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Institutions and corruption relationship: Evidence from African countries

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ABSTRACT

This study considers the combined effects of formal (i.e., national governance) and informal (i.e., national culture) institutions on corruption based on a sample of 52 African countries over the 2007–2022 period. Employing institutional theory, our findings are three-fold. First, we find weak formal institutions (i.e., national governance systems) to be associated with higher levels of corruption. Second, regarding the effects of informal institutions (i.e., national culture) on the level of corruption, our results suggest that high power distance, uncertainty avoidance, and collectivism are associated with higher levels of corruption. However, masculinity has a negative and significant influence on the level of corruption in Africa. Finally, our main results indicate that the joint effect of formal (national governance) and informal (national culture) institutions tends to be associated with a high incidence of corruption at societal level.

1. Introduction

The issue of why corruption appears to be more pervasive in some countries compared to others has been a subject of both academic and policy analyses over the past three decades (e.g., Achim, 2016; Aidt et al., 2008; Bayley, 1966). Among the many causes of corruption theorized in the literature, academics, policymakers, civil society, and anti-corruption agencies broadly agree that institutional deficiencies constitute one of the main causes of corruption (OECD, 2000; Wu, 2005; Fan et al., 2008; Estrin and Prevezer, 2011). Thus, institutional theorists (e.g., North, 1990; North, 1991; Powell and DiMaggio, 1991) contend that social actors are embedded in institutional environment and that economic activities cannot be analysed without the consideration of the institutions in which these activities occur. Therefore, institutions have been widely acknowledged as a critical factor in explaining both individual

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and organizational actions and processes (Dacin et al., 2002; Alon and Hageman, 2017; Adomako et al., 2021).

Despite this, studies examining the causes and consequences of corruption have tackled the issue by focusing predominantly on the effects of one aspect of institutions, either formal institution[1] or informal institution,[2] especially formal ones, on corruption (e.g., Husted, 1999; Wu, 2005; Seleim and Bontis, 2009; Dela Rama, 2012; Alon and Hageman, 2017). Thus, the extant literature has largely ignored the combined effect of formal and informal institutions on corruption (Tonoyan et al., 2010; Boateng et al., 2020). For example, the work of Wu (2005) and Aidt et al. (2008) examined the effects of formal institutions (i.e., national governance) on the level of corruption, whilst Husted (1999) and Mensah (2014), among others, have examined the role of informal institutions (i.e., national culture) on corruption. One exception to prior studies is the work of Tonoyan et al. (2010). However, it is pertinent to point out that, Tonoyan et al. (2010) did not directly analyse the combined effect (i.e., interactions between formal and informal institutions) but rather carried out separate analyses of the effects of both formal and informal institutions on corruption.

Our study is motivated by the sharp disagreements between the two competing perspectives which underpin how formal and informal institutions evolve and interact with each other. On the one hand, Scott (1995) argues that informal and formal institutions are analytically independent and interaction with each other could not be expected. On the other hand, Hirsh (1997); Bebchuk and Roe (1999); Aguilera and Jackson (2003); and Filatotchev et al. (2013) disagree and argue that formal and informal institutions are not analytically or operationally independent; rather they interact with each other to influence the behaviour of actors in a society. Which of the two views regarding the effects of formal and informal institutions prevails in practice is an open empirical question that this study attempts to address. Importantly, institutional theorists, such as Scott (1995) contend that formal institutions (national governance), provide a framework on the behaviour of actors in the society whilst Hofstede (2010); Peterson and Barreto (2014) suggest that informal institutions (national culture) influence firm and individual perception of ethical situations, norms of behaviour and ethical judgment. Therefore, the processes by which institutions influence individual actions, decision making, and interpretation of issues are important in fighting corruption at the societal level (Husted, 1999; Tonoyan et al., 2010; Mensah, 2014). Consequently, North (1990) and Filatotchev et al. (2013) argue that any analysis of the cause and effect of corruption will be incomplete if only one element of institutions is considered. Indeed, Judge et al. (2008) suggest that all the elements of institutions must be considered together to obtain a holistic understanding of social phenomena. Furthermore, researchers, such as North (1990, 1991), Helmke and Levitsky (2003), Schwens et al. (2011) and Tonoyan et al. (2010) have theoretically articulated the potential interaction effects between formal and informal institutions on the incidence of corruption. Yet surprisingly the interaction effects of formal and informal institutions in the fight against corruption have rarely featured in any of the existing empirical analysis of corruption. In this study, we contend that the lack of holistic approach among past studies investigating the effects of institutions on corruption may account for the reasons why policymakers and multilateral institutions, have focused disproportionately on reforming formal institutions, especially corporate governance systems[3] and ignored the joint effect of formal and informal institutions (national culture) in the fight against corruption with little success. Employing institutional theory and building on the recent study by Boateng et al. (2020), this study seeks direct evidence of the joint effects of formal and informal institutions on corruption in African context where institutions are weak and corruption accounts for poor economic development. We do so through a study of 52 African countries over the period of 2007–2022.

The choice of Africa is motivated by three considerations. First, corruption appears rampant in African countries with about 25 % of its gross domestic product (GDP) reportedly lost each year through corruption (African Development Bank, 2006; United Nations Economic Commission for Africa, 2009). According to the Transparency International (2018), apart from few African countries, such as Botswana, Cape Verde, Mauritius, Namibia and Rwanda, African countries are among the worst scoring countries on the corruption perceptions index over the past 10 years. The global average of corruption perception index in 2017 on a reverse scale of 0 (very clean) – 100 (very corrupt) was 56.93 and 43 out of 52 African countries (about 82 %) had worse scores than the global average of 56.93, suggesting that Africa is the worst performing region with overall average of score of about 68 (Transparency International, 2018). Second, institutions, especially formal ones in Africa appear under-developed and weak (Luiz and Stewart, 2014), and this is compounded by weak political leadership, disease, conflicts and war, as pointed out by United Nations Economic Commission for Africa (2009); and Transparency International (2018). In fact, Luiz and Stewart (2014) argue that the pervasiveness of corruption in Africa is closely associated with poor institutions, and thereby reinforcing the point that institutions appear to be an important issue in the fight against corruption at corporate and societal levels. Finally, the incidence of extreme and open poverty is relatively high in most African countries (United Nations Economic Commission for Africa, 2009; Luiz and Stewart, 2014). This along with pervasive lower levels of pay, especially in the public services often render public officials highly susceptible to corrupt and unethical practices (Justesen and Bjornskov, 2014), imposing high transaction costs on individuals and firms (Lambsdorff, 2003). Thus, given that African institutions are weak and have distinctive cultures, we contend that African countries warrant a special and separate attention to provide better

[1] Formal institutions refer to laws and regulations that are often examined in the context of national governance indicators (Kaufmann et al., 2010). They encompass indicators, including: the rule of law, the regulatory quality, government effectiveness, voice and accountability, political stability, and absence of violence.

[2] Informal institutions, which we define to include norms, conventions, and internally devised codes of conduct (North, 1990), are operationalized in this study, as national culture. Thus, we use Hofstede's (1980) four cultural dimensions, namely, power distance, individualism, uncertainty avoidance, and masculinity.

[3] For example, over the past 20 years, 435 formal good corporate governance codes and principles have been enacted in over 95 countries, along with the formation of various committees to assess and recommend improvements in corporate governance systems across countries (Collier and Zaman, 2005; Cuomo et al., 2016; OECD, 2000; World Bank, 2004). This highlights excessive emphasis on formal institutions (i.e., rules of national governance systems) over informal (i.e., cultural norms) institutions in reducing corruption by improving formal institutions.

understanding of the impact of formal and informal institutions on corruption. The above considerations arguably provide an ideal setting by which to explore the effects of formal (i.e., national governance) and informal (i.e., national culture) institutions on corruption.

Employing both univariate and multivariate regression analyses, we find weak formal institutions to be associated with higher levels of corruption. Regarding the effects of informal institutions, our results suggest that whereas high power distance, uncertainty avoidance, and collectivism are positively related to higher levels of corruption, masculinity has a negative and significant influence on the level of corruption in Africa. Lastly, our main results indicate that the joint effect of formal and informal institutions is associated with a high incidence of corruption in Africa.

The rest of the paper proceeds as follows. In Section 2, we present a review of corruption and institutions in Africa. Section 3 provides the theoretical background and develops the hypothesis of the study. Section 4 sets out our research methods. Section 5 reports and discusses our results. Implications, contributions, and conclusions of the study follow in Section 6.

