (low -skilled)	17.13	23.17	0.00	100.00
Firm size	Number of Full Time Employees (FTEs), in logs	3.98	1.39	0.69	9.74
Digital readiness-Email	Email is used to communicate value chain	0.84	0.37	0.00	1.00
Digital readiness-Web	Wedsite is used to communicate value chain	0.60	0.49	0.00	1.00
Senior management time	% of C-level management time spent in dealing with government regulations?	13.29	18.69	0.00	100.00
Frequency of inspections	Frequency of inspections a year /requirement for meeting by tax officials	4.31	5.61	1.00	30.00
Court system perception	Court system is unfair and corrupted -1 corrupted - 4 not corrupted	-2.23	1.00	-4.00	-1.00
Pervasive corruption	Cronbach alpha of the level of pervasive corruption in the host country, from -3 (low) to 3 (high), composite of share sales paid in informal payments % (1); need to offer a gift when expecting to public officials, (2) share of contract value in informal gifts to government officials to secure contract, (3)	-0.03	0.70	-0.41	2.96
Arbitrary corruption	Cronbach alpha of the level of arbitrary corruption in the host country, from -3 (low) to 3 (high) (composite of firm knowing in advance how much an unofficial payment will be when you applied for a water connection and an informal gift requested (1), applied for a telephone connection and an informal gift requested (2), applied for an import license and an informal gift requested (3), applied for an operating license and an informal gift requested (4).	-0.01	0.85	-2.70	0.45
Country level characteristics					
GDP global	Global GDP (logarithm), World Bank (2016)	31.89	0.10	31.73	32.00
Seats	Proportion of seats held by women in national parliaments (%)	16.86	8.90	0.00	43.30
Discrimination	Binary variable=1 if country ratified the C111 - Discrimination (Employment and Occupation) Convention, 1958 (No. 111), zero otherwise (ILO, 2018)	0.90	0.30	0.00	1.00
Maternity	Binary variable=1 if country ratified C003 - Maternity Protection Convention, 1919 (No. 3), zero otherwise (ILO, 2018)	0.14	0.35	0.00	1.00
FLPR	Female labor participation rate, World Bank (2016)	44.35	16.15	6.88	86.70
Schooling	School enrollment, primary and secondary (gross), gender parity index (GPI) (UNESCO, 2018)	0.90	0.19	0.59	1.07
Low income	Countries classified by the World Bank (2018) as low income and low-middle income (< 3895 Gross National Income per capita).	0.57	0.49	0.00	1.00
High Income	Countries classified by the World Bank (2018) as high income (> 12,055 Gross National Income per capita).	0.12	0.33	0.00	1.00
Economic development	GDP per capita in constant 2010 prices (logarithm) (World, Bank (2016)	3.51	0.42	2.50	4.56

Source: ILO (2018), UNESCO Institute of statistics (2018), World Bank (2015, 2016, 2018).

pharmaceuticals, non-metallic and plastic materials make up more than half of each sample. Unlike the European Union's firm size classification, which uses a combination of staff headcount and either turnover or balance sheet total (European Commission, 2021), the WBES uses headcount to distinguish between small (5-19 employees), medium (20-99 employees), and large (100+ employees) firms (World Bank, 2021). Definitions and descriptive statistics for our variables are listed in Table 1. The list of countries included in this study and additional information about our variables can be seen in Table A2 (Appendix).

3.2. Variables

3.2.1. Dependent variable

Our firm-level dependent variable is *export intensity*, calculated as the share of exports in a firm's total sales. This is calculated as a share variable using the World Bank's Enterprise Surveys. Export intensity is a well-established proxy for the internationalization activity of firms (Bonaccorsi, 1992; Calof, 1994; Fisman & Svensson, 2007; Olney, 2016).

We adopt the input-output model of a Cobb-Douglas production function, following Lichtenberg and Siegel (1991) and Hall, Lotti, and Mairesse (2013), extended to include corruption within firms' capabilities. Firm export decisions and export intensities are captured by the input-output function in which a firm decides on costs to export (including informal and formal costs).

Firm export decisions and share of exports are captured by the input-

output function in which a firm decides on costs to export (including informal and formal costs) in the countries in the sample. The level of export, q_{ijt}, can be identified by solving the problem of the profit-maximizing firm:

$$\max_{q_{ij}} \pi_{ij} = p_i q_{ij} - c_{ij}(M_i, R_j, \quad F_i | q_{ij}) - C_{ij} \quad (1)$$

where π_{ijt} is a profit function of firm i, country j; p is the price of goods sold abroad, c is variable cost, and C is the firm's average total cost. Endogenous factors affecting the profits of firms at the country level, such as institutional quality or other settings for regulations, are denoted by M at the firm level, denoted by R at the regional level, while firm characteristics are denoted by F.

Profit maximizing export, q_{ij}^*, is at $d\pi_{ij}/dq_{ij} = 0$ (assuming that profit function is concave, $\frac{d^2\pi_{ij}}{dq^2_{ij}} < 0$), thus:

$$q^*_{ij} = \left\{ \begin{array}{c} f(p_i, M_t, R_{jt}, \quad F_i) \text{ if } \pi_{ij} \geq 0 \\ 0 \text{ if } \pi_{ij} < 0 \end{array} \right\} \quad (2)$$

The exports of a firm can be estimated as follows:

$$q_{ij} = \alpha_1 + \alpha_2 p_i + \alpha_2 q_{ij} + \beta_k F_i + \gamma_l R_j + \delta M_i + \mu_{ij} M_i \times F_{ij} + \epsilon_{ij} \quad (3)$$

where ϵ is an error term with zero mean ($E(\epsilon) = 0$) and $M_i \times F_{ij}$ is an interaction term. The above equation can be rearranged as:

Table 2
Cronbach's alpha results for pervasive corruption and arbitrary corruption.

Arbitrary corruption item component	Obs.	Sign	item-test correlation	item-rest correlation	Inter-item correlation	Alpha
firm knowing in advance how much to pay when applying for a water connection.	4714	+	0.89	0.49	0.46	0.71
firm knowing in advance how much to pay when applying for a phone connection.	4714	+	0.89	0.36	0.56	0.79
firm knowing in advance how much to pay when applying for a import license	4714	+	0.91	0.57	0.39	0.66
firm knowing in advance how much to pay when applying for an operating license	4714	+	0.94	0.53	0.39	0.66
Test scale					**0.45**	**0.77**
Pervasive corruption item component	Obs.	Sign	item-test correlation	item-rest correlation	Inter-item correlation	alpha
composite of share sales paid in informal payments %	4714	+	0.86	0.38	0.42	0.69
Binary variable=1 if need to offer a gift when expecting to public officials	4714	+	0.82	0.53	0.53	0.70
share of contract value in informal gifts to government officials to secure contract	4714	+	0.79	0.51	0.53	0.69
Test scale					**0.49**	**0.69**

Source: World Bank (2015, 2016).

$$p_i q_{ij} = \frac{\alpha_1}{1 - \alpha_2} + \beta_k F_i + \gamma_l R_j + \delta M_i + \mu_{ij} M_i \times F_{ij} + \epsilon_{ij} \quad (4)$$

or

$$p_i q_{ij} = \alpha_0 + \alpha_1 M_i + \sum_{k=1}^{p} \beta_k F_i + \sum_{l=1}^{q} \gamma_l R_j + \sum_{n=1}^{s} \mu_n M_i \times F_{ij} + \epsilon_{ij} \quad (5)$$

where $\alpha_0 = \frac{\alpha_1}{1 - \alpha_2}$.

