CREDITOR RIGHTS, CORRUPTION AND CAPITAL STRUCTURE: EVIDENCE FROM EMERGING MARKETS

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Abstract

This paper investigates the impact of creditor rights on the relationship between corruption and capital structure. We hypothesize that creditor rights can mitigate the impact of corruption on capital structure. The data consists of 17,114 firms listed in 24 emerging countries during the period from 2012 to 2020. Our setting of emerging countries can be an interesting context because firms in these countries may rely more on debt than equity. In these countries, the corruption may be more severe and thus we expect that the impact of corruption on corporate capital structure may be more prominent. Using a pooled ordinary least square (POLS) regression model, we find that firms tend to use more leverage in countries with a high level of corruption. However, this relationship can be weakened in strong creditor rights countries. This result does not change when we employ random effects and fixed effects models. The results of this study imply that policymakers should consider improving the degree of creditor rights if they want to deal with the high level of corruption in a country.

Keywords: Creditor Rights, Corruption, Capital Structure, Leverage, Emerging Market

1. INTRODUCTION

The topic of corruption and its impact on the financial market has drawn substantial attention from many economists and policymakers recently. Corruption influences the financial market's transparency by creating regulatory loopholes and hindering public scrutiny. Chen et al. (2010) find that bribes can prevent the media from revealing the truth and reduce the reliability of forecasting reports of financial analysts. Accordingly, increased information asymmetry makes investors feel hesitant and lose their confidence in investment decisions. The limitation of investment flow from the stock market moves firms to mobilize loans from banks. Moreover, bribes can create direct

incentives for bureaucrats to extort firms, forcing firms to use more debt to avoid the expropriation of firms' assets (Singh & Kannadhasan, 2020). Cross-sectional studies also suggest that corporations operating in corrupt countries and weak legal systems tend to use more leverage to finance rather than equity (Fan et al., 2012), especially short-term debt (Lemma, 2015). In contrast, Ciocchini et al. (2003) note that corruption across countries in emerging markets distorts the corporate governance mechanisms' effectiveness, creates uncertainty, and increases operational and borrowing costs, thereby reducing profits as well as deterring firms' abilities to repay loans. As a result, banks are unwilling to grant corporate credit in highly corrupt countries and weak legal protection for creditors (La Porta et al., 1997).

Recent years have recorded a significant increase in research on country governance as an important factor affecting corporate leverage. The factor focuses on not only the corruption level or anti-corruption campaign (Wu & Liu, 2022; Fan et al., 2012) but also other aspects such as political stability (Çam & Özer, 2022), government effectiveness (Awartani et al., 2016) and investor protection (Cho et al., 2014). Regarding legal protection, on one hand, Houston et al. (2010) examine the "supply-side" view and indicate that stronger creditor rights may encourage bank risk-taking. They suggest that strong creditor rights create several privileges for banks to seize the collaterals of borrowers, increasing the expected recovery rates if the borrowers go bankrupt. Consequently, banks tend to be more confident in their lending decisions as well as more willing to grant credit to risky borrowers. It is clearly seen that there is a positive relationship between strong creditor protection and a firm's use of debt (Cheng & Shiu, 2007; Djankov et al., 2007). However, the "demand-side" view asserts an inverse relationship (Cho et al., 2014). Standing on the borrowers' side, the managers of financially distressed firms may be seriously interfered in business activities and even be dismissed from their positions (Houston et al., 2010). Therefore, managers and shareholders tend to avoid using high leverage. This will help them to reduce the default risk and the risk of being taken by another company. Empirical evidence can be seen from Vig (2013) and Closset and Urban (2019).

Recent studies in capital structure have shown that institutional environment and economic situation are more meaningful in explaining how a firm sets up the leverage than the firm's characteristics. Accordingly, debt financing might be affected by the development of capital markets, information asymmetry (Booth et al., 2001) as well as country-specific legal enforcement (de Jong et al., 2008). Most of the previous studies are designed to determine the impact of only a single factor on corporate financing policy rather than various factors at the same time. Perhaps only de Jong et al. (2008) investigate the direct and indirect impacts of both firm and country-specific determinants on the financing decision. However, remarkably absent in the extant literature is an investigation of the links between corruption, creditor rights, and capital structure. Thus, our paper attempts to contribute to the extant literature by analyzing the moderation of creditor rights on the relationship between corruption and capital structure.