2. Institutional background and corruption in Africa

Corruption[4] which is defined as the abuse of entrusted power for private gain (Transparency International, 2018; Rose-Ackerman, 1999), is endemic, particularly, in emerging and developing countries (Transparency International, 2018). In the context of Africa, corruption is seen as one of the major obstacles to economic development (World Bank, 2007; United Nations Economic Commission for Africa, 2009). Corruption appears so rampant in Africa that, it is not surprising that the names of African countries (apart from Botswana, Cape Verde, Namibia, Mauritius, Rwanda and Seychelles) are always found at the bottom level of the list of most perceived corrupt countries in the world (see Table A in the appendix based on Transparency International 2022 statistics). According to the United Nations Economic Commission for Africa (UNECA) (2009), the continent loses about $148 billion through corruption every year since 2004. The pervasiveness of corruption is also emphasized by various Transparency International reports, which indicated that nearly 75 million people living in sub-Saharan Africa are estimated to have paid bribes in 2014 with most escaping punishment by the police or law courts. Global Financial Integrity Report (2014) and African Development Bank (2006) reported that, governments in Africa lose around 50 % of total annual estimated tax revenues through various corrupt practices, such as collusions between government officials and businesspeople. For example, the tax revenue lost through mis-invoicing only over the period of 2002-2011 by a number of African countries can be broken down as follows: Uganda (12.7 %); Ghana (11 %); Mozambique (10.4 %); Kenya (8.3 %) and Tanzania (7.4 %) (Global Financial Integrity Report, 2014). It is important to point out that corruption in Africa is wide ranging and permeates across a large spectrum of African society, ranging from businessmen; civil and public servants; political office holders, firms and churches. High profile corruption cases abound, including: former president of South Africa, Jacob Zuma's private home scandal, which resulted in a reported 246 million Rands cost being charged to the taxpayer; former president Zoina el-Abidine Ben Ali of Tunisia was found guilty of stealing about $2.6 billion from state coffers; the amassing of a fortune estimated between $5–8 billion by Mobutu Sese Seko (former president of Democratic Republic of Congo); and the loss of almost 55 million barrels of oil every year in Nigeria for almost three decades in the 1975–2005 (UNODC (United Nations Office on Drugs and Crime), 2009).

Researchers, policymakers, multilateral institutions, and civil society have attributed the pervasive nature of corruption to poor institutions and weak corporate governance systems in Africa and have, therefore, called for reforms (World Bank, 2007; United Nations Economic Commission for Africa, 2009; Justesen and Bjornskov, 2014). In response to this call, African governments have reformed corporate governance systems and created several anti-corruption agencies, and initiatives to stem and control the occurrence of corruption. At the core of the extensive corruption-focused national reforms, is the establishment of formal anti-corruption (i) state institutions (e.g., Serious Fraud Office and Economic and Financial Crimes Commission, both in Nigeria; Bureau of National Investigations, Economic and Organised Crime Office, and more recently, the Office of Special Prosecutor, all three in Ghana). In fact, almost every country in Africa has a formal state/national anti-corruption agency. At the international level, transnational bodies (e.g., United Nations Convention against Corruption (UNCAC); IMF; African Union and World Bank) and civil society (e.g., Integrity Initiative, Transparency International and Corruption Perception Index) are at the forefront of the fight against corruption in Africa. Observably, the quality of the national governance environment, as measured by government effectiveness, political stability and absence of violence, regulatory quality, rule of law, and voice and accountability (Kaufmann et al., 2010) of African countries appear relatively weak compared with other regions of the world (Fafchamps, 2004; Easterly, 2008). Thus, despite the apparent pursuit of reforms that are primarily aimed at strengthening formal institutions (national governance systems) in Africa, corruption shows no sign of abating (Transparency International, 2018). In fact, Kaufmann et al. (2004) notes that the experience of countries implementing good governance reforms to curb corruption has been mixed.

Against the backdrop of mixed results, scholars have turned their attention to informal institutions (e.g., national culture) (Husted, 1999; Fisman and Miguel, 2007; Lopez and Santos, 2014; Mensah, 2014). This is because scholars (e.g., Hofstede, 1980; North, 1990) point out that informal constraints are central to understanding the path of economic development of which corruption has a huge detrimental effect. Research evidence (e.g., Seleim and Bontis, 2009; Daniel et al., 2012; Lopez and Santos, 2014) demonstrates that corrupt practices of individuals are rooted in culture and that culture operates to motivate and justify actions compatible with prevailing values in the society (Licht et al., 2005). In support of the above argument, Getz and Volkema (2001) found cultural values to influence decisions about whether to engage in corrupt transactions in their study of corruption. Table 1 provides a summary score of

[4] In this study, we use the definition provided by Transparency International (TI), as we collect our data regarding our dependent variable from TI database.

Table 1
Summary of cultural dimensions for Africa in comparison to other regions around the world.

Region	Power distance	Uncertainty avoidance	Individualism	Masculinity
Africa	71	53	26	42
Latin America	67	77	24	50
Asia Pacific	67	50	32	54
North America	40	47	86	57
EU	52	71	59	46
Other Europe	55	69	52	33
Middle-East	65	74	38	50

Notes:
1. Compiled by Authors based on Hofstede (2010) cultural Index. 2. North America countries include USA and Canada only.
2. Hofstede (1980) defines cultural dimensions as follows: Individualism (*IDV*) is the degree to which members within a society are encouraged on individual achievement rather than collective achievement. Power distance (*PDI*) is the degree to which less powerful members within a society expect power to be unequally distributed and accept it as normal. Masculinity (*MAS*) refers to the extent to which values such as assertiveness, aggression and competitiveness are valued. Uncertainty avoidance (*UAI*) is the degree to which members within a society tolerate deviance and risk.

Hofstede's four cultural dimensions for Africa in comparison to other regions around the world. Drawing on Hofstede (1980), Hofstede (2010), and Hofstede (2003) cultural dimensions, the table shows that Africa is generally characterized by high levels of power distance and collectivism, but low to moderate in respect of masculinity and uncertainty avoidance.

An important question, therefore, is: to what extent do formal and informal institutions in Africa jointly influence perceived corrupt practices? This paper seeks to address this question by investigating joint effects of formal (national governance) and informal (national culture) institutions on the level of corruption in African countries.

3. Theoretical background and hypothesis development

3.1. Institutional theory

Institutions defined by North (1990: 3) as "the rules of the game in a society" has been approached and classified in a number of ways (Casson et al., 2010). Scott (1995) developed a three-level model, namely, the regulative, the normative, and the cognitive-culture to study the institutional environment within the institutional theory. According to Scott (1972), the regulative element of institutions consists of regulations and laws that guide individuals and organizations actions and perspectives through the threat of sanctions. The cognitive-cultural element of institutions encompasses symbols, words, signs, learning, education and the cultural rules and a framework that guide the understanding of the nature of and the frame through which that meaning is developed (Scott, 1972). The normative element of institutions focuses on the rules of thumbs, and standards that guide the actions of individuals and organizations emanating from obligations. According to Li and Wu (2010), all the three elements of institutions may influence corruption because all the three pillars together generate legitimacy in a given society.

In contrast to the above typology, North (1991) and Helmke and Levitsky (2003) group institutions into two broad taxonomies - formal and informal. New institutionalism differentiates between formal and informal institutions (Schwens et al., 2011) and how they influence the actions and behaviours of individuals and organizations. According to Peng (2000), formal institutions are manifested in rules and laws, legal decisions, and economic issues. In contrast, Peng (2000: 4) suggests that informal institutions include "….socially sanctioned codes of conduct and norms of behaviour which are embedded in culture and ideology". According to Scott (1995), these two institutions generate isomorphic pressures that tend to encourage or constrain behaviours and actions of actors in the society. In this case, Scott (1972, 1995) regulative elements of institutions are more similar to North (1991) and Helmke and Levitsky's (2003) definition of formal institutions. By contrast, the normative and, to a large extent, cognitive elements of Scott's neoinstitutional framework map well into North (1991) and Helmke and Levitsky's (2003) classification of informal institutions. Meanwhile, systematic research evidence demonstrates that the development of bureaucracies, corrupt practices and attitudes of individuals are conditioned by the broader socio-economic environment, which include formal and informal institutions (Daniel et al., 2012; Lopez and Santos, 2014).