A firm must decide whether to export or not; if the firm chooses to export, it must then choose the inputs needed. The firm also must decide how much to export, determining its share of exports in sales from 1 to 100 percent, which we can denote as $\widehat{p_i q_{ij}}$. This statement of the problem is modeled with a two-stage Tobit model (Wooldridge, 2003). First, a manager decides whether or not to export $\widehat{p_i q_{ij}}$. If the decision is made to export, then:

$$\widehat{p_i q_{ij}} = \alpha_0 + \alpha_1 M_i + \sum_{k=1}^{p} \beta_k F_i + \sum_{l=1}^{q} \gamma_l R_{jt} + \sum_{n=1}^{s} \mu_n M_t \times F_{ij} + \epsilon_{ij} \quad (6)$$

Accordingly, exports of firm i is an (observable) indicator function which takes a value from 1 to 100. If firm i has (or reports) positive exports, $\widehat{p_i q_{ij}}$ and zero otherwise. $\widehat{p_i q_{ij}}$ is a censored indicator variable, such that firm i decides to export if M_i, R_j, F_i as a set of explanatory variables affecting the decision on export intensity, and ϵ_{ij} is the error term. For those firms engaged in exports, we observe the intensity of resources M_i, R_j, F_i devoted to this activity.

The export intensity variable was reported by 98% of firms in the survey, which allows us to conclude that selection bias is unlikely. The Heckman (1979) two-stage selection procedure we adopted as a robustness check confirms this.

3.2.2. Explanatory variables

We use two measures for corruption, drawn from the World Bank Enterprise Survey (World Bank, 2015). *Pervasive corruption* measures the likelihood that a firm will encounter demand for bribes when dealing with the government (Lehne et al., 2018). This may include share of sales paid in informal payments; gaining government contracts by allocating a share of the contract's value in informal gifts to government authorities to secure the contract; and dealing with customs services and law enforcement agencies by bribing the government authorities responsible for performing inspections. *Arbitrary corruption* measures uncertainty regarding the demand for bribes (Cuervo-Cazurra, 2008), in terms of knowing in advance the expected bribe amount when applying for water and telephone connections, import and operating licenses, or obtaining a service after paying a bribe. Our corruption measures draw on Uhlenbruck, Rodriguez, Doh, and Eden (2006) and Cuervo-Cazurra

(2008) and are created as aggregates using Cronbach alpha (Cronbach, 1951) as shown in Table 2 below.

Our other key explanatory variable is *female CEO*. We use a binary variable reflecting whether a top manager in the firm is a female (1 = yes; o = no), sourced from the question "Top manager is: Male/Female" from the Enterprise Survey. The term 'top manager' refers to the highest management individual. This person may be the owner if they work as the manager of the firm.

We also create two interaction terms by multiplying female management with both types of corruption: *female management*pervasive corruption* and *female management*arbitrary corruption*. The coefficients of these interaction terms measure the additional influence of female management on export intensity beyond the direct effects captured by each individual explanatory variable.

3.2.3. Control variables (Country-Level)

We control for home country characteristics and the institutional environment by including variables that may affect the decision to export and the subsequent export intensity. The inclusion of these additional country characteristics was inspired by Cuervo-Cazurra's (2008) analysis and allows us to further control whether the export intensity is by a greater proportion explained by country characteristics of female labor market access, level of schooling, maternity protection, or equal rights. This also allows us to assess the fairness of the system in our analysis – data taken from the World Bank (2016). More specifically, we include the share of seats held by women in national parliaments as a proxy for women's political empowerment. We used the binary variable *discrimination to* identify whether or not a country ratified the C111 - Discrimination (Employment and Occupation) Convention, 1958 (No. 111), which concerns discrimination in respect of employment and occupation (entered into force 15 Jun 1960) (ILO, 2018). We used the binary variable *maternity* to identify whether a country ratified the C003 - Maternity Protection Convention, 1919 (No. 3), which concerns the employment of women before and after childbirth (entered into force 13 Jun 1921) (ILO, 2018).

We include female labor force participation rate (FLPR) and a share of female population ages 15 and elder. We added school enrollment (schooling), primary and secondary school (gross) as a gender parity index (GPI). A GPI of less than 1 suggests girls are more disadvantaged than boys in learning opportunities, while a GPI of greater than 1 suggests the opposite. Eliminating gender disparities in education would help increase the status and capabilities of women (UNESCO Institute for Statistics, 2018). These country-level characteristics will have a direct implication on export decisions for female CEOs, as highly developed countries are likely to have greater labor market protections and stronger enforcement of regulations supporting female labor market

Table 3

Tobit estimation results for export intensity.

