



Perception of corruption as a business obstacle, generalized trust and relation centrism in low- and middle-income nations: the moderating influence of governance

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Abstract

We examine regional differences in how generalized trust and relation centrism influence how 16,785 firms across 20 lower- and middle-income countries perceive corruption as a business obstacle. Using the machine learning method LASSO, our empirical findings indicate that higher out-group generalized trust is associated with increased perceptions of corruption hindering business operations. Conversely, higher in-group friend centrism aligns with reduced perceptions of corruption as an obstacle. Interestingly, regional disparities highlight that family centrism generally outweighs friend centrism in firms' perceptions of corruption obstacles. Furthermore, while legal institutional and regulatory quality partly mitigate this effect, political stability consistently plays the most significant role in weakening this association.

Keywords Business · Corruption · Governance · Norms · Social · Values

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1 Introduction

Corruption, often defined as the misuse of public or organizational resources for private benefits (Hatak et al. 2015; Rose-Ackerman and Palifka 2016), poses a global challenge to economic and social development (Harri et al. 2020; Wu et al. 2023). It is an obstacle to the operations of businesses and manifests itself in various forms. These forms range from high-level corruption involving substantial sums, major corporations, senior-level public or private sector workers, and significant kickbacks—sometimes crossing national borders—to petty corruption, encompassing smaller sums, lower-level workers, and localized practices (Correa et al. 2016; Jong and Ees 2014). Empirical evidence indicates that although the perception of corruption by firms is subjective, firms identifying corruption as a primary business obstacle in different lower- and middle-income regions experience significant negative impacts on business operations (Aidis and Mickiewicz 2006; Bukari and Anaman 2021; Galtung and Pope 1999; Hauser 2019).

In-group and out-group dynamics refer to how individuals perceive and interact with others who are either members of their own group (in-group) or not (out-group) (Brewer 1999; Granitz and Ward 2001; Marler and Stanley 2018). In-group members tend to have higher levels of trust, cooperation, and commitment to their group than they do to out-group members. This can lead to greater social cohesion and higher levels of in-group performance, but it can also lead to prejudice, discrimination, and exclusion of out-group members (Castano et al. 2002; Harrison et al. 1998). Furthermore, in-group members may be more likely to engage in unethical behaviors that benefit their in-group, such as favoritism and nepotism (Eckel et al. 2022; Raz et al. 2023). This can lead to negative consequences for the firm and society including reduced morale, efficiency and performance (Krueger et al. 2022; Treviño et al. 2006). Out-group members might encounter perceptions of being excluded, discriminated against, and distrusted, resulting in reduced motivation, involvement, and allegiance to the organization. Such outcomes can have adverse effects on the company's culture, reputation, and financial performance (Marler and Stanley 2018).

This study aims to explore the variations in the perception of corruption as a business obstacle, generalized trust, and relation centrism across diverse lower- and middle-income regions and the potential influence of governance quality on these relationships. It introduces novel insights by investigating corruption as a business obstacle using national-level generalized trust and relation centrism in family and friends. Additionally, it fills gaps in the literature by highlighting regional disparities in how generalized trust and relation centrism impact firms' perceptions of corruption obstacles. Furthermore, it examines whether governance quality mitigates the effects of generalized trust and relation centrism on firms' perceptions of corruption hindrances. In summary, this study aims to answer key questions: (1) Do higher levels of generalized trust and relation centrism relate to increased perceptions of corruption as a business obstacle? (2) How do regional variations affect the association between generalized trust, relation centrism, and firms' perceptions of corruption obstacles? and (3) Does a country's governance quality weaken the

impact of generalized trust and relation centrism on firms' perceptions of corruption obstacles?

Based on a comprehensive micro-firm level cross-country database in lower- and middle-income nations, the study indicates that firms' perceptions of corruption as a business obstacle inversely relate to higher levels of in-group friend centrism. However, notable regional variations emphasize the need for firms to acknowledge these differences, crucial for making strategic decisions when entering or expanding operations in new territories. For example, in regions where higher relation centrism in family or friends is associated with reduced perceived corruption obstacles, firms could strategically employ relational ties. Conversely, caution is advised in regions where the opposite holds true. Additionally, while legal institutional and regulatory quality partly mitigate the impact of generalized trust and relation centrism on the perception of corruption as a business obstacle, political stability consistently exhibits the most significant weakening effect on this relationship.

These findings hold significance for various reasons. Firstly, they illuminate the relationship between firms' perceptions of corruption as a business obstacle, out-group generalized trust, and in-group relation centrism. Consequently, it's essential for firms to acknowledge and address both out-group and in-group dynamics within their operational contexts. Secondly, our study offers valuable insights for policy-makers aiming to mitigate the detrimental impact of relation-centrism on corruption as a business obstacle. The results underscore the effectiveness of political stability in weakening the adverse effects of corruption hurdles for firms.

2 Literature review and hypotheses development

2.1 Generalized trust, relation centrism and corruption as a business obstacle

Putnam (1993) theorized that trust, reciprocity and civic engagement are indispensable to collective existence and argued that communities become prosperous because they have a vital civic life. A multi-level characterization and complexity of trust has also been recognized in management studies (Rousseau et al. 1998; Zheng et al. 2023). Generalized trust is impersonal and not related to specific social exchange relationships between people (Ellwardt et al. 2012; Martinangeli et al. 2023). It is an abstract attitude towards the out-group and people in general, encompassing those beyond immediate familiarity, including strangers (people one randomly meets in the street, fellow citizens, and foreigners, amongst others) (Freitag and Traunmüller 2009; Zheng et al. 2023). Generalized trust is associated more with "weak ties" social capital that can create bridges, promote openness, exchange, knowledge diffusion, and decrease corruption (Uslaner 2004). These weak ties could make it easier to engage in corrupt practices because social capital investments may not be needed to engage in corrupt activities.

The social network may also encourage corruption through wide-ranging social pressures that influence the decisions of agents (Besser and Miller 2011; Danis et al. 2011). According to Hofstede's individualism-collectivism cultural dimension (Hofstede 2011), people, in individualistic societies are expected to care primarily for

themselves and their immediate families while in collectivist cultures, people view themselves as members of larger groups, including extended family members, and are expected to take responsibility in caring for such larger groups (Huff and Kelley 2005). Collectivistic societies are typically found in low- and middle-income countries of the Global South such as most of Latin America, Africa, Asia, and the Middle East, where bribe-taking is widespread (Sanyal 2005).

In this paper, we introduce a new concept called “relation centrism”, which we define as the importance that people give to family and friends in society. While generalized trust refers to an abstract trust in the out-group, relation centrism builds on the concept of in-group centrism to refer to trust in family members or friends (Bullough et al. 2017; Eckel et al. 2022; Kruglanski et al. 2006). Ethnic and non-ethnic ties affect firms (H. Li 2020; Santana et al. 2009; Yeung 1997; Zhu et al. 2022) and the literature has defined particularized relational trust as trust found in close social proximity and extended toward people the individual knows from everyday interactions (e.g., family members, friends, neighbors and co-workers) (Freitag and Traummüller 2009; Zheng et al. 2023). Furthermore, social networks can enable the coordination of corrupt activities and override practices meant to govern firm behavior (Ju and Wang, 2023; Liu et al. 2024; Santana et al. 2009).

Particularized relational trust has been reported to facilitate corruption (Uslaner 2004), with the following logic: to form a bribery-corruption relationship (the transaction type corruption), some minimal trust must exist because of the time lag and geographic separation between the bribe payment by the briber to the bribe receiver, and delivery of the good to the briber (S. Li and Wu 2010). The literature has however not distinguished between relation centrism in family and friends as regards the perception of corruption as a business obstacle. When investigating the spheres of trust and the role of relationships in the community and workplace, the deepest bonds are usually for the family (Gonzalez et al. 2018), followed by friendship bonds (Jamieson et al. 2006), and the weakest bonds are usually generalized trust in other members of society (Bjørnskov 2007; Tan and Tambyah 2011).

Generalized trust beliefs likely facilitate the establishment of informal cooperation and the forging of alliances (Ellwardt et al. 2012). Institutional theory posits that a firm’s corruption environment encompasses two dimensions – the formal corruption environment (FCE) and the informal corruption environment (ICE) (Kouznetsov et al. 2019). In many cases, corruption thrives within the context of the informal institutions in developing and/or low- and middle-income countries (Mateev et al. 2024). Informal networks and relationships based on kinship, ethnicity, or personal connections may influence access to resources, services, and opportunities. Nepotism, favoritism, and bribery are often facilitated through these informal channels, allowing individuals to circumvent official procedures and regulations for personal gain. As a result, corruption becomes entrenched within the fabric of society, eroding trust in public institutions, undermining the rule of law, and hindering economic progress. The association between corruption and informal institutions can be particularly pronounced in developing and low- to middle-income countries, where formal governance structures may be weak or ineffective (Mateev et al. 2024). In the absence of robust legal and regulatory frameworks, informal networks often serve as alternative mechanisms for resolving disputes, allocating resources, and exercising

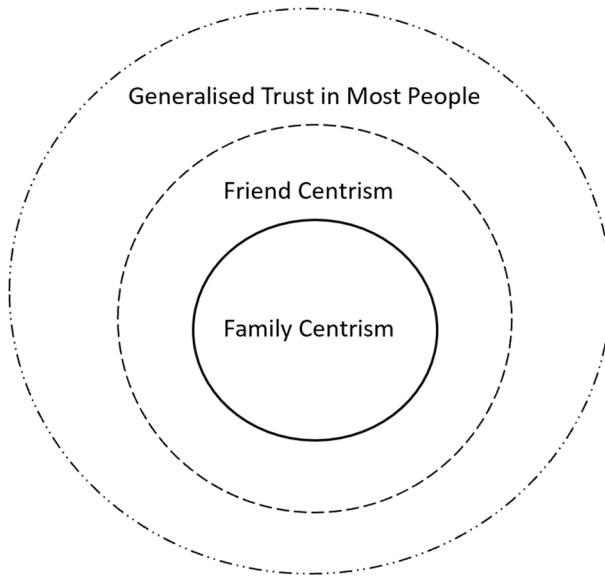


Fig. 1 Levels of generalized trust and relation centrism

authority. However, these informal systems may lack transparency, accountability, and safeguards against abuse, creating opportunities for corruption to flourish unchecked.