The impact of both creditor rights and corruption on firm financial policies is scant. In this paper, we aim to explore the moderation effect of creditor rights on the relationship between corruption and corporate capital structure. In this study, we use a sample consisting of 17,114 firms across 24 emerging countries from 2012 to 2020. Our context of emerging countries provides an interesting experiment because firms in emerging countries might need to rely more on debt than equity. We expect that corruption will be more severe in emerging markets and therefore the effect of corruption on capital structure will be more prominent. If creditor rights can impact the relationship between corruption and capital structure, this impact might also be salient.

In our study, we look at corruption, creditor rights, and capital structure relationships across many countries. This setting is valuable because it may reduce the endogeneity problem caused by reversed causality. Specifically, we can argue that corruption and creditor rights at the country level can impact capital structure at the firm level, but it is hardly arguable that the latter can affect the former. Our results show that an increase in corruption can exert a positive impact on corporate leverage and this effect will be attenuated by strong creditor rights. In economic terms, when the creditor rights increase by 1 unit, the positive impact of corruption on firm leverage can be reduced by around 50%. This result is robust when we run the regression model using a pooled ordinary least square (POLS) model, a fixed effects model, or a random effects model.

Our paper contributes to the literature in several ways. First, we provide more evidence showing the positive impact of corruption on corporate leverage. This result is consistent with the previous results of Singh and Kannadhasan (2020) and Fan et al. (2012). Second, our paper complements the literature on the impact of creditor rights on corporate financing policy. We show that creditor rights can affect not only the capital structure of a company but also the relationship between corruption and capital structure. We believe we are one of the first to show that strong creditor rights can mitigate the impact of corruption on capital structure.

The rest of this paper proceeds as follows. Section 2 provides the literature review. Section 3 describes the data and our methodology. Section 4 presents the empirical results. Finally, Section 5 concludes the paper.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Corruption and capital structure

According to the World Bank (2020), the concept of "corruption" was classified as the abuse of public office for private gain. Corruption is related to dishonest behaviors or criminal offenses undertaken by powerful people or authorities to obtain personal benefits. Since the early 1990s, research topics about corruption have attracted the full attention of many economists due to its importance and practicality. Economists believe that the construction of indicators of corruption could be used in many empirical

studies (Abed & Gupta, 2002). In recent years, there has been a gradual movement in the research subject area. Instead of investigating the effects of corruption on macro-factors (Mauro, 1995; Wei, 2000; Gupta et al., 2001), economists switch the focus to defining the impact of corruption on micro-factors such as stimulating the business growth (Wang & You, 2012). Furthermore, this effect is stronger in countries with high levels of financial development rather than in countries with financial constraints.

Using a sample including firms of countries in Central and Eastern Europe and the Former Soviet Union, De Rosa et al. (2015) indicate a negative relationship between corruption and firm performance. Asiedu and Freeman (2009) find mixed evidence of the effects of corruption on firm investment. They report that corruption is the most important determinant of corporate investment in Transition countries, and it negatively impacts investment growth for firms in this region. However, corruption does not exert any effect on investment growth in Latin America and sub-Saharan Africa.

One of the most concerning topics in corporate finance, capital structure refers to the combination of debt and equity. An optimal capital structure could help a corporation increase the firm performance and provide momentum to the organization's development. In contrast, non-optimal capital structure or ineffective financing decisions can potentially lead to the threat of bankruptcy, especially in the financial crisis (Eriotis et al., 2007). The literature suggests that there are two conflicting views on the effect of corruption on corporate capital structure.

On the one hand, corruption can negatively affect the capital structure of a company. In general, creditors' payoff, including the principal and interest payment, is fully specified in the lending contracts. Shleifer and Vishny (1993) and Chen et al. (2010) suggest that information asymmetry and lack of transparency in the financial markets tend to become worse in countries with high corruption. Additionally, they find that creditors face a high risk of capital loss and find it difficult to confiscate the collateral when the lending contract is violated in those countries. As a result, banks tend to reduce lending to firms in high-corruption countries (the supply side effects). Butler et al. (2009) indicate that state level of corruption and political integrity can impact significantly on credit risk as well as municipal bond rating. This suggests that in nations with high corruption, creditors are more likely to decline firm debts compared to those in countries with low corruption. Empirical evidence can be found in a single-country sample in China, where an anti-corruption strategy was widely implemented to promote economic development through positive proactive adjustment of corporate leverage (Wu & Liu, 2022; Hu & Xu, 2019).

