Modeling Public Sector Corruption and the Institutional Environment in Emerging Economies: An Institutional Theory View

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This paper models and empirically explores the institutional environment in emerging economies concerning public sector corruption. Employing perspectives from institutional theory, the paper develops strategies for reducing the perceived level of corruption by assessing the interaction between regulatory, cognitive, and normative institutional elements. We find that the regulatory, institutional elements, the legal system, and business, and professional associations have a positive linear relationship with reduced perceived level of corruption. In contrast, the freedom of the media does not have a linear relationship with the perceived level of corruption and serves as a moderator. Finally, the interaction effect between the legal system and the media is stronger than the interaction effect between the media and business and professional associations.

Keywords: corruption, institutional environment, emerging economies, institutional theory, institutional voids

INTRODUCTION

Existing literature in management has identified several challenges and institutional constraints in emerging economies, such as an intrusive bureaucracy and, excessive regulations, lack of resources and financing, but perhaps few are more formidable than the challenge of dealing with corruption in these economies. Studies have found that corruption is a major barrier to development and is associated with reduced foreign direct investment, and lower rates of entrepreneurship and is one of the factors critical to the existence of low-income and poverty traps in emerging economies (Godinez et al., 2018; Andvig and Moene, 1990; Blackburn *et al*., 2006, 2008; Misangyi et al., 2008). While corruption exists in advanced economies, there is a significant gap in the levels of corruption between emerging and developed economies (Treisman, 2000; Uslaner & Badescu, 2004).

Emerging economies can be understood to include both developing and transition economies and are characterized as low-income countries that achieve rapid growth and development through economic

liberalization and the adoption of a free market system (Hoskisson et al., 2000: 249). Transparency International (2014) defines corruption as "the abuse of entrusted power for private gain." While most acts of corruption, such as bribery, are deemed illegal in countries worldwide (Noonan, 1984), and there have been substantial initiatives to combat corruption, research has revealed that corruption is still rampant in most emerging economies (Kaufmann and Kraay, 2008). Despite substantial research by academics and policymakers, effective strategies for reducing systemic corruption are still lacking (Misangyi et al., 2008).

Research on corruption has also highlighted its systemic and persistent nature as it can be between individuals or multiple actors at the individual, industry, regional or national level (Misangyi et al., 2008). While papers such as Tonoyan et al. (2010), Brouthers et al. (2008), Robertson and Watson (2004), Spencer and Gomez (2011), and Bhattacharyay and Jiao (2014) have explored the impact of corruption from an economic or cultural perspective and highlighted reasons as to why corruption is significantly higher in emerging economies compared to developed economies, extant literature in management has rarely focused on empirically examining strategies and mechanisms aimed at reducing corruption in these countries. Over the last decade, with the rapid growth rate of emerging economies, it is important to focus on emerging markets (Hawksworth and Cookson, 2008). However, according to Transparency International's *Corruption Perceptions Index 2014* rankings, emerging economies ranked in the lowest quartile (i.e., most corrupt) due to the significant levels of corruption in these countries.

For this paper, our proposed theoretical model is to explore the institutional environment in emerging economies using perspectives from institutional theory to develop strategies to reduce the perceived level of public sector corruption in these countries. One of the novel contributions of this paper is our attempt to theoretically and empirically assess how the interaction between distinct regulatory, cognitive, and normative institutional elements in emerging economies can impact the perceived levels of corruption in the country. Employing the definition proposed by the Corruption Propensity Index from Transparency International, we define the perceived level of public sector corruption as "corruption in the public sector, or corruption which involves public officials, civil servants or politicians" (Transparency International, 2014).

THEORETICAL MODEL AND HYPOTHESES

As per the literature in institutional theory, the fields surrounding an actor (firms, organizations, communities, etc.) shape its strategy and social behavior (Scott, 1991). Actors respond to institutional pressures in their environment by adopting structures and practices perceived as legitimate in their organization field (DiMaggio and Powell, 1983; Meyer and Rowan, 1977). As such, actors are subject to "institutional pressures to conform to a society's conventions and expectations" (Spencer and Gomez, 2011) through three processes—coercive, normative, and mimetic (DiMaggio and Powell, 1983). We can define them in the following way: "*Coercive* processes reflect pressures imposed by an authority; *normative* pressures reflect established paradigms in the society; and *mimetic* processes reflect pressures for firms to imitate successful enterprises in their organizational field" (Spencer and Gomez, 2011). By conforming to these pressures, actors gain legitimacy and acceptance by other actors in an economy's institutional environment (Parson, 1960), which is critical for the firm's survival (Miller and Chen, 1995).

In emerging economies, institutions are unstable and are characterized by shifts and frequent changes in norms and values that legitimize the existing political and regulatory frameworks (Newman, 2000). Given these uncertain and unstable institutional environments, actors cannot rely on their experience or existing economic, social, political and legal norms as these are often in a perpetual flux (Newman, 2000).

In response to institutional pressures, actors often mimic strategies adopted by other actors in a similar environment resulting in isomorphism in organizational fields (David and Okhmatovskiy, 2012; DiMaggio & Powell, 1983). As DiMaggio and Powel (1983) indicate, actors often opt for imitation as a strategic response to institutional pressures under conditions of uncertainty. We argue that in an emerging country characterized by uncertainty, an actor in response to institutional pressures to engage in corrupt practices will follow mimetic processes in the institutional environment leading to the actor's conformity to the

existing social norms to attain legitimacy. Thus, if corrupt practices such as bribery are institutionalized in the economy, an actor is more likely to conform and engage in corrupt practices to attain legitimacy.