Specification Sample	(1) Full sample	(2)	(3)	(4)	(5)	(6)	(7) Reduced
DV	Firm exports intensity						
Foreign Technology	-7.37***	-7.00***	-6.87***	-7.03***	-6.55***	-6.20***	-5.01**
	(2.27)	(2.27)	(2.26)	(2.27)	(2.29)	(2.28)	(2.01)
Firm Age	0.10	0.14	0.13	0.11	0.09	-0.02	0.15
	(0.22)	(0.22)	(0.22)	(0.22)	(0.22)	(0.22)	(0.24)
Firm Age (squared)	-0.02	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Female CEO	-0.30	-0.51	-0.36	-0.15	0.53	0.69	7.21**
	(3.11)	(3.11)	(3.11)	(3.11)	(3.12)	(3.10)	(3.52)
Female high-skill	0.05	-0.06	-0.06	-0.06	-0.14	-0.20**	-0.04
	(0.09)	(0.09)	(0.09)	(0.09)	(0.10)	(0.10)	(0.10)
Female low-skill	0.35***	0.25***	0.25***	0.25***	0.24***	0.24***	0.14***
	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Firm size	16.01***	15.42***	15.39***	14.39***	14.48***	14.76***	11.59***
	(0.82)	(0.82)	(0.82)	(0.94)	(0.94)	(0.94)	(0.91)
Digital readiness-Email	32.62***	33.20***	33.21***	32.64***	32.32***	30.06***	34.40***
	(4.67)	(4.68)	(4.68)	(4.71)	(4.73)	(4.74)	(7.20)
Digital readiness-Web	21.31***	21.19***	21.10***	20.80***	20.06***	17.75***	24.02***
	(2.53)	(2.53)	(2.53)	(2.53)	(2.56)	(2.57)	(3.14)
Senior management time	0.05	0.02	0.03	0.02	0.01	-0.01	0.11**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Frequency of inspections	-0.03	0.02	0.02	0.02	0.07	0.10	0.47***
	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.17)
Court system perception	-0.06	-0.54	-0.55	-0.54	-1.36	-0.59	-2.81**
	(0.97)	(0.99)	(0.99)	(0.99)	(1.01)	(1.02)	(1.22)
Arbitrary corruption (H1b)	*3.47*** (1.14)*	*3.20****	*4.00****	*4.11****	*3.75****	*2.81***	*2.16***
		(1.14)	*(1.22)*	*(1.22)*	*(1.22)*	*(1.22)*	*(0.78)*
Female CEO x Arbitrary corruption (H2b)			*-6.68***	*-6.72***	*-6.60***	*-6.23***	*-4.86***
			(3.38)	*(3.38)*	*(3.67)*	*(3.64)*	*(2.12)*
Pervasive corruption (H1a)	*-2.60*** (0.97)*	*-2.41***	*-3.03*** (1.02)*	*-3.09*** (1.02)*	*-2.81****	*-1.24***	*-1.46***
		(0.96)			*(1.02)*	*(0.72)*	*(0.80)*
Female CEO x Pervasive corruption (H2a)			*5.49***	*5.53***	*8.04****	*7.93***	*12.44****
			(2.92)	*(2.93)*	*(3.28)*	*(3.26)*	*(4.86)*
Seats					0.16	0.10	0.25
					(0.13)	(0.14)	(0.16)
Discrimination					-3.91	-6.83*	-11.77
					(3.71)	(3.78)	(8.04)
Maternity					12.78***	11.78***	7.83
					(2.78)	(2.91)	(5.49)
FLPR					0.09	0.10	0.61***
					(0.08)	(0.08)	(0.16)
Schooling					-11.91**	-8.96*	-40.14***
					(5.99)	(5.04)	(14.05)
Economic development						6.41*	17.29
						(3.83)	(12.80)
Economic development x High Income						2.43***	0.85
						(0.86)	(2.01)
Economic development x Low Income						-1.28	-0.41
						(1.29)	(2.30)
GDP global		-24.98**	-25.02**	-24.27**	-4.06	2.50	94.48***
		(11.25)	(11.24)	(11.25)	(12.29)	(12.63)	(27.90)
Constant	-119.1***	463.5	465.2	446.9	-203.3	-423.1	-381.19***
	(8.14)	(8423.09)	(8291.63)	(8176.47)	(8214.97)	(8575.26)	(96.26)
Industry fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	4714	4714	4714	4714	4714	4714	2966
chi-squared	1282.64	1349.08	1352.91	1357.47	1387.94	1433.80	888.72
Log-likelihood	-9721.85	-9688.63	-9686.72	-9684.44	-9669.20	-9646.27	-5999.25
Number left censored	3131	3131	3131	3131	3131	3131	1967
Number uncensored (export>0)	1583	1583	1583	1583	1583	1583	997
pseudo R2	.06	.06	.07	.07	.07	.07	.08
Pervasive corruption= Arbitrary corruption (H1c)			26.02	26.52	29.22	30.12	13.02

Notes: The level of statistical significance is * p<0.10; ** p<0.05 and *** p<0.01. Standard errors are in parenthesis and are robust for heteroskedasticity. Industry fixed – effects are included and suppressed to save space. Reference industry: Other manufacturing.

Source: Authors calculation.

participation and equality. To measure the level of economic characteristics (economic development), we included the logarithm of gross domestic product (GDP) per capita in constant 2010 prices, as well as two binary variables for low- and high-income countries according to the World Bank classification. We interacted low- and high-income country variables with GDP per capita to understand the extent of economic development that may change export intensity for firms in low- and high-income countries.

3.2.4. Control variables (Firm-Level)

We also control for several firm-level variables that may affect the relationship between corruption and firms' exports intensity (Olney,

2016). Since a firm's decision to export and the volume of exports may depend on a number of firm-level characteristics, we account for investment in knowledge and knowledge collaboration (Audretsch, Belitski, & Brush, 2020), tangible and intangible assets used as production inputs (Di Gregorio, Musteen, & Thomas, 2008; Gerschewski, Rose, & Lindsay, 2015) and *firm size* and *age* (e.g., Balabanis & Katsikea, 2003; Calof, 1994; Penrose, 1959). Larger and older businesses are usually more likely to participate in cross-border activities, as these firms are more capable of perceiving business opportunities and developing the networks and knowledge needed to operate in foreign markets.

We use the number of full-time employees as a proxy for firm size, taken in logarithms. Previous research suggests that firms of smaller size are damaged more by corruption (Do & Levchenko, 2009), at least in part because they have limited resources (Tonoyan, Strohmeyer, Habib, & Perlitz, 2010). We included firm age, calculated as the difference between the year a survey was made and the year in which the firm began operations. Firm age enters in the equation both in levels and as a quadratic term.

We also included whether or not a firm licenses *foreign technology* from a foreign firm (yes=1; 0=no) to measure the extent of advanced technology use and knowledge transfer. In addition, we measure the use of digital technologies by including a binary variable examining whether or not firms employ *emails for communication with partners and clients (Digital readiness-Email) (1=yes, 0=no)*, which may be an indicator of internet connectedness and e-commerce for emerging economies.

We include a binary variable Web (*Digital readiness-Web)* if a firm has a corporate website to connect with customers and suppliers, operating within a vertical supply and demand chain. To control for the regulatory environment of a country, we use *senior management time* spent dealing with government regulations and the *frequency of inspections* annually required for meetings with tax officials (Estrin et al., 2013). A manager's ability to deal with regulatory requirements could boost exports because of regulatory compliance or could harm exports because higher transaction costs could divert resources from export-oriented activities. Manager perceptions about fairness in the court system may change the export intensity, as it becomes more difficult to enforce international contracts in uncertain regulatory environments (Audretsch, Belitski, & Desai, 2019). *Court system perception* illustrates the extent to which a manager considers the legislative system fair and uncorrupted (-4) or unfair (-1).

In order to control for female labor force participation in a firm, we include *female high-skill engagement*, which is measured by the percentage of the highly-skilled labor force that is female, reflecting collective high-level female human capital as well as a share of the low-skilled labor force that is female.

We include the logarithm of global GDP to capture global market dynamics during the study period. Given we include this indicator, we do not include year-fixed effects in the model. Finally, we use industry dummies to control for industry-specific effects.

3.3. Estimation strategy

A potential selection problem in estimating Eq. (6) may arise because the sample of firms involved in exports is not random, i.e., exports represent an endogenous treatment. Because the decision to export is correlated with u_i, our econometric strategy is informed by the literature on treatment effects (Wooldridge, 2003). For simplicity, suppose that each firm's decision to export or not can be modeled according to the following Probit or Tobit specification:

$$pq_{it} = \gamma' W_i + \varepsilon_i \qquad (7)$$

where pq=1 if $pq_i>0$ and $pq_i=0$ if $pq_i=0$, $W_i = Z_i + X_i$, Z_i is a vector of variables which explain, along with X_i, a firm's decision to export.