On the other hand, it is arguable that corruption can exert a positive impact on firms' leverage. This argument is based on the "demand side" view. Myers and Majluf (1984) contributed the "pecking order theory", indicating that firms should use debt rather than outside equity to finance new projects if the level of information asymmetry is high. Since the information asymmetry is more visible in highly corrupt countries (Shleifer & Vishny, 1993; Chen et al., 2010), firms should issue new debt to finance

new projects in these countries, which implies a positive relationship between corruption and firms' leverage. McChesney (1987) indicates that government officials might take advantage of loopholes in regulations or complex tax rules to expropriate the assets of a company. To avoid this, companies can use a higher level of leverage because the expropriation of debt holders is much more challenging than the expropriation of equity holders (Singh & Kannadhasan, 2020). Severe corruption in countries makes the capital market regulations as well as the investor protection laws ineffective and neglected. This directly affects the attraction of domestic and international investment capital in those countries (Mauro, 1995; Wei, 2000). Thus, companies in high-corruption countries tend to raise capital from banks to make up for financial shortfalls. In addition, the authorities can collude with companies' managers to prevent in-depth investigations from independent audits and stakeholders. This problem can be mitigated by concentrated ownership and by employing bank credit (Du, 2008). To support the demand side effects, Fan et al. (2012) and Chen et al. (2013) provide empirical evidence of a positive relation between corruption and firms' leverage.

2.2. Creditor rights and capital structure

Bae and Goyal (2009) introduce a crucial factor that influences lending decisions, which is creditor rights. This concept referred to the right of creditors to place a lien on debtors' properties. Stronger creditor rights suggest safer recovery rates and asset expropriation of a bankrupt firm. One of the first indexes to measure the degree of creditor rights was constructed by La Porta et al. (1997). This index measures the effectiveness of legal rules as well as the quality of law enforcement to protect creditors. In La Porta et al. (1997), the creditor rights index is calculated for 49 countries. Then the index was further developed by Djankov et al. (2007) for 133 countries. Since its establishment, the creditor rights index has been widely used and applied in many studies, especially in corporate finance topics such as diversifying acquisitions strategies in strong creditor rights countries (Acharya et al., 2011).

González (2016) finds that corporate investment can be reduced by stronger creditor rights implemented during a crisis. Additionally, the level of corporate cash holdings is also negatively associated with creditor rights (Seifert & Gonenc, 2016). By contrast, Yung and Nafar (2014) provide evidence that corporate cash holding tends to increase in countries having stronger creditor rights, hence leading to a negative impact on firm value. Brockman and Unlu (2009) indicate that firms in countries with stronger creditor protection are more likely to pay dividends and if they pay dividends, the dividends payout is also higher.

Extant literature suggests that there are two conflicting views on whether strong creditor rights increase or decrease corporate debt financing (Cho et al., 2014). Standing on the "supply side", the hypothesis indicates that creditors might feel more confident in their lending decisions in countries with strong creditor rights (La Porta et al., 1997). Unlike stockholders, creditors often do not prefer

maximizing profit under the motto "high risk high return", especially in cases of excessive risk. Instead, banks' lending incentives are mostly based on the reliability of the business's repayment commitments, the quality of the collateral, or the recovery rate in the event of default. When creditor rights are stronger, creditors feel safer lending money to borrowers, therefore the creditors are more willing to provide credit. This can increase the leverage of the borrowers. Using international data, Houston et al. (2010) suggest that strong creditor rights bring more power to creditors in the expropriation of firms' assets, forcing the repayments or even taking control of the business in the event of bankruptcy. In addition, creditors can impose more restrictions on corporate reorganization as well as remove ineffective managers in the event of a financial crisis.

However, the "demand side" view suggests that when creditor rights get stronger, companies tend to reduce their leverage. In a strong creditor rights country, to avoid being deprived of control over assets and businesses, managers tend to reduce the use of debt (Rajan & Zingales, 1995; Cho et al., 2014). The excessive creditor rights and pressure of a liquidation-oriented bankruptcy regime can lead to the premature liquidation of firms' assets (Vig, 2013). Moreover, Acharya et al. (2011) also point out that the expropriation of lenders' assets could lead to the bankruptcy of the business. Consequently, to mitigate the probability of distress, companies' shareholders and managers may diversify investments to lower cash-flow risk as well as reduce corporate leverage. Creditor protection is considered an important factor in a country's governance, accordingly, companies operating in countries with strong governance will tend to reduce leverage and increase equity. Çam and Özer (2022) point out that in countries with effective management and supervision mechanisms, businesses tend to use mainly long-term loans to finance business activities. Effective governance also increases investors' confidence and encourages their equity funding, thus reducing the cost of equity and increasing opportunities for businesses to raise funds in the equity market.

