Institutions, resource dependence, and the dual nature of corruption in firm internationalisation

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Abstract

Despite extensive research on institutions and firm internationalisation, the joint firm and macro-level effects of informal relationships, that is, corruption, on firm internationalisation, particularly within specific industrial contexts (resource-based vs. non-resource industries), remain underexplored. To investigate how firms internationalise under 2 boundary conditions – resource dependency and variations in institutional quality – we apply the Heckman-type selection bias and use 186,027 firms spread across 137 countries, with data collected through multiple firm surveys conducted by the World Bank Enterprise Surveys between 2006 and 2024. Our empirical findings demonstrate the double-edged sword of corruption. While it positively affects firm exports by mitigating bureaucratic procedures at the managerial level, the effect on exports turns negative as it increases uncertainty and operational costs at the macro-level. The effects are accelerated for firms in resource-based sectors. We highlight

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the interplay between corruption, resource dependencies and internationalisation and provide targeted policy and practical implications.

Keywords
corruption, exports, institutions, internationalisation, resources

Introduction

Firm internationalisation and exports are essential for countries due to their contribution to enhancing economic growth, fostering competitiveness and diversifying risks associated with domestic market volatility (Ferraz, 2025; Hessels and van Stel, 2011; Murshed, 2022). The critical role of institutions in shaping firm internationalisation, particularly within the context of emerging economies (Estrin et al., 2013; Gaur et al., 2018; Ko et al., 2021) as well as transition and mature market economies (Castellani et al., 2024; Santangelo and Symeou, 2024), is well-documented. Formal and informal institutions establish the framework within which firms formulate their strategic decisions, including their approach to internationalisation (North, 1990). Scholarly work (i.e. Deng and Zhang, 2018; Meyer et al., 2009) demonstrates that the institutional quality of a firm's home country significantly influences its ability to expand internationally by shaping regulatory environments, bureaucratic inefficiencies and informal institutional structures.

Although most studies have focused on formal institutions (Cai et al., 2025; Li et al., 2021) and individual or firm-level effects (Cho and Lee, 2018; Thai et al., 2022), limited attention (Tajeddin et al., 2023) has been given to the combined effect of firm-level informal behaviour and corruption as an informal institution (Kumari et al., 2025; Nuruzzaman et al., 2020) on firms' internationalisation. In particular, the multi-level role that informal institutions play in addressing institutional voids and creating incentives to modify the costs associated with conducting business to bolster firms' export behaviours (Belitski et al., 2016; Williamson, 2000) is important. Corruption represents a critical element of national governance and culture that affects firms' competitiveness and market predictability (Peng et al., 2008). Its impact is especially pronounced in emerging economies, where firms often operate within weak regulatory frameworks that heighten market uncertainty (Cuervo-Cazurra, 2016; Tonoyan et al., 2010). In this study, we adopt the definition of corruption formulated by Rose-Ackerman (2007), defining it as using public office for personal gain.

Recent studies (Cieślik and Ryan, 2023; Ufere et al., 2020) further emphasise that the impact of corruption differs among firms depending on their strategic choices and industry-specific constraints. Prior research has stressed the positive effects of corruption as a strategic choice on firm behaviour (Kamasak et al., 2019) and overall business growth in some emerging and developing economies (Yurdakul et al., 2022). For example, Belitski et al. (2016) and Mohamadi et al. (2017) concluded that corruption might alleviate bureaucratic delays and transaction costs associated with business initiation and economic growth. In many emerging and developing economies, informal institutions have become a necessary strategy to sustain exports, and successful negotiations may enhance firm survival by securing permits and licenses (Belitski and Desai, 2024; Kamasak, 2017). Hence, delineating the relationship between corruption and firm exports leading

to greater internationalisation is inherently intricate due to its contextual and methodological complexities.

We also argue that the resource-based perspective is particularly relevant in this relationship as some industries, which we call resource-based, are highly dependent on localised natural resource sectors (e.g. oil, gas, minerals), where firms are less mobile and, therefore, more vulnerable to regulatory bottlenecks and increased transaction costs associated with corruption (Kalyuzhnova and Belitski, 2019). Conversely, firms in technology-intensive or service-oriented sectors may often possess more flexible, mobile and intangible resources and circumvent corrupt institutional settings through innovation, adaptability or relocation (Hernández et al., 2022). Thus, the nature of the industry, that is, resource-based or non-resource-based, in which firms operate shapes firm behaviour.

The resource-based view of the firm (RBV) asserts that a firm's unique resources and capabilities confer competitive advantages (Barney, 1991; Wernerfelt, 1984). In our study, we suggest that firms within resource-based industries may strategically exploit corruption at the firm level and turn it into a competitive intangible resource that expedites regulatory approval and facilitates internationalisation, leading to enhanced exports.

Drawing on the integration of institutional theory, which explains the strategic context created by informal institution corruption, and RBV, which highlights how resource characteristics critically shape firms' varied responses to institutional constraints, we theorise and empirically test the multi-level effect of corruption on firm exports across resource-based versus non-resource-based industries. Furthermore, we move beyond testing solely binary export decisions and intentions of firms and examine firms' export intensity and performance.

We contribute to theory in three ways. First, we introduce a novel multilevel analysis of corruption, where the dual effects of informal institutional behaviour at the firm level (micro) and regional/national level (macro) are disentangled. Instead of treating corruption as a uniform environmental factor, we show that it simultaneously acts as a strategic enabler (grease) for firms navigating institutional voids and as a systemic hurdle (sand) when embedded at higher governance levels. Second, we identify resource-based industry dependence as a core boundary condition that intensifies both positive and negative impacts of corruption on export performance. Finally, we add to the discourse on corruption's home-country and managerial effects as informal human relationships (Tajeddin et al., 2023; Tonoyan et al., 2010) and offer significant practical implications by identifying industries most vulnerable to corruption and suggesting tailored mitigation strategies.

The remainder of this paper is structured as follows. The next section presents the theory and hypotheses, followed by a discussion of the empirical model and data. We then report and analyse our findings before concluding with theoretical contributions and policy recommendations.

Theory and hypotheses

Institutional theory, resources and firm exports

Institutions are defined as the rules of the game that influence firms' behaviours and actions (North, 1990). Firms differ in their degree of independence from institutions

based on their size and industries, and thus, they may choose to respond to institutional forces in different ways when deciding on exporting and determining how much to export (LiPuma et al., 2013; Ngo et al., 2016; Yang et al., 2021). Such inter-firm variations in the effects of institutions are particularly important in emerging and transition economies (Tonoyan et al., 2010), where firms experience different institutional barriers and voids (Furnari, 2016; Khlystova et al., 2022) compared to those in developed economies (Audretsch et al., 2022b). Prior research has investigated the importance of home country informal institutions in explaining internationalisation, particularly in smaller firms (Ngo et al., 2016; Shinkle and Kriauciunas, 2010), the role of actors' behaviour at the micro level and why exactly they become engaged in corruption, with a paucity of knowledge regarding larger firms or the general effects (LiPuma et al., 2013).

To advance this conceptual debate, researchers have called for work to investigate the contextual conditions under which the actual effect of home country institutions is likely to transpire, such as regional, industry and organisational context effects (Haddoud et al., 2021; Santangelo and Stucchi, 2018). Contrary to the institutional view, studies that use the resource-based view suggest that differences in export intensity are the result of differences in firms' resources and capabilities (Cavusgil and Zhou, 1994; Piercy et al., 1998) as well as the degree to which firms depend on specific resources within certain geographical proximities and institutions (Audretsch et al., 2022a).

The resource-based view suggests that each firm represents a unique combination of valuable, rare and difficult-to-replicate resources, which can be established both due to the firm's characteristics and capabilities (Barney, 1991) and due to the industry specificity where the firm is located (Audretsch and Belitski, 2023; Kamasak et al., 2016). The resource-based view and the institutional theory can complement one another in explaining firm internationalisation, as differences in firms' access to and accumulation of resources may also influence the benefits firms acquire and the extent to which they depend on and need to rely on local institutions and local resource providers, including the government (Zhang et al., 2025).