The social network is important to this enquiry because research from Korea shows that family control of firms may facilitate corruption (Oh et al. 2019), and research from India suggests that firms with closer social networks with the government are more likely to engage in corruption (Collins et al. 2009). Similarly, in China, the process of building up *guanxi* (personal networks) for financing business operations has led to the normalization of corruption (Kang et al. 2023; Zhu et al. 2022). For this reason, we introduce a new construct “relation centrism”, defined as the importance that people give to family and friends in society. While generalized trust refers to trust in out-group members of society, relation centrism builds on the concept of in-group centrism to refer to trust in family members or friends (Kruglanski et al. 2006). Such ties and in-group favoritism affect firm activity (Yeung 1997; Zhu et al. 2022) and the literature has defined particularized relational trust as trust found in close social proximity and extended toward people the individual knows from everyday interactions (e.g., family members, friends, neighbors and co-workers) (Zheng et al. 2023). When investigating the spheres of trust and the role of relationships in the community and workplace, the deepest in-group bonds are usually for the family (Gonzalez et al. 2018), followed by friendship bonds (Jamieson et al. 2006), and then out-group bonds for generalized trust in other members of society (Freitag and Traunmüller 2009). We express this relationship in Fig. 1.

When people put more importance on family members, they interact more frequently with them in activities and may make decisions in their interests although such decisions are sub-optimal from the broader society (Cruz et al. 2012; Zhu et al.

2022). This type of bond is especially strong in cases of vulnerability and also where there are ties of kinship and affection (Rose-Ackerman 2001; Zhu et al. 2022). A different bond could place importance on friends and can be “interest-based” reflecting shared values and goals (Braithwaite and Levi 1998; Cook 2001). Family and friendship ties, distinct from each other and from the weak ties implied by generalized trust, often hold greater strength and may represent in-group connections grounded in trust and relationships, albeit with potential variations in their individual effects. Similarly, in societies valuing relation-centric values, firms might perceive corruption as a more significant obstacle due to the robust emotional or interest-based ties within family or friends. This could potentially isolate individuals without strong family or friend ties, making them feel that corruption is a greater business obstacle.

Banfield (1967) argued that economic performance in southern Italy was depressed because of an inability to trust economic exchange partners outside a close family network. He called it “amoral familism” and showed that trust among members of a business group can functionally exist and be promoted by mistrust of other societal groups. Thus, “bonding” or “strong ties” social capital might lead to strong trust within groups but not between them; indeed, to the extent that strong ties are exclusive, they may promote disintegration and distrust between groups which could lead to increased corruption (Harris 2007). For these reasons, we anticipate a negative correlation between generalized out-group trust and in-group family centrism. Furthermore, we aim to explore whether heightened levels of generalized trust within society, as well as family or friend centrism, correspond to increased perceptions of corruption as a business obstacle for firms. These bonds range from generalized trust in society members to deeper connections within friend groups and the deepest affiliations with family members, forming the basis for our initial hypotheses:

Hypothesis 1a Higher levels of generalized trust in society are associated with higher levels of the extent to which firms perceive corruption as a business obstacle.

Hypothesis 1b Higher levels of friend centrism in society are associated with higher levels of the extent to which firms perceive corruption as a business obstacle.

Hypothesis 1c Higher levels of family centrism in society are associated with higher levels of the extent to which firms perceive corruption as a business obstacle.

2.2 Regional differences

Getz and Volkema (2001) use Hofstede’s cultural dimensions to show that culture can allow corruption to be tolerated in some regions (Hofstede 2011). For example, the dimensions of uncertainty avoidance moderated the relationship between economic adversity and corruption in some regions, whereas power distance and uncertainty avoidance were positively associated with corruption in other regions. This implies that the relationships we have hypothesized are likely to vary across different regions and countries. Regional cultures vary in the degree to which people

– individually and within their organizations – trust and interact with one another, which is why regional outcomes vary (Malecki 2012). Generalized trust has been found to have a relationship with ethnic nepotism in Africa (Zerfu et al. 2009), and political participation in Asia (Kim 2014). As broad categorizations, we group the countries in Africa and Asia separately to exploratorily examine the relationships of the role of generalized trust and relation centrism for the extent to which firms perceive corruption as a business obstacle in these two continents given their geographical and cultural differences (Dunford and Liu 2017; Gohou and Soumaré, 2012; Lipshitz and Raveh 1998).

Corruption prevails in numerous lower- and middle-income countries due to underdeveloped political landscapes that foster a culture conducive to corruption. Well-connected firms often leverage these conditions for personal gain (Beesley and Hawkins 2022; Petrou and Thanos 2014; Taylor et al. 2022; Wang et al. 2018). Additionally, cultural, religious, and contextual disparities in these nations significantly influence perceived corruption, impacting how firms view it as a business obstacle (Adomako et al. 2021; Budak and Rajh 2014; Mensah 2014). Given these regional disparities, differences in relation centrism and generalized trust play varying roles in shaping corruption as a business hurdle. Focusing on lower- and middle-income countries, we categorize these nations into four regions based on the United Nations geoscheme,¹ aligning with geographical, political, economic, and historical cultural contexts: South and Central Asia, Middle East and North Africa (MENA), Sub-Saharan Africa, and ASEAN (WorldAtlas, 2023). While these regions share commonalities, disparities in cultural norms, per-capita incomes, and legal institutions are prevalent. These disparities should facilitate different in-group and out-group dynamics due to different cultural bases for a wider range of market-based transactions thus significantly impacting how generalized trust, relation centrism in family or friends, and firms' perceptions of corruption as a business obstacle are interconnected, forming the basis for our ensuing hypotheses:

Hypothesis 2a There are regional differences in how levels of generalized trust in society are associated with the extent to which firms perceive corruption as a business obstacle.

Hypothesis 2b There are regional differences in how levels of family centrism are associated with the extent to which firms perceive corruption as a business obstacle.

Hypothesis 2c There are regional differences in how levels of friend centrism are associated with the extent to which firms perceive corruption as a business obstacle.

¹ The United Nations geoscheme is a system devised by the United Nations Statistics Division which divides the countries of the world into regional and subregional groups based on the M49 coding classification. The groups are closely correlated with geographical, political, economic and historical cultural contexts.

2.3 Quality of governance weakens corruption as a business obstacle

Governance generally refers to “rule by the rulers” under some defined laws, processes and vivid authority and good governance, more specifically, entails effectiveness and efficiency in state administration (Kaufmann et al. 2011; World Bank 2017). Therefore, while good governance tends to imply impartiality and effectiveness in government, poor governance creates more incentives and chances for corruption. The role of governance in determining corruption is well documented. Kaufmann et al. (1999) contended that the predominant cause of corruption is weak governance. Meagher et al. (2005) made similar conclusions from a study in Bulgaria where they found that corruption was due to failures in regulatory quality and accountability in designing policies. Analogously, Shim and Eom (2008) and Dreher et al. (2009) also showed that good governance leads to a decrease in corruption. Likewise, Attila (2011) investigated the relationship between corruption and regulation, bureaucracy and political structures and concluded that better public institutions are connected to lower levels of corruption. Moreover, Goel et al. (2012) explored the impact of economic freedom, bureaucratic quality, democratic accountability, and law and order on corruption and found an inverse relationship between corruption and institutional factors.

The quality of governance is important for this research because related studies reveal that governance, economic, and socio-political features considerably affect anti-corruption disclosure (Manes-Rossi et al. 2023), and that managers should avoid obfuscating governance records to ensure greater accountability (Ferri et al. 2023). In the same vein, Bjørnskov (2007), who uses social confidence as a measure of institutional quality, posited that countries with a high level of social trust and confidence are more likely to address corruption problems effectively. Therefore, the level of social trust in a society and its relation to the perception of corruption as a business obstacle is influenced by the quality of governance that exists. Firms expect a country with high-quality governance to have less corruption as individuals will have faith in institutions and thus be less reliant on relations to get things done. Rothstein (2011), argues that government institutions, especially courts and law-enforcement offices matter in explaining why generalized or particularized trust is high in society.

Motivated by theory, this paper focuses on three aspects of governance: legal institutional quality, political stability, and regularity quality as corruption is a social, political and economic construct that is related to a country’s legal, political and social systems (Kaufmann et al. 1999; Keefer and Knack 1997). High quality legal institutions imply that the public has confidence that everyone will be treated equally under the law (Berkel et al. 2022; Lv et al. 2021). High political stability means that there is less politically motivated violence and terrorism within a country (Khurana et al. 2022; Miao et al. 2022), while high regularity quality means that the rules formulated by the state promote private sector development (Boudreaux et al. 2022; Kaufmann et al. 1999; Treisman 2000). Although these country-level aspects of governance are important for all economies, they are crucial for the less developed and emerging countries that we sample (Keefer and Knack 1997; Treisman 2000). We, therefore, propose that better governance indicators will reduce the

perception of corruption as a business obstacle through generalized trust and relation centrism. Consequently, we make the following hypotheses:

Hypothesis 3a Better country governance weakens the effect of generalized trust on the extent to which firms perceive corruption as a business obstacle.