The demand side and supply side effects of creditor rights and corruption on capital structure suggest that creditor rights can affect the relationship between corruption and capital structure. Regarding the demand side effects, firms are more likely to use more leverage in highly corrupt countries whereas they avoid using leverage in countries with strong creditor rights. Following the supply side effects, lenders tend to reduce the level of debt which supply to the market in high-corruption countries, while they are more willing to lend money to borrowers in strong creditor rights countries. As a result, both the demand side and supply side effects suggest that strong creditor rights can mitigate the effects of corruption on firm leverage. Thus, we develop the following hypothesis:

H1: Creditor rights weaken the relationship between corruption and firm leverage.

3. DATA AND METHODOLOGY

3.1. Research data

The data of this study includes public companies listed on the stock exchange of 24 emerging markets from 2012 to 2020. The data is sourced from the Bloomberg database. According to Morgan Stanley Capital International (MSCI), 24 emerging markets are classified into three main geographical regions, which are the Americas, Europe, Middle East, Africa (EMEA), and Asia Pacific. In our paper, we also collect the inflation rate of these countries from the World Bank. We exclude financial institutions from our sample because these institutions have distinctive characteristics of financial leverage and are imposed by various regulatory requirements. Our final sample consists of 17,114 firms and 120,368 firm-year observations.

3.2. Regression variables

3.2.1. Dependent variable

The dependent variable of our study is the capital structure (*LEVERAGE*) of a company. We follow previous studies and measure the capital structure by the ratio of total debt over the market value of total assets (Chen et al., 2014; Cho et al., 2014; Abdulla & Ebrahim, 2020; Singh & Kannadhasan, 2020). Using market-based leverage can reflect the capital structure of a company better because the book value measure of leverage may lead to the company's inaccurate financing decisions due to a backwards-looking view of this value (Welch, 2004).

3.2.2. Independent variables

In our paper, the independent variables include corruption and creditor rights.

1. Corruption (*CORRUPTION*) can act as grease to facilitate government services and allow entrepreneurs to break the barriers of inefficient legislation (Mo, 2001). Djankov et al (2003) and La Porta et al. (1999) state that corruption is one of the most salient factors to influence the legal system of a country, resource allocation and company behavior. We follow Singh and Kannadhasan (2020) and employ the corruption perception index (CPI) as the index of corruption. This index is constructed by Transparency International and measures the level of the perception of politicians and public officials about the country's corruption. This index has the advantage of providing both time-series and cross-sectional variations (Fan et al., 2012), which can help to investigate the impact of corruption on capital structure for panel data. As a result, this index is widely used in many previous literature (Pellegrini & Pellegrini, 2013; Singh & Kannadhasan, 2020). An increase in the corruption index suggests a decrease in the level of corruption.

2. Creditor rights (*CREDITOR_RIGHTS*). The concept of "creditor rights" refers to the ability to protect lenders from the abuse of companies. In this paper, we employ a creditor rights index developed by Djankov et al. (2007) as the proxy for creditor rights. The authors construct the creditor rights index for a larger number of countries by a two-stage process. In the first stage, they review and record all

reforms to bankruptcy legislation of the countries in their sample. In the second stage, they conducted a survey of 440 local lawyers from 133 countries to verify the results of the legal review and assess their effects on the creditor rights index. The outcome is an index that ranges from 0 to 4, with a higher value of the index indicating stronger creditor rights. This creditor rights index is employed in many empirical studies, such as Kyröläinen et al. (2013), Bae and Goyal (2009), Byrne and O'Connor (2012), and Houston et al. (2010).

3.2.3. Control variables

In this paper, we decided to include both firm-level and country-level variables. Firstly, we control the effects of firm size on leverage by including the natural logarithm of total assets in the regression model (*SIZE*). The trade-off theory predicts that large companies with low bankruptcy costs may be able to use more debt. The second control variable is firm profitability. We measure this variable by the ratio of earnings before interest and taxes (EBIT) over the market value of total return on assets (*ROA*). Based on the pecking order theory, profitable firms have more internal funds and thus may not need to issue debt to finance new projects. The next control variable is firm growth, measured by the market-to-book (*MB*) value of the company. Firms with high opportunity growth may suffer greatly from financial distress. As a result, they may want to avoid using debt. The last control variable is

countries' inflation (*INFLATION*). During inflationary periods, firms have a higher demand for corporate bonds because inflation can decrease the real cost of debt (Zwick, 1977; Corcoran, 1977). Singh and Kannadhasan (2020) and Cho et al. (2014) also use inflation as one of their control variables.

The definition of variables employed in our sample is summarized in Table 1. To mitigate the impact of outliers on the results, all variables are winsorized at the 1st and 99th percentile.