This dynamic seems more prominent in developing and emerging economies because they are open to developing international collaborations despite their limited available resources and capabilities. However, they may be constrained by the industry resources they need to export. In this regard, prior research has examined how a firm's individual behaviour and home country institutions facilitate or constrain firms' exporting depending on different firm-specific resources (Chen et al., 2018; Hernández et al., 2022; Kamasak, 2011) and the industry where they are located (Li et al., 2013). Together, these studies provide multiple insights into whether firm-specific resources and capabilities may foster individual corrupt behaviour, limiting or creating opportunities for export growth. However, despite these contributions, little research explicitly investigates the joint influence of firm-level and country-level institutions on firm export performance and internationalisation, with prior research focusing on specific dimensions without their concurrent consideration (Belitski et al., 2023; Fang et al., 2018).

Firm corruption and exports

In less developed institutional contexts, access to information and resources is often limited to a few privileged firms with political connections or those engaging in political

entrepreneurship and lobbying (Belitski et al., 2021; Khlystova et al., 2022). The 'greasing the wheels' hypothesis posits that in highly bureaucratic or inefficient institutional environments, bribery reduces the transaction costs associated with dealing with inefficient bureaucrats for export approvals, foreign investment registration and compliance with local regulations (Audretsch et al., 2022b; Belitski et al., 2016, 2021). Particularly in resource-based industries, where firms rely on government-controlled assets, corruption may serve as a means to negotiate business conditions (Audretsch and Belitski, 2024; Kalyuzhnova and Belitski, 2019). Thus, firms engaged in internationalisation may leverage corrupt networks to navigate customs procedures, avoid import/export barriers and gain favourable tax treatment in foreign markets (Hernández et al., 2022).

We argue that firm-level corruption related to managerial behaviour and engagement with authorities informally will facilitate firm export due to 'the greasing the wheels effect'. Firstly, this will help firms to overcome institutional barriers and bureaucratic inefficiencies. Studies (i.e. Doh et al., 2017; Tajeddin et al., 2023) highlight that in transition economies, where financial and legal institutions are underdeveloped, bribery can substitute for efficient governance, facilitating quicker access to resources and market entry. Managers, particularly, can leverage their personal networks and relationships as these networks often span formal and informal domains, where political and business connections help firms 'get things done' amidst institutional inefficiency (Belitski and Grigore, 2022). Corruption, understood here as informal deal-making or facilitation payments, may be embedded in such networks, enabling firms to bypass red tape and expedite the export process. Informal institutional context inevitably augments uncertainty among other market entrants, increases the cost of exporting (Baron et al., 2018), and encourages exporters to engage with authorities and bribe (Cuervo-Cazurra, 2008).

Secondly, engaging informally with authorities on export will lead to potentially favourable treatment and preferential contracts, including procurement contracts (Cataltepe et al., 2023; Kalyuzhnova et al., 2022). Corruption allows firms to gain preferential treatment in international trade by securing government contracts, subsidies and favourable trade policies (Cuervo-Cazurra, 2016). Based on these explanations, we hypothesise:

> Hypothesis 1a (H1a): Firm corruption positively affects firm internationalisation (*greasing the wheels effect*).

Institutional corruption and firm exports

In contrast to its favourable *greasing the wheels effect*, corruption is likely to *sand the wheels* of exports and negatively affect firm internationalisation at the macro-level for several reasons. Firstly, high macro-level corruption creates uncertainty in market transactions, discouraging firms from engaging in international trade and investment (Tajeddin et al., 2023). Firms operating in highly corrupt environments face unpredictable enforcement of contracts, weak property rights and arbitrary regulatory decisions, which increase the risks associated with internationalisation (Cuervo-Cazurra, 2016).

Secondly, macro-level corruption imposes additional costs on firms, as businesses must continuously pay bribes to maintain operations, access government services and secure trade permits (Weißmüller and Zuber, 2023). This 'bribery tax' disproportionately affects firms seeking to expand internationally, as they must navigate corruption not only in their home country but also in foreign markets with similar institutional weaknesses (Hernández et al., 2022). Thirdly, corruption reduces firm productivity and innovation by diverting financial and managerial resources away from value-generating activities (Ko et al., 2021). Firms that rely on domestic corrupt practices may struggle to compete in international markets where stricter anti-corruption regulations are in place (Belitski and Desai, 2024; Kamasak et al., 2019). Corruption at the macro-level also undermines the credibility of home-country firms, making them less attractive partners for foreign investors and limiting their expansion opportunities (Hernández et al., 2022).

Finally, overall regional and country corruption will create additional risks for the most productive firm to enter the market in fear of being targeted by corrupt authorities, increasing doing business costs. In highly corrupt home countries, firms face challenges in entering international markets due to the arbitrary corruption effect (Audretsch et al., 2022b), where bribing may not guarantee benefits, as everybody else bribes as well (Cuervo-Cazurra, 2016). Studies (i.e. De Jong and Bogmans, 2011; Narayan and Bui, 2021) on transition and emerging economies have demonstrated that high macro-level corruption discourages foreign direct investment and reduces the likelihood of firms engaging in export activities. We contend that macro-level corruption weakens firms' long-term internationalisation prospects and hypothesise:

Hypothesis 1b (H1b): Macro-level corruption negatively affects firm internationalisation (*sanding the wheels effect*).

Resource-based sectors, institutions and exports

Context characteristics do not solely influence internationalisation but may also be contingent upon firm resources and the sector in which the firm is located, which may either limit or increase the use and supply of resources (Meyer et al., 2009; Zhu and Morgan, 2018). For example, resource-based sectors, such as oil, gas, minerals and other natural resources, are more prone to corruption due to their inherent inability to relocate swiftly to a different region or country. The limited ability to relocate and dependence on licenses for exports push firms to seek privileged access to government support for favourable treatment and resources. Thus, the benefits and costs of corruption manifest differently across sectors. The positive effect of firm-level corruption on exports could accelerate in resource-based sectors for the following reasons.

Firstly, firms in resource-based industries depend highly on the government to secure licenses, including procurement and access to natural resources, privileged and exclusive rights on extraction, and export contracts (Bauhr, 2012; Kalyuzhnova and Belitski, 2019). Corruption enables these firms to expedite negotiations with state authorities to obtain these critical permits and bypass bureaucratic inefficiencies that would otherwise

slow their internationalisation process. Previous research (Kamasak et al., 2019; Katic and Hillman, 2023; Krammer, 2019) shows that firms in resource-based sectors often adopt non-market, that is, corporate political activities or relationship-based strategies with government officials to secure access to knowledge and resources. Furthermore, firms in resource-based industries often cannot relocate their operations quickly. They can use bribery to ensure business continuity and gain access to state-controlled logistics networks in highly regulated environments (Cuervo-Cazurra, 2016).

Secondly, international expansion for resource-based firms often requires entry into countries with similar weak institutional frameworks, where bribery is an accepted business practice (Tajeddin et al., 2023). Empirical research suggests that resource firms operating in high-corruption environments often utilise informal networks and bribery to secure preferential treatment in bidding for resource extraction contracts (Hernández et al., 2022). Resource-based firms can establish local partnerships, gain political backing and reduce risks associated with expropriation or regulatory changes by engaging in corrupt practices. Similarly, prior research has shown that firms in extractive industries are more likely to use corruption to bypass bureaucratic bottlenecks and maintain political ties (Belitski et al., 2021; Ko et al., 2021). From this perspective, corruption in resource-based sectors may become a necessary cost to grease the wheels, and this practice helps them absorb the risks and better navigate complex regulatory landscapes than firms from non-resource industries (Cuervo-Cazurra, 2016).

Finally, unlike firms in non-resource-based industries, such as retail and manufacturing, which rely on competitive pricing and product differentiation, resource-based firms operate in oligopolistic markets where government relationships dictate access to resources (Kalyuzhnova and Belitski, 2019). Firms in these industries often leverage corruption to ensure long-term stability and protection from foreign competitors. In many oil-exporting countries, multinational firms navigate local corruption dynamics to form joint ventures with state-owned enterprises, which is essential for securing operational legitimacy. Thus, we hypothesise the following:

> Hypothesis 2a (H2a): Firms in resource-based industries further increase the positive effect of firm corruption on their internationalisation (*greasing the wheels effect*).