Hypothesis 3b Better country governance weakens the effect of family centrism on the extent to which firms perceive corruption as a business obstacle.

Hypothesis 3c Better country governance weakens the effect of friend centrism on the extent to which firms perceive corruption as a business obstacle.

3 Data and methods

3.1 Data sources and sample

A comprehensive list and descriptive statistics of all our variables is presented in Table 1. In the sample, the firm-level data on corruption perception, firm characteristics, and their views on legal institutional quality and business environment are from the 2013–2016 World Bank Enterprise Survey (WBES) database of the World Bank Group.² The sample is restricted to firms from 20 lower- and middle-income countries where data was collected using the global methodology³ from 2013–2016 to ensure data uniformity. The Enterprise Surveys are administered to a representative sample of firms in the non-agricultural formal private economy and are firm-level data. The final sample consists of 16,785 firms from the manufacturing, services, transportation and construction sectors. Public utilities, government services, health care, and financial services sectors are not included in the sample. The WBES is based on a wide array of qualitative and quantitative information through face-to-face interviews with firm managers and owners regarding the business environment in their countries and the productivity of their firms. The topics covered in the WBES include corruption, infrastructure, trade, finance, regulations, taxes and business licensing, crime and informality, finance, innovation, labor, and perceptions about obstacles to doing business (World Bank 2017).

In addition to the WBES database, we make use of the World Value Survey (WVS) for the corresponding years to capture generalized trust and family and friend centrism at the national level. The WVS consists of nationally representative surveys conducted in countries that contain almost 90% of the world's population, using a common questionnaire. The WVS is the largest non-commercial, cross-national, time series investigation of human beliefs and values. Variables in

² The Enterprise Surveys implemented in Eastern Europe and Central Asian countries are also known as Business Environment and Enterprise Performance Surveys (BEEPS).

³ Meaning that all the firms were given the same questionnaires and the variables capture the same dimensions in all the country settings.

Table 1 Descriptive statistics

Variable	Measurement	Mean (Std dev)
Perception of corruption as a business obstacle	How much of an obstacle is corruption to the current operations of this establishment? [1 = No obstacle, 5 = Severe obstacle; Dutta et al. (2022) and Zhu and Zhang (2017) employ the same variable]	2.83 (1.44)
Generalized trust in most people	Most people can be trusted [0 = No, 1 = Yes]	0.15 (.09)
Family centrism	Family is important [0 = Lowest, 4 = Highest]	2.94 (.08)
Friend centrism	Friends are important [0 = Lowest, 4 = Highest]	2.31 (.15)
Legal institutional quality	The court system is fair and impartial [1 = Strong disagreement, 4 = Strong agreement]	2.57 (1.22)
Political stability	Score measure of the perception of the likelihood of political instability and/or politically motivated violence, including terrorism. (WGI)	- 1.22(.88)
Regulatory quality	Score measure of the ability of the government to formulate and implement sound policies and regulations (WGI)	- 41(.55)
Facebook proportion	Proportion of country population active on facebook	21.64(18.38)
Twitter Proportion	Proportion of country population active on twitter	5.88(11.4)
Social media participation	Cronbach's alpha of facebook and twitter proportions {scale reliability coefficient}	13.73(12.07) {0.7}
Business obstacle	How much of an obstacle to business is? (1) Transport infrastructure ; (2) Crime, theft and disorder (3) Customs & trade regulations ; (4) Electricity (5) Telecommunications; (6) Access to land ; (7) Tax rates (8) Business & licensing permits ; (9) Political instability (10) Access to finance ; (11) Labor regulations (12) Inadequately educated Workforce; [1 = No obstacle, 5 = Severe obstacle]	$I = 2.18$ (1.23); $2 = 2.17$ (1.31); $3 = 1.89$ (1.26); $4 = 2.82$ (1.47); $5 = 1.89$ (1.17); $6 = 1.99$ (1.29); $7 = 2.56$ (1.29); $8 = 1.96$ (1.17); $9 = 2.81$ (1.54); $10 = 2.41$ (1.34); $11 = 1.88$ (1.08); $12 = 2.09$ (1.21);

Table 1 (continued)

Variable	Measurement	Mean (Std dev)
Business obstacle index	Inverted cronbach's alpha of 12 business obstacle indices [1 = No obstacle, 5 = Severe obstacle][Scale reliability coefficient]	2.8(.71){0.83}
Firm size	Firm size by number of employees[Size = Small (< 20)][Size = Medium (20–99)][Size = Large (100 & Over)]	48%33%19%
Capital city	Official capital city[No = 0, Yes = 1]	.26(.44)
Business city	Main business/commercial city [No = 0, Yes = 1]	.39(.49)
Line of credit	Possession of a line of credit[No = 0, Yes = 1]	.23(.42)
Fixed assets	Did this establishment purchase any fixed assets in last fiscal year?[No = 0, Yes = 1]	1.51(1.38)
Annual sales	In last fiscal year, what were this establishment's total annual sales? [log 1 + Sales]	16.01 (3.21)
Total labor cost	Total labor cost (incl. wages, salaries, bonuses, etc.) in last fiscal year [log 1 + Labor cost]	13.81(3.37)
Variable	Measurement	Mean(Std Dev)
Total labor cost	Total labor cost (incl. wages, salaries, bonuses, etc.) in last fiscal year [log 1 + Labor cost]	13.81(3.37)
% of domestic sales	Percentage of sales: national sales	85%
% of sales indirectly exported	Percentage of sales: indirect exports	5%
% of sales directly exported	Percentage of sales: direct exports	10%
% of government firm ownership	Percentage owned by government/state	7%
% of foreign firm ownership	Percentage owned by private foreign individuals, companies or organizations	6%
% of domestic firm ownership	Percentage owned by private domestic individuals, companies or organizations	87%
Country income classification	Country income classification by world bank definition (dummies)[higher middle income] [lower middle income] [low income]	25%66%9%
Geographic region	Geographic region (dummies)[Africa][Europe][Central Asia] [Western Asia] [South-East Asia]	49%7%1%15%28%
Landlocked	Is country landlocked? (Dummy)[No = 0, Yes = 1]	19%(.39)

the WVS database explore the beliefs, values and motivations of people throughout the world (Alemn and Woods 2016; Harris 2007; Rose-Ackerman 2001). Finally, we gathered two indicators of country governance, political stability and regulatory quality, from the World Governance Indicators (WGI). The WGI is a research dataset summarizing the views on the quality of governance provided by a large number of enterprise, citizen and expert survey respondents in industrial and developing countries (Kaufmann et al. 2011). The data are gathered from several survey institutes, think tanks, non-governmental organizations, international organizations, and private sector firms and scaled from -2.5 to 2.5. For these indicators, higher scores reflect higher-quality country governance, and lower scores reflect lower-quality country governance. Table 1 provides more details regarding each variable's definition.

3.2 Variables

3.2.1 Dependent variable: perception of corruption as a business obstacle

Our dependent variable “Perception of Corruption as a Business Obstacle” is proxied using the question: “How much of an obstacle is corruption to the current operations of this establishment?” from the WBES database of the World Bank Group to measure corruption as an obstacle to operations as perceived by firms. World Bank Enterprise Surveys (WBES) are nationally representative firm-level surveys answered by top managers and owners of businesses. Answers to this question range from 1 to 5, with 1 indicating “no obstacle,” 2 indicating “minor obstacle,” 3 indicating “moderate obstacle,” 4 indicating “major obstacle,” and 5 indicating “severe obstacle.” This Likert-type ordinal scale variable is extensively used in the literature. The descriptive statistics presented in Table 1 show an average of 2.83.

3.2.2 Independent variables: generalized trust, family and friend centrism

Measures of social network ties were drawn from the WVS. We use three variables from the WVS. They are: (1) Most people can be trusted; (2) family is important and; (3) friends are important. The first variable implies generalized trust in most members of society, the second variable implies that family is important, and the third variable implies that friends are important. The first variable serves as a measure of generalized trust in most members of society, the second variable serves as a measure of family centrism, and the third variable serves as a measure of friend centrism.

3.2.3 Legal institutional quality

We control for the effect of institutions as their role in combating corruption has received attention (Harri et al. 2020; Uberti 2018) with studies suggesting large institutional effects on firms' output levels (Efendic et al. 2011). Institutional quality can increase or reduce corrupt practices by having implications for the resultant

consequences of corruption (Osei-Assibey et al. 2018). An effective legal system is a key institution for tackling corruption (Sarmidi et al. 2014). Corruption also flourishes where there are institutional voids with consequences for the business environment (Khanna and Palepu 2013; Mickiewicz and Olarewaju 2020). For legal institutional quality, we use the WBES variable that asks if “the court system is fair and impartial”. Responses range from 1 indicating “strong disagreement that the courts are fair and impartial”, which we interpret as meaning that the courts do not possess good legal institutional qualities to 4 indicating “strong agreement that the courts are fair and impartial”, which we interpret as meaning that firms perceive that the courts possess good legal institutional qualities.