Using Scott's (2001) seminal work that classified the institutional environment as having regulatory, cognitive and normative dimensions, De Clercq et al. (2010) categorize institutional voids (which they term as 'institutional burdens') into regulatory (related to the functioning of the state bureaucracy and laws and regulations in a country), cognitive (related to knowledge and information constraints in a country), and finally normative (related to societal perception of corruption) burdens. As per Khanna and Palepu (2000: 868), institutional voids in emerging economies can be understood as the presence of "weak markets and corporate governance, lack of legal and financial intermediaries, and problems in labor and product markets." Employing the classification proposed by DeClercq et al. (2010), we identify three significant institutional voids that impact the perceived level of public sector corruption in an emerging economy context: (1) the legal environment, (2) the freedom and transparency of the media, and (3) the presence of business and professional associations.

Legal Environment

A stable and effective legal environment is crucial for fostering growth and attaining sustainable economic development in an economy (Baumol, 1990; Henrekson, 2007, Parker, 2007; Shane, 2003). However, one of the challenges in emerging economies is that the legal environment is typically weak and ineffective. As per extant research, in such challenging environments, actors compensate for the ineffectiveness of the legal system by engaging in corruption to accomplish their goals (Aidis & Adachi, 2007: 403; Rose, 2000: 147).

One of the most significant deterrents for actors engaging in corruption is the penalties associated with getting caught. The probability of getting caught is determined partially by the efficiency of the country's legal system. Additionally, the cost of engaging in corruption is related to the efficiency of the legal system and how strictly the law is enforced (Eckstein, 1966). The performance of such deviant and criminal behavior depends on the costs or penalties of engaging in acts such as corrupt transactions (Becker, 1968). Actors thus consider the anticipated costs of the sanctioning and build that into their expectations when planning a corrupt deal.

In emerging economy environments characterized by inefficient legal systems, actors expect the penalties for engaging in corrupt transactions to be low. Liezel (1997:125) supports this notion by pointing out that, "to the extent that breaking rules entails some risk of a future punishment, including a loss of reputation, individuals will be more willing to run such risks in less stable settings." Tonoyan et al. (2010) find evidence that for emerging economies in the Soviet Bloc, inefficient court system and law enforcement increased the entrepreneur's likelihood of engaging in corruption. The magnitude of the penalties for engaging in corrupt transactions is also important. From fines to dismissal and even to prosecution, the more severe the penalty, the higher the cost (Becker and Stigler, 1974). Dong and Torgler (2013) exploit provincial panel data to find the causes of corruption in China empirically. They find that provinces with greater anti-corruption penalties are markedly less corrupt. This leads us to our first hypothesis:

Hypothesis 1: The perceived level of corruption in an emerging economy will decrease as the enforcement of laws and the magnitude of the penalties for engaging in corruption increases.

Presence of Business and Professional Associations

The relevance of membership in business and professional associations for actors as a means of generating legitimacy is also supported by the literature on institutional theory. Authors such as Scott and Meyer (1983) and Suchman (1995) have pointed out the legitimacy gains and the importance associated with conforming to the existing rules from regulatory institutions and professional associations. David et al. (2013: 580) argued in their paper concerning entrepreneurial organizations how certification served as a "legitimating symbol that increases [d] the confidence of constituents and thereby enhance[ing] an entrepreneur's ability to obtain the resources needed for start-up…if an entrepreneur holds a certificate

from an authorized institutional actor indicating that the proposed project meets all required conditions, constituents are more likely to accept the venture as a viable risk."

In our paper, we take the above argument further and note that in addition to the legitimating benefits gained by actors by being part of business associations or attaining certification, conforming to the existing rules of a professional association reduces the actors' tendency to engage in corruption. Actors in emerging economies that are members of associations (such as for a firm in India being listed in the National Stock Exchange or being a member of the Federation of Indian Chambers of Commerce and Industry) must follow certain ethical conduct for continued membership that necessitates ongoing transparency. These associations have stringent ethical codes and due process for complaints with respect to unethical behavior (such as engaging in corrupt transactions) by members. Thus, the normative pressure of maintaining ethical conduct to remain part of these business associations is a deterrent to an actor's tendency to engage in corruption.

Collins et al. (2009) found that managers of organizations that are part of professional networks, such as the Institute of Chartered Accountants in India, the Bar Association, or the Medical and Pharmaceuticals Association are less likely to engage in corruption due to the effective norms that exist in professional networks. The above points and reasoning lead us to the following hypothesis:

Hypothesis 2: *The perceived level of corruption in an emerging economy will decrease with an increase in the overall level of participation in business and professional associations in an economy.*

Interaction Effects Between Institutional Elements

Using Scott's (2001) classification of how institutional environments comprise of regulatory, cognitive, and normative aspects, we consider how the interaction between the three institutional elements identified above impacts the perceived level of public sector corruption in emerging economies.

As discussed above, the legal system and business and professional associations in an emerging country represent the institutional environment's regulatory elements consisting of laws, regulations, and expectations that permit actors to engage in certain types of behavior and penalize others (DiMaggio & Powell, 1983). In comparison, the presence of free and transparent media represents the cognitive element in a country's institutional environment that reflects shared knowledge and categories that people employ to understand a particular phenomenon (Kostova & Roth, 2002; De Clercq et al., 2010). The media also represents the normative element in a country's institutional environment as it also defines and shapes the values, beliefs, norms, and assumptions about human behavior that are socially acceptable by individuals in a country (Kostova & Roth, 2002; Scott, 2001).

The Role of the Media as a Moderator

As mentioned above, one of the key institutions with a normative and cognitive element concerning the perceived level of corruption in emerging economies is the presence of a free and transparent media (Bruneti and Weder, 2003). As David et al. (2007: 581) point out, the media impacts public perception and is critical in establishing legitimacy by playing an important role in "providing order and meaning to fields of activity." Building on this, we argue that in emerging countries where the press and media outlets are not monitored or censored, the media serves as an institution that raises awareness about corruption in the economy to the general public. Furthermore, free and active media and press will serve as a deterrent for actors in an emerging economy to engage in corrupt transactions for fear of being exposed and penalized by the regulatory institutions.