While building informal human relations with local bureaucrats is believed to provide a quicker and more effective way of accessing resources (Belitski et al., 2021), it also increases uncertainty and transaction and search costs (Audretsch et al., 2022b; Kiss and Danis, 2008). Increased transaction and search costs are irrevocable and unavoidable for all industries. However, they may be more pronounced in resource-rich sectors where access to natural resources is at the heart of the business model and firm operationability. This resource dependency and the time required to build relationships with authorities distract managers from other macro-challenges, such as economic shocks, competition and logistics. Firms in resource-based sectors must focus on developing and improving their technology and technical skills to handle the challenges of internationalisation, rather than spending their time and finances on dealing with a locally corrupt environment.

In other words, the diversion of effort and attention towards bribing authorities in resource-rich sectors is to an extent unavoidable as firms in non-resource-based sectors may have a more flexible choice of location and choice of region, hence regional authorities to deal with. Existence of institutional voids in home country institutions forces firm managers to allocate resources to bribery instead of improving quality of export products and services, expanding to other markets (Marano et al., 2016). The protracted administrative processes related to licenses, permissions, taxes and public procurement requirements, including local-specific technical and environmental requirements for the resource-rich sector, will act at the macro-level as 'sanding the wheels' of the export effect (Graycar and Villa, 2011; Kalyuzhnova and Belitski, 2019). Finally, foreign stakeholders and customers may perceive a firm as risky to collaborate with if it originates from a high-corruption context, where informal relations with authorities are necessary to facilitate exports and may impede collaboration and investment (Qian et al., 2017). Firms from corrupt contexts can be perceived as less credible, less trustworthy and less predictable. Due to constrained resource mobility in resource-based sectors, an informal relationship with the government is unavoidable for internationalisation and business maintenance. Thus, we hypothesise the following:

Hypothesis 2b (H2b): Firms in resource-based industries further increase the negative effect of regional corruption on their internationalisation (*sanding the wheels effect*).

Data and methodology

Sample

This research draws on firm-level and country-level data to test its hypotheses using the World Bank Enterprise Surveys (WBES) (2025), specifically designed to evaluate the influence of government policies on firm exports and business activities. This dataset includes survey information and randomly conducted face-to-face interviews with firm managers and owners. Our sample comprises 186,027 firms spread across 137 countries, with data collected through multiple firm surveys conducted by the World Bank's Enterprise Survey team between 2006 and 2024. The comprehensive list of countries with several firm distributions is provided in Appendix A. Based on Appendix A according to the World Bank income classifications, we have 21 developed countries (high-income economies) in a sample Austria, Belgium, France, Germany, Hong Kong, China, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Singapore, South Korea, Spain, Sweden, Switzerland, United Arab Emirates, United Kingdom and the United States and 116 developing and emerging countries (low- and middle-income economies).

These cross-sectional surveys provide unique indicators that capture various forms of interactions between firms and public authorities, taking into account the firm's location. Since export patterns are influenced by firm-level, regional and country-level characteristics, our estimation approach involves firm-level variables while controlling for regional and country-level variances. Each survey represents a stratified sample of firms by size, sector and region.

Additionally, we matched two third-party organisation datasets of World Bank governance indicators by the World Bank Group (2025) for the period 2006–2023 to use as a control for the corruption index, where the values range from +2.5 (least corrupt) to −2.5 (most corrupt). However, we reversed the indicator so that an increase in the indicator would mean more corruption in a country. We also matched the Corruption Perceptions Index (CPI) and reversed it from Transparency International (2025) from 2006 to 2024. The CPI of Transparency International ranges from 100 (least corrupt countries) to −10 (most corrupt countries). By focusing on multiple cross-sections within each country from 2006 to 2024, we mitigate the problem of unobserved heterogeneity associated with regional and macroeconomic trends.

Furthermore, we reduce issues related to compositional effects and unobserved regional-level heterogeneity by controlling for country, industry and year-fixed effects. Detailed information about data sources and variable descriptions is found in Table 1. The correlation table for the variables used is presented in Table 2. The distribution of sectors and firm size within our sample is depicted in Table 3.

Variables

Dependent and explanatory variables. Our dependent variable, a firm's export intensity, is measured by the proportion of foreign sales in total sales, also termed export intensity. The share of a firm's direct and indirect exports over total sales ranges from 0% to 100%, with higher values indicating a greater export share of total sales volume, consistent with prior studies such as Qi et al. (2020) and Wai et al. (2022).

To test H1a and H1b, we consider individual (firm) and regional corruption levels, and for H2a and H2b, we introduce the industry-specific effect of corruption on firm internationalisation. Given their place-based business dependence on the country's formal and informal institutions, we argue that firms in resource-based industries may accelerate the effect of firm and regional corruption on a firm's internationalisation. Many studies addressing the impact of corruption rely on country-level analysis and data sourced from comprehensive indices like Doing Business (World Bank Group, 2025), World Governance Indicators (World Bank Group, 2025), Economic Freedom Index (Heritage Foundation), Global Competitiveness Index (World Economic Forum) and Corruption Perception Index (Transparency International) (Belitski et al., 2016; Chowdhury et al., 2019).

We compute two primary explanatory variables: firm and regional level of corruption. For firm-level corruption, we use a Cronbach's alpha ($\alpha = 0.72$) of the following firm characteristics available from the WBES (2025) at firm level and Tonoyan et al.'s (2010) study which specified that facing more bureaucracy firms will be more involved in corruption directly and indirectly, we use the following indicators – total annual informal payment in logs, percent of total annual sales paid in informal payments to authorities, perception of an obstacle to business: customs and trade regulations; perception of an obstacle to business: corruption; perception of court system as fair, impartial (reversed); if a gift was requested during tax and other administrative inspections; if a gift was requested while exporting. We follow the same approach when calculating regional corruption levels, using a Cronbach's alpha ($\alpha = 0.67$) of the firm characteristics above,

Table 1. Descriptive statistics.

Variable	Description of variables	Mean	St. dev.	Min	Max
Export intensity	What % of the establishment's sales were direct and indirect exports?	11.156	26.281	0.000	100.000
Age	Firm age since establishment, in logarithms	3.256	0.515	0.693	5.872
Employment, logs	Number of full-time employees, logs	3.386	1.317	0.000	12.047
Female	Female is a top executive = 1 and 0 otherwise	0.138	0.345	0.000	1.000
Technology licenced	Do you use technology licensed from a foreign-owned company	0.106	0.308	0.000	1.000
Web	The website is used for e-commerce and communication in a value chain	0.537	0.499	0.000	1.000
Training	Share of full-time employees who received specialised innovation, ICT and sales training	10.257	27.677	0.000	100.000
University degree	Share of full-time employees with a university degree	1.733	4.474	0.000	100.000
High-school degree	Share of full-time employees who finished high school	26.973	39.922	0.000	100.000
Resource firm	The firm is in a resource-based industry, zero otherwise	0.084	0.277	0.000	1.000
Firm corruption	Cronbach alpha of the following firm characteristics (total annual informal payment in logs, percent of total annual sales paid in informal payments to authorities, perception of an obstacle to business: customs and trade regulations; perception of an obstacle to business: corruption; perception of court system as fair, impartial (reversed); if a gift was requested during tax and other administrative inspections; if a gift was requested while exporting) ($\alpha = 0.72$)	−0.001	0.457	−0.671	4.218
Regional corruption	Cronbach's alpha of firm corruption calculated by region where a firm is located, with the survey weighting created using firm size, industry and regional stratified random sampling; see WBES (2025) for details	0.002	0.208	−0.560	1.134
Control for corruption reversed	Control for corruption estimate varies between −2.5 – least corrupt and 2.5 – most corrupt	0.296	0.753	−2.236	1.672
Corruption perception index reversed	The corruption perception index of Transparency International varies between −100 least corrupt and 10 most corrupt	−51.156	21.875	−90.000	−7.000

Source: WBES (2025).
ICT: information and communication technologies.
Number of observations: 186,027.

Table 2. Correlation matrix.