3.2. Formal and informal institutions and corruption

In this study, we utilize the formal and informal institutions classification, which was built on the ideas of North (1991) by Helmke and Levitsky (2003) because they appear more suitable and relevant to the study of corruption (Husted, 1999; Tonoyan et al. 2010; Mensah, 2014). More importantly, researchers argue that this typology focuses on interactions of formal and informal institutions to influence individual and firm actions and behaviours (Li and Wu, 2010; Alon and Hageman, 2017). To explain the antecedents of corruption, formal and informal institutions have been applied by previous studies (see Vitell et al., 1993; Li and Wu, 2010; Tonoyan et al., 2010). For example, previous studies have identified the following themes under formal institutions: the rule of law, the regulatory quality, government effectiveness, voice and accountability, political stability, and absence of violence, as measures of formal institutions (Sung, 2004; Pellegrini and Gerlagh, 2008; Kaufmann et al., 2010; Mensah, 2014). In a survey on the sources of corruption, Chafuen and Guzman (2000); Pellegrini and Gerlagh (2008) identified the rule of law and regulatory quality/burden to influence the

level of corruption. Mensah (2014) arrived at a similar conclusion indicating that the formal institutions have significant influence on corruption and have been examined in the context of corporate governance (Alon and Hageman, 2017).

The explanatory power of the association between formal institutions and corruption lies in the fact that the elements of formal institutions shape behaviours and actions of individuals and firms within a society (Scott, 1995; Peng et al., 2008). Formal institutions help to minimize conflict of interest involving actors in society, emphasising the legal mechanisms that prevent the use of entrusted power for private gain (Johnson et al., 2000). Wu (2005) and Black et al. (2000) reported that good national governance system is an effective anti-corruption tool, while weaknesses in governance system foster corruption. For example, weak formal institutions may allow a monopolist firm to bribe public officials to make it more difficult for competitors to enter and operate in the market. Formal institutions do not only impose constraints on those engaged in corrupt practices but increase the chance of detection (see Wu, 2005). Teorell and Hadenius (2006), therefore, concluded that a large body of research evidence suggests a close relationship between national governance and the level of corruption.

Regarding informal institutions (national culture), scholars support the contention that national culture has a palpable influence on corruption (see Tsalikis et al., 1993; Vitell et al., 1993; Husted, 1999). Specifically, prior studies (e.g., House et al., 2004; Hofstede, 1980) note that all cultural dimensions, (namely: power distance; individualism/collectivism; uncertainty avoidance; masculinity/femininity; short-term/long-term orientation; and indulgence/restraint) influence individual and firm perception of ethical situations, norms of behaviour and ethical judgment, and hence national cultural differences are expected to influence corruption.

3.3. Interaction between formal and informal institutions

Institutions which consist of formal and informal institutions provide stability and meaning to social behaviour (Scott, 1995; North, 1990). Scott (1995) and Judge et al. (2008) point out that all elements of institutions must be considered together in order to obtain a comprehensive understanding of social phenomena. Therefore, Lopez and Santos (2014) and, Fisman and Miguel (2007) argue that neither formal institutions nor cultural values alone can fully explain the incidence of corruption across societies. For example, formal institutions serve to constrain and standardise social behaviour through regulative mechanisms (Lopez and Santos, 2014; Li and Wu, 2010). Therefore, formal institutions set rules and laws, monitor compliance, sanction certain activities and punish corrupt practices (Judge et al., 2008). On the other hand, informal institutions set the behaviours expected within a society and exert enormous influence on behavioural expectations (Roberts and Greenwood, 1997). The overall thrust of institutional theory is that institutional contexts, that is, the combination of formal and informal rules and their enforcement, are important in explaining the behaviour of individuals and organizations within a society (North, 1990, 1991; Scott, 1995). For example, Husted (1999) contends that the interaction between the regulatory effectiveness of government and low-level uncertainty avoidance may help reduce corruption at the societal level, whereas the converse may increase corruption. Thus, the combination of formal and informal rules may be important in explaining the level of corruption in a society (North, 1990; Li and Wu 2010; Judge et al., 2008). In the light of above discussion, we hypothesize that:

H1: The interaction of formal and informal institutions is related to the level of corruption in African countries.

4. Data and methodology

4.1. Data sources

The data utilized in this study is mainly drawn from three sources. Following prior studies (Davis and Ruhe, 2003; Husted, 2002; Mensah, 2014), we gather the Corruption Perceptions Index (*CPI*) data from Transparency International (TI) to measure the level of corruption. CPI has been the most popular way to measure the level of corruption at the country level. It measures the perceived levels of corruption instead of absolute levels of corruption and constructed from several sources, including multinational agencies, not-for-profits organizations and consulting firms (Lambsdorff, 2001). Besides, we obtain the Control of Corruption (*COC*), which is among the series of Worldwide Governance Indicators compiled by the World Bank, as an alternative measure of corruption to enhance robustness of our results (Kaufmann et al., 2010; Mensah, 2014). National governance (*NG*) data is extracted from the World Bank's Worldwide Governance Indicators, including voice and accountability (*VOICE*), political stability and absence of violence/terrorism (POL), government effectiveness (*GOV*), regulatory quality (*REG*) and rule of law (*RULE*). The Worldwide Governance Indicators capture the political, economic, and institutional dimensions of governance, which is compiled through surveys, rating agencies, nongovernmental organizations and multinational agencies (World Bank, 2007; Kaufmann et al., 2010). We collect Hofstede's cultural dimensions (namely, power distance, uncertainty avoidance, individualism and masculinity) from Hofstede (1980, 2010) and utilize macroeconomic data, such as GDP, inflation, imports of goods and services, and population, among others, from the World Bank.

Our sample comprises data from 52 African countries for the period of 2007 to 2022. The selection of the sample period from 2007 to 2022 is driven by corporate governance and institutional reforms undertaken by many African governments since 2007 in response to the call by the civil societies in Africa, World Bank (2007) and other international institutions such IMF, OECD after the global financial crisis in 2007/2008. As a results, African governments have undertaken governance reforms and established several anti-corruption agencies and initiatives aimed at curbing and managing corruption (United Nations Economic Commission for Africa, 2009; Justesen and Bjornskov, 2014). According to Cuomo et al. (2016), we have seen an enactment of over 435 corporate governance codes and principles in over 95 countries, with many Africa countries featuring prominently as part of IMF conditionalities for support. Therefore, the selection of 2007–2022 as a sample period provides an ideal setting to assess the effects of institutional reforms on corruption.

4.2. Measurement of variables and empirical models

4.2.1. Dependent variable

Our dependent variable is corruption. Prior studies indicate that there are several definitions of corruption, including: the misuse of public office for private benefit (Treisman, 2000). Similarly, Jain (2001) defines corruption as acts in which the power of public office is used for personal gains in a manner that contravenes the rules of the game. However, following the extant literature on corruption (e.g., Davis and Ruhe, 2003; Mensah, 2014; Wu, 2005), we use the *CPI*, as our proxy for the country level of corruption. Consistent with the definition provided by Transparency International (TI), we define corruption as the abuse of entrusted power for private gain (Rose-Ackerman, 2006; Transparency International, 2018). This definition is broad and considers not only government officials, but also all individuals, including employees, trustees, shareholders and private citizens, among others. Moreover, it accounts for the fact that the person is abusing entrusted power by engaging in actions that are beyond his or her mandate for personal benefits (Cuervo-Cazurra, 2016).

The original CPI is an inverse measure of corruption as it ranges from 0, indicating high levels of corruption, to 100 for countries with low levels of corruption. In order to obtain a direct indicator of the level of corruption and consistent with the logic of our developed hypotheses, we re-calculate the CPI as 100 (Davis and Ruhe, 2003; Benfratello et al., 2018), and it ranges from 0 (very clean) to 100 (very corrupt). In the context of Africa, Somalia, for instance, has a highest CPI score of 88 (very corrupt), while Seychelles has a lowest CPI of 30 (clean) in 2022. In addition, we also employ the country-level *COC* from Worldwide Governance Indicators (*WGI*), as an alternative measure for the corruption for robustness checks. It reflects perceptions of the extent to which public power is exercised for private gain, ranging from −2.5 for the least corrupt country to 2.5 for the most corrupt country.