However, in many emerging countries, the media cannot operate freely and is censored due to laws and regulations that control media content, political influence over media content, and repressive actions such as "arrests, murders or suspensions of journalists, physical violence against journalists or facilities, self-censorship, harassment, expulsion, etc." (Bruneti and Weder, 2003: 1806). In such countries, the media cannot effectively serve as a watchdog or raise awareness about the perceived levels of corruption. Several studies on corruption have highlighted how the media helps monitor and report acts of public sector corruption (Ahrand, 2002; Stapenhurts, 2000; Freille et al., 2007). Thus, we hypothesize that in emerging

economies with the presence of institutional voids, the existence of a free and transparent media can play a critical role in impacting the perceived levels of corruption by making knowledge about corrupt transactions more widely available in the country and also shaping values, beliefs, and norms concerning how society views corruption.

In this paper, we argue that free and transparent media serves as a moderator or a catalyst that enhances the existing link between the regulatory institutional elements (i.e. the legal system and business and professional associations) on the perceived level of corruption in the economy. The media can identify corrupt activities and raise awareness and shape societal perception with respect to corruption in an economy. Still, it cannot penalize actors for engaging in corrupt transactions for which we need regulatory institutions, i.e. the media is a necessary institution to help reduce corruption. Still, it alone is not sufficient to deter corruption in the economy. Thus, in terms of the interaction between the three institutional elements, we argue that the media can strengthen the impact on the perceived levels of corruption, conditional on the presence of existing strong regulatory institutions such as a strong legal system and business and professional associations in emerging economies. This leads us to Hypothesis 3 and 4:

Hypothesis 3: The relationship between the legal system and the perceived level of corruption in an emerging economy is moderated by the presence of a free and transparent media, such that the relationship is significantly stronger with a more free and transparent media.

Hypothesis 4: The relationship between the presence of business and professional associations and the perceived level of corruption in an emerging economy is moderated by the presence of free and transparent media, such that the relationship is significantly stronger with a more free and transparent media.

Finally, looking at the two regulatory institutions, the legal system, and the presence of business and professional associations that we explore in this paper, we can argue that there is a key difference between the two regulatory institutions. The legal system proposes rules and regulations that apply equitably and fairly to every actor in the economy. At the same time, business and professional associations can have industry-specific rules that apply to a few sets of actors that are members of the associations and can vary across different associations in the economy. With the widespread prevalence of corruption in emerging economies, one of the most effective and powerful deterrents for corruption is the risk of getting caught and legally penalized (Eckstein, 1966). Here, the penalties associated with violating the rules and regulations stipulated by the country's legal system are more severe (i.e., the maximum penalty being imprisonment) than the extent of penalties imposed by a business and professional association.

Thus, we hypothesize that concerning the interaction between the three institutional elements, the perceived level of public sector corruption will decrease more significantly in an emerging economy with the interaction between the strong legal system and a free and transparent media versus the interaction effect between the presence of business and professional associations and the media. This leads us to our fifth hypothesis:

Hypothesis 5: The perceived level of corruption in an emerging economy will decrease more significantly with the interaction between the media and the legal system compared to the interaction between the media and the presence of business and professional associations.

FIGURE 1
HYPOTHESIZED RESEARCH MODEL
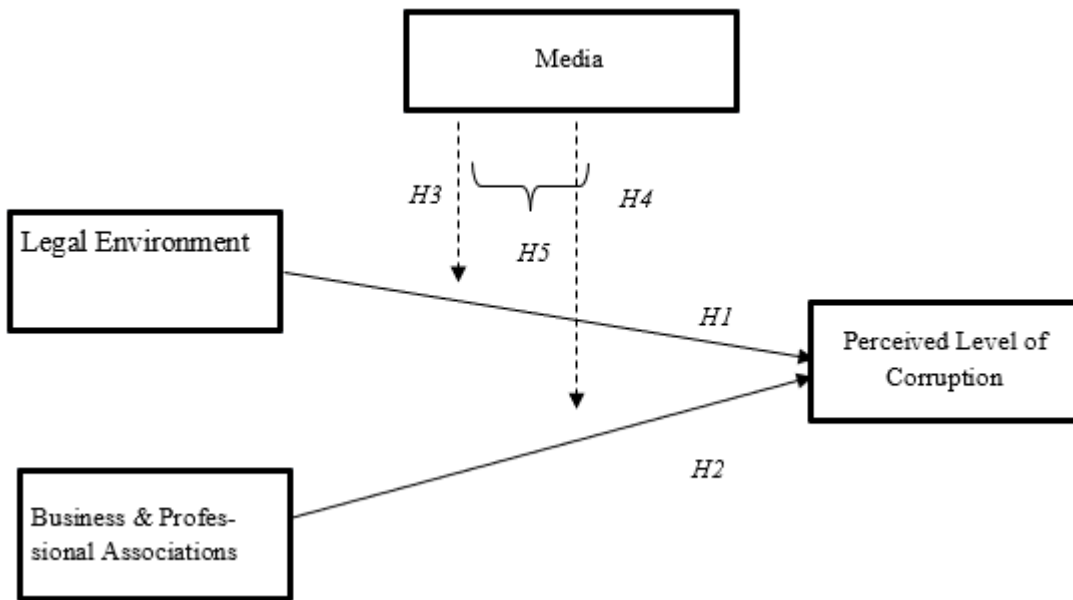
EMPIRICAL METHODOLOGY AND DATA

This study employs multiple databases using the following cross-sectional data: the Bayesian Corruption Index (BCI) from Standaert (2015)[1], Worldwide Governance Indicators including the Press Freedom Index and Rule of Law index from the World Bank, and data on professional associations from the World Values Survey[2]. In particular, we retrieve "Rule of Law" and "Voice and Accountability" among Worldwide Governance Indicators as the two proxies for the rule of law and media freedom, respectively.[3] The estimated numerical values of governance range from -2.5 to 2.5, and they measure the governance performance. The higher the value is, the stronger a government's performance is, and a negative value represents a weak government performance.