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Export intensity	1												
2. Age	0.053*	1											
3. Employment logs	0.287*	0.238*	1										
4. Female	−0.004*	−0.060*	−0.070*	1									
5. Technology licenced	0.153*	0.028*	0.204*	−0.010*	1								
6. Web	0.147*	0.094*	0.328*	0.008*	0.157*	1							
7. Training	0.153*	0.121*	0.234*	−0.028*	0.142*	0.122*	1						
8. University degree	0.041*	0.094*	0.109*	−0.017*	0.080*	0.005*	0.207*	1					
9. High school degree	0.034*	−0.139*	0.133*	0.050*	0.040*	0.156*	0.028*	−0.039*	1				
10. Resource firm	−0.002	0.035*	0.068*	−0.049*	0.033*	0.016*	0.119*	0.176*	0.038*	1			
11. Firm corruption	0.021*	0.057*	0.018*	−0.023*	0.016*	−0.064*	0.023*	0.014*	−0.108*	−0.024*	1		
12. Regional corruption	−0.050*	0.063*	−0.037*	−0.047*	−0.038*	−0.151*	−0.001	0.016*	−0.181*	−0.051*	0.464*	1	
13. Control for corruption reversed	−0.115*	−0.090*	−0.027*	−0.033*	−0.068*	−0.237*	−0.038*	0.076*	−0.114*	−0.002*	0.282*	0.551*	1
14. Corruption perception index reversed	−0.108*	−0.089*	−0.045*	−0.033*	−0.062*	−0.232*	−0.058*	0.055*	−0.126*	−0.013*	0.283*	0.554*	0.858*

Source: WBES (2025).
Number of observations: 186,027.

Table 3. Sample distribution by sector and firm size.

Industry	Number of firms	Share
Basic metals	475	0.26
Basic metals/fabricated metals	651	0.35
Chemicals & chemical products	3536	1.90
Chemicals, non-metallic minerals and plastics	155	0.08
Chemicals, plastics & rubber	950	0.51
Construction	3782	2.03
Electrical & computer products	43	0.02
Electronics	445	0.24
Electronics & communications Equip.	933	0.50
Fabricated metal products	4699	2.53
Food	15,127	8.13
Furniture	893	0.48
Garments	6996	3.76
Hospitality & tourism	1074	0.58
Hotels	1853	1.00
Hotels & restaurants	1168	0.63
IT & IT services	1712	0.92
Leather products	670	0.36
Machinery & equipment	4084	2.20
Manufacturing	18,432	9.91
Manufacturing panel	229	0.12
Metals, machinery, computers	77	0.04
Minerals, metals, machinery & equipment	83	0.04
Motor vehicles	1220	0.66
Motor vehicles & transport Equip.	126	0.07
Non-metallic mineral products	4252	2.29
Other manufacturing	20,095	10.80
Other services	38,704	20.81
Other services panel	184	0.10
Printing & publishing	160	0.09
Professional activities	233	0.13
Publishing, telecommunications & IT	54	0.03
Rest of the universe	3600	1.94
Restaurants	963	0.52
Retail	28,279	15.20
Retail panel	184	0.10
Rubber & plastics products	2038	1.10
Services	5734	3.08
Services of motor vehicles	663	0.36
Services of motor vehicles/wholesale	749	0.40
Textiles	3286	1.77

(Continued)

Table 3. (Continued)

Industry	Number of firms	Share
Textiles & garments	2101	1.13
Textiles, garments & leather	114	0.06
Transport	246	0.13
Transport, storage & communications	993	0.53
Wholesale	2644	1.42
Wholesale & retail	668	0.36
Wholesale, including motor vehicles	147	0.08
Wood products & furniture	202	0.11
Wood products, furniture, Paper & Pub.	321	0.17
Total	186,027	100,00
Firm size		
Micro and small firms (<20 FTES)	86,782	46.65
Medium small (20–99 FTES)	63,264	34.01
Medium large and large firms (100 FTEs and more)	35,981	19.34
Total	186,027	100,00

calculated by region and available from the WBES (2025) data, weighted by survey-stratified weights by firm size and industry. The methodology of using weights and random sampling is available from WBES (2025). As part of robustness check of regional corruption level, we used national-level corruption indicators such as control for corruption estimate which varies between −2.5 (least corrupt) and 2.5 (most corrupt) from the World Bank development indicators (World Bank Group, 2025) and the corruption perception index from Transparency International (2025) which varies between −100 least corrupt to 10 most corrupt (reversed) countries.

We created a 'resource-based firm' binary variable, which equals one (1) if a firm belongs to a resource-based industry and zero (0) otherwise. We use the United Nations Industrial Development Organization classification and the Standard Industrial Classification (SIC) system to select resource-based industries (United Nations Department of Economic and Social Affairs, Statistics Division, 2008). More specifically, we define resource-based industries as those that are highly dependent on natural resources and government-controlled extraction or licensing processes. These industries include mining and quarrying, oil and gas extraction, forestry and logging, basic metal production and metal products, fabricated metals, machinery and equipment, chemicals and chemical products, chemicals, plastics and rubber, wood products and furniture, minerals, metals and machinery, mining-related manufacturing and petroleum products (see Table 3).

Control variables. We control for firm characteristics, which are known as the main determinants of firms' exporting (Shinkle and Kriauciunas, 2010), by using key firm-level attributes such as the firm's age and size (in terms of employment). Prior research indicates that small firms, compared to larger firms, face the liability of smallness, meaning

they lack the resources necessary to effectively deploy the routines required to implement a challenging internationalisation strategy (Brouthers et al., 2009; Narula, 2004). Smaller firms must raise resources to successfully enter foreign markets (Filatotchev et al., 2009). Additionally, we control a firm's utilisation of information and communication technologies, including email, website, e-commerce, international technology sourcing, and the firm's sector and location.

Estimation strategy

We adopt the input–output model to test our hypotheses. In addition to corruption, the model includes conventional inputs (labour, capital and technology), with extra factors of production represented by institutional and industry measures (Estrin et al., 2013). To test our hypotheses, we utilise the Tobit estimation model. Equation (1) illustrates a firm's export intensity (Aikten et al., 1997) and the share of its exports. The share of exports in total sales may vary from 0 to 100 (export intensity):

$$E_{it} = \gamma' W_{it} + v_{it} \tag{1}$$

where $i = 1, \ldots, K$; $t = 1, \ldots, T$; E_{it} is the export intensity of firm i at time t; W_{it} is a vector of explanatory and control variables; γ' is the corresponding coefficient of a vector W_{it} and v_{it} is an error term.

We conducted a multicollinearity test by examining the variance inflation factors (VIFs) for all variables, and each *VIF* was found to be less than 10. In addition, the Pearson correlation coefficients were examined, all of which were statistically significant at the 5% level with a correlation coefficient of $p < 0.70$.

Furthermore, when estimating Equation (1), controlling for a sample selection bias was necessary. The bias can originate from the fact that some firms report exports while others do not. Thus, observations on export intensity can be affected for firms that report exports, as some firms engage in exports without disclosing this fact.

Following a two-stage Heckman (1979) approach, we first estimate a probit Equation (2), where the dependent variable is a firm that reports (or does not) its exports. Secondly, we use the predicted values for reporting export from Equation (2) to compute the inverse Mills' ratio for firm i located in region z and country m (λ_{izm}).

Stage 1: Selection model:

$$\Pr(D = 1 \mid z_{ijk}) = \Phi(\alpha' z) \tag{2}$$

where $D = 1$, if the firm reports export and $D = 0$, otherwise; α is a vector of unknown parameters, and Φ is the cumulative distribution function of the standard normal distribution; z is a vector of explanatory variables that affect the decision to report export or

Table 4. Selection model: marginal effects after the probit estimation (Dependent Variable [DV]: export sales disclosed = 1).

Two-step Heckman approach	Model 1: disclosure = 1		
	dx/dy	SE	Confidence intervals
Age (log)	1.55**	0.06	1.44–1.68
Firm is a part foreign-owned alliance 1 = yes, 0 = otherwise	0.92	0.06	0.80–1.05
How much of an obstacle: Labour regulations? (0 – no obstacle; 5 – severe)	0.88***	0.01	0.85–0.91
How much of an obstacle: Tax administration? (0 – no obstacle; 5 – severe)	0.94***	0.01	0.91–0.97
Country dummies (reference country = Bolivia)	Yes		
Industry dummies (reference = construction and transport)	Yes		
Number of obs.	199,146		
LR chi^2 (188)	6964.29		
Prob > Chi^2	0.00		
Pseudo-R^2	0.2071		
Log-likelihood	−13,329.741		

Source: WBES (2025).
Marginal effects and robust standard errors from the probit regression model are shown. The inverse Mills' ratios calculated are used in the final stage to predict exports.
***, ** and * Number of obs. 199,146. Significance at the 1%, 5% and 10% levels, respectively. Both models include year controls, which are jointly significant.

not. The estimation Equation (2) results are reported in Table 4 and are based on a full sample of 186,027 observations.