To estimate (6), a further refinement is necessary because the selection mechanism involves both the decision of whether to export or not, as well as how much to export. We know that export share may vary from 0 to 100 in total sales. To account for both forms of endogeneity, following Wooldridge (2003: 643-644), we first calculate the predicted values in the decision to export (Eq. 6) from the following Tobit model:

$$pq_{it} = \gamma' W_i + \nu_i. \qquad (8)$$

Our Eq. (8) is an econometric way to describe a choice model of export and export intensity, elaborated in the theoretical framework through Eqs. (1)–(5).

We performed the variance inflation factors (VIF) test for all variables, finding each to be less than 10, indicating multicollinearity is not a problem in our study. In addition, Pearson correlation coefficients were calculated to address possible multicollinearity concerns, with all of them being statistically significant in a full sample at 5% significance level and < 0.70 cutoffs. We analyzed all variable histograms and found the errors are identically and independently distributed with constant variance.

Our model (6) is estimated as a Tobit model (Wooldridge, 2003), with the "Tobit" option in Stata controlling for unobserved heterogeneity in firms by employing industry-fixed effects to control for the potential heterogeneity of firms across different sectors.

It is worth pointing out that introducing an interaction term to our estimations does not decrease the degree of freedom of the estimation. Although the use of a two-way interaction approach may be criticized for being difficult to interpret, in our case this interpretation is straightforward because we only use one continuous variable (corruption type), whereas CEO gender is a binary variable.

4. Results

4.1. Main results

In order to test our research hypotheses, we estimate Eq. (6). Table 3 below illustrates our main findings. Our results are robust across all six specifications, including and excluding global GDP, country-level characteristics, and gender equality of national institutions.

We find support for H1a, which predicted that pervasive corruption has a negative relationship with export intensity. On a scale from -4.00 to 4.00, a one-unit increase in pervasive corruption is associated with a decrease in firm export intensity of between 1.24 and 2.81 percent (p<0.05) (Table 3, specifications 5-6).

In contrast, we do not find support for H1b, which predicted that arbitrary corruption would negatively impact export intensity. The estimated marginal effects of a one-unit change in arbitrary corruption (on a scale from -4.00 to 4.00) is associated with an increase in firm export intensity of between 2.81 and 3.75 percent (p<0.01) (Table 3, specifications 5-6). There could be two potential interpretations of this result. Firstly, the positive result may be related to the episodic character of corruption which represents the extent to which this type of corruption exists. In case the bribe amount is random and affordable, for exporter and is infrequent, then it allows most proactive firms who are i) willing and ii) able to negotiate with authorities on export regulations to facilitate transactions occasionally, without imposing a large overall penalty and adding to the fixed cost of exports. Secondly, arbitrary corruption affects some specific sectors of the economy, particularly those firms with the highest returns to exports, and does not affect others. Regression analysis would capture the average net effects, which might reflect that the gains an average exporter makes from arbitrary corruption are greater than the costs associated with arbitrary corruption. In other words, this result may reflect the canceling out of the microlevel effects.

To test H1c, which predicted that arbitrary corruption would be more harmful for exporting than pervasive corruption, we performed a t-test on differences in the means of estimated coefficients of both types of
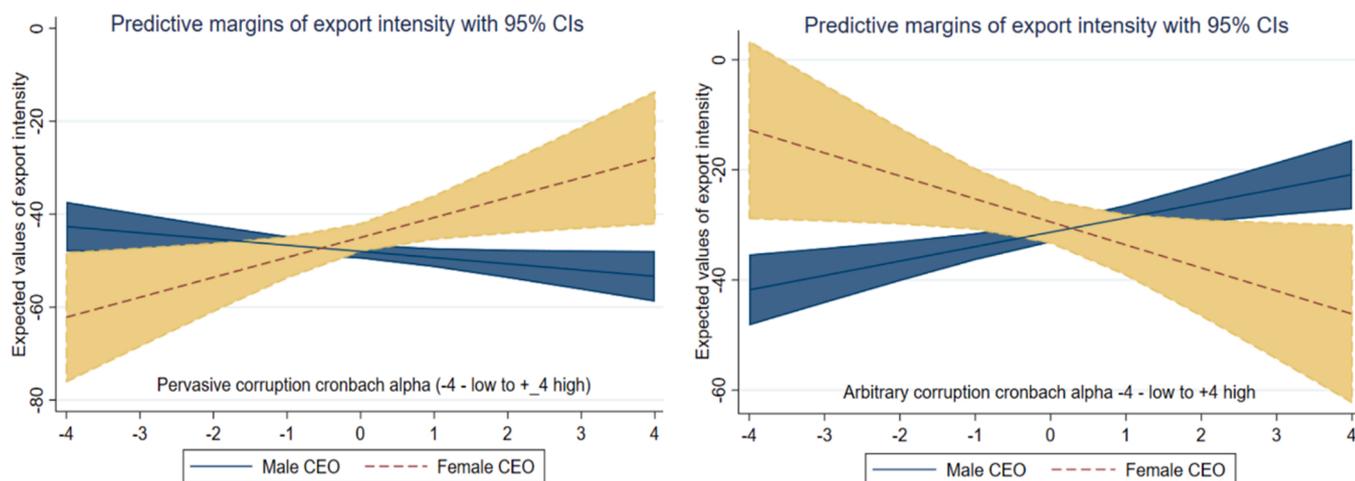
Fig. 1. Predictive margins with 95% confidence intervals of firm export intensity between women-led and men-led firms for pervasive corruption (left) and arbitrary corruption (right) (full sample 4714 firms from 75 countries). Source: Authors calculation.

corruption across different model specifications (Table 3, specifications 3-6). We found a significant difference in the magnitude of the effect of each type of corruption on firm exports, which highlights the importance of considering the type of institutional context explaining the decision-making about export. While there are significant differences, our H1c is not supported as the direct effect of arbitrary corruption on firm exports is on average positive. Before we turn to the next set of hypotheses, note that the effect of a female CEO effect on export intensity is not statistically significant (Table 3, specifications 1-6). This indicates there is no difference in export intensity among firms led by female and male CEOs, expanding what we know from prior research (Ahl, 2006; Fischer et al., 1993; Belitski & Desai, 2019).

4.2. Moderating effects

We find support for H2a, which predicted that that women CEOs positively moderate the relationship between pervasive corruption and firm export intensity. When a firm has a female CEO, a one-unit increase in pervasive corruption results in a 2.46 percent increase in export intensity (-3.03 + 5.49=2.46, p<0.10) (Table 3, specification 3). For male CEOs, the effect of pervasive corruption on firm exports remains negative (β=-3.03, p<0.01). Controlling for country conditions and gender institutional characteristics yields robust results: a one-unit increase in pervasive corruption results in a 5.23 percent increase in firm export intensity (-2.81 + 8.04=5.23, p<0.01) (Table 3, specification 5) for women-led firms and a -2.81 percent decrease in export intensity (β=-2.84, p<0.01) in men-led firms.