We select the Bayesian Corruption Index (BCI) from Standaert (2015) as our dependent variable. BCI provides a ranking of countries/territories based on how corrupt their public sector is perceived to be. It is a composite corruption index that considers the perceived overall level of corruption and contains information from 110 survey questions. The reason why we choose the Bayesian Corruption Index (BCI) instead of the other well established the Corruption Perception Index (CPI) is that the former index is an augmented version of the latter that is designed to truly represent the underlying data. The explanatory variables include the press freedom index or the voice of accountability, the rule of law index (ROL), participation in business and professional associations, and their interaction terms. We retrieve our explanatory variables from the Worldwide Governance Indicators (WGI) and World Values Survey (WVS) databases. The surveys are "based on 32 individual data sources produced by various survey institutes, think tanks, non-governmental organizations, international organizations, and private sector firms." We employ the "Voice and Accountability" and "Rule of Law" dimensions of governance as our proxies for country-level press freedom index and rule of law index. The proxy for the presence of business and professional associations is from the WVS database. The WVS survey, which started in 1981, consists of nationwide descriptive surveys conducted in nearly 100 economies. The relevant survey question in this study asks about the degree of an actor's participation in business and professional associations. We retrieve data from the sixth wave database in an attempt to make the cross-sectional data compatible with each other. We then calculate the average values for the period of six years and then match the calculated WGI and

CPI points to the data points in the WVS wave 6 data. For participation in a professional association, we calculate the percentage of active members in the association by counting how many active members are in the association. The first three explanatory variables capture the linear relationship between the explanatory factors and the perceived level of corruption, similar to the extensive literature on the causes of corruption (Tonoyan et al., 2010). The interaction term we propose, which has not been explored previously in the extant literature, evaluates the second-order effects between each factor.

Our sample provides one possible outcome of the repeated samples of the random variable (here, developing nations). We assume the sample data used are independently and identically drawn from the population data. This assumption allows us to make a key assumption about the estimates: estimates are random variables' outcomes.

PRELIMINARY ANALYSIS

Figure 2 in the Appendix shows the scatterplots and correlations between variables. There are a few things worth pointing out. In these graphs, we don't observe any obvious large outliers. We can see negative correlations between the rule of law and corruption rankings and between the voice of accountability and corruption rankings[4]. And these relationships all have the expected negative signs, suggesting that this variable may help explain a country's corruption perceptions. However, the high positive correlation (a value of 0.663) between the rule of law and the voice of accountability is concerning because it can cause relatively high variances in our estimated results. Table 1 in the Appendix presents descriptive statistics of these variables. Notice that nearly all variables exhibit big ranges. This is mainly due to differences in the level of development among these countries. We include three additional variables: per person real GDP, the level of population, and ethnic fractionalization. Overall, all variables show a lot of variations within the data.

MODEL SPECIFICATIONS

We assume that the data are i.i.d (independently and identically distributed). And each data point does not provide any information on the remainder of the outcomes in our data. For example, a score for Armenia has nothing to do with a score for China for the same variable. However, countries are likely connected through international trade and some other factors.

We establish the base model using the logarithm of the rule of law, the the voice of accountability, and the logarithm of participation in a professional association as the only explanatory variables. It is plausible to assume that citizens in a society with a better rule of law are more likely to enjoy freedom of expression and free media. Moreover, it is conceivable that people in a country with more freedom of expression and free media are less likely to hide their illegal activities, such as extortion and bribing. A possible bias is induced by omitting either rule of law or voice and accountability in the regression model. The base model is designed as follows:

$$BPI = \beta_0 + \beta_1 ROL + \beta_2 VOA + \beta_3 Pro\_Asso + \mu \qquad (1)$$

where BPI is the Bayesian Corruption Index, ROL is the rule of law, VOA is voice and accountability, Pro_Asso is the participation in a professional association, $\beta_i, i = 1,2,...$ is the estimated coefficient, and u is the error term. We expect that, on average, countries with higher ROL scores have lower BPI scores than countries with the lower rule of law index and that countries with more freedom of expression also rank higher on corruption perceptions.[5] This means that we expect the signs of the estimated parameters before the three variables to be negative.

The rule of law and freedom of speech should not depend on the level of corruption. Suppose we control for real GDP per capita and the size of population. In that case, we should expect to see a relatively low level of corruption in countries where sound rule of law systems and a higher degree of freedom of expression through media are in place. The higher the real GDP per capita, the more likely a country has

more established and diverse industries, hence the higher possibility for all kinds of professional associations and a better justice system. We add the logarithm of real GDP per capita to the base model. Besides real GDP per capita, we also include ethnic fractionalization and population as additional control variables for social influence on personal behavior. When ethnic diversity is intermediate, constituencies act as a check and balance device to limit ethnically-based corruption (Cerqueti et al., 2009). We obtain the Historical Index of Ethnic Fractionalization (HIEF) from the Dataverse of Harvard University and the size of the population from World Bank database. Equation (3) illustrates the further modified regression model:

$$BPI = \beta_0 + \beta_1 ROL + \beta_2 VOA + \beta_3 Pro\_Asso + \beta_4 pcGDP + +\beta_5 Pop + \beta_6 Eth\_Fra + \mu \qquad (2)$$

where Pop is the size of the population, Eth_Fra is ethnic fractionalization, and μ is the error term. We conduct join significant tests or the F-test to justify the inclusion of real GDP per capita and ethnic fractionalization. Table 2 in the Appendix shows the F-statistic results for the different restrictions imposed on the explanatory variables. The test of the overall significance of the regression model shows that at least one of the explanatory variables has an influence on the level of corruption. Furthermore, the F-test results for individual pairs show that we can reject the null hypothesis that the logarithm of real GDP and the logarithm of ethnic fractionalization is not jointly significant with at least one of the explanatory variables, except for the rule of law (ROL). This may look counter-intuitive at first. However, the legal system in many developing countries are not very established . And its effect on deterring engaging in corruption may be more effective when combined with press freedom. Nevertheless, the results suggest that the effect of the explanatory variable on the level of corruption captures the effect of the size of the economy, indicating potential omitted variable problems if real GDP per capita and/or ethnic fractionalization are not included.