The Tobit model was used because the outcome variable is censored between zero and one hundred in export intensity. The calculation was done in *STATA 17* using longitudinal data collected every year cross-sectionally between 2006 and 2024. We used industry, year and country-fixed effects as additional control variables. We also included the inverse Mills' ratio from estimation Equation (2) in our Tobit Equation (1). We used the maximum number of observations available for non-missing values to test our hypotheses and treated all non-applicable, non-identified and other responses as missing values. The results of the Tobit estimation of Equation (1) for testing all hypotheses are presented in Table 5.

Results

Table 5 takes a step-wise approach to testing H1a, H1b, H2a and H2b starting with the baseline model which includes control variable, Mills ratio (spec. 1) gradually adding firm and regional effects of corruption (spec. 2–4) and effect for resource-based firms (spec. 5–6) eventually controlling for all interaction effects (spec. 7, Table 5).

We find the positive effect of firm-level corruption on export growth, as an increase in one standard deviation in the firm corruption index is associated with a 3.6%–10.1%

Table 5. Tobit regression (DV – share of direct export in total sales of establishments, %).

Specifications	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Step-wise approach	Baseline	+ Firm corruption	+ Regional corruption	Firm and regional + corruption	Resource-based + firm corruption	Resource-based + regional corruption	All controls
Age	−2.857*** (0.43)	−2.764*** (0.43)	−3.174*** (0.43)	−3.060*** (0.43)	−2.811*** (0.43)	−3.234*** (0.43)	−3.119*** (0.43)
Employment	16.08*** (0.18)	16.02*** (0.18)	16.25*** (0.18)	16.15*** (0.18)	16.03*** (0.18)	16.26*** (0.18)	16.17*** (0.18)
Female CEO	1.853*** (0.64)	1.890*** (0.64)	1.477** (0.64)	1.402** (0.64)	1.681*** (0.64)	1.266** (0.64)	1.163* (0.64)
Foreign technology	23.42*** (0.63)	23.29*** (0.63)	23.20*** (0.63)	22.73*** (0.63)	23.27*** (0.63)	23.20*** (0.63)	22.71*** (0.63)
Website for e-commerce	25.28*** (0.49)	25.52*** (0.49)	23.95*** (0.49)	24.01*** (0.49)	25.49*** (0.49)	23.93*** (0.49)	23.97*** (0.49)
Job training	0.268*** (0.01)	0.267*** (0.01)	0.270*** (0.01)	0.268*** (0.01)	0.271*** (0.01)	0.275*** (0.01)	0.273*** (0.01)
University degree	0.068** (0.03)	0.072 (0.05)	0.043 (0.05)	0.042 (0.05)	0.037 (0.05)	0.004 (0.05)	0.004 (0.05)
High School degree	0.035*** (0.01)	0.031*** (0.01)	0.053*** (0.01)	0.052*** (0.01)	0.030*** (0.01)	0.052*** (0.01)	0.051*** (0.01)
Mills ratio	−21.24*** (4.14)	−23.50*** (4.16)	−11.96*** (4.14)	−13.84*** (4.14)	−22.90*** (4.15)	−11.17*** (4.15)	−13.11*** (4.14)
Firm corruption (H1a)		3.666*** (0.47)		10.087*** (0.52)	2.937*** (0.49)		9.415*** (0.55)
Regional corruption (H1b)			−23.15*** (1.10)	−33.63*** (1.23)		−23.96*** (1.15)	−33.83*** (1.29)
Resource firm					−4.899*** (0.79)	−5.716*** (0.81)	−5.845*** (0.81)
Resource firm × Firm corruption (H2a)					7.335*** (1.61)		7.031*** (1.77)
Resource firm × Regional corruption (H2b)						4.823 (3.72)	−1.151 (4.11)
Constant	−135.10*** (1.58)	−134.70*** (1.58)	−135.90*** (1.58)	−135.10*** (1.57)	−134.50*** (1.58)	−135.80*** (1.57)	−134.90*** (1.57)
var(export intensity)	4794.80*** (37.35)	4792.30*** (37.33)	4776.30*** (37.19)	4760.80*** (37.06)	4786.50*** (37.29)	4770.10*** (37.15)	4753.80*** (37.01)
Number of obs.	186,027	186,027	186,027	186,027	186,027	186,027	186,027
Chi-squared	25,417.79	25,479.62	25,868.75	26,243.09	25,540.89	25,926.66	26,317.85
Loglikelihood	−304,612.4	−304,581.5	−304,386.9	−304,199.8	−304,550.9	−304,358	−304,162.4
Number of left-censored	141,278	141,278	141,278	141,278	141,278	141,278	141,278
Number uncensored	44,749	44,749	44,749	44,749	44,749	44,749	44,749
Residual DOF	186,018	186,017	186,017	186,016	186,015	186,015	186,013
Pseudo R^2	0.040	0.040	0.040	0.041	0.040	0.040	0.041

Source: World Bank Group (2025).
The 90%, 95% and 99% confidence intervals do not include zero. Reference category for sector = Minerals.
Significance is *0.1%, **0.05% and ***0.01% do not include zero.

increase in export intensity (spec 2–4, Table 5), supporting H1a. When this is interpreted practically, a firm that currently derives 60% of its revenue from exports can raise its export share to between 62.1% and 66% with a one standard deviation increase. This increase can be particularly significant in highly regulated or low-trust environments where formal mechanisms do not function efficiently. The argument that aligns with H1a is that corruption at the firm level can act as a 'grease the wheels' mechanism in export markets. By reducing bureaucratic barriers, firms that engage in corruption (e.g. bribing officials for licenses, contracts or export permissions) may experience faster regulatory approvals, easier customs clearance and reduced transaction costs in export operations. In corrupt environments, firms that know how to navigate informal networks may gain privileged access to trade incentives, tax reductions or preferential procurement contracts in foreign markets. Finally, corrupt firms may be able to bypass rigid trade regulations or institutional voids that would otherwise limit their ability to operate in international markets. Thus, at the firm level, corruption may be an adaptive strategy (Cuervo-Cazurra, 2016) – particularly in weak institutional settings – where firms leverage informal payments or connections to overcome institutional inefficiencies and expand into foreign markets.

Interestingly, we find the mixed effects of corruption on firm internationalisation as the regional corruption effect is negative and significant. One standard deviation increase in regional corruption is associated with a 23%–33% reduction in export intensity (spec. 3–4, Table 5), supporting H1b. As a practical interpretation at the regional level, this implies a drop between 46.2% and 40.2% for the same hypothetical firm, which generates 60% of its revenue from exports. This suggests that, at the regional level, corruption functions as 'sanding the wheels', undermining firms' ability to export due to macro-level institutional deterioration. This finding can be attributed to the following mixed mechanisms. Firstly, institutional uncertainty, as institutionalised corruption at the regional level, increases uncertainty in business environments, as firms face arbitrary demands for bribes, unstable regulations and the risk of contract enforcement failures. Secondly, destroying trust and reputation in the industry – as foreign partners and investors may perceive firms from highly corrupt regions as high-risk entities, making it difficult for these firms to access international finance, secure trustworthy foreign partners or comply with global anti-corruption laws. Thirdly, an increase in transaction costs may occur as regional corruption creates additional costs that outweigh any firm-level advantages. Excessive demands for informal payments at customs, tax offices or trade facilitation agencies may increase operational inefficiencies, reducing firms' ability to compete in global markets. In corrupt regions, firms may suffer from weaker infrastructure, lower quality public services and limited access to trade-related resources, making it more challenging for firms to scale their export activities. Thus, while firm-level corruption can be strategically beneficial, systemic regional corruption creates a hostile business environment, offsetting potential firm-level gains by increasing costs, risks and regulatory inefficiencies.

The results are both novel and intriguing. The current literature presents two opposing perspectives: corruption as a barrier (sanding the wheels), which increases transaction costs and market uncertainty, and Corruption as an enabler (greasing the wheels), which allows firms to bypass bureaucratic inefficiencies (Belitski et al., 2016; Mohamadi et al., 2017).