3.2.4 Control variables

Control variables at the firm and national levels are also included from the WBES data. At the firm level, firm size, location in a capital or main business city, possession of a line of credit, fixed assets, annual sales, total labor costs, percentage of domestic sales, indirectly exported and directly exported, and percentage of firm ownership by the government, foreigners and domestic individuals are introduced as control variables in the estimations. At the national level, country classification by income classification, geographic region, and landlocked are introduced as control variables in the estimations. Twelve indices are of particular interest from the WBES database because they capture characteristics of the firm’s business environment and perceptions about institutions at the national level. They are indices that ask firms “how much of an obstacle to business are” (1) transport infrastructure, (2) crime, theft and disorder, (3) customs and trade regulations, (4) electricity, (5) telecommunications, (6) access to land, (7) tax rates, (8) business and licensing permits, (9) political instability, (10) access to finance, (11) labor regulations, (12) and an inadequately educated workforce. They measure how obstructive each of these variables are to business performance and responses range from 1 indicating “no obstacle” to 5 indicating “severe obstacle”.

As a final measure of internal consistency, we construct a Cronbach’s alpha index from the twelve indices to operationalize a consistent indicator that measures obstacles in the business environment as perceived by the firms. In line with the underlying variables, the Cronbach’s alpha variable ranges from 1 indicating “no obstacles in the business environment as perceived by the firms” to 5 indicating “severe obstacles in the business environment as perceived by the firms”. To ensure uniformity with our other variables, we invert this variable so that 1 represents the no obstacle and 5 severe obstacle. The scale reliability coefficient for the Cronbach alpha for the twelve business environment indices is 0.83. These variables are presented in Table 2 while the correlation matrix is presented in Table 3 and as expected, generalized out-group trust and family centrism in-group trust negatively correlate. Both the business obstacle index and court indices are typical of what the literature expects from the sample of countries with the business obstacles index having an average of 2.8 from a range of 1–5, and a legal institutional quality average of 2.19 from a range of 1–4 in ascending order (with higher values meaning better values) (Commander and Svejnar, 2011). The descriptive statistics also reveal that the most

Table 2 Key country variables

Country (income classification)	Number of firms from country	Average corruption index	Legal institutional quality	Political stability	Regulatory quality	Facebook proportion	Twitter proportion	Business obstacle index
Afghanistan (LI)	402	3.88	1.67	-2.41	-1.12	3.7	5.7	3.35
Belarus (UMI)	351	1.68	2.56	0.01	-1.07	5.9	9.81	1.76
Dominican Republic (UMI)	354	2.74	1.64	0.25	0.20	36.3	9.4	2.39
Egypt (LMI)	2,817	3.33	2.46	-1.64	-0.64	23.2	1.8	2.24
Ghana (LMI)	672	2.78	1.74	0.06	0.08	9.9	1.03	2.47
Jordan (LMI)	497	2.39	2.28	-0.61	0.14	47.4	2.4	2.04
Kazakhstan (UMI)	560	2.15	2.07	-0.40	-0.37	5.1	1	1.74
Kyrgyz Republic (LMI)	270	3.44	1.54	-0.91	-0.31	3.7	3.4	2.16
Lao PDR (LMI)	364	2.17	1.27	0.53	-0.72	7.2	3.4	2.07
Lebanon (UMI)	553	3.77	1.49	-1.69	-0.08	46	2.8	2.34
Malaysia (UMI)	902	2.27	2.57	0.26	0.75	55.1	6.7	2.42
Myanmar (LMI)	562	1.92	2.09	-0.80	-0.87	2.4	0.07	1.71
Nigeria (LMI)	2,573	2.98	2.44	-2.13	-0.82	7.4	0.7	2.22
Pakistan (LMI)	1,216	3.37	1.95	-2.60	-0.70	7.7	1.6	2.53
Philippines (LMI)	1,085	2.27	2.29	-0.71	-0.04	38.3	8	1.77
Tunisia (LMI)	592	2.81	2.64	-0.90	-0.33	41.7	1.6	1.86
Turkey (UMI)	1,313	1.88	2.26	-1.25	0.43	51.5	44	1.71
Uganda (LI)	755	2.65	2.03	-0.84	-0.24	1.1	0.8	2.58
Yemen (LMI)	352	4.55	1.55	-2.37	-0.73	5.9	0.6	2.94
Zimbabwe (LI)	595	3.01	2.41	-0.62	-1.72	5.3	0.6	2.38

Facebook proportion, proportion of country population active on facebook; Twitter proportion: proportion of country population active on twitter

Income group; HI, high income; UMI, upper middle income; LMI, lower middle income; LI, low income

Business obstacle Index: 1 = No obstacle, 5 = Severe obstacle

Table 3 Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) Perception of corruption as a business obstacle	1.00													
(2) Generalized trust in most people	0.16***	1.00												
(3) Family centrism	0.09***	-0.11***	1.00											
(4) Friend centrism	-0.01	0.01	0.15***	1.00										
(5) Legal institutional quality	-0.05***	-0.03***	0.14***	0.05***	1.00									
(6) Political stability	-0.28***	-0.34***	-0.34***	-0.39***	-0.02**	1.00								
(7) Regulatory quality	-0.20***	-0.33***	0.14***	0.12***	-0.01	0.46***	1.00							
(8) Facebook proportion	-0.14***	-0.46***	0.24***	0.14***	0.07***	0.31***	0.78***	1.00						
(9) Twitter proportion	-0.22***	-0.21***	0.01	0.33***	0.01*	0.10***	0.53***	0.57***	1.00					
(10) Business obstacle index	-0.56***	-0.10***	-0.02***	0.03***	0.05***	0.17***	0.13***	0.18***	0.20***	1.00				
(11) Level of income	-0.19***	-0.06***	-0.18***	0.31***	-0.02***	0.34***	0.59***	0.56***	0.49***	0.22***	1.00			
(12) Firm size	-0.02**	-0.05	0.04***	-0.09***	0.03***	0.07***	0.13***	0.19***	0.08***	0.01	0.10***	1.00		
(13) Annual sales	-0.05***	0.18***	-0.36***	-0.12***	-0.11***	0.08***	-0.07***	-0.14***	-0.06***	0.04***	0.19***	0.35***	1.00	
(14) Total labor cost	-0.07***	0.17***	-0.39***	-0.16***	-0.11***	0.14***	-0.04***	-0.12***	-0.05***	0.06***	0.22***	0.34***	0.83***	1.00

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

common business obstacles reported by all firms are electricity, political instability, and corruption. We show the United Nations geoscheme grouping in Table A1 of the appendix section.

We also control for social media because trust in online environments is a different type of trust that needs to be measured differently (Enli and Rosenberg 2018). Most modern firms have a social media presence and firms are increasingly developing strategies that take advantage of social media platforms (Agnihotri et al. 2016). From a corruption perspective, the exposure that social media brings to firms could reduce corruption because of the fear of getting caught in the face of potential quick dissemination of proof through social media or increase corruption because the enhanced connectivity via social media could create more avenues for corruption. Many studies suggest that social media should reduce the incidence of corruption (Bertot et al. 2012; Enikolopov et al. 2018; Goel et al. 2012). We operationalize social media participation by including national-level proportions of Facebook and Twitter users thus capturing the proportion of the nation that actively uses these two popular social media sites. We focus on these two sites because they are the most popular social media sites (Etter et al. 2018; Gu et al. 2016). Research shows that Facebook and Twitter are the primary sources of social media usage across lower- and middle-income countries (Poushter 2016), so we focus on countries with this income classification. We also do not include countries that banned or temporarily limited access to Facebook and Twitter during the period we studied to our sample.

3.3 Model

This study posits that higher levels of generalized trust in society and higher levels of relation centrism are associated with higher levels of the extent to which firms perceive corruption as a business obstacle. It also posits that there are regional differences in this regard, and that the quality of governance lessens the effect of generalized trust and relation centrism on the extent to which firms perceive corruption as a business obstacle. Empirically, it is tempting to test this proposition utilizing workhorse multivariate (multiple and multivariate) regression models. However, the outcome variable for the perception of corruption as a business obstacle used in this study is measured on a Likert-type ordinal scale which is multinomial distributed (see 3.2.1), where the natural evolution of the data drives the unobserved (latent) process of the outcome variable as it progressively moves towards higher thresholds of the obstacle corruption places on the operations of business organizations. For this reason, we employed the Least Absolute Shrinkage and Selection Operator (LASSO) model reduction method to help select the most important variables that are truly essential in influencing the Likert-type ordinal scale variable of corruption as a business obstacle (we have also included an explanation of the LASSO reduction method in the appendix). Consequently, we utilized the LASSO method for the variable selection of the baseline model to determine the nexus between the perception of corruption as a business obstacle, general trust and relation centrism covariates as follows:

$$y_i^* = \mathbf{X}'_i \boldsymbol{\beta} + \varepsilon_i \quad (1)$$

where $\mathbf{X}'_i \boldsymbol{\beta} = \beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_k x_{ik}, y_i^*$ is a latent variable ranged $-\infty$ to $+\infty$ on the i^{th} observation, $\mathbf{X}$ denotes $n \times K$ of explanatory variables, ε_i is the error term. Assuming that our data consists of n independent countries facing J -ordered alternative of obstacles to corruption, such that:

$$\begin{aligned} y_i &= 1, \text{ if } y_i^* \leq \alpha_1 \rightarrow \text{no obstacle to corruption} \\ y_i &= 2, \text{ if } \alpha_1 < y_i^* \leq \alpha_2 \\ y_i &= 3, \text{ if } \alpha_2 < y_i^* \leq \alpha_3 \\ &\vdots \\ y_i &= J, \text{ if } \alpha_{J-1} < y_i^* \rightarrow \text{severe obstacle to corruption} \end{aligned} \quad (2)$$

where $\alpha_1 < \alpha_2 < \alpha_3 \dots \alpha_{J-1}$. Notice that the obstacles to corruption in country i, y_i , is observed in one of the J categories demarcated by the cutoff points. Consequently, for a model with m -alternative ordered alternatives, that alternative j for corruption is observed in country i is expressed as follows:

$$Pr_{ij} = \Pr(y_i = j) = \Pr(\alpha_{j-1} < y_i^* \leq \alpha_j) = F(\alpha_j - \mathbf{X}'_i \boldsymbol{\beta}) - F(\alpha_{j-1} - \mathbf{X}'_i \boldsymbol{\beta}) \quad (3)$$

where F denotes the cumulative density function of ε_i . The coefficients can be identified by both ordered logit and ordered probit models. However, the error term, ε , follows a logistic distribution for the logit model with $F(z) = e^z / (1 + e^z)$; while it takes the form of a standard normal distribution with $F(\cdot) = \Phi(\cdot)$ for the probit model.⁴ The empirical estimation of Eq. (1) render estimators of $\boldsymbol{\beta}$ whose sign can determine whether the unobserved variable, y_i^* , increases or decreases. Consequently, the marginal effect of the j^{th} covariate, from Eqs. (1) and (3), is:

$$\frac{\partial(y^*)}{\partial \mathbf{X}_i} = \frac{\partial(\mathbf{X}'_i \boldsymbol{\beta})}{\partial \mathbf{X}_i} = \{F'(\alpha_{j-1} - \mathbf{X}'_i \boldsymbol{\beta}) - F'(\alpha_j - \mathbf{X}'_i \boldsymbol{\beta})\} \boldsymbol{\beta} \quad (4)$$