The estimates for voice of accountability (VOA) are not statistically significant at any level, suggesting that voice of accountability may not have a linear relationship with the level of corruption. Figure 3 in the Appendix shows the scatterplot of the relationship between the dependent variable BPI and voice of accountability (VOA). We fit the scatterplot with a linear model and a quadratic model. We can see that the curvy line seems to fit the data better.[6] We decide to add a squared term VOA^2 to the enhanced model, and the base model is expanded to model (III). It describes the pattern of the scatterplot in the sense that as the level of voice of accountability increases, the effect on the level of corruption gets smaller and smaller.

$$BPI = \beta_0 + \beta_1 ROL + \beta_2 VOA + \beta_3 VOA^2 + \beta_4 Pro\_Asso + \beta_5 pcGDP + +\beta_6 Pop + \beta_7 Eth\_Fra + \mu \qquad (3)$$

According to the theory established in the first half of this study, voice of accountability affects the level of corruption not only by itself but also through its interaction with rule of law as well as the participation in professional associations. We further expand the regression model further by including two interaction terms: $ROL * VOA$ and $ASSO * VOA$.

$$BPI = \beta_0 + \beta_1 ROL + \beta_2 VOA + \beta_3 VOA^2 + \beta_4 Pro\_Asso + \beta_5 ROL * VOA + \beta_6 VOA * Pro\_Asso$$
$$+\beta_7 pcGDP + +\beta_8 Pop + \beta_9 Eth\_Fra + \mu \qquad (4)$$

We check whether the rule of law (ROL) and participation in professional associations (ASSO) impact the voice of accountability (VOA). The t-tests indicate that the interaction term $ROL * VOA$ has significant effects on the level of corruption at any level of significance. We use a robust F-test to check a joint significance of the two interaction terms. We find that the null hypothesis can be rejected at the level of 5% significance and conclude that the two interaction terms are jointly important despite the insignificance result on $Pro\_Asso * VOA$ at the 5% level. The model shows that the marginal effect of voice of accountability on the level of corruption depends on the level of rule of law and that the effect is higher when the level of rule of law is higher.

We have imperfect multicollinearity problem in our regression model due to the high correlation (0.68) between VOA and ROL. It is widely known that imperfect multicollinearity inflates the variance of more

coefficient estimators. However, we are likely to run into the omitted variable bias problem if we do not include important explanatory variables, which is usually a more serious problem than imperfect multicollinearity. Both VOA and ROL should be included or else omitted variable bias will happen. We conduct the collinearity diagnostics test and report the variance inflation factor (VIF) scores. Our VIF scores range from 1.408 to 3.883, with highest VIF scores on VOA, the interaction term. As Mela and Kopalle (2002) point out, VIF scores less than 10 indicate limited concerns of multicollinearity. The VIF scores are lower than 10 for all of the variables in model (IV).

We run diagnostic checks to the residuals of regression model (IV). Firstly, we check the errors to see if the errors have zero mean and constant variance. Figure 4 in the Appendix presents scatterplots of the fitted values against the residuals of the regression model. We see that the residuals roughly center at value zero on the fitted versus residual plot, indicating that the linearity assumption about the parameters is not violated. Moreover, we don't observe any obvious patterns in the residuals on this plot, i.e., the residual spread does not change systematically as fitted values vary. This suggests that the constant variance assumption is not violated. To confirm this, we conduct the Breusch-Pagan test to test for heteroskedasticity. As indicated in Table 4 in the Appendix, the test result shows that we cannot reject the null that the variance of the residuals is constant, thus heteroskedasticity is not present in the regression model (IV). Nevertheless, robust standard errors are used to construct valid hypothesis tests and confidence intervals.

In addition, we create Q-Q plots for the residuals of our regression specifications to check the normality of the errors. Figure 5 in the Appendix presents Q-Q plot for the residuals. The points on the Q-Q plot of our final regression model are fairly close to the line, and no large discrepancies are detected along the line. We conclude that the residuals generated by regression model (IV) could follow a normal distribution. To confirm the conclusion made by checking the Q-Q plots, we also conducted the Shapiro-Wilk test. Table 4 shows we cannot reject the null hypothesis that the residuals are sampled from a normal distribution. This is important because our sample is relatively small with only 45 observations. And normality of errors makes small-sample inference valid besides other regular OLS assumptions that have been met.

RESULTS

Table 5 in the Appendix presents the coefficient estimates with significance codes (the asterisks), robust standard errors in parentheses below, and other relevant summary statistics.

The estimates for the rule of law are statistically significant at all levels for all specifications. This means that rule of law is an important factor in explaining the level of corruption. The estimates for voice of accountability are not statistically significant by it alone. However, the estimated coefficient of VOA has the expected negative sign once the quadratic term is added to the regression model in column (IV). Furthermore, the estimated parameter of VOA in column (IV) is statistically significant at 5% level, suggesting that the effect of voice of accountability on corruption may not be linear. And this is consistent with the theoretical prediction by our theory. The VOA, ROL, and Pro_Asso estimates do not vary much in the first two model specifications. And the sign of VOA estimate changes to negative in model (IV). This further indicates that model (I)-(III) could suffer omitted variable problems. Our theory also predicts that VOA affects the perceived corruption through its interaction with rule of law (ROL) and the participation in professional associations (ProAsso). As column (IV) shows, the two interaction terms ROL*VOA and ProAsso*VOA are statistically significant at the 1% level and the 5 % level, respectively. In addition, the adjusted R^2 and residual standard error both improve greatly in the specification (IV). Unfortunately, we cannot verify the strength of estimates of the interaction terms hence test the theory that the interaction between the legal system and the media has a stronger effect than the interaction effect between free media and professional associations.