Fig. 1 below (left column) illustrates the effect sizes of an increase in pervasive corruption on firm export intensity for women-led and men-led firms (moderating effects), supporting H2a. It shows that an increase in pervasive corruption for firms with female CEOs led to an increase in export intensity, while the confidence intervals between women-led and men-led firms do not overlap.

While the values of the coefficients of interest increase when controlling for country conditions and gender institutions, the coefficients are positive and statistically significant. When controlling for country characteristics and quality of gender-related institutions, the CEO gender effect continues to mitigate the negative direct effect of pervasive corruption on firm export intensity.

We found the opposite result for arbitrary corruption. H2b predicted that female leadership would negatively moderate the relationship between arbitrary corruption and firm export intensity, and is supported. In economic terms, a one-unit increase in arbitrary corruption is associated with a 2.68 percent decrease (4.00 - 6.68=-2.68, p<0.05) in export intensity (Table 3, specification 3) for women-led firms, while the

relationship between arbitrary corruption and export intensity remains positive (β=4.00, p<0.01) for men-led firms. This is robust when we control for country conditions and gender institutional characteristics: a one-unit increase in arbitrary corruption is associated with a 2.85 percent decrease in export intensity (3.75 - 6.60=-2.85, p<0.01) (Table 3, specification 5) in women-led firms and a 3.75 percent increase in export intensity (β=3.75, p<0.01) in men-led firms.

Fig. 1 (right column) illustrates the effect sizes of an increase in arbitrary corruption on firm export intensity for women- and men-led firms (moderating effects), supporting H2b. A low level of arbitrary corruption is associated with higher export intensity for women-led firms. As long as the level of arbitrary corruption increases, export intensity is negative for women-led firms, while men-led firms increased their export intensity.

4.3. Control variables

We did not find differences between firms of different ages and export intensities, while we found that larger firms have, on average, higher export intensities (16-17 percent). We find that licensing from a foreign company corresponds with lower export intensity, and that the use of email and websites for firm communications increases exports (Table 3, specifications 1-6). We also find that senior management time spent dealing with authorities and frequent inspections are positively related to export intensity (Table 3, specifications 1-6).

Our controls for other types of (non-management) female engagement in firms yielded interesting results. High-skilled female engagement, measuring female human capital among firm employees, is not significant; however, low-skilled female engagement is positively associated with export intensity (Table 3, specifications 1-6). This may mean that export-oriented firms in developing countries rely significantly on female low-skilled labor in their exports.

Economic development is positively associated with export intensity, and a 1 percent increase in GDP is associated with a 6.41 percent (β=6.41, p<0.05) increase in export intensity. Institutions matter for business growth, with countries where institutions support gender equality, e.g., the ratification of the Maternity Convention and which have a higher proportion of female seats in parliament, on average demonstrating a higher export intensity.

4.4. Robustness check

There is significant heterogeneity in the sample, which consists of 4714 firms from 75 countries. As Table A2 illustrates, the number of firms with female CEOs is too low in some countries. For example, the
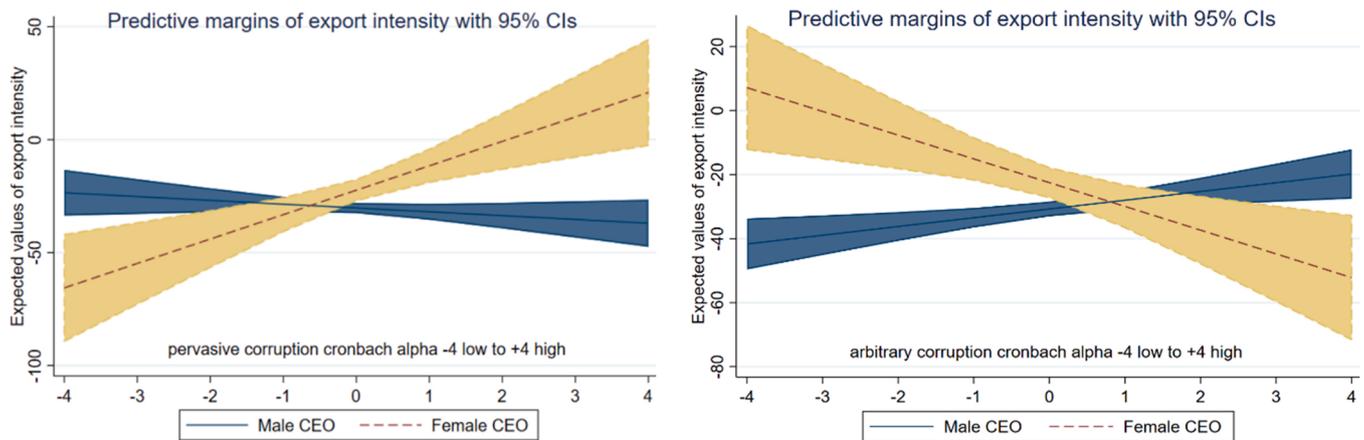
Fig. 2. Predictive margins with 95% confidence intervals of firm export intensity between women-led and men-led firms for pervasive corruption (left) and arbitrary corruption (right) (reduced sample of 2966 firms from 10 countries). Source: Authors calculation.

female CEO share is zero for both the 3 Albanian firms and the 4 Mauritian firms, and there are similar figures for a number of other countries. At the same time, the female CEO share is 6 percent for the 1131 Indian firms, and 9 percent for the 233 Mexican firms. The sample from India of 1131 firms and others may therefore be overrepresented. Countries such as Albania (3 firms), Angola (14 firms), Madagascar (8 firms), Mali (4 firms), Montenegro (8 firms), Panama (7 firms) and others are also underrepresented, especially when the focus is on the effect of institutional context in different countries.

As part of the robustness check we reduced our sample to 10 countries and 2966 firms in Argentina, Chile, Colombia, India, Mexico, Myanmar, Peru, Russia, Turkey and Ukraine, where the number of observations is always greater than 100 firms per country. The share of female CEOs in a sample is lowest in Argentina (3%) and highest in Myanmar (20%). Our robustness check is based on the methodological recommendation (Wooldridge, 2003) to use at least 50 cases per unit of analysis (country) where the institutional context is concerned, and at least 8 observations per independent variable. Other sources (Box & Tiao, 1975) suggest that the modeling approach and the purpose of the analysis matter, while the rule of thumb is that research should have more than 100 observations.