4.2.2. Independent variables

Our main independent variables measure the quality of national governance and national culture. We employ voice and accountability (*VOICE*), political stability and absence of violence/terrorism (*POL*), government effectiveness (*GOV*), regulatory quality (*REG*) and rule of law (*RULE*) to capture different dimensions of national governance. Kaufmann et al. (2010) describe these measures as follows: *VOICE* measures the extent to which people can select their government, as well as freedom of expression, association and free media and the extent of participative democracy. *POL* measures the probability that the government will be destabilized or overthrown by unconstitutional means or politically inspired violence. *GOV* is used to measure the effectiveness of the government, including the quality of public services, the quality of the civil service and the degree of its independence from political pressures, and government commitment to good governance. *REG* captures the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Finally, *RULE* measures the extent to which agents have confidence in and abide by the rules of society. These five dimensions range from −2.5 (weak) to 2.5 (good) governance performance (Kaufmann et al., 2010). To capture a composite indicator of national governance, we conducted a principal component analysis to determine the main components that explain most of the variance of our national governance dimensions (Larcker et al., 2007).

Regarding the national culture, we use Hofstede's (2010) four cultural dimensions: power distance (*PODI*), individualism (*INDV*), uncertainty avoidance (*UNAI*) and masculinity (*MASC*) and cultural distance (*CD*) due to lack of data on long-term orientation and indulgence versus restraint dimensions for some African countries in our sample. Specifically, power distance (*PDI*) is defined as the degree to which less powerful members within a society expect power to be unequally distributed (Davis and Ruhe, 2003; Husted, 1999). The greater the power distance, the less likely that members tend to challenge the authority and rules, which might lead to high levels of corruption. Individualism (*IDV*) is measured as the degree to which members are praised/rewarded for or encouraged to pursue individual achievements rather than collective ones (Davis and Ruhe, 2003). Whereas in a collectivist society, resources sharing, and collective action are encouraged. Groups could protect individuals in order to gain loyalty. Thus, we expect that the greater the level of Individualism (*IDV*), the lower the perceived level of corruption. Uncertainty avoidance (*UAI*) is defined as the degree to which members tolerate uncertainty (Davis and Ruhe, 2003; Husted, 1999). High degree of uncertainty avoidance means that members are more likely to feel uncomfortable in the face of unpredictable situations and less likely to challenge the authority. It is generally believed that a high degree of uncertainty avoidance relates to high levels of corruption. Masculinity (*MAS*) refers to a society preferring money, power, and achievement, which could promote corruption and unethical behaviour (Davis and Ruhe, 2003; Husted, 1999). Thus, a high degree of masculinity is likely to have high levels of corruption.

We employ Kogut and Singh's (1988) cultural distance to measure the cultural differences between countries for the following reasons. Maseland et al. (2018) argue that combining cultural dimensions assumes that each dimension contributes equally to the effects on the outcome variable. However, this may not be justified in the context of culture because such an approach fails to consider possible society variations and between country similarities (Tung and Verbeke, 2010). Even in cultural environments, where cultures are similar, people in different countries experience different degrees of pressures to engage in corrupt practices (Bernhard et al., 2006; Tajfel and Turner, 1985). The variations in cultural practices/context impact corrupt practices and Cuypers et al. (2018) recommend that these unique differences should be taken into account. To account for the impact of idiosyncratic differences of culture in each country, we use Kogut and Singh (1988) measure. According to Cuypers et al. (2018), the index enables us to measure a relative distance to a common reference point, which is symmetric such that the distance between two points is equal in either direction and furthermore obeys the triangular inequality. This is then standardised by the denominator - within-dimension variance that serves to dampen the effect of noise or measurement error in the contribution from high variance dimensions. It is calculated by using Hofstede's (2010) four cultural dimensions (*PODI, INDV, UNAI* and *MASC*). Formally, we compute the cultural distance as follows:

$$CD_j = \sum_{i=1}^{4} \left(\frac{I_{ij} - I_{ic}}{V_i} \right) \Big/ n \quad (1)$$

where *CD* is the cultural distance between top country perceived to be least corrupt *j* and each country within the sample, I_{ij} is top country *j*'s score on the *i*th cultural dimension, I_{ic} is the score of each Africa country on this dimension, V_i is the variance of the score of the dimension and *n* is the number of cultural dimensions.

4.2.3. Control variables

Following prior studies (Davis and Ruhe, 2003; Getz and Volkema, 2001; La Porta et al., 2004; Levine et al., 2000; Swamy et al.,

Table 2
Measurements/definitions of variables.

Panel A: Dependent variables - corruption	
COR	Corruption, is our main dependent variable. COR is measured in two ways: (i) corruption perception index (CPI); and (ii) control of corruption (COC).
CPI	CPI is based on expert assessments and opinion surveys developed by Transparency International (TI). It measures the perceived levels of public sector corruption in countries worldwide, scoring from 0 (least corrupt) to 100 (highly corrupt). The CPI is published annually by TI
COC	COC is published annually by the World Bank. It reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state elite and private interests, scoring from −2.5 (least corrupt) to 2.5 (highly corrupt).

Panel B: Independent variables: national governance	
NG	National governance is our main independent variable. We measure NG in six different ways: (i) voice and accountability; (ii) political stability and absence of violence/terrorism; (iii) government effectiveness; (iv) regulatory quality; (v) rule of law; and (vi) principal component analysis obtained NG measure of the first five measures defined below. National governance (NG) data is extracted from the World Bank.
VOICE	Voice and accountability. This reflects perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media, ranging from −2.5 (weak) to 2.5 (good) governance performance).
POL	Political stability and absence of violence/terrorism. This reflects perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically- motivated violence and terrorism ranging from −2.5 (weak) to 2.5 (good) governance performance.
GOV	Government effectiveness. This reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies ranging from −2.5 (weak) to 2.5 (good) governance performance.
REG	Regulatory quality. This reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development ranging from −2.5 (weak) to 2.5 (good) governance performance.
RULE	Rule of law. This reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence ranging from −2.5 (weak) to 2.5 (good) governance performance.
NG	A composite indicator of the quality of national governance by using a principal component analysis to determine the main components that explain most of the variance of our NG indicators, namely, VOICE, POL, GOV, REG and RULE.

Panel C: Culture dimensions variables	
CUL	Culture is measured in four dimensions: (i) PDI; (ii) UAI; (iii) IDV; (iv) MAS. The national culture data is extracted from Hofstede (2010).
PODI	Power distance index. The degree to which the less powerful members of a society accept and expect that power is distributed unequally, ranging from 0 to 100.
UNAI	Uncertainty avoidance index. The degree to which the members of a society feel uncomfortable with uncertainty and ambiguity, ranging from 0 to 100.
INDV	Individualism index. Loosely-knit social framework in which individuals are expected to take care of only themselves and their immediate families versus tightly-knit framework in society in which individuals can expect their relatives or members of a particular in-group to look after them in exchange for unquestioning loyalty, ranging from 0 to 100.
MASC	Masculinity index. A preference for achievement, heroism, assertiveness and material rewards for success versus a preference for cooperation, modesty, caring for the weak and quality of life, ranging from 0 to 100.
CD	Cultural distance is measured by Kogut and Singh's (1988) cultural distance index. Cultural distance is often used to measure the extent to which one country's culture is similar to, or different from, another country's culture.
NG*CD	Interaction between national governance and cultural distance

Panel D: Control variables	
UK	1, if legal origin is UK, 0 otherwise
LGDP	Log of GDP (per capita)
IMP	Imports of goods and services (percentage of GDP)
LPOP	Natural logarithm of total population
INF	Inflation rate, consumer prices (annual percentage)
LAB	Female labor force (percentage of total labor force)
LIFE	Life expectancy at birth (total number of years)
UNE	Total unemployment (percentage of total labor force)

2001; Treisman, 2000), we included a number of control variables (demographic characteristics and macroeconomic factors) when examining the relationship between corruption, national governance and culture. It has been argued that the judicial framework or legal system of a country, which refers to the different ways by which judges interpret and enforce the law, can affect the level of corruption. La Porta et al. (2004), for example, show that corruption is lower in common law countries, where legal protection is stronger compared with civil law countries, where legal protection is weaker. Therefore, and following prior studies (e.g., La Porta et al., 2004; Treisman, 2000), countries following English Common Law System (e.g., legal origin is UK) are captured and included, as a control variable, and it is measured a dummy variable that equals to 1 if a country's legal origin is common law (UK), 0 otherwise.