Our model suggests that rule of law (ROL) and voice of accountability (VOA) do not individually affect the corruption level. This is consistent with the theoretical prediction. Specifically, the effect of rule of law on perceived corruption depends on the level of voice of accountability , and the marginal effect of voice of accountability on the level of corruption depends on the level of rule of law as well as the participation

in professional associations. Based on our estimated results, the partial effect of ROL is less than zero regardless of the value of VOA. This means that improving a country's justice system at any given level of freedom of speech reduces the country's perceived corruption. The influence of VOA on the level of corruption is more intricate as the partial effect of VOA on perceived corruption depends on VOA itself, ROL, and professional association (ProAsso). The effect can be negative or positive, depending on the values of VOA, ROL, and ProAsso. Using the average values of these variables, we calculate the point effect of VOA on perceived corruption to be 5.58. This means that an increase in VOA by one point causes the perceived corruption index to go up by 5,58 points, which is a higher perceived level of corruption. One possible explanation is that the average levels are already very low, indicating low levels of development in all aspects. A professional association (ProAsso) directly and indirectly influences the perceived level of corruption through interaction terms. However, the direct effect is not statistically significant at any level of significance, while ProAsso affects corruption via the voice of accountability indirectly.

Although the estimated parameters for the three control variables, namely real per capita GDP, ethnic fractionalization, and population size, are not statistically significant across all model specifications, we decide to keep all three to control for idiosyncrasies in economic development and social preferences among different countries. Table 2 shows that the heteroskedasticity-robust version of the F-test (Waldtest) results for the join hypotheses are highly significant at all levels of significance. We can reject the null hypothesis that all coefficients are zero at any level of significance and conclude that the three control variables can assist other explanatory variables in explaining the dependent variable, namely the perceived level of corruption index.

We summarize the main results as follows. We choose regression model (IV) as the most suitable specification for the highest R^2, highest adjusted R^2, lowest RSE, and results in the diagnostic tests. The coefficient of the rule of law index (ROL) is statistically significant at all levels of significance. This confirms. Hypothesis 1 that rule of law is an effective anti-corruption tool. The variable for voice and accountability (VOA) has a negative sign, and the estimate of the quadratic term is statistically significant at the 5% significance level, which is consistent with Hypothesis 2. However, we only find evidence for the indirect effect of participation in a professional association (ProAsso) on perceived corruption scores. We cannot empirically confirm our theoretical prediction, which states that business and professional associations have a positive linear relationship with reduced perceived level of corruption. We argue that agents may join business and professional associations in some developing countries to be involved in corrupt activities that could benefit their businesses. For example, some business leaders may see benefits from improved efficiency such as faster processing of permits or less interference from governmental officials. Nevertheless, our regression analysis show that participation of professional associations, rule of law, and freedom of media effectively reduce corruption to certain degrees. Furthermore, the freedom of media, once combined with rule of law, improves the impact in influencing corruption. In other words, we cannot reject Hypothesis 3 and 4 as the freedom of media seems to work as a positive catalyst or mediator that strengthens the existing relationship between the regulatory institutional elements and perceived level of corruption. As specification (IV) implies, the interaction terms between the freedom of media and the presence of business and professional associations are significantly differently from zero but the sign depends on the levels of VOA, ROL, and ProAssp. We cannot make conclusions about differences in the strength of the interaction effects between media and professional associations and the interaction effects between the media and rule of law. In this case, we only partially find evidence supporting both Hypothesis 4 and Hypothesis 5. In summary, the above results highlight the importance of interaction effects between institutional elements and the role of the media as a moderator variable.

DISCUSSION

This paper focuses on the institutional environment in emerging economies. It builds a theoretical framework to identify three institutional elements (the legal system, the freedom of the media, and the presence of business and professional associations) that impact public sector corruption. Based on these

three institutional elements and their interaction effects, we propose strategies to reduce corruption in emerging economies.

Contribution

One of our key contributions to the paper is our exploration of the media as a catalyst or a moderator variable in impacting corruption conditional on the presence of strong existing regulatory institutions, which we empirically confirm through our findings that the media does not have a linear relationship with the perceived level of corruption and serves a moderator variable. We didn't find support for our hypotheses that, conditional on the presence of a strong legal system and business and professional associations, the freedom of media will enhance the impact that the regulatory institutional elements have in reducing the perceived corruption in emerging economies. However, we also fail to reject that the interactions between the freedom of media and the legal system could improve their impact on reducing the perceived level of corruption depending on the levels of other explanatory variables. Concerning the two interaction effects discussed in our paper, the interaction effect between the legal system and the media is stronger than the interaction effect between the media and the business and professional associations in emerging economies.

Implications for Practice

Our paper has important strategic implications for academics and policymakers in emerging economies that are combating corruption. In particular, for emerging economies with limited resources, our study's findings reflect that to effectively reduce corruption in these economies; an emerging country should first invest in building a robust legal system. The presence of free media alone does not contribute in reducing corruption. While the presence of a free media plays an important role in reducing corruption, the presence of a free media and a strong legal system could contribute to reducing corruption. However, if an emerging country already has or develops a strong legal system, then having a more free and transparent media could further improve the country's efforts in dealing with corruption. Finally, the findings in our study establish that the presence of business and professional associations is the third most important institutional element or strategy that policymakers in emerging countries should focus on for reducing corruption; i.e., developing business and professional associations in an emerging economy is effective only after the country has first established a strong legal system followed by having a free and transparent media.

ENDNOTES

1. The availability of the full dataset is determined by the data on professional associations from World Values Survey because they are collected in the form of waves. One wave is six years in length. We adopt the last wave or the sixth wave and construct the other variables using data from Transparency International and the World Bank.
2. Voice and accountability: "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." Rule of law: "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."
3. A the smaller the Bayesian Corruption Index (BPI) number is, the lower level of corruption perception is.
4. There is a clear pattern which shows a bigger variance at a lower level of VOA. This issue is addressed in the diagnostic part of model specification.