Furthermore, firm and regional corruption disproportionately affects resource-based firms that rely on oil, gas and mineral resources located within a specific country. This is due to their dependency on government-issued licenses and immobile resources in the soil. Corruption may strategically benefit some resource-based firms to a greater extent, and this is what we find. Being a resource-based firm and experiencing an increase in firm-level corruption by a standard deviation increases export intensity by 10.3% (7.4% + 2.9%), supporting H2a. This differs from the direct effect of firm corruption on average export intensity – 2,9% (spec. 4, Table 5). For regional corruption, the direct effect remains negative, resulting in a 23% reduction in export intensity for both resource-based and non-resource-based firms. The interaction is insignificant and does not support H2b (spec. 6, Table 5).

Overall, we find that both resource- and non-resource-based firms increase their internationalisation if they are engaged in corrupt behaviour. Larger firms, particularly in resource-based sectors, with extensive political connections and lobbying power, may be better positioned to navigate corruption, using it as a tool to facilitate exports. Resource-based firms are essentially larger in size and are well-connected with policymakers. Unlike other firms, they may find corruption as a greasing wheel tool for exports.

Robustness checks

In Table 6, we take a different approach and substitute the regional corruption measure with the national level of corruption as a control for the corruption index from the World Bank Group (2025) and the corruption perception index (Transparency International, 2025) instead of the regional corruption measure. Table 6 presents the main results broken down into two models for two measures of macro-level corruption – control for corruption (spec. 2, Table 6) and corruption perception index (spec. 4, Table 6). We support H1a, which states that firm-level corruption has a positive effect on firm internationalisation ($\beta = 12.413$, $p < 0.01$) (spec. 1, Table 6). We support H1b, which states that the macro-level of corruption has a negative effect on firm internationalisation using control for corruption ($\beta = -19.091$, $p < 0.05$) (spec. 1, Table 6) and using the corruption perception index ($\beta = -0.641$, $p < 0.01$) (spec. 3, Table 6). In economic terms, a 1 standard deviation increase in firm corruption is associated with 12.4% increase in export intensity constructed from informal payments, bribery frequency and perceived institutional obstacles, while a 1 unit increase in control estimate of corruption reduces export intensity by 19% (spec. 1, Table 6) and one position increase in corruption perception index reduces export intensity by 0.64% (spec. 2, Table 6), supporting H1b.

Furthermore, we test the interaction effects of resource-based firms and mixed levels of corruption. We confirm H2a, which states that firms in resource-based industries further increase the positive impact of firm corruption on their internationalisation between 8.60% and 8.88% ($\beta = 8.607$–8.884, $p < 0.05$), supporting H2a. This is the greasing the wheels effect, which works with both proxies for national corruption. To test H2b, we use the following approach – we interact the resource-based binary variable with two proxies for the national level of corruption. For the control for corruption index of the World Bank, we find that a one unit increase in national corruption for resource-based firms reduces its export intensity from 18.31% to 27.0% (−18.3 + (−8.7)) (spec. 2, Table 6),

Table 6. Regression analysis with alternative third-party organisations' institutional measures of national corruption.

Specifications	(1)	(2)	(3)	(4)
Step-wise approach	Firm and national + corruption	All controls	Firm and national + corruption	All controls
Age	−1.570*** (0.45)	−1.622*** (0.45)	−0.990** (0.45)	−1.050** (0.45)
Employment	17.42*** (0.18)	17.45*** (0.18)	17.14*** (0.18)	17.19*** (0.18)
Female CEO	1.188* (0.65)	1.007 (0.65)	1.063 (0.66)	0.899 (0.66)
Foreign technology	20.911*** (0.64)	20.891*** (0.64)	21.611*** (0.64)	21.601*** (0.64)
Website for e-commerce	19.001*** (0.51)	18.952*** (0.51)	19.771*** (0.51)	19.701*** (0.51)
Job training	0.254*** (0.01)	0.257*** (0.01)	0.248*** (0.01)	0.249*** (0.01)
University degree	0.265*** (0.05)	0.317*** (0.05)	0.180*** (0.05)	0.228*** (0.05)
High school degree	−0.065*** (0.01)	−0.063*** (0.01)	−0.064*** (0.01)	−0.062*** (0.01)
Mills ratio	0.558 (4.19)	0.864 (4.18)	0.195 (4.20)	0.490 (4.19)
Firm corruption (H1a)	12.413*** (0.49)	11.471*** (0.51)	11.911*** (0.49)	10.991*** (0.51)
Control for corruption reversed (H1b)	−19.091*** (0.31)	−18.311*** (0.32)		
Corruption perception index reversed (H1b)			−0.641*** (0.01)	−0.613*** (0.01)
Resource firm		−3.973*** (0.81)		−24.371*** (2.30)
Resource firm - Firm corruption (H2a)		8.884*** (1.65)		8.607*** (1.64)
Resource firm - Control for corruption reversed (H2b)		−8.727*** (1.01)		
Resource firm - Corruption perception index reversed (H2b)				−0.353*** (0.04)
Constant	−117.26** (1.60)	−116.90*** (1.60)	−156.40*** (1.70)	−154.40*** (1.70)
var(export intensity)	4679.00*** (37.11)	4668.40*** (37.03)	4706.10*** (37.35)	4695.50*** (37.26)
Number of obs.	186,027	186,027	186,027	186,027
Chi-squared	28,530.7	28,663.06	27,989.1	28,122.72
Loglikelihood	−290,394.8	−290,328.6	−290,665.6	−290,598.8
Pseudo R^2	0.046	0.047	0.045	0.046

Source: World Bank Group (2025).
The 90%, 95% and 99% confidence intervals do not include zero. Reference category for sector = 80–85.
Significance is *0.1%. **0.05% and ***0.01% do not include zero.

supporting H2b. For the control for corruption perception index of Transparency International, we find that for resource-based firms, a one unit increase in the corruption perception index reduces export intensity from 0.61% to 0.96% (−0.61 + (−0.35)) (spec. 4, Table 6), supporting H2b. Thus, we support H2b with two various proxies for the national level of corruption, finding that in resource-based industries, the negative effect is accelerated (sanding the wheels effect). Finally, we split the sample for resource-based firms (spec. 1, 3 and 5, Table 7) and non-resource-based firms (spec. 2, 4 and 6, Table 7).

We test our H1a which is confirmed given firm corruption has positive effect on export intensity across different specifications when controlling for regional corruption (spec. 1–2), control for corruption of the World Bank (spec. 3–4) and corruption perception index (spec. 5–6, Table 7). Interestingly, the positive effect is double when comparing coefficients of firm-level corruption effect on exports between resource-based ($\beta = 16.40$, $p < 0.05$) and non-resource-based firms ($\beta = 9.35$, $p < 0.05$) (spec. 1–2, Table 7), supporting H2a. The results are confirmed when controlling for macro-corruption and corruption perception index in spec. 3–6 (Table 7).

Our H2b is also confirmed as we find that the effect of control for corruption of World Bank on a firm's export intensity is negative between resource-based ($\beta = -16.16$, $p < 0.01$) and non-resource-based firms ($\beta = -8.35$, $p < 0.01$) (spec. 3–4, Table 7). The negative effect on resource-based firms doubles. We find that the effect of the corruption perception index of Transparency International on a firm's export intensity is negative between resource-based ($\beta = -0.378$, $p < 0.01$) and non-resource-based firms ($\beta = -0.089$, $p < 0.05$) (spec. 5–6, Table 7). Interestingly, the size of the effect of macro-corruption indicators on firm exports is consistent across both resource- and non-resource-based firms. The Inverted Mills ratio is significant, which accounts for selection bias in firms' export intensity, emerges as negative for resource-based firms and positive for non-resource-based firms. This significance reveals the presence of selection bias in firm exports and the importance of employing the Heckman (1979) procedure. Our findings thus highlight the nuanced relationship between firm corruption and corrupt context proxied by regional or national levels of corruption.

Our results demonstrate that in industries where firms have strong government connections, such as resource-based sectors, corruption may provide a competitive advantage by securing faster export licenses and smoother trade regulation controls, providing preferential treatment in contracts, or reducing regulatory burdens. For macro-corruption (Cuervo-Cazurra, 2016) firms, including resource-based are disadvantaged by a corrupt environment as they perceive corruption as costs and their corrupt behaviour may be less efficient if they operate in the environment when everyone is corrupt, reducing the competitive advantage and security to receive benefits and privileges if they bribe, extending the discussion in Audretsch et al. (2022b) between the export strategies of firms in arbitrary and pervasive corruption contexts.