Similarly, macroeconomic variables, including natural log of GDP Per Capita (*LGDP*) and imports of goods and services, as percentage of GDP (*IMP*) as measure of the state of economic development, with growing economies often tend to have low levels of corruption (e.g., Davis and Ruhe, 2003; Getz and Volkema, 2001). Additionally, we use natural log of total population (*LPOP*) as a measure of the country size (e.g., Davis and Ruhe, 2003; Levine et al., 2000), inflation rate (*INF*) and unemployment rate (UNE), as measures of economic adversity (e.g., Davis and Ruhe, 2003; Getz and Volkema, 2001; Levine et al., 2000), female labour force as percentage of total labour force (*LAB*), as prior literature documents that women are less likely involved in corruption (e.g., Swamy et al., 2001), and life expectancy (*LIFE*) as low rates of life expectancy which is argued to be associated with high levels of corruption (e.g., Blackburn and Sarmah, 2008). Detailed variable definitions, including dependent variables, independent variables and control variables are reported in Table 2.

4.3. Empirical model

To test our hypothesis, we use a number of analytical approaches, namely, pooled ordinary least square, fixed effect and system GMM to ensure the robustness of our findings and address endogeneity concerns. Our baseline model to examine the relationship between the quality of NG and the level of corruption is specified as follows:

$$COR_{it} = \alpha_0 + \beta_1 NG_{it} + \sum_{i=1}^{n} \gamma_i CONTROLS_{IT} + \delta_i + \varepsilon_{it} \quad (2)$$

where *COR* is our dependent variables (*CPI* and *COC*), the *NG* is independent variable which refers to the quality of national governance (*VOICE, POL, GOV, REG* and *RULE*). *CONTROLS* refers to a set of control variables, namely, GDP per capita, imports of goods and services as percentage of GDP (*IMP*), natural log of total population (*LPOP*), inflation rate (*INF*), female labour force as percentage of total labour force (*LAB*), life expectancy (*LIFE*) and unemployment rate (*UNE*).

Table 3
Descriptive statistics.

Variables	Mean	Median	SD	Minimum	Maximum
Panel A: Dependent variable: corruption (COR)					
CPI	68.162	70.000	11.407	30.000	92.000
COC	0.621	0.669	0.630	−1.698	1.869
Panel B: Independent variables: national governance (NG)					
VOICE	−0.587	−0.628	0.754	−2.233	1.203
POL	−0.557	−0.436	0.876	−3.315	1.384
GOV	−0.760	−0.773	0.636	−2.487	1.036
REG	−0.710	−0.706	0.632	−2.645	1.181
RULE	−0.683	−0.691	0.620	−2.606	0.996
NG	−0.014	−0.062	0.995	−3.063	2.638
Panel C: Cultural variable					
PODI	71.588	70.000	8.563	49.000	85.000
UNAI	48.529	50.000	14.230	15.000	68.000
INDV	32.059	30.000	14.454	15.000	63.000
MASC	46.294	45.000	15.287	15.000	80.000
CD	0.941	0.716	0.822	0.056	3.052
Panel D: Control variables					
UK	0.365	0.000	0.481	0.000	1.000
LGDP	7.270	7.083	1.073	0.000	10.032
IMP	43.489	39.040	22.826	1.128	236.392
LPOP	15.970	16.321	1.569	11.351	19.202
INF	8.938	5.319	17.746	−35.837	57.302
LAB	42.438	45.413	8.622	15.802	54.995
LIFE	61.565	61.172	6.659	45.500	77.237
UNE	9.162	6.328	7.169	0.315	35.460

This table fully defines all the variables employed in this study.

Table 4
Correlation matrix.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	VIF
1.VOICE	1																	
2.POL	0.598**	1																2.123
3.GOV	0.679**	0.626**	1															1.798
4.REG	0.725**	0.613**	0.884**	1														1.452
5.RULE	0.722**	0.689**	0.910**	0.873**	1													1.844
6.PODI	−0.354**	−0.266**	−0.492**	−0.450**	−0.476**	1												1.645
7.UNAI	−0.270**	−0.034	−0.127*	−0.165**	−0.244**	−0.306**	1											1.392
8.INDV	0.036	−0.236**	0.172**	0.129*	0.074	−0.358**	−0.123*	1										2.007
9.MASC	−0.347**	−0.508**	−0.034	−0.130*	−0.065	−0.115	−0.318**	0.476**	1									2.564
10.UK	0.291**	0.166**	0.227**	0.279**	0.280**	−0.396**	−0.276**	0.380**	−0.01	1								1.322
11.LGDP	0.160**	0.367**	0.425**	0.283**	0.382**	−0.155*	0.158*	0.579**	0.062	0.024	1							2.174
12.IMP	0.182**	0.275**	0.116**	0.064	0.118**	0.175**	0.088	−0.341**	−0.325**	0.023	0.096**	1						1.534
13.LPOP	−0.137**	−0.507**	−0.059	−0.032	−0.117**	0.024	−0.196**	0.401**	0.536**	0.114**	−0.291**	−0.539**	1					1.975
14.INF	−0.094**	−0.119**	−0.120**	−0.152**	−0.101**	0.168**	−0.227**	0.001	0.092	0.164**	−0.047	−0.111**	0.096**	1				1.079
15.LABOR	0.231**	0.248**	0.042	0.175**	0.080*	0.05	−0.115	−0.417**	−0.548**	0.295**	−0.409**	−0.002	−0.015	0.001	1			2.126
16.LIFE	0.158**	0.228**	0.418**	0.206**	0.420**	−0.012	0.207**	0.109	0.245**	−0.189**	0.472**	0.05	−0.101**	0.007	−0.495**	1		1.788
17.UNE	0.089*	0.235**	0.221**	0.119**	0.218**	−0.276**	0.312**	0.287**	−0.123*	0.153**	0.515**	0.285**	−0.285**	0.037	−0.229**	0.126**	1	1.599

Notes: **. $p < 0.01$ level (two-tailed) *. $p < 0.05$ level (two-tailed). Table 2 fully defines each variable.

Regarding the relationship between the national culture and the level of corruption, we adopt the following model:

$$COR_{it} = \alpha_0 + \beta_1 CUL_{it} + \sum_{i=1}^{n} \gamma_i CONTROLS_{IT} + \delta_i + \varepsilon_{it} \quad (3)$$

where COR is the main dependent variable that is measured by Corruption Perceptions Index (*CPI*) and Control of Corruption (*COC*). Power Distance (*PODI*), Individualism (*INDV*), Uncertainty Avoidance (*UNAI*) and Masculinity (*MASC*) are our main independent variables. *CONTROLS* refers to a set of control variables, namely, GDP per capita, imports of goods and services as percentage of GDP (*IMP*), natural log of total population (*LPOP*), inflation rate (*INF*), female labour force as percentage of total labour force (*LAB*), life expectancy (*LIFE*) and unemployment rate (*UNE*).

To test the effects of interaction between formal (national governance) and informal (national culture) institutions on the level of corruption (i.e., the combined effect of national governance and national culture on corruption, we propose the following model:

$$COR_{it} = \alpha_0 + \beta_1 NG_{it} + \gamma_j CD + \delta_k INTERACTION_{it} + \sum_{i=1}^{n} \epsilon_i CONTROLS_{IT} + \theta_i + \varepsilon_{it} \quad (4)$$

where *COR* refers to Corruption Perceptions Index (CPI) and Control of Corruption (*COC*). NG refers to national governance, *CD* refers to cultural distance, *INTERACTION* refers to interaction variable created between national governance and national culture distance (*NG_CD*) and *CONTROLS* remains the same as in eq. 3.

5. Summary statistics and regression results

5.1. Descriptive analysis and correlation matrix

Table 3 presents the summary statistics of the corruption variables in Panel *A*. This panel shows that the level of corruption varies substantially across different countries. For instance, *CPI,* as a main indicator of corruption, ranges from a minimum of 30 to a maximum of 92, with a mean (median) of 68.162 (70.000). Similarly, *COC,* as an alternative measure of corruption shows a similar

Table 5
The effects of national governance on the level of corruption.