Thus, the estimation strategy of this paper including the modelling framework and model specification is underpinned by theoretical and empirical literature and aided by machine learning via LASSO model reduction (Belloni et al. 2012; Tibshirani 1996). We estimate the equations utilising the Stata software, we employed the 'robust' command to ensure that the standard errors were unbiased and to address the problem of heteroscedasticity.

⁴ Assuming that errors are jointly normally distributed, $\varepsilon \sim N(0, \Sigma)$ where $\varepsilon = [\varepsilon_1 \dots \varepsilon_m]'$.

4 Results and discussion

The Ordered Probit Model estimates, assisted by the LASSO method, are shown in Table 4. We used the Ordered Probit Model because it is preferable in situations where the dependent variable has an ordinal scale. The Likert-type ordinal scale of our dependent variable, “How much of an obstacle is corruption to the current operations of this establishment?”, ranges from 1, indicating “no obstacle,” to 5, indicating “severe obstacle” for each firm. By using the ordered probit model in this scenario, we can appropriately handle the ordinal nature of the dependent variable, providing more accurate and meaningful interpretations of the relationships between the dependent variable and the predictors (Becker and Kennedy 1992). The first column represents the base model, while columns 2, 3, and 4 introduce generalized trust, family centrism, and friend centrism individually. The significant and positive coefficient for generalized trust aligns with Hypothesis 1a, indicating that increased generalized trust is associated with heightened perceptions of corruption as a business obstacle. However, Hypothesis 1b lacks support, and the noteworthy negative coefficient on friend centrism contradicts Hypothesis 1c, suggesting that increased friend centrism is associated with reduced perceptions of corruption as a business obstacle. The result indicating that higher levels of generalized trust in society are associated with a greater extent to which firms perceive corruption as a business obstacle is significant because it underscores the need for effective mechanisms to reduce objective corruption despite the subjective perception of corruption as a business obstacle.

This result gains further importance considering that perceptions of corruption as a business obstacle decrease with improved legal institutions, greater political stability, higher regulatory quality, increased Twitter engagement, and fewer business obstacles, aligning with previous research findings (Enikolopov et al. 2018; Herzfeld and Weiss 2003). The marginal estimates from the Ordered Probit Model using LASSO (columns 2, 3, and 4) are illustrated in Fig. 2 and detailed in Tables A2, A3, and A4 in the appendix. These findings suggest that the connection among key variables varies based on the severity of corruption’s impact on firms. Notably, they indicate a substantial rise in generalized trust when corruption significantly hampers business operations.

To test Hypotheses 2a, 2b, and 2c, we employ the Ordered Probit Model using LASSO for African and Asian countries separately (Fig. 3 and 4, Tables 5 and 6). The results indicate stronger support for Hypothesis 1 in Asian countries, revealing a more pronounced link between increased generalized trust and heightened perceptions of corruption as a business obstacle in this group. Furthermore, while increased family centrism is associated with severe corruption in African countries (Table 5), the opposite holds for Asian countries (Table 6). These findings underscore substantial regional disparities in how relation centrism and generalized trust are associated with firms’ perceptions of corruption as a business obstacle.

In the context of Hofstede’s individualism-collectivism cultural dimension (Hofstede 2011), greater social bonding and trust could be held in the family over

Table 4 Generalized trust and relation centrism for the extent to which firms perceive corruption as an obstacle

	Coefficients base model	Coefficients:generalized trust in most people	Coefficients:family centrism	Coefficients:friend centrism
Generalized trust in most people	1.401*** (0.144)	1.536*** (0.142)		
Family centrism	-0.0517 (0.182)		0.0742 (0.181)	
Friend centrism	-0.478*** (0.0926)			-0.639*** (0.0907)
Legal institutional quality	-0.0705*** (0.00856)	-0.0735*** (0.00849)	-0.0706*** (0.00852)	-0.0669*** (0.00850)
Political stability	-0.309*** (0.0201)	-0.252*** (0.0147)	-0.311*** (0.0157)	-0.380*** (0.0164)
Regulatory quality	-0.322*** (0.0341)	-0.343*** (0.0325)	-0.302*** (0.0336)	-0.278*** (0.0324)
Facebook proportion	0.0143*** (0.00106)	0.0152*** (0.00102)	0.0110*** (0.000979)	0.0103*** (0.000958)
Twitter proportion	-0.0131*** (0.00137)	-0.0138*** (0.00136)	-0.0153*** (0.00136)	-0.0141*** (0.00136)
Business obstacle index	-1.014*** (0.0163)	-1.005*** (0.0162)	-0.994*** (0.0161)	-1.007*** (0.0163)
Level of income	0.0848*** (0.0306)	0.0173 (0.0262)	0.0974*** (0.0269)	0.179*** (0.0280)
Firm size	-0.00427 (0.0153)	-0.00253 (0.0152)	0.00402 (0.0153)	0.000978 (0.0152)
Annual sales	-0.0123*** (0.00578)	-0.0120*** (0.00574)	-0.0147*** (0.00577)	-0.0148*** (0.00574)

Table 4 (continued)

	Coefficients base model	Coefficients:generalized trust in most people	Coefficients:family centrism	Coefficients:friend centrism
Total labor cost	-0.00437 (0.00546)	-0.000508 (0.00537)	0.00466 (0.00538)	-0.00112 (0.00541)
Constant 1	-4.192*** (0.610)	-3.015*** (0.0874)	-2.838*** (0.560)	-4.421*** (0.212)
Constant 2	-3.579*** (0.610)	-2.401*** (0.0863)	-2.225*** (0.560)	-3.809*** (0.211)
Constant 3	-2.959*** (0.610)	-1.782*** (0.0855)	-1.609*** (0.560)	-3.191*** (0.211)
Constant 4	-2.106*** (0.610)	-0.932*** (0.0852)	-0.767 (0.560)	-2.345*** (0.210)
R ² /Pseudo R ²	0.143	0.142	0.139	0.140
N	11,952	11,952	11,952	11,952

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; Standard errors of coefficients ()

Dependent variable: How much of an obstacle is corruption? [1 = No obstacle, 5 = Severe obstacle]

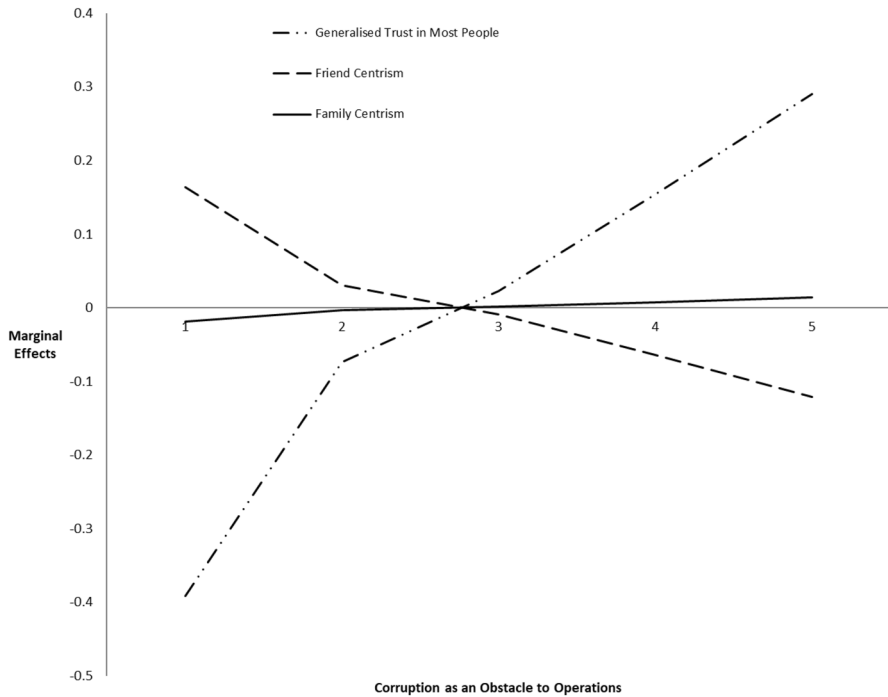


Fig. 2 Marginal effects estimation results for key variables tested in relation to the extent to which firms perceive corruption as an obstacle

friends or the general society (Bengtson 2001; Harris 2007; Shi et al. 2015). Such trust in one group over another can lead to behavior that undermines state functions (Huff and Kelley 2005; Warren 1999), and this sort of behavior could differ across contexts (Cuervo-Cazurra 2016; Getz 2006; Luo 2011), to create levels of disintegration, promoting distrust between groups and leading to differences in the extent to which firms perceive corruption as a business obstacle. Collectivism culture in African and Asian societies shares some commonalities but also exhibits distinct differences shaped by historical, social, and cultural factors. In both African and Asian cultures, collectivism emphasizes group harmony, interdependence, and loyalty to family or community over individual desires. Both cultures often prioritize cooperation, consensus-building, and maintaining social cohesion. Family ties are usually strong, and decisions are often made with the well-being of the group in mind rather than individual interests.