We estimate Eq. (6) using the sample of 2966 firms from 10 countries as a robustness check of our hypothesis, controlling for country conditions and gender institutional characteristics (specification 7, Table 3). Our H1a is supported, as we find that pervasive corruption is negatively associated with the level of firm export intensity (β=-1.46, p<0.10 (spec. 7, Table 3). Our H1b is not supported, consistent with the results in the full sample where the coefficient is positive and statistically significant (β=2.16, p<0.05 (spec. 7, Table 3). Our H1c is not supported. While there is a difference in the effects of pervasive and arbitrary corruption on firm export intensity, the effect of arbitrary corruption has remained positive in the sample used for the robustness check. The hypothesis that arbitrary corruption would have a more negative effect on firm exports compared to pervasive corruption is therefore not supported. The results of both the reduced and full samples are consistent. Our H2a and 2b on the moderating role of CEO gender in the relationship between institutional environment and firm export intensity are also supported. We find that a one-unit increase in pervasive corruption results in a 10.98 percent increase in export intensity (-1.46 + 12.44=10.98, p<0.01) (Table 3, specification 7). The size of the moderating effect of CEO gender is greater than in the full sample. Our H2b is supported, as we find that a unit increase in arbitrary corruption is associated with a 2.70 percent decrease (2.16- 4.86 =-2.70, p<0.05) in export intensity (Table 3, specification 7) for women-led firms. Fig. 2 illustrates the effect sizes of an increase in pervasive and arbitrary corruption on firm export intensity for women-led and men-led firms

(moderating effects) for the reduced sample. Our robustness check demonstrated two distinct differences compared to the full sample. Firstly, we find that the moderating effect for pervasive corruption and firm exports is greater than in the full sample. Secondly, firm export intensity in women-led firms is 7.21 percent higher than in men-led firms.

5. Discussion and conclusion

5.1. General discussion

Our study improves our understanding of corruption and firm exports of women-led firms (Swamy et al., 2001; Zahra, Wright, & Abdelgawad, 2014). We provide fresh insight into how female CEOs respond when faced with pervasive vs. arbitrary corruption and how this shapes exports, extending prior research on female management and entrepreneurial judgment (Brush et al., 2009; Jenning & Brush, 2013).

Our findings provide different results for the two types of corruption, as we find that pervasive corruption is negatively associated with firm exports, while arbitrary corruption is positively associated with firm exports. The opposing findings demonstrate the idiosyncratic effects of each type of corruption on manager decisions about firm internationalization (Cuervo-Cazurra, 2008; Liu et al., 2015). These differential effects help to explain the confusion regarding why corruption is found to be harmful in some institutional contexts and not others, furthering prior research on the role of institutional context for firm internationalization (Cuervo-Cazurra, 2008; Mauro, 1995; Welter et al., 2019; Yang et al., 2021).

Engaging in exports requires firms to invest resources; therefore, if pervasive corruption exists in a country where firms must engage in bribery in several instances, it will add to the cost of engaging in exports. Arbitrary corruption can be less costly, since managers are not expected to engage in bribery. Our finding on the positive effect of arbitrary corruption on firm exporting is intriguing, as it demonstrates that this symptom of an unpredictably predatory institutional context may—in comparison to a consistently predictably predatory context —enable exporters to extract an ad hoc premium from bribing opportunities. Our results suggest that there might be a potential trade-off between perceived short-term gains from arbitrary corruption characterized by higher risk and uncertainty and long-term gains from pervasive corruption. In contrast, the interactions between pervasive corruption and female CEOs suggest that the predictability of pervasive corruption may be less disruptive for business activities, likely because it allows managers to consider corruption as part of the process or cost structure of doing business (Cuervo-Cazurra, 2008; Galtung et al., 2013).

5.2. Theoretical contribution

Scholars have long called for deeper microfoundational analysis and research into institutional context and CEO gender in firm exports (Balabanis & Katsikea, 2003; Cuervo-Cazurra, 2006; Cuervo-Cazurra & Genc 2008), most recently calling for a better understanding of microfoundations in institutions-export relationships (Ahsan, 2017; Yang et al., 2021). In particular, there have been calls to apply the multi-level multi-country approach to explain the relationships between institutional context through lower levels of analysis, such as the firm (Estrin et al. 2013). Within the scope of these topics, our study responds to a recent call in the international business literature (Ramón-Llorens et al., 2017) to further our understanding of the influence of CEO characteristics in firm internationalization and the role of business context. We also draw on prior research calling for greater insight into corruption and exporting among men- and women-led firms (Swamy et al., 2001; Zahra et al., 2014). Our post-structural feminist lens provides a link to the role of social roots that can affect the context for managerial decision-making on firm internationalization (Henry et al., 2016; Jennings & Brush, 2013).

By applying a post-structural feminist perspective (Henry et al. 2016), this study articulates how economic opportunities and business engagement conditions (Brush et al., 2009; Chell & Baines, 1998; Jennings & Brush, 2013) may explain how CEOs influence internationalization decisions under different institutional contexts. Differences in context—such as whether corruption is pervasive or arbitrary—can manifest to managers in different and gendered ways, which can be processed in different ways in exporting decisions.

Our study demonstrated that CEO gender can be an important factor in understanding the heterogeneity of corruption and firm activities. Our empirical findings reveal that depending on the type of corruption, CEO gender may act as either an impediment and conduit for exporting (Henry et al., 2016; Jennings & Brush, 2013).

We found that the presence of a female CEO has no direct effect on firm internationalization, and further findings on gender differences in corrupt contexts implicate the social and economic context. Our study is relevant to debates, often situated in political science, on whether women are more honest and ethical than men (Sung, 2003). The finding that greater representation of women in government is linked with lower corruption (Dollar et al., 2001) raises questions about the roots of these differences. For example, scholars have questioned whether the links are psychological and sociological, or whether they result from more equal systems (Esarey & Chirillo, 2013).

5.3. Policy implications

Our results shed further light on the realities of firm internationalization in different institutional contexts, an important policy question because of the consequences for growth (see Van Biesebroeck, 2005; Baldwin & Gu, 2004). The importance of predictability for women-led firms is apparent given our contrasting findings for the moderating effects of female CEOs. In environments with high risk and uncertainty (e. g., financial crises, interruptions to supply chains, climate change, and so on), specific activities to mitigate gendered gaps related to resources, information, and other areas through which corruption infiltrates could be considered to help reduce the uncertainty associated with arbitrary corruption.

Our empirical findings put a spotlight on the direct relevance of corruption—and therefore the treatment of corruption via anti-corruption policies and enforcement—in shaping firm behavior. This is in line with recent research documenting the negative effects of corruption at the micro level on firm activities, motivations for new business activity, and outcomes (see Audretsch et al., 2022).

Direct guidance for policy is complicated, and country context makes a one-size-fits-all approach unrealistic. Our study addresses important questions that can help policymakers chart a course forward. First, it is

important for policymakers to understand what kind of corruption exists in the country in order to appropriately frame their responses and determine how it may be affecting firm outcomes. In countries with pervasive corruption, an additional dilemma is that widespread corruption may mean that some decision-makers in a position to influence anti-corruption efforts may themselves be corrupt. In pervasively corrupt contexts, there may be greater risks associated with not being corrupt (Esarey & Chirilll, 2013). In addition, anti-corruption efforts, for example punishing specific behaviors such as bribe-taking, may be more difficult to undertake when corruption is pervasive. In other words, firing large numbers of people in a highly-corrupt system is likely not a realistic anti-corruption strategy. In addition, the effectiveness of punitive measures under pervasive corruption may depend on the effectiveness of enforcement legal systems, which may themselves also be corrupt.