	(1)	(2)	(3)	(4)	(5)	(6)
VOICE	−8.188***					
	(−20.33)					
POL		−6.534***				
		(−13.45)				
GOV			−14.053***			
			(−31.81)			
REG				−11.907***		
				(−27.55)		
RULE					−14.874***	
					(−33.39)	
NG						−9.230***
						(−33.76)
UK	−0.349	−2.115**	−0.159	−0.069	1.464**	0.967*
	(−0.55)	(−3.03)	(−0.31)	(−1.12)	(2.91)	(1.97)
LGDP	−2.012***	−0.350***	−0.090	−0.612**	−0.766**	−1.191
	(−5.82)	(−3.36)	(−0.30)	(−1.973)	(−2.77)	(−0.686)
IMP	−0.027*	−0.062***	−0.020*	−0.044***	−0.043***	−0.031**
	(−1.90)	(−3.92)	(−1.706)	(−3.55)	(−3.93)	(−2.82)
LPOP	0.259*	−0.991***	1.344***	0.959**	0.656***	0.405**
	(1.678)	(−3.79)	(7.68)	(5.10)	(3.91)	(2.43)
INF	0.018*	0.024**	−0.002	−0.006	−0.003	−0.008
	(1.83)	(2.22)	(−0.31)	(−0.641)	(−0.335)	(−0.99)
LABOR	−0.241***	−0.182***	−0.103**	−0.164***	−0.089*	−0.018
	(−5.93)	(−3.682)	(−3.08)	(−4.57)	(−2.72)	(−0.53)
LIFE	−0.535***	−0.554***	−0.178***	−0.484***	−0.071*	−0.207***
	(−10.49)	(−9.45)	(−4.019)	(−10.71)	(−1.71)	(−4.90)
UNE	−0.097**	−0.054	−0.009	−0.088**	0.018	−0.040
	(−2.11)	(−1.047)	(−0.243)	(−2.20)	(0.04)	(−1.11)
CONSTANT	117.42***	135.75***	51.74***	88.39***	62.82***	77.88***
	(17.99)	(18.90)	(8.57)	(14.75)	(11.12)	(14.45)
Adj R^2	0.633	0.536	0.761	0.720	0.775	0.778
N	712	712	712	712	712	712
Prob (F)	0.000	0.000	0.000	0.000	0.000	0.000

Notes: ***, **, and * denote significance at the 1 %, 5 % and 10 % levels, respectively. T statistics in parentheses are reported. Table 2 fully defines each variable.

pattern. The average COC is 0.621, with a minimum value of −1.698 and a maximum value of 1.869. The measures of national governance (*NG*) are reported in Panel *B*. We employ five different measures to capture the different dimensions of *NG* quality, namely: (i) voice of accountability (*VOICE*); (ii) political stability (*POL*); (iii) government effectiveness (*GOV*); (iv) rule of law (*RULE*); and (v) regulatory quality (*REG*). Overall, the NG has a mean of −0.014, which appears low. Regarding the individual measures, the mean scores for the five variables range from −0.557 to −0.760, suggesting that the quality of governance among African countries appears weak.

Panel *C* presents summary descriptive statistics relating to the four culture dimensions, namely, power distance (*PODI*); uncertainty avoidance (*UNAI*); individualism (*INDV*); and masculinity (*MASC*). We exclude the other two culture dimensions (long-term orientation, indulgence versus restraint) from our calculation due to the fact that only 13 out of 52 African countries have long-term orientation and indulgence versus restraint data, which could bias our results. Table 3 indicates that the mean scores for the four cultural dimensions used in this study range from 32.059 to 71.588. We included several variables to control the effects of legal origin and major economic characteristics. The statistical summary of the control variables is reported in Panel *D* of Table 3.

Table 4 reports the correlation matrix between the variables. The correlation coefficients between the variables are generally low between our controls and but high among national governance quality, suggesting that multicollinearity may be a concern if they are included in the same model. To overcome the potential problem associated with multicollinearity, we entered our key variables (national governance quality and culture dimensions) successively in the regression models. Furthermore, we perform the Variance Inflation Factor (VIF) test and the values reported in Table 4 do not exceed the threshold of 10, confirming that multicollinearity appears not to be a problem in this study (Gyimah et al., 2022; Wooldridge, 2016).

5.2. Empirical results

5.2.1. National governance and corruption

Before testing our hypothesis (*H1*), we conducted a number of baseline tests on the link between national governance, national culture and the control variables and corruption. Table 5 presents the results estimating the impact of *NG* (a proxy for formal institutions) measured by voice of accountability, political stability, government effectiveness, the rule of law and regulatory quality on the level of corruption that is measured by the *CPI*. The results reported in Models 1 to 6 indicate that the coefficients of *VOICE* ($\beta = -8.188$: $p < 0.01$); *POL* ($\beta = -6.534$: $p < 0.01$); *GOV* ($\beta = -14.053$: $p < 0.01$); *REG* ($\beta = -11.907$: $p < 0.01$) *and RULE* ($\beta = -14.874$: $p < 0.01$); have negative signs and are all statistically significant, suggesting that African countries have poor quality of formal

Table 6
The effects of culture dimensions on the level of corruption.

	(1)	(2)	(3)	(4)	(5)
PODI	0.718***				
	(10.10)				
UNAI		0.334***			
		(7.96)			
INDV			0.223*		
			(1.71)		
MASC				−0.272***	
				(−5.82)	
CD					1.908**
					(2.24)
UK	2.693**	−0.834	−6.306**	−5.955***	−4.295**
	(2.10)	(−0.673)	(−3.69)	(−5.03)	(−3.20)
LGDP	−3.643***	−2.199**	−4.865***	−0.301	−3.223***
	(−5.75)	(−3.25)	(−4.36)	(−0.413)	(−4.260)
IMP	−0.176***	−0.043	−0.038	−0.004	−0.042
	(−6.26)	(−1.56)	(−1.11)	(−0.10)	(−1.32)
LPOP	−0.521	0.657	−0.492***	2.181***	0.277
	(−1.26)	(1.57)	(−0.70)	(4.11)	(0.601)
INF	−0.021	0.079**	0.054**	0.299***	0.032
	(−1.12)	(4.10)	(2.47)	(4.79)	(1.48)
LABOR	−0.625***	−0.568***	−0.359***	−0.564***	−0.476***
	(−8.71)	(−7.56)	(−3.02)	(−6.09)	(−5.71)
LIFE	−0.788***	−0.985***	−0.690***	−0.864***	−0.799***
	(−8.69)	(−10.01)	(−5.28)	(−8.89)	(−7.56)
UNE	0.167*	−0.374***	−0.083	−0.173**	−0.115
	(1.91)	(−3.89)	(−0.83)	(−2.05)	(−1.159)
CONSTANT	131.1***	147.0***	166.5***	124.9***	158.8***
	(11.25)	(12.12)	(11.75)	(8.85)	(11.96)
Adj R^2	0.585	0.530	0.408	0.481	0.414
N	315	315	315	315	315
Prob (F)	0.000	0.000	0.000	0.000	0.000

Notes: ***, **, and * denote significance at the 1 %, 5 % and 10 % levels, respectively. T statistics in parentheses are reported. Table 2 fully defines each variable.

institutions. The results imply that the level of perceived corruption is higher in African countries may be due to the fact that they suffer from poor governance practices, such as lower voice of accountability, political instability, less government effectiveness, weak rule of law and poor regulatory quality. In addition, to capture a composite indicator of the quality of national governance (*NG*), we used a principal component analysis to determine the main components that explain most of the variance of our NG quality indicator. The effect of *NG* on the level of corruption (*CPI*) is reported in Model 6 of Table 5. The results suggest that weak national governance systems in Africa is associated with higher levels of corruption, and thereby offers further support for the findings from Models 1 to 5.

Overall, the results indicate that the quality of NG is an important determinant of the level of corruption and explains why corruption appears to be pervasive in Africa. Our results offer empirical support for institutional theory, which suggests that weak NG systems breed corruption (Segon and Booth, 2010), while good governance systems are associated with low incidence of corruption. Our results are also in line with the findings of Wu (2005); and that of La Porta et al. (2004).

Regarding the control variables and although not the main focus of our study, we find that GDP, Imports of goods and services, female labour force, life expectancy are negatively related to the *CPI*. However, the total population variable has a positive and significant effect on corruption. The findings are consistent with previous studies, such as Davis and Ruhe (2003), Levine et al. (2000), and Getz and Volkema (2001) that reported similar results for these variables. The results also imply that our findings are not sensitive to the inclusion of these control variables.