However, notable differences exist between African and Asian collectivism, ultimately impacting management and control systems within these cultures (Mitter et al. 2023). In African cultures, collectivism is often deeply rooted in communal traditions, extended family structures, and tribal affiliations. Social identity and belonging are closely tied to one's lineage, clan, or ethnic group. Cooperation and mutual support are emphasized within these tight-knit social networks. In contrast, Asian collectivism often emphasizes hierarchical relationships, respect

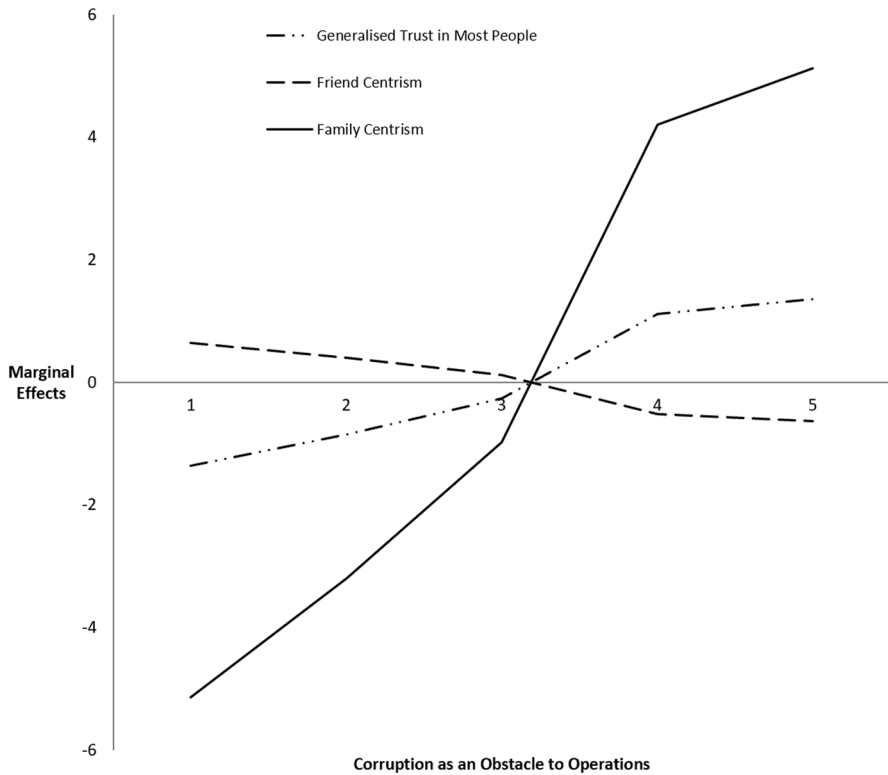


Fig. 3 Marginal effects estimation results for key variables tested in relation to the extent to which firms perceive corruption as an obstacle: Africa

for authority, and adherence to social norms and roles. Confucian values, prevalent in many Asian societies, underscore the importance of filial piety, respect for elders, and maintaining harmony within social hierarchies. Group harmony is prioritized, and individuals may suppress personal desires for the sake of preserving social order.

Religious and philosophical influences also shape collectivist cultures differently in Africa and Asia. African collectivism may be influenced by indigenous spiritual beliefs, animism, or Islam, Christianity, and other religions introduced through colonization obstacle (Mensah 2014). In Asia, collectivism may be influenced by Confucianism, Buddhism, Hinduism, or other indigenous belief systems, each emphasizing community and duty (Tan and Tambyah 2011). The differences between Tables 5 (Africa) and 6 (Asia) show the importance of contextualizing the relationship between the perception of corruption as a business obstacle, generalized trust and relation centrism in these regions given that family centrism is associated with severe perceptions of corruption as a business obstacle in the African sample but not in the Asian sample. The results support show that Asian family centrism which emphasizes hierarchical relationships, respect

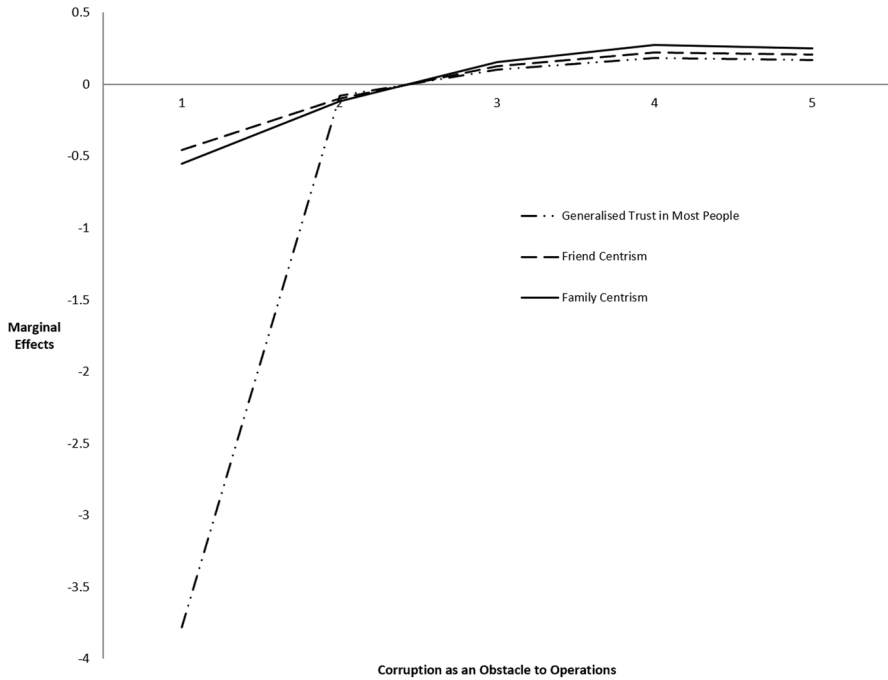


Fig. 4 Marginal effects estimation results for key variables tested in relation to the extent to which firms perceive corruption as an obstacle: Asia

for authority, and adherence to social norms and roles has a negative relationship with severe perceptions of corruption as a business obstacle.

To explore Hypotheses 2a, 2b, and 2c further, an Ordered Probit Model is applied using United Nations geoscheme categories: South and Central Asia, Middle East and North Africa (MENA), Sub-Saharan Africa, and ASEAN. Table 7 highlights deeper regional disparities in the relationships among generalized trust, family or friend centrism, and firms' perceptions of corruption as a business obstacle. In South and Central Asia and MENA, both generalized trust and family centrism significantly affect how firms perceive corruption, with an additional notable positive effect of friend centrism in the MENA region. However, in Sub-Saharan Africa, friend centrism displays a significant negative effect. Conversely, in ASEAN, both generalized trust and friend centrism exhibit a significant negative effect on firms' perceptions of corruption as a business obstacle. As seen in Tables 5 and 6, friend centrism displays a significant negative effect with the perception of corruption as a business obstacle again for the Sub-Saharan Africa sample and the ASEAN sample.

The perception of corruption by firms can be influenced by friend centrism in several ways. In societies where friend centrism is strong, personal relationships and networks play a significant role in business interactions and decision-making (Mitter et al. 2023). As a result, firms may perceive corruption as a more significant obstacle when personal relationships or connections are perceived to be necessary for successful business transactions (Massaro et al.

Table 5 Regional marginal effects estimation results in Table 5 (column 1) for key variables tested in relation to the extent to which firms perceive corruption as an obstacle: Africa

	1 (No obstacle)	2 (Minor obstacle)	3 (Moderate obstacle)	4 (Major obstacle)	5 (Severe obstacle)
Generalized trust in most people	-0.376 (0.271)	-0.133 (0.0962)	-0.0296 (0.0216)	0.180 (0.130)	0.358 (0.259)
Family centism	-3.167*** (0.505)	-1.121*** (0.182)	-0.250*** (0.0483)	1.516*** (0.245)	3.022*** (0.482)
Friend centism	0.685*** (0.0750)	0.242*** (0.0272)	0.0540*** (0.00856)	-0.328*** (0.0365)	-0.654*** (0.0716)
Legal institutional quality	0.0107*** (0.00263)	0.00378*** (0.000933)	0.000842*** (0.000228)	-0.00511*** (0.00126)	-0.0102*** (0.00251)
Political stability	0.101*** (0.0323)	0.0359*** (0.0115)	0.00800*** (0.00272)	-0.0486*** (0.0155)	-0.0968*** (0.0308)
Regulatory quality	-0.0260** (0.0132)	-0.00919* (0.00469)	-0.00205* (0.00108)	0.0124*** (0.00634)	0.0248*** (0.0126)
Business obstacle index	0.243*** (0.00576)	0.0861*** (0.00304)	0.0192*** (0.00213)	-0.116*** (0.00356)	-0.232*** (0.00526)
Firm size	0.00589 (0.00546)	0.00208 (0.00193)	0.000465 (0.000435)	-0.00282 (0.00262)	-0.00562 (0.00521)
Annual sales	0.00324* (0.00188)	0.00115* (0.000665)	0.000255* (0.000151)	-0.00155* (0.000900)	-0.00309* (0.00179)
Total labor cost	0.000330 (0.00147)	0.000117 (0.000521)	0.000260 (0.000116)	-0.000158 (0.000704)	-0.000315 (0.00140)