Our findings on arbitrary corruption are both encouraging and discouraging. On one hand, the notion that one-off instances of corruption are especially problematic for exporting may suggest a "smaller" problem compared to the overwhelming "wholeness" question of an entire pervasively corrupt system. On the other hand, the very nature of arbitrary corruption means that it will be difficult to know when and where corruption will be taking place, rendering direct and targeted action difficult and potentially costly. In the same way that arbitrary corruption raises uncertainty for exporting firms because it is difficult to anticipate, it also raises uncertainty for policy efforts that may want to track it.

This study has implications for boards who might view women as strategic assets, particularly when dealing with corrupt authorities and creating political connections, expanding what we know from Cui, Hu, Li, and Meyer (2018a).

5.4. Managerial implications

Particularly with regards to the issue of corruption type, export-oriented firms should understand the type of corruption they face in every specific case. The costs of pervasive corruption can increase the cost of doing business, diverting resources which could otherwise go towards boosting firm exports. Esarey and Chirillo (2013) note that in some contexts, it may be worse *not* to be corrupt, and we consider this applies to both bureaucrats and managers. This can present an almost existential crisis for a firm, and may make it more difficult for managers to interpret how to deal with arbitrary corruption and plan for "just in case" scenarios. They may have to consider how this could lead to navigating the legal system, as well as other systems (see Yang et al., 2021). For managers who respond to arbitrary corruption by hedging their bets through relationship-building, cultivating favors and putting themselves in a favorable position to take advantage of corruption if and when necessary, it is important to recognize that these efforts (and the resources used to advance them) still come at the cost of direct investment in production and building up export capacity (Gaviria, 2002).

Regardless of the type of corruption they encounter, managers face legal, regulatory, social, and ethical dilemmas when dealing with corruption. We found that exporting by women-led firms increased under conditions of pervasive corruption, and declined under conditions of arbitrary corruption, which does not indicate that one type is "better" or less "bad" than the other for exporting. One way to interpret these findings is that consistency and predictability are better leveraged among women-led firms, perhaps due to the reliability of pervasive corruption. This could be the case if the broader social context means women find it more costly to obtain new or rapidly-changing information, and to develop relationships to obtain this information.

Another related interpretation is that a potential pathway of influence by arbitrary corruption is to raise opportunity and transaction costs to a greater extent in women-led firms (see Akter et al., 2019; Pergelova et al., 2018). For example, in countries where women may not travel as freely as men, knowing about pervasive corruption could mean it is

Table A1
Averages of main variables split by industry and firm across two models.

Industry	obs.	% in total	exports intensity	share of female CEO	arbitrary corruption	pervasive corruption
Textiles	256	5.43	22.00	0.14	0.10	0.01
Leather	16	0.13	15.00	0.00	-0.50	-0.09
Garments	373	7.91	26.49	0.23	-0.03	-0.03
Food	935	19.83	13.19	0.13	0.09	-0.06
Metals and machinery	943	20.00	9.42	0.06	-0.05	-0.06
Electronics	138	2.93	12.76	0.11	0.00	0.06
Chemicals and pharmaceuticals	450	9.76	13.62	0.14	0.04	-0.08
Wood and furniture	96	2.04	11.80	0.18	-0.05	0.04
Non-metallic and plastic materials	717	15.21	8.17	0.06	0.02	0.00
Auto and auto components	88	1.87	6.44	0.02	-0.47	0.06
Other manufacturing	397	8.42	14.66	0.09	-0.02	-0.08
Retail and wholesale trade	55	1.17	4.16	0.11	-0.12	0.03
Hotels and restaurants	60	1.27	1.88	0.18	0.23	-0.04
Other services	126	2.67	13.55	0.05	-0.36	0.15
Other: Construction, Transportation	64	1.36	10.06	0.06	-0.66	0.29
Firm size						
Small(<20)	1196	25.37	3.41	0.13	-0.01	-0.01
Medium Small (20-99)	1906	40.43	8.88	0.10	-0.09	0.01
Medium large and large (100 and over)	1612	34.20	24.70	0.10	0.08	-0.08

Note: Number of firms = 4714.
Source: ILO (2018), UNESCO Institute of statistics (2018), World Bank (2015, 2016, 2018).

possible (though still ultimately negative for the firm and the broader economy) for a firm to designate someone else to attend offsite meetings with bureaucrats. This could also mean that women-led firms engage with third parties on interactions with bureaucrats to facilitate predictable transactions which they expect to be corrupted. It is easier to anticipate when this will be possible with pervasive corruption. On the other hand, it is harder and more costly to undertake these types of strategies under arbitrary corruption, both because the manager does not know which transactions will be subject to corruption, when, or perhaps even in what way they will be corrupted. In some countries, women may be actively discriminated against, or have difficulty obtaining permits, opening bank accounts, and accessing the same business-related protections as men. In these contexts, this unpredictability can make potential mitigation actions even more expensive, for example due to the need to hire intermediaries to deal with bureaucrats.

Our study has implications for boards who might view women as strategic assets, particularly when dealing with corrupt authorities and creating political connections, expanding what we know from Cui et al. (2018a). This calls for a better understanding of the influence of gender and for research into the engagement of men and women board members in developing firm internationalization strategies and actions. These findings could inform board members when developing firm internationalization strategies and actions. For example, they could be used to determine if a more collegial and transparent organization culture would lead to more appropriate decision-making about exporting.

5.5. Limitations and future research

A crucial limitation of the overwhelmingly majority of current research on informal institutions, including our study, is that women experience corruption differently from men. This is not limited only to the context which we examine related to monetary incentives such as gifts or tangible exchange of resources. We focused on two types of corruption, which we were able to study because of data availability. While our study provides needed nuance by not using a single homogeneous approach to corruption, we are unable to consider the expansiveness of gender-based corruption. For example, greater insight into "sexploitation" is urgently needed from a research and policy perspective, and is increasingly the subject of policy efforts to better understand how women face unique conditions in economic systems. While women and men may both be targeted for sextortion, case studies on sextortion

also reveal it is an important concern for women (Stahl, 2021). The lack of systematic data about women, from women, and interpreted using a women-focused lens, is a barrier to understanding the vulnerability and impact of corruption on women. The sextortion type of corruption, which includes sexual bribery and the exploitation of sexual acts, can take place in a very different way than the forms of corruption studied in most research. Data is limited, and this kind of corruption can also capitalize on other forms of social and cultural discrimination for women in many countries, including shame and stigma. This can further include legal structures which put undue weight on women to prove they have been subject to sexual violence, and may even penalize them for it. Future efforts should prioritize insight into how corruption may look different for women.