5.2.2. National culture and corruption

Table 6 reports the effects of informal institutions (national culture) on corruption. Models 1 to 4 of the table indicate that power distance ($\beta = 0.718$: $p < 0.01$); uncertainty avoidance ($\beta = 0.334$: $p < 0.01$); individualism ($\beta = 0.223$: $p < 0.10$) have coefficients, which are positive and statistically significant, whilst masculinity ($\beta = -0.272$: $p < 0.01$) have negative signs and statistically significant. The results indicate that high levels of power are positively and significantly related to corruption. The finding that high power distance (median of 70) is associated with the level of corruption is expected in that, Africa, based on Hofstede (2010) index, is generally characterized with unequal distribution of power, and therefore, Africans are less likely to challenge authority and rules. Less powerful members within a society expect power to be unequally distributed and accept it as normal. People in subordinate positions therefore accept the superiority of their senior managers and government officials. This leads to a culture of favouritism and nepotism, and thereby heightening the level of corruption. The results are consistent with those studies, which support the contention that high power distance countries tolerate corruption (Achim, 2016; Mensah, 2014; Getz and Volkema, 2001; Husted, 1999). Regarding uncertainty avoidance, our results suggest that high uncertainty avoidance appears to contribute to the prevalence of corruption. The findings appear unsurprising in that individuals are made nervous in situations that are unclear and unpredictable. Cultures with high uncertainty avoidance, therefore, seem to promote corruption, as individuals prefer to preserve their ways of doing things because breaking out would engender uncertainty (Getz and Volkema, 2001). Shleifer and Vishny (1993) share similar views and argue that

Table 7
Joint effect of national governance and national culture.

	(1)	(2)
NG	−8.896***	−5.944***
	(−18.81)	(−8.28)
CD	0.186	1.270**
	(0.40)	(2.46)
NG*CD		−3.354***
		(−5.72)
UK	−0.815	−2.441**
	(−1.08)	(−2.45)
LGDP	−0.257*	−1.431**
	(−0.52)	(−2.84)
IMP	0.036	0.003
	(1.480)	(0.16)
LPOP	0.469	1.065***
	(1.437)	(3.59)
INF	0.094*	−0.053***
	(1.81)	(3.64)
LABOR	−0.152**	0.029**
	(−2.52)	(3.35)
LIFE	−0.468***	−0.017
	(−6.60)	(−0.02)
UNE	0.089	0.154**
	(1.58)	(2.28)
CONSTANT	93.75***	51.02***
	(10.23)	(5.14)
Adj R^2	0.803	0.800
N	332	332
Prob (F)	0.000	0.000

Notes: ***, **, and * denote significance at the 1 %, 5 % and 10 % levels, respectively. T statistics in parentheses are reported. Table 2 fully defines each variable.

companies with on-going corrupt relationship with key public officials tend to resist reforms because of fear of uncertain future. Our results, therefore, support the findings of Getz and Volkema (2001), who documented that a high degree of uncertainty avoidance is associated with a high level of corruption.

The study also finds that high collectivism is positively associated with high levels of corruption. This is also expected because Africa is characterized by high collectivism, which is associated with loyalty to in-groups (Husted, 1999). In high collectivist Africa, laws are more likely to be applied unevenly to favour in-groups, family members and friends, and thereby undermining the equity sought by the laws. According to Husted (1999, 2002), such an uneven application of the law may undermine confidence in the formal institutions that apply these laws, and hence high levels of corruption. The finding also supports the conclusion drawn by Lopez and Santos (2014) that cultures marked by high collectivism are prone to all forms of corruption. However, the negative relationship between masculinity and corruption appears surprising in that it was expected that masculinity would be positively related to corruption in Africa, given the weakness of national governance. This is because in many African countries, the pursuit of material success appears high with many people tolerant of questionable practices. Accordingly, the "end" is more important than the "means" by which the "end" is achieved. While this finding appears interesting, the reasons for this finding appear not readily apparent and more studies along the same lines of this study may be appropriate in offering new empirical insights regarding these issues. Further, in order to construct a comprehensive measure reflecting the impact of national culture, we employed the cultural distance (CD) using Kogut and Singh's (1988) cultural distance index. Cultural distance is often used to measure the extent to which one country's culture is similar to, or different from, another country's culture. The influence of CD on the extent of corruption (CPI) is presented in Model 5 of Table 6. The results show that CD is positively and significantly associated with corruption. This finding suggests that cultural differences lead to lower levels of trust, engender suspicions and misunderstandings, thereby fostering opportunities for corrupt behaviours (Achim, 2016; Sampath and Rahman, 2019).

5.3. The joint effect of cultural distance and national governance on corruption

To test our primary hypothesis, that is, the joint effect of NG*CD on corruption, we estimate the cultural distance between a top country in the CPI index perceived to be least corrupt country through a Euclidean version of the Kogut and Singh (1988) index. Unlike the Kogut and Singh index, which implicitly assumes that all of the cultural dimensions are equally important, the Euclidean distance version relaxes this assumption (Shenkar, 2001). Table 7 reports the overall effect of national governance, national culture and the

Table 8
Additional analyses.

	Alternative measure	Fixed effects	System GMM	Lagged effects
NG	−0.477***	−3.417***	−3.083***	−5.061***
	(−11.82)	(−3.96)	(−3.74)	(−6.25)
CD	0.003	1.156**	1.575**	0.176
	(0.115)	(2.81)	(2.22)	(0.72)
NG*CD	−0.088**	−2.502***	−2.056**	−1.054**
	(−2.67)	(−3.56)	(−2.84)	(−2.05)
UK	−0.002	−2.015**	−1.441	−1.090
	(−0.03)	(−2.23)	(−0.61)	(−1.33)
LGDP	0.084**	−1.461	−2.040**	0.062
	(2.98)	(−1.19)	(−2.37)	(0.12)
IMP	−0.001	0.003**	0.143***	0.030
	(−0.72)	(2.68)	(3.68)	(1.24)
LPOP	0.066***	1.495***	1.065***	0.994**
	(3.98)	(3.56)	(3.59)	(2.63)
INF	−0.001*	−0.004***	−0.041	−0.005
	(−1.78)	(3.42)	(0.44)	(−0.09)
LABOR	0.011**	0.227**	0.011	−0.057
	(2.957)	(2.97)	(0.03)	(−0.83)
LIFE	−0.003	−0.324	−0.245**	−0.450***
	(−0.763)	(−0.60)	(−2.36)	(−5.65)
UNE	−0.004	0.109**	0.121	0.123**
	(−0.985)	(2.31)	(1.56)	(2.03)
Lagged_Corruption			0.879***	
			(12.83)	
CONSTANT	−1.272**	5.17***	5.17	7.64***
	(−2.28)	(6.01)	(0.18)	(7.04)
Adj R^2	0.792	0.473	–	0.792
AR (1) Test			0.00	
AR (2) Test			0.18	
Hansen P Value			0.52	
N	332	332	332	310
Prob (F)	0.000	0.000	0.000	0.000

Notes: ***, **, and * denote significance at the 1 %, 5 % and 10 % levels, respectively.
T statistics in parentheses are reported. Table 2 fully defines each variable.

joint effects of national governance and national cultural variables on corruption. Model 1 in Table 7 suggests that higher level of perceived corruption in African countries is negatively associated with formal institutions (national governance). As discussed earlier, a plausible explanation for our findings is that Africa, generally, is characterized by weak governance systems. The findings underscore the significance of national governance quality as a crucial factor influencing the prevalence of corruption in the context of Africa. This aligns with the principles of institutional theory, as argued by Segon and Booth (2010), which posits that weak NG systems provide fertile ground for corruption, while strong governance systems are linked to lower corruption rates.

Regarding the interaction between the national culture and national governance in Model 2, the coefficient of the interaction ($\beta = -3.354$; $p < 0.01$) has a negative sign, suggesting that national culture and national governance together explain why corruption appears more rampant in some countries than others. Few studies have systematically examined the effects of interactions between national culture and national governance on corruption at the societal level. However, it is pertinent to point out that the test of interactions as evidenced in this study can provide a holistic and enhanced understanding of the effects of institutions on individual actions and behaviours at the societal level. More specifically, this study illuminates the importance of interactions of both formal and informal institutions in the fight against corruption at the societal level. Our results, therefore, support the theoretical view that argues that cultural values and beliefs interact with the formal institutions of governance, operating as both a complement and substitute, to explain the level of corruption.