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; Standard errors of coefficients ()

Dependent variable: How much of an obstacle is corruption to operations? [1 = No obstacle, 5 = Severe obstacle]

Table 6 Regional marginal effects estimation results in Table 6 (column 2) for key variables tested in relation to the extent to which firms perceive corruption as an obstacle: Asia

	1 (No obstacle)	2 (Minor obstacle)	3 (Moderate obstacle)	4 (Major obstacle)	5 (Severe obstacle)
Generalized trust in most people	-1.436*** (0.157)	-0.104*** (0.0146)	0.250*** (0.0301)	0.445*** (0.0511)	0.846*** (0.0915)
Family centism	0.249** (0.123)	0.0181** (0.00893)	-0.0434** (0.0215)	-0.0773** (0.0381)	-0.147*** (0.0721)
Friend centism	0.459*** (0.111)	0.0333*** (0.00844)	-0.0798*** (0.0198)	-0.142*** (0.0347)	-0.270*** (0.0649)
Legal institutional quality	0.0210*** (0.00362)	0.00152*** (0.000298)	-0.00366*** (0.000638)	-0.00651*** (0.00114)	-0.0124*** (0.00215)
Political stability	0.0523*** (0.0129)	0.00379*** (0.000969)	-0.00910*** (0.00227)	-0.0162*** (0.00401)	-0.0308*** (0.00761)
Regulatory quality	0.248*** (0.0536)	0.0180*** (0.00417)	-0.0431*** (0.00969)	-0.0767*** (0.0168)	-0.146*** (0.0313)
Business obstacle index	0.266*** (0.00521)	0.0193*** (0.00181)	-0.0463*** (0.00207)	-0.0825*** (0.00280)	-0.157*** (0.00437)
Firm size	0.0277*** (0.00678)	0.00201*** (0.000523)	-0.00481*** (0.00120)	-0.00856*** (0.00211)	-0.0163*** (0.00400)
Annual sales	-0.00775** (0.00303)	-0.000563** (0.000226)	0.00135** (0.000530)	0.00240** (0.000943)	0.00457** (0.00179)
Total labor cost	-0.0113*** (0.00325)	-0.000818*** (0.000249)	0.00196*** (0.000571)	0.00349*** (0.00101)	0.00664*** (0.00192)

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; Standard errors of coefficients ()

Dependent variable: How much of an obstacle is corruption to operations? [1 = No obstacle, 5 = Severe obstacle]

Table 7 Regional generalized trust and relation centrism for the extent to which firms perceive corruption as an obstacle

	Ordered probit coefficients: South and Central Asia	Ordered probit coefficients: MENA	Ordered probit coefficients: Sub – Saharan Africa	Ordered probit coefficients: ASEAN
Generalized trust in most people	2.644*** (0.681)	30.648*** (3.742)	4.352*** (1.290)	– 3.764*** (0.780)
Family centrism	16.372*** (3.323)	17.393*** (21.115)	19.761*** (3.520)	– 0.387 (0.333)
Friend centrism	0.274 (1.566)	12.137*** (1.560)	– 1.906*** (0.609)	– 1.682*** (0.389)
Legal institutional quality	– 0.036 (0.033)	– 0.054*** (0.014)	– 0.052*** (0.017)	– 0.018 (0.020)
Social media penetration	– 1.007*** (0.062)	0.006 (0.005)	– –	– 1.050*** (0.036)
Business environment	0.020 (0.131)	– 1.125*** (0.031)	– 1.075*** (0.034)	0.011 (0.078)
Firm size: small	– 0.063 (0.113)	– 0.034 (0.064)	0.046 (0.080)	0.051 (0.064)
Firm size: medium	0.309*** (0.100)	– 0.086* (0.051)	0.086 (0.080)	0.069 (0.071)
Capital city	0.026 (0.091)	– 0.056 (0.108)	0.049 (0.051)	0.045 (0.050)
business city	– 0.118 (0.093)	0.066 (0.106)	0.083 (0.051)	– 0.020 (0.050)
Line of credit	– 0.036 (0.041)	– 0.003 (0.044)	– 0.070 (0.060)	– 0.006 (0.010)
Fixed assets	– 0.034 (0.023)	0.035** (0.018)	0.012 (0.017)	– 0.009 (0.020)
Annual sales	– 0.004 (0.027)	– 0.006 (0.013)	– 0.012 (0.010)	0.006 (0.025)
Total labor cost	45.285*** (12.320)	– 0.015 (0.014)	0.001 (0.007)	– 8.729*** (2.019)
Constant 1	45.702*** (12.321)	54.407*** (6.658)	50.557*** (9.167)	– 7.943*** (2.019)
Constant 2	46.325*** (12.322)	54.455*** (6.658)	51.337*** (9.168)	– 7.050*** (2.018)
Constant 3	47.023*** (12.323)	54.516*** (6.658)	51.913*** (9.168)	– 6.200*** (2.016)
Constant 4	2.644*** (0.681)	54.597*** (6.659)	53.091*** (9.170)	– 3.764*** (0.780)
R ² /Pseudo R ²	0.13	0.15	0.12	0.13
P	0.00	0.00	0.00	0.00
N	1,147	4,382	3,068	2,647

Table 7 (continued)* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; Standard errors of coefficients ()

Dependent variable: How much of an obstacle is corruption? [1 = No obstacle, 5 = Severe obstacle]

2019). Additionally, in environments where trust in formal institutions is low and reliance on personal relationships is high, firms may be more likely to perceive corruption as a pervasive and unavoidable aspect of doing business. Once again, while friend centrism in Sub-Saharan Africa, ASEAN, South and Central Asia and the MENA regions share some similarities due to cultural values that prioritize personal relationships and social connections, there are some notable differences due to clan and tribal structural differences within these regions. In many sub-Saharan African and ASEAN countries, tribal or clan structures play a significant role in social organization and identity. Friend centrism may intersect with these traditional structures, influencing social and economic dynamics within communities. Such tribal affiliations are less prevalent in the MENA and South and Central Asia regions. Furthermore, the MENA region is characterized by the predominance of Islam, which shapes cultural norms and social interactions. Islamic principles of brotherhood, hospitality, and solidarity may influence the expression of friend centrism and interpersonal relationships in business and society. This could explain why the MENA region has the highest positive association between friend centrism and the perception of corruption as a business obstacle. Overall, however, the results emphasize that family centrism holds greater importance for firms compared to friend centrism concerning their perceptions of corruption as a business obstacle.

Table 8 incorporates an interaction term between corruption and three governance indicators to test our hypothesis regarding the moderating influence of better country governance on generalized trust and relation centrism concerning corruption as a business obstacle. Overall, the results support Hypotheses 3a, 3b, and 3c, indicating that enhanced country governance diminishes the impact of generalized trust and family or friend centrism on firms' perceptions of corruption as a business obstacle. Notably, political stability consistently emerges as the most influential governance indicator in weakening this effect. Specifically, Table 8 (Columns 2, 5, and 8) illustrates that even when regulatory quality (Column 3) and legal institutions (Column 4) do not exhibit a similar effect, political stability consistently weakens the impact of generalized trust and relation centrism on firms' perceptions of corruption. This trend remains evident in the estimations conducted separately for Africa and Asia, as shown in appendix Tables A5 and A6 (Columns 2, 5, and 8), signifying that higher political stability in countries reliably diminishes the influence of generalized trust and relation centrism on corruption as a business obstacle. As robustness checks, we also rerun all the estimations with country-fixed effects, year-fixed effects, and industry-fixed effects included in the regression analyses. The results remain consistent across all specifications.

Table 8 Effects of interaction between generalized trust and relation centrism for the extent to which firms perceive corruption as an obstacle and country governance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable: How much of an obstacle is corruption? [1 = No obstacle, 5 = Severe obstacle]									
Generalized trust in most people	1.958*** (0.333)	-0.468 (0.342)	2.571*** (0.402)	1.326*** (0.266)	1.744*** (0.268)	1.548*** (0.270)	1.361*** (0.267)	1.526*** (0.268)	1.164*** (0.273)
Family centrism	0.453*** (0.196)	1.341*** (0.222)	0.248 (0.203)	0.540** (0.223)	3.108*** (0.302)	-7.569*** (1.675)	0.482** (0.196)	-1.007*** (0.287)	0.523*** (0.197)
Friend centrism	-0.0241 (0.115)	0.307** (0.122)	-0.285** (0.131)	-0.0252 (0.115)	-0.764*** (0.132)	-0.591*** (0.164)	0.239 (0.180)	-2.556*** (0.377)	-0.288* (0.152)
Generalized trust in most people x legal institutional quality	-0.341*** (0.108)								
Generalized trust in most people x political stability		-1.872*** (0.227)							
Generalized trust in most people x regulatory quality			2.510*** (0.608)						
family centrism x legal institutional quality				-0.0551 (0.0846)					
Family centrism x Political stability					-5.610*** (0.490)				
Family centrism x regulatory quality						-11.16*** (2.308)			
Friend centrism x legal institutional quality							-0.117* (0.0604)		
Friend centrism x political stability								-1.670*** (0.237)	
Friend centrism x regulatory quality									-0.753*** (0.286)

Table 8 (continued)