Discussion

Theoretical contributions

We extend the institutional economics and business literature by challenging two prevailing assumptions and providing evidence that firm internationalisation is influenced

Table 7. Robustness check with alternative third-party organisations' institutional measures of national corruption for firms in resource-rich sectors and other sectors.

Specification	(1)	(2)	(3)	(4)	(5)	(6)
Sample	Resource firms	Non-resource firms	Resource firms	Non-resource firms	Resource firms	Non-resource firms
Type of macro-corruption index	Regional corruption based on firm-level data		Control for corruption reversed		Corruption perception index reversed	
Age	−1.726 (1.25)	−3.128*** (0.46)	−1.547 (1.25)	−3.604*** (0.47)	−1.592 (1.25)	−3.657*** (0.47)
Employment	13.73*** (0.52)	15.65*** (0.18)	13.72*** (0.52)	15.74*** (0.19)	13.72*** (0.52)	15.74*** (0.19)
Female CEO	−0.466 (2.03)	0.519 (0.65)	−0.305 (2.03)	0.729 (0.66)	−0.321 (2.03)	0.714 (0.66)
Foreign technology	10.78*** (1.50)	12.94*** (0.63)	10.72*** (1.50)	12.79*** (0.65)	10.76*** (1.50)	12.82*** (0.65)
Website for e-commerce	20.17*** (1.45)	18.45*** (0.52)	20.15*** (1.45)	18.80*** (0.53)	20.16*** (1.45)	18.82*** (0.53)
Job training	0.103*** (0.02)	0.127*** (0.01)	0.106*** (0.02)	0.130*** (0.01)	0.105*** (0.02)	0.130*** (0.01)
University degree	0.062 (0.11)	0.110** (0.05)	0.072 (0.11)	0.100* (0.05)	0.044 (0.11)	0.093* (0.05)
High school degree	0.001 (0.02)	0.015** (0.01)	−0.012 (0.02)	0.013** (0.01)	−0.011 (0.02)	0.016*** (0.01)
Mills ratio	−100.40** (42.79)	102.40*** (13.81)	−92.73** (42.87)	98.10*** (14.04)	−96.38** (42.79)	96.69*** (14.04)
Firm corruption (H1a, H2a)	16.40*** (1.28)	9.358*** (0.51)	16.02*** (1.25)	8.583*** (0.51)	15.96*** (1.25)	8.535*** (0.51)
Regional corruption (H1b, H2b)	−4.872 (4.81)	−9.674*** (1.86)				
Control for corruption reversed (H1b, H2b)			−16.16** (6.69)	−8.353*** (1.83)		
Corruption perception index reversed (H1b, H2b)					−0.378** (0.17)	−0.089* (0.05)
Constant	−99.09** (8.19)	−114.8*** (8.48)	−97.11** (8.22)	−102.50*** (9.02)	−122.0** (13.16)	−116.30*** (8.52)
var(export intensity)	2586.0** (63.41)	3978.5*** (32.13)	2584.1** (63.36)	4012.3*** (33.17)	2584.8** (63.37)	4012.8*** (33.17)
N	14,967	171,060	14,967	171,060	14,967	171,060
Chi-squared	4358.113	43,327.49	4362.933	41,443.71	4361.928	41,426.03
Loglikelihood	−26,431.2	−266,874.8	−26,428.8	−255,149.8	−26,429.3	−255,157.8
No. of left censored	10,711	130,567	10,711	125,581	10,711	125,581
No. uncensored	4256	40,493	4256	38,667	4256	38,667
Residuals DOF	14,901	170,872	14,901	164,066	14,901	164,066
Pseudo R^2	0.076	0.075	0.076	0.075	0.076	0.075

Source: World Bank Group (2025).
The 90%, 95% and 99% confidence intervals do not include zero. Reference category for sector = 80–85.
Significance is *0.1%. **0.05% and ***0.01% do not include zero.

by a combination of institutional, industry and firm-level factors. Firstly, we provide industry-specific insights and demonstrate that not all firms are equally affected by institutional constraints and that firms in resource-based industries may have more pronounced effects at the individual level, as they can benefit more from individual corruption. At the same time, they also suffer more from corruption's costs due to sector-specific immobility and regulatory exposure. Secondly, we argue that the assumption that corruption hurts business growth and internationalisation is not valid and that corruption can both grease and sand the wheels of business, with the fact that the mixed effect of corruption is pronounced at firm and regional (national) levels. However, we propose that the transition between the grease and sand roles depends on a complex array of boundary conditions that extend beyond the type of industry. One condition that shifts corruption from firm-level (grease effect) to inhibit broader institutional efficiency (sand effect) is regulatory intensity and complexity, as well as discretionary bureaucratic power. While corruption acts as a grease in environments with intense or discretionary regulations, where bribes may expedite access to necessary permits, corruption transforms into a sand mechanism where regulatory complexity, such as the requirement of multiple state approvals, leads to additional costs, the creation of uncertainty and the deterrence of sustained international engagement. Another condition can be a firm's level of capabilities. Although firms with absorptive capacity may tactically leverage the grease effect of corruption in dynamic markets to overcome temporary bottlenecks, those with lower technological readiness or managerial capabilities, in which learning and knowledge transfer are distorted (Kamasak et al., 2017), become more dependent on corruption, which ultimately proves to have a sand effect. Lastly, the temporal horizon, that is, short-term or long-term strategic decisions for exports, can be another critical determinant in the grease-sand transition. While corruption can grease the wheels in the short term by facilitating rapid market entry, it may sand internationalisation by entrenching informal dependencies and weakening formal institutional engagement.

Additionally, we show the multilevel effects of corruption, as well as positive individual and negative regional-level corruption effects. Existing research typically examines corruption at the national and individual levels, but not altogether. Yet, this study employs multiple regional and national corruption indicators to reduce the bias and quantify the multi-level effect of corruption. At the industry level, we demonstrate that a resource-based industry is a critical boundary condition for the multi-level effect of corruption on a firm's exports. We also reveal that corruption is an informal institutional constraint that firms engage with corruption and can, in fact, benefit from it, with the effect stronger in minerals, metals and oil and gas sectors as a specific informal institutional mechanism and place-based localisation of industry.

Specifically, we contribute to the ongoing debate on whether corruption 'greases' or 'sands' the wheels of business (Dreher and Gassebner, 2013). Despite some studies suggesting that corruption alleviates bureaucratic delays and facilitates transactions (Mohamadi et al., 2017), our findings indicate that corruption acts as a tax on exports rather than an efficiency enhancer in highly regulated, resource-dependent industries.

Finally, a key insight from this study is that not all resources are equally constrained by corruption. While our earlier discussion referenced access to natural resources and talent, these two types of resources play distinct roles in shaping firms' internationalisation

strategies. We do not claim a direct correlation between corruption and talent acquisition but rather acknowledge that different industries face different types of institutional barriers. Natural resources are industry-specific, often requiring regulatory approval and government oversight, making them highly susceptible to corruption-related inefficiencies. By contrast, access to talent is more relevant in knowledge-intensive sectors, which, while subject to institutional constraints, are not immobilised by corruption in the same way as resource-dependent firms.

Policy and practical implications

We offer distinct implications for policymakers and institutions at the macro-level, as well as for firms and managers at the micro-level, to support firm internationalisation and address corruption. At the macro-level, we find that home country institutional quality is a critical consideration for firm internationalisation, with regional corruption posing a significant impediment. Therefore, policymakers can enhance exporting institutions by actively combating corruption through several implementations.

We suggest that policymakers adopt industry-specific anti-corruption measures (Jones, 2023). One application could be the digitalisation of administrative processes, namely, transitioning from traditional paper-based systems to digitalised permit systems, which have been shown to enhance transparency in decision-making and reduce opportunities for bribery and regulatory bottlenecks. Case studies from Estonia's e-Government system (E-Estonia, 2025) and Georgia's digital business registration (Georgia Digital, 2025) provide evidence that automated permit processing can substantially lower corruption risks, particularly in resource-based sectors where reliance on government permits is high.