5.4. Additional analyses

In this section, we conduct additional tests to check the robustness of our findings. First, we employ the country-level Control of Corruption (COC) indicator from the Worldwide Governance Indicators (WGI) as an alternative measure of corruption. This measure reflects the perceptions regarding the degree to which public authority is exercised for personal advantage, with scores ranging from −2.5 (indicating the least corrupt country) to 2.5 (indicating the most corrupt country). The results of COC are presented in the model 1 of Table 8. Overall, the findings are similar to those presented in Model 2 of Table 7, which indicate that our findings appear to be robust to alternative measure of corruption. Second, we perform fixed effects estimation to address possible country-level heterogeneity because other unobserved country level factors which could affect the level of corruption (Kumar et al., 2021). The usage of fixed effects model can control for unobservable or time-invariant characteristics, account for heterogeneity and reduce omitted variable bias. The results shown in Table 8 (Model 2) remain similar to the main findings in Table 7, implying that our findings do not suffer from the potential country-level heterogeneity issue. Third, we use the system generalized method of moments (GMM) to mitigate the potential concerns of endogeneity (e.g., reverse causality and simultaneity). While institutions can affect the level of corruption, it is plausible that corruption can also shape the nature of the institutions that emerge. For instance, corruption within institutions has the potential to diminish public trust and confidence in these entities (Bayley, 1966; Guetat, 2006). When people perceive corruption as widespread, their faith in the institution's ability to serve the public interest may also decline. This decline in trust can weaken the institution's legitimacy, thereby hindering its ability to carry out its functions effectively (Seligson, 2002; Thompson, 2018). We employ internal instruments based on lagged values of both the independent and dependent variables to account for potential dynamic and simultaneous endogeneity, as suggested by Blundell and Bond (1998) and Wintoki et al. (2012). The results reported in Table 8 (Model 3) are consistent with our main findings in Table 7, and hence our findings are not sensitive to endogeneity problems. Finally, we estimate a lagged effect model to address the potential simultaneous relationship between institutions and corruption. The results shown in Model 4 of Table 8 appear to our main findings, thus provide further support to the robust of our findings.

6. Contributions, implications and conclusion

Corruption is generally seen to be endemic around the world and constitutes one of the biggest obstacles to economic and social development, especially in developing countries (World Bank, 2004). Official statistics from the World Bank estimates that more than US$1 trillion are paid in bribes each year and[1, 2, 3 and 4] that countries that tackle corruption by reforming formal governance institutions and rule of law stand to increase their per capita by approximately 400 % (World Bank, 2004). In the context of Africa, despite reforms of governance institutions under the auspices of IMF and other multinational bodies, most African countries are still bedeviled with corruption and are at the bottom of corruption perception league table (Transparency International, 2018). Naturally, the question that emerges is: what accounts for the high levels of corruption in African countries? This study attempts to answer this question by examining the combined effects of formal (national governance) and informal (culture) institutions on corruption, which has produced sharp disagreements between the two competing perspectives but yet not been given systematic empirical attention (see Boateng et al., 2020). Employing a cross-country dataset of 52 African countries over the period of 2007–2022, our baseline results suggest that weak national governance systems in Africa are associated with high levels of perceived corruption. We also find that whilst power distance, uncertainty avoidance, and collectivism are associated with high levels of corruption, masculinity has a negative and significant influence on the level of corruption in Africa. Our main results indicate that the joint effect of formal (national governance) and informal (national culture) institutions tends to be associated with high incidence of perceived corruption at the societal level.

This study makes several important contributions to the extant literature in the following ways. First, unlike previous studies that examine the effects of one element of institutions or that simply assume theoretically that formal and informal institutions are analytically independent and interaction with each other could not be expected (Scott, 1995), this study explicitly tests the effects of interaction between formal and informal institutions on corruption. By so doing, we contribute to the research stream which proposes that formal and informal institutions interact to influence social phenomenon. More specifically, our results that formal (i.e., national

governance) and informal (i.e., national culture) elements of institutions interact among themselves to influence national corruption provide direct evidence to support and validate that theoretical model proposed by Hirsh (1997); Bebchuk and Roe (1999); Aguilera and Jackson (2003); and Filatotchev et al. (2013). This study therefore represents one of the first attempts to test the joint effects of formal and informal institutions on corruption by openly and directly interacting formal and informal institutional variables consistent with the theoretical framework put forward by Helmke and Levitsky (2003); and North (1990). We also highlight the point that corruption has socio-economic dimensions, and therefore focusing on only country-level formal institutions as antecedents can only yield a partial explanation of corruption. This study provides evidence that all elements of institutions interact to offer a powerful and inclusive explanation of individual and organizational actions and social institutions that drive corruption. Second, we show evidence on why and how the level of corruption appears to be more pervasive in some countries than others, indicating that national culture together with national governance provide explanation for the differences in corruption among societies. Our findings indicate that corruption appears high in countries, where there are high levels of power distance, uncertainty avoidance, and collectivism coupled with low quality of formal institutions.

Our results have several regulatory, ethical and policy implications in the fight against corruption in Africa and across the world. One clear implication is that the focus of reforms only on formal governance institutions will yield little results in the fight against corruption, and this supports the view of Filatotchev et al. (2013). Although informal institutions, such as culture is slowest to change (Mensah, 2014), but our findings suggest that efforts should be made by governments, senior managers with the support of traditional leaders, who are custodians and embodiments of cultures in Africa to embark on cultural change in Africa (Aliye, 2020; Tsalikis et al., 1993). Culture should not be ignored in the attempt to fight corruption by senior managers of both national and multinational firms operating in Africa. We also recommend that policy makers and senior managers should also engage civil society to take an active part in influencing changes in aspects of social institutions that promote corrupt practices in their respective countries. Another interesting implication is that the results of this study offer global regulators, national and international institutions, policy makers and anti-corruption campaigners a strong basis to adopt a two prone approach in tackling corruption by reforming both formal and informal institutions through co-operative strategies and joint efforts of national government, civil societies, and traditional leaders in order to have a desired effect on curbing corruption. Similarly, global efforts at promoting convergence of good governance practices across the world to reduce corruption is a step in the right direction and should be intensified.

While our research constitutes an important attempt to explore the joint effect of formal and informal institutions on corruption, its limitations should be acknowledged. First, similar to prior archival studies of this nature, our proxies for governance, corruption and national culture may not entirely reflect actual practice. Our results should, therefore, be interpreted with a degree of caution. Second, we have relied on insights from the institutional theoretical perspective in one of the first attempts to examine the combined effects of governance and culture on corruption. Third, we employed four out of the six dimensions of culture due to lack of data on long-term orientation, indulgence versus restraint dimensions. We suggest future studies investigate the relationship between national governance, national culture using all the six dimensions when data becomes available, and corruption by integrating other theoretical perspectives, for instance, joining institutional perspectives with resource dependency theory to explore the moderating effects of resources in the fight against corruption. Future studies /may also be able to offer additional insights on the relationships examined in this study by conducting in-depth case studies and developing qualitative analysis based on interviews with relevant stakeholders, such as government agencies, regulators, professional bodies, corporate executives, investors, and transnational bodies.

Credit authorship contribution statement

Agyenim Boateng: Conceptualization, Supervision, Writing – original draft, Writing – review & editing. **Yan Wang:** Data curation, Formal analysis, Methodology, Validation, Writing – review & editing, Conceptualization, Writing - original draft. **Collins G. Ntim:** Conceptualization, Methodology, Supervision, Validation, Writing – review & editing. **Mohamed Elmagrhi:** Data curation, Formal analysis, Methodology, Writing – review & editing, Conceptualization.

Data availability

Data will be made available on request.

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Appendix A

Table A
Corruption Perceptions Index 2022 for Africa countries.

Country	CPI	World Rank	Country	CPI	World Rank

(*continued on next page*)

Table A (*continued*)

Country	CPI	World Rank	Country	CPI	World Rank
Algeria	33	116	Namibia	49	59
Angola	33	116	Niger	32	123
Benin	43	72	Nigeria	24	150
Botswana	60	35	Rwanda	51	54
Burkina Faso	42	77	Sao Tome and Principe	45	65
Burundi	17	171	Senegal	43	72
Cameroon	26	142	Seychelles	70	23
Cape Verde	60	35	Sierra Leone	34	110
Central African Republic	24	150	Somalia	12	180
Chad	19	167	South Africa	43	72
Comoros	19	167	Sudan	22	162
Congo Republic	21	164	Swaziland	30	130
Côte d'Ivoire	37	99	Tanzania	38	94
Djibouti	30	130	Togo	30	130
Egypt	30	130	Tunisia	40	85
Equatorial Guinea	17	171	Uganda	26	142
Eritrea	22	162	Zambia	33	116
Ethiopia	38	94	Zimbabwe	23	157
Gabon	29	136			
Gambia	34	110			
Ghana	43	72			
Guinea	25	147			
Guinea-Bissau	21	164			
Kenya	32	123			
Lesotho	37	99			
Liberia	26	142			
Libya	17	171			
Madagascar	26	142			
Malawi	34	110			
Mali	28	137			
Mauritania	30	130			
Mauritius	50	57			
Morocco	38	94			
Mozambique	26	142			

Source: Transparency International (2018).

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