Legal institutional quality	-0.00515 (0.0191)	-0.0518*** (0.00873)	-0.0618*** (0.00872)	0.103 (0.249)	-0.0632*** (0.00870)	-0.0626*** (0.00872)	0.213 (0.141)	-0.0589*** (0.00869)	-0.0598*** (0.00869)
Political stability	-0.211*** (0.0356)	0.172*** (0.0593)	-0.175*** (0.0371)	-0.218*** (0.0356)	16.26*** (1.439)	-0.172*** (0.0369)	-0.216*** (0.0356)	3.551*** (0.535)	-0.228*** (0.0357)
Regulatory quality	-0.241*** (0.0502)	-0.360*** (0.0526)	-0.619*** (0.108)	-0.225*** (0.0499)	-0.0200 (0.0534)	32.62*** (6.793)	-0.216*** (0.0501)	-0.294*** (0.0506)	1.455** (0.640)
Facebook proportion	0.0148*** (0.00118)	0.0164*** (0.00119)	0.0137*** (0.00122)	0.0150*** (0.00118)	0.0106*** (0.00124)	0.0190*** (0.00144)	0.0146*** (0.00119)	0.0204*** (0.00141)	0.0160*** (0.00124)
Twitter proportion	-0.0203*** (0.00172)	-0.0202*** (0.00172)	-0.0171*** (0.00187)	-0.0202*** (0.00171)	-0.0120*** (0.00186)	-0.0189*** (0.00174)	-0.0199*** (0.00172)	-0.0170*** (0.00177)	-0.0161*** (0.00229)
Business obstacle index	-1.056*** (0.0169)	-1.029*** (0.0172)	-1.071*** (0.0172)	-1.056*** (0.0169)	-1.057*** (0.0169)	-1.063*** (0.0169)	-1.059*** (0.0169)	-1.038*** (0.0171)	-1.050*** (0.0170)
Level of Income	0.148*** (0.0398)	0.213*** (0.0408)	0.177*** (0.0408)	0.136*** (0.0396)	0.0269 (0.0408)	0.213*** (0.0426)	0.136*** (0.0396)	0.0329 (0.0423)	0.107*** (0.0411)
Firm size	0.0143 (0.0158)	0.00174 (0.0159)	0.00253 (0.0161)	0.0151 (0.0158)	-0.0254 (0.0162)	0.00118 (0.0161)	0.0161 (0.0158)	0.0229 (0.0159)	0.00976 (0.0159)
Annual sales	-0.0184*** (0.00597)	-0.0137*** (0.00601)	-0.0142*** (0.00607)	-0.0187*** (0.00597)	-0.00540 (0.00608)	-0.0135*** (0.00607)	-0.0192*** (0.00598)	-0.0228*** (0.00600)	-0.0174*** (0.00599)
Total labor cost	-0.00484 (0.00555)	-0.000262 (0.00558)	-0.00315 (0.00556)	-0.00500 (0.00555)	0.00459 (0.00561)	-0.00219 (0.00557)	-0.00503 (0.00555)	-0.00431 (0.00555)	-0.00292 (0.00560)
Non landlocked	-0.0582 (0.0613)	0.0639 (0.0631)	-0.204*** (0.0716)	-0.0492 (0.0612)	-0.000194 (0.0614)	-0.148*** (0.0645)	-0.0559 (0.0613)	0.0508 (0.0630)	-0.0164 (0.0625)
Constant 1	-1.897*** (0.665)	1.569** (0.790)	-2.879*** (0.699)	-1.782** (0.736)	4.064*** (0.845)	-26.65*** (5.146)	-1.372* (0.737)	-11.77*** (1.538)	-2.414*** (0.683)

Table 8 (continued)

Constant 2	-1.280*	2.187***	-2.260***	-1.165	4.687***	-26.03***	-0.755	-11.15***	-1.796***
	(0.665)	(0.790)	(0.698)	(0.736)	(0.845)	(5.145)	(0.737)	(1.538)	(0.683)
Constant 3	-0.651	2.817***	-1.631**	-0.537	5.319***	-25.40***	-0.126	-10.52***	-1.167*
	(0.665)	(0.790)	(0.698)	(0.736)	(0.845)	(5.145)	(0.737)	(1.537)	(0.683)
Constant 4	0.214	3.686***	-0.767	0.327	6.187***	-24.54***	0.738	-9.654***	-0.303
	(0.665)	(0.790)	(0.699)	(0.736)	(0.845)	(5.145)	(0.737)	(1.537)	(0.683)
R ² /Pseudo R ²	0.148	0.149	0.148	0.147	0.151	0.148	0.148	0.149	0.148
Observations	11,952	11,952	11,952	11,952	11,952	11,952	11,952	11,952	11,952

Standard errors of coefficients ()* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

5 Contribution and limitations

5.1 Contributions

We have expanded the connections within the trust and corruption literature (Hatak et al. 2015; Keig et al. 2015; Raz et al. 2023) by emphasizing the significance attributed to trust in family, friends, or the broader community (Bullough et al. 2017; Harris 2007; Uslaner 2004). There are three possible interpretations of our results. The first is that medium ties do not create pressures to engage in corrupt behavior because they do not imply significant obligations towards members of the family in-group, nor do they imply substantial trust in out-group members. The second, and in our view more likely interpretation, is that the moderate ties implied by friend centrism serve to deter severe forms of corruption that could pose obstacles to firms in such contexts. This interpretation aligns with consistently lower coefficients for corruption as a business obstacle in Tables 5 and 6, columns 4 and 5. The third interpretation, related to the second, may stem from not having to rely on dense kinship ties to perform business tasks. Markedly, the results for family centrism in Tables 7 and 8 highlight that family centrism generally outweighs friend centrism in firms' perceptions of corruption obstacles.

Our focus has revealed that higher out-group generalized trust, and to a lesser extent, in-group family centrism, are most frequently associated with greater perceptions of corruption hindering business operations. We have also discovered that moderate relation centrism, particularly friend centrism, is most frequently associated with a decrease in the extent to which firms perceive corruption as an obstacle in their operations. Our contribution does not end there, however, as we have also found that regional disparities exist in the nature of these relationships, but that family centrism generally outweighs friend centrism in firms' perceptions of corruption obstacles. Regionally, family centrism is associated with severe perceptions of corruption as a business obstacle in the African sample but not in the Asian sample. Thus, two significant contributions of this paper are that: (i) friend-centric approaches, particularly in organizational or group settings, are more likely than generalized trust and family-centric approaches to maintain checks and balances in lower- and middle-income countries, ensuring that firm relationships and decisions remain ethical, unbiased, and effective; and (ii) family-centric approaches, which emphasize ordered relationships, respect for the rule of law, and adherence to social norms and roles, are more likely to have a negative relationship with severe perceptions of corruption as a business obstacle. Furthermore, we have contributed to the anti-corruption literature by demonstrating the crucial role of political stability in moderating the impact of trust spheres and relationship dynamics on the perception of corruption as a business impediment across regions (Hauser 2019; Jong and Ees 2014).

5.2 Limitations

The study's limitation lies in our examination of lower- and middle-income countries, where strong family ties often play a crucial role in surmounting societal and structural challenges (Mertzanis 2019). Additionally, we remain uncertain about the

interplay: whether political stability diminishes the necessity for corruption through generalized trust and relation centrism, or if, in stable political contexts, these elements are employed to reduce corruption. Nevertheless, the robust findings we've presented hold significance, highlighting the crucial need for firms to acknowledge and tackle in-group and out-group dynamics. This awareness is essential not only to foster positive group dynamics but also to alleviate the adverse impacts of exclusion and discrimination within their operational spheres.

Consequently, in societies where family and friend centrism, which focus on relationships, demonstrate a positive and significant relationship with corruption as a business obstacle, firms must ensure that their employees make unbiased decisions devoid of influence from family or other in-group considerations. These findings hold particular importance for firms situated in lower- and middle-income countries, where ethnic and group ties profoundly impact business activities. In such contexts, relationship-centric interactions occur frequently and may significantly impact corruption as a business obstacle and the strategies adopted to mitigate it. Future research could benefit from utilizing longer time-series data across a wider array of countries, as this may reveal deeper dynamics in the evolving nature of regional disparities in how generalized trust and relation centrism impact firms' perceptions of corruption obstacles over time.

6 Conclusion

Utilizing a pioneering approach introduced in this paper, machine learning has been employed to delineate the nature of social ties within lower- and middle-income regions. These regions exhibit stronger ties within family circles, medium ties within friendships, and weaker ties within the broader societal context. Through this investigation, we have observed a consistent trend: an increase in medium-tie friend centrism is most frequently associated with a decrease in how extensively firms perceive corruption as a business obstacle. Thus, this research underscores the existence of significant relationships between firms' perceptions of corruption as a business impediment and various spheres of trust. Furthermore, our study highlights a significant finding: a country's governance quality diminishes the connections between firms' perceptions of corruption as a business obstacle and generalized trust, along with relation centrism. This emphasizes that superior governance is associated with reduced instances of corruption as a business obstacle. Finally, our distinctive analysis elucidates that enhanced country governance, particularly political stability, consistently mitigates the impact of generalized trust and relation centrism on firms' perceptions of corruption as a business obstacle.

The ICE encompasses corruption subcategories that are only identifiable through out-group generalized trust and in-group relation centrism. Consequently, corruption exhibits a social dimension, aligning with the social aspects of firm conduct. This study establishes a connection between the degree to which corruption impedes business operations and the influence of generalized trust and relation centrism. It also demonstrates the pivotal role of political stability in moderating the associations

that generalized trust and relation centrism hold with how firms perceive corruption as a business obstacle.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s11846-024-00802-9>.

Declarations

Conflict of interest None.

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