The establishment and empowerment of independent anti-corruption agencies can also be an effective mechanism to curb corruption. For example, Botswana's Directorate on Corruption and Economic Crime (Koranteng, 2018) has effectively deterred rent-seeking behaviours in contexts related to trade facilitation. However, policymakers must ensure that these agencies are institutionally insulated from political interference and have the autonomy to investigate processes with enforcement authority.

Trade facilitation reforms and initiatives that simplify and streamline customs procedures, through risk-based inspections and electronic customs clearance, have the potential to minimise discretionary power and reduce firms' exposure to bribery. For example, the implementation of Brazil's Single Window Trade System has been linked to decreasing customs processing times and increased transparency in export activities. Equally important is the reform of public procurement processes, especially for firms in resource-intensive industries. The adoption of open contracting data standards and real-time public tender tracking systems, as demonstrated by Ukraine's ProZorro e-procurement system (Kelman and Yukins, 2022), has successfully reduced corruption risks in government contracting.

Finally, robust whistleblower protection mechanisms play an essential role in encouraging the reporting of corrupt practices without fear of reprisal, with initiatives in South Korea and Canada evidencing increased reporting rates and strengthened corporate accountability (OECD, 2023). Collectively, these targeted interventions provide a rich

and practical framework for reducing corruption's adverse impact on exports, underscoring the necessity for context-specific reforms that address the unique challenges faced by different sectors in emerging economies. Governments can play a pivotal role by supporting programs and institutional reforms designed to reduce institutional voids and increase transparency. The comprehensive reforms undertaken in Georgia, for example, illustrate the positive impact of coordinated policy initiatives aimed at enhancing governance and curbing corruption (Khlystova et al., 2022).

At the micro-level, managers in international firms must prioritise the development of internal capabilities and the diversification of supply chains and market bases. Enhanced capabilities reduce firms' dependence on specific resources and strengthen their bargaining power when negotiating export permits and licences. Investment in research and development, along with improved access to external knowledge, may enhance technological capabilities and productivity, thereby enabling firms to navigate informal institutional voids and alleviate the burden of resource dependency. This strategic adaptation not only mitigates the disadvantages posed by corruption in the home country but also fosters the development of more robust, knowledge-based resources. Similarly, diversification of supply chains and export markets helps firms access alternative licensing environments and develop regionally distributed operations where firms can avoid bottlenecks generated by locally embedded corrupt networks. Lastly, the exploration of strategic partnerships with foreign firms that adhere to global anti-bribery management systems, such as ISO 37001 (Utami and Barokah, 2024), may elevate internal compliance standards and improve access to export finance, procurement platforms and new markets.

Together, these targeted measures underscore the need for a multifaceted approach to combating corruption, thereby strengthening the framework for firm internationalisation in emerging and developing economies.

Limitations and future research

Our study has some limitations. We use only informal relationships in this research. Empirical tests for formal versus informal relationships with authorities and firm exports could become an important starting point in evaluating the multifaceted role of institutions in internationalisation. Our dataset lacks information on firms' government permits or licenses; therefore, we could not explicitly control dependence on such permits or licenses. We classified industries as resource-based or non-resource-based and suggested that resource-based industries inherently rely on government permits and licenses based on previous literature. Addressing this limitation, future research should incorporate firm-level data over multiple formal regulations, such as permit acquisition processes and contract dependencies. Such data could empirically clarify whether these regulatory factors significantly influence the observed relationships beyond mere sector classification.

Future studies may investigate specific differences between developed and developing countries, as well as between developing and emerging countries, and incorporate regional-level corruption and industry-specific effects. Moreover, firms in highly corrupt regions, particularly those in resource-intensive industries, must develop adaptive strategies, such

as leveraging political connections or diversifying regulatory risks, to mitigate the negative effects of corruption. One-size-fits-all anti-corruption measures rarely yield optimal results. Instead, policies must be carefully tailored to address the specific vulnerabilities inherent in certain sectors and remit further research.

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Appendix A. Sample distribution by country used in the study.

Country	Number of firms	Share	Country	Number of firms	Share	Country	Number of firms	Share
Afghanistan	846	0.45	Finland	676	0.36	Niger	262	0.14
Albania	959	0.52	France	1515	0.81	Nigeria	3807	2.05
Angola	700	0.38	Gabon	164	0.09	North Macedonia	1393	0.75
Argentina	2961	1.59	Gambia	469	0.25	Pakistan	2863	1.54
Armenia	1247	0.67	Georgia	1840	0.99	Panama	888	0.48
Austria	475	0.26	Germany	1589	0.85	Paraguay	1654	0.89
Azerbaijan	916	0.49	Ghana	1584	0.85	Philippines	3321	1.79
Bahamas	142	0.08	Grenada	152	0.08	Poland	1988	1.07
Bahrain	144	0.08	Guatemala	1435	0.77	Portugal	2044	1.10
Bangladesh	2596	1.40	Guinea	359	0.19	Romania	2742	1.47
Barbados	285	0.15	Guyana	163	0.09	Russia	5994	3.22
Belarus	1198	0.64	Honduras	1060	0.57	Rwanda	1157	0.62
Belgium	579	0.31	Hong Kong, China	546	0.29	Samoa	254	0.14
Benin	289	0.16	Hungary	2139	1.15	Saudi Arabia	1303	0.70
Bhutan	642	0.35	India	17,467	9.39	Senegal	742	0.40
Bolivia	1295	0.70	Indonesia	4776	2.57	Serbia	1566	0.84
Bosnia and Herzegovina	1382	0.74	Iraq	1612	0.87	Sierra Leone	358	0.19
Botswana	1214	0.65	Israel	845	0.45	Slovak Republic	1215	0.65
Brazil	1721	0.93	Italy	1926	1.04	Slovenia	1312	0.71
Bulgaria	2995	1.61	Jamaica	295	0.16	Solomon Islands	137	0.07
Burkina Faso	365	0.20	Jordan	743	0.40	South Sudan	864	0.46
Cambodia	1254	0.67	Kazakhstan	2460	1.32	South Africa	1617	0.87
Cameroon	689	0.37	Kenya	2321	1.25	Spain	1026	0.55
Central African Republic	278	0.15	Kosovo	643	0.35	Sri Lanka	575	0.31

(Continued)

Appendix A. (Continued)

Country	Number of firms	Share	Country	Number of firms	Share	Country	Number of firms	Share
Chad	454	0.24	Kyrgyz Republic	1200	0.65	St. Kitts and Nevis	144	0.08
Chile	1999	1.07	LaoPDR	1300	0.70	St Vincent and Grenadines	141	0.08
China	2489	1.34	Latvia	835	0.45	Sudan	570	0.31
Colombia	3760	2.02	Lebanon	997	0.54	Suriname	371	0.20
Congo	457	0.25	Lesotho	428	0.23	Sweden	567	0.30
Costa Rica	851	0.46	Lithuania	837	0.45	Tajikistan	1320	0.71
Croatia	1810	0.97	Luxembourg	164	0.09	Tanzania	1535	0.83
Cyprus	483	0.26	Madagascar	1099	0.59	Timor-Leste	497	0.27
Czechia	954	0.51	Malawi	552	0.30	Togo	443	0.24
Côte d'Ivoire	1446	0.78	Malaysia	1970	1.06	Tunisia	1158	0.62
DRC	1167	0.63	Mali	576	0.31	Turkiye	3712	2.00
Denmark	962	0.52	Mauritania	352	0.19	Uganda	1130	0.61
Djibouti	204	0.11	Mauritius	667	0.36	Ukraine	2897	1.56
Dominica	149	0.08	Moldova	1160	0.62	Uruguay	1479	0.80
Dominican Republic	674	0.36	Mongolia	1053	0.57	Uzbekistan	1913	1.03
Ecuador	1364	0.73	Montenegro	537	0.29	Vanuatu	217	0.12
Egypt	6312	3.39	Morocco	1665	0.90	Venezuela	286	0.15
El Salvador	2442	1.31	Mozambique	799	0.43	Viet Nam	2917	1.57
Estonia	1175	0.63	Namibia	790	0.42	West Bank and Gaza	1089	0.59
Eswatini	580	0.31	Netherlands	789	0.42	Yemen	779	0.42
Ethiopia	1410	0.76	New Zealand	329	0.18	Zambia	1357	0.73
Fiji	143	0.08	Nicaragua	1088	0.58			

Source: World Bank Group (2025).