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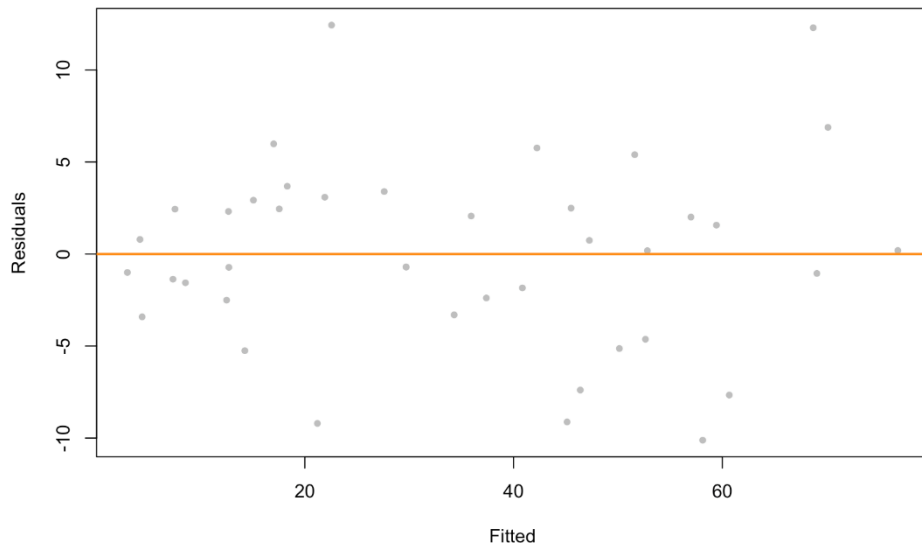
APPENDIX

FIGURE 2
SCATTERPLOTS AND CORRELATIONS
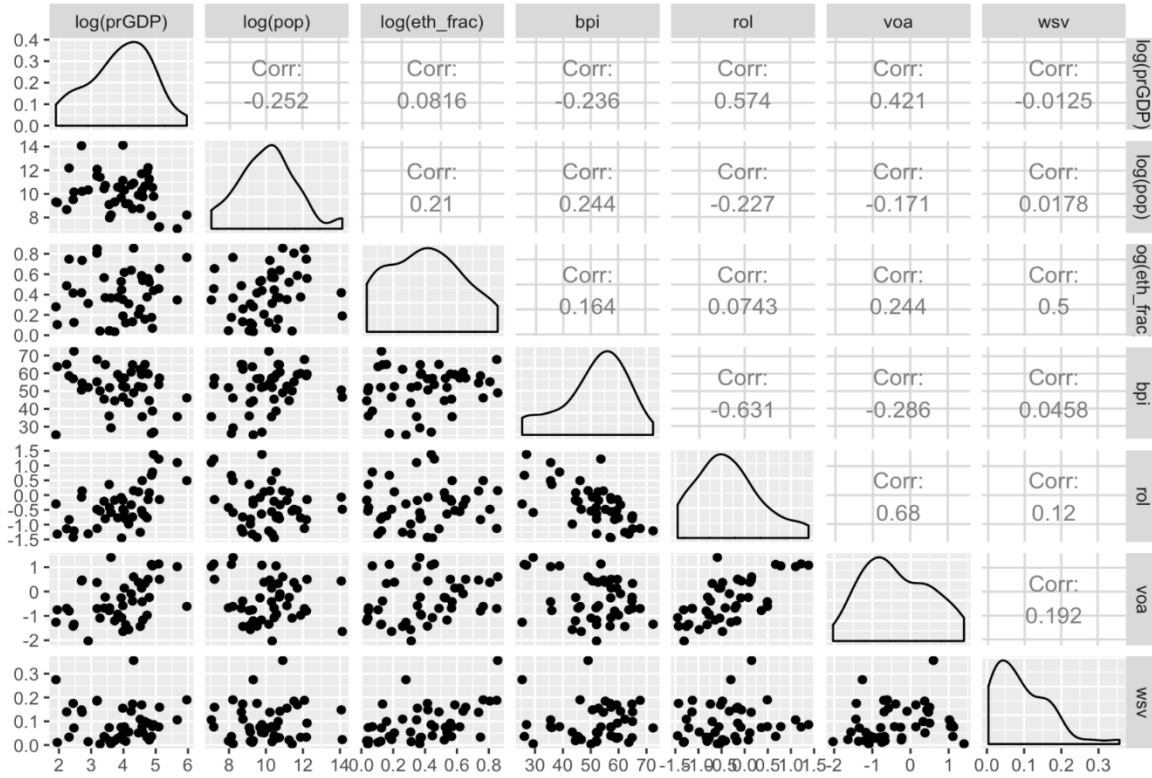
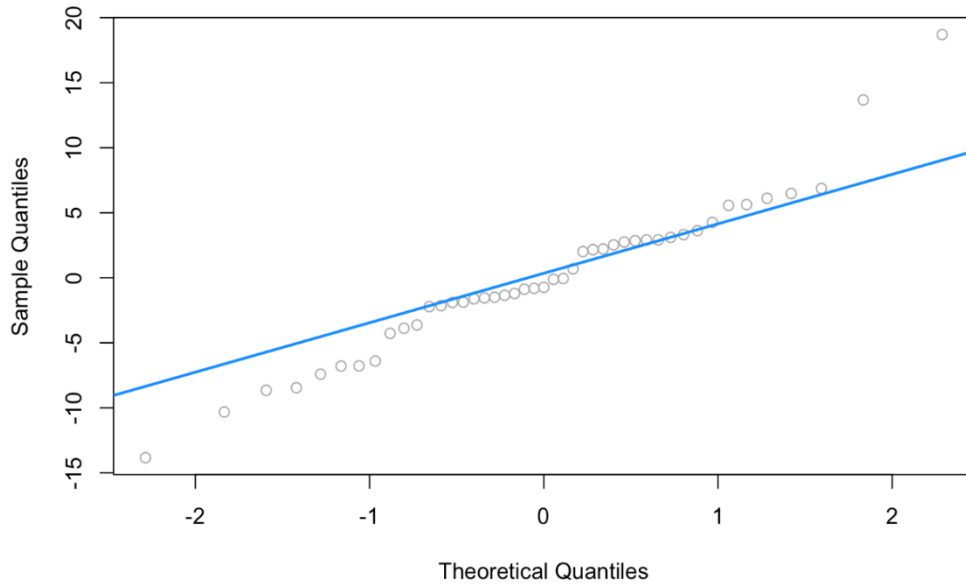**FIGURE 3**
FIITED SCATTERPLOT OF BPI VS. VOA
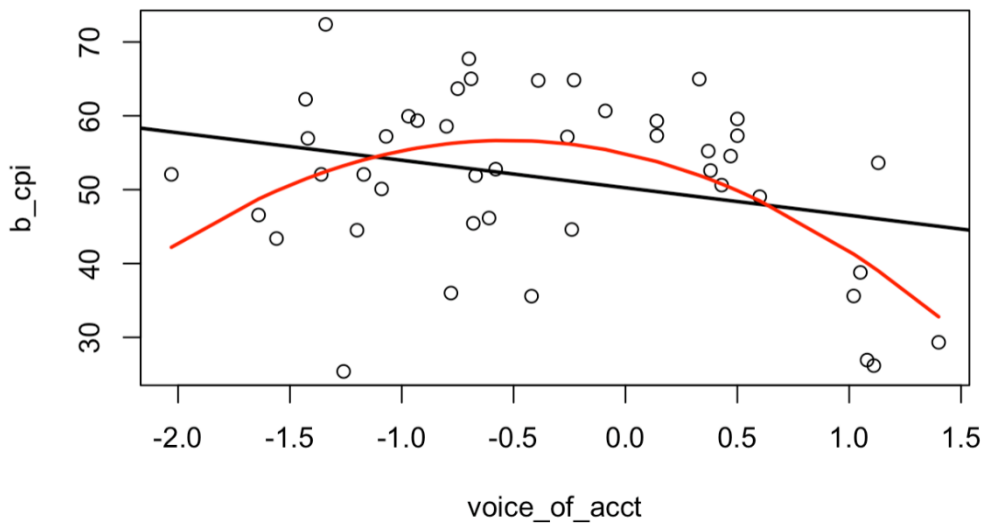
FIGURE 4
SCATTERPLOT OF THE FITTED VALUES VS. RESIDUALS