There are also several limitations specific to our study. First, we were unable to observe the characteristics of the founding teams and boards of the firms we studied. Future research could examine this question from the team lens, which could engage feminist theories with upper echelons theory. This could be especially interesting in emerging economies, which also tend to be dominated by family firms, as the team lens adds a layer of family or spousal decision-making complexity to the research question. A second limitation is that we only examined exports in the current study, but firm outcomes can vary significantly and may even trend in different directions. For example, imports may be the main source of knowledge about new products and technologies, making corruption particularly threatening for firm imports. Comparing the ways pervasive or arbitrary corruption can affect different firm outcomes is worthwhile, as it could shed light on alternative decision-making by managers. For example, under some conditions managers may choose to focus on domestic markets instead of export markets. A third limitation is an empirical limitation, which is that our Cronbach's alpha results for pervasive corruption are 0.69, less than the "rule of thumb" threshold of Cronbach's alpha (>0.70). This calls for more experimentation and verification of pervasive corruption measures in future research.

Our study offers new and preliminary insights which have not previously been empirically documented, raising many new questions for further research to test and validate the patterns in the relevant relationships. The implied idiosyncrasies of how female CEOs can decide on exports and their intensity across countries with different types of corruption is a fruitful field of research. Further research could also consider other variables for firm internationalization (e.g., project

Table A2

Countries included in this study, number of observations and key indicators of interest by country (Number of firms 4714).

Country	Number firms	Exports Intensity	Female CEO share	Arbitrary Corruption	Pervasive Corruption
Afghanistan	36	2.22	0.06	0.16	0.41
Albania	3	33.33	0.00	-0.54	0.23
Angola	14	0.00	0.07	-1.49	0.48
Argentina	207	14.73	0.03	0.15	-0.13
Armenia	32	16.34	0.03	0.14	-0.19
Azerbaijan	20	7.00	0.10	-0.09	0.04
Bangladesh	61	38.43	0.13	-1.28	0.51
Belarus	18	11.56	0.11	0.42	-0.24
Bhutan	41	12.78	0.12	0.44	-0.27
Bolivia	30	9.17	0.03	0.15	0.04
Bosnia	35	36.09	0.09	0.38	-0.28
Bulgaria	14	32.43	0.07	0.40	-0.35
Burkina Faso	18	9.06	0.11	0.20	-0.19
Burundi	14	3.71	0.14	0.21	-0.07
Cameroon	32	6.16	0.06	-0.82	0.62
Chile	258	10.14	0.09	0.28	-0.31
Colombia	200	10.05	0.14	0.28	-0.25
Costa Rica	35	15.26	0.11	0.02	-0.31
Croatia	16	28.13	0.25	0.32	-0.24
Czech Rep.	23	33.61	0.22	0.38	-0.33
Djibouti	7	0.00	0.43	0.42	-0.28
Dominica	17	18.06	0.12	0.15	-0.14
Ecuador	30	13.93	0.10	0.37	-0.33
Egypt	65	16.37	0.03	-0.12	-0.18
El Salvador	40	24.00	0.15	0.37	-0.33
Estonia	8	59.13	0.25	-0.12	-0.33
Ethiopia	18	15.28	0.06	-0.34	-0.21
Georgia	5	8.20	0.20	0.38	-0.31
Ghana	25	2.88	0.12	-0.02	0.11
Guatemala	92	19.85	0.14	0.20	-0.11
Honduras	51	7.75	0.10	0.34	-0.24
Hungary	14	35.57	0.07	0.02	-0.35
India	1131	5.50	0.06	-0.16	0.00
Indonesia	78	24.91	0.18	-0.19	0.10
Israel	20	32.50	0.15	0.40	-0.34
Jamaica	10	0.70	0.10	0.36	-0.08
Kazakhstan	41	4.90	0.24	0.03	0.09
Kyrgyz Rep	38	20.13	0.16	-0.13	0.41
Lao PDR	49	26.84	0.24	-0.38	0.15
Latvia	17	38.94	0.24	0.33	-0.32
Lebanon	14	28.71	0.07	-0.07	0.28
Lithuania	22	32.32	0.14	0.27	-0.28
Madagascar	8	33.88	0.13	0.00	-0.02
Malawi	30	13.63	0.27	0.29	-0.06
Mali	4	0.00	0.25	0.38	0.09
Mauritania	7	33.33	0.00	-0.54	0.10
Mauritius	4	35.00	0.00	0.38	-0.12
Mexico	233	9.55	0.09	0.12	-0.13
Moldova	46	15.74	0.17	0.10	-0.10
Mongolia	82	7.87	0.32	-0.32	-0.01
Montenegro	8	10.38	0.25	0.39	-0.19
Myanmar	121	10.12	0.20	-0.52	0.62
Nepal	49	14.00	0.07	0.25	0.18
Nicaragua	29	13.66	0.28	0.15	-0.12
Pakistan	16	10.00	0.00	-0.77	0.27
Panama	7	0.00	0.00	0.39	-0.41
Paraguay	23	4.65	0.04	-0.02	0.12
Peru	228	22.21	0.10	0.14	-0.19
Poland	14	28.79	0.14	0.34	-0.35
Romania	42	23.57	0.10	0.37	-0.23
Russia	119	6.94	0.14	-0.14	0.02
Senegal	8	15.75	0.13	0.41	-0.24
Serbia	29	17.76	0.17	0.27	-0.26
Slovak Rep.	8	47.88	0.13	0.39	-0.24
Slovenia	6	46.83	0.17	0.40	-0.38
Sri Lanka	19	2.11	0.21	0.00	-0.19
Tajikistan	40	6.17	0.10	-0.32	0.39
Tanzania	42	13.38	0.10	0.19	-0.22
Turkey	232	25.77	0.10	0.24	-0.24
Ukraine	117	13.62	0.19	-0.22	0.21
Uruguay	58	18.62	0.16	0.29	-0.30
Uzbekistan	17	9.53	0.06	0.03	-0.08
Venezuela	36	2.42	0.22	-0.06	0.11
Yemen	57	8.25	0.00	-1.22	1.10
Zambia	80	1.91	0.13	0.20	-0.13

Source: World Bank (2015).

collaboration, knowledge spillovers, investment in R&D, joint ventures, and so on).

Although we were not able to directly test it, an important question remains: Are there intrinsic differences between men and women in management, or are the systems by which they perceive and respond to corruption different?

In addition, it is important for future research to understand how men and women are exposed to corruption. For example, if women bribe less, is it because they have fewer opportunities to bribe? This could be an important future research direction, as we saw a substantial increase in the female CEO and corruption-type interaction coefficients between the baseline estimation and when controlling for country institutions. Our controls for country institutions and gender equality suggest that the system matters, and that female CEOs can be an essential predictor of export intensity in countries with different types of institutional context.

Future scholars may wish to study the role of CEO gender in the relationship between the two types of corruption and firm internationalization in developed countries and compare the results with our study, which focused on developing economies. Another important question requiring further research relates to differences in corruption between the home country and the target market country. In other words, it would be interesting to uncover whether the effect of female management in this relationship varies when the corruption distance between the home country and the target market changes. Future research will require embedding the institutional quality of both the host and home countries to shed more light on female decision-making in different contexts.

Appendix

See Appendix Table A1 and Table A2

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