FIGURE 5
Q-Q PLOT FOR THE RESIDUALS

TABLE 1
DESCRIPTIVE STATISTICS

Variables	Mean	Standard Deviation	Maximum Value	Minimum Value
Bayesian Corruption Index	51.569	11.535	72.380	25.382
Professional Association	0.092	0.0760	0.356	0.004
Rule of Law	-0.346	0.707	1.380	-1.450
Voice of Accountability	-0.349	0.884	1.400	-2.030
Real GDP per capita (100s)	75.231	73.430	389.642	6.747
Ethnic Fractionalization	0.4000	0.237	0.856	0.034

TABLE 2
F-STATISTIC RESULTS

Hypothesis	F-statistic value	P-value
Log ROL = 0; log GDP = 0; log Ethnic Fractionalization; log population	0.644	0.592
log VOA = 0; log GDP = 0; log Ethnic Fractionalization; log population	6.601	0.001
Log ProAsso = 0; log GDP = 0, log Ethnic Fractionalization; log population	3.1824	0.035
Overall = 0	8.274	0.000

TABLE 3
VIF SCORES

Variable	VIF Score
Pro_Asso	1.433
ROL	2.462
VOA	3.883
VOA^2	2.444
Log GDP	1.714
ROL*VOA	2.341
Pro_Asso*VOA	2.514
pcGDP	1.714
Eth_Frac	1.489
Population	1.408

TABLE 4
BREUSCH-PAGAN TEST AND SHAPIRO TEST

Test	Estimated value	p - value
Breusch-Pagan heteroskedasticity test	12.643	0.179
Shapiro-Wilk normality test	0.960	0.120

TABLE 5
REGRESSION RESULTS FOR DIFFERENT MODEL SPECIFICATIONS

	CPI			
	(I)	(II)	(III)	(IV)
Pro_Asso	14.458	14.783	2.225	10.916
	(17.436)	(26.394)	(20.354)	(16.562)
ROL	-13.217***	-14.502***	-13.992***	-13.560***
	(3.889)	(4.105)	(3.648)	(2.649)
VOA	3.217	2.973	0.206	-1.478
	(4.151)	(3.773)	(3.391)	(1.901)
VOA^2			-5.498**	-9.383***
			(2.056)	(1.420)
$VOA * ROL$				6.996***
				(2.449)
$Pro_A sso * VOA$				32.590*
				(16.577)
Log pcGDP		2.461	2.294	1.795
		(1.945)	(1.645)	(1.164)
Log Population		0.917	0.359	0.263
		(0.968)	0.713	(0.628)
Ethnic Fractionalization		0.348	0.263	-0.213
		(1.312)	(1.341)	(1.088)
Obs.	45	45	45	45
R^2	0.445	0.486	0.606	0.737
Adj.R^2	0.404	0.404	0.531	0.670
RSE	8.904(df=41)	8.902(df=38)	7.897(df=37)	6.631(df=35)
F-Stats	8.904	5.979	8.127	10.900
	(df=3; 41)	(df=6; 38)	(df=7; 37)	(df=9; 35)
		* p < 0.1;	** p < 0.05;	*** p < 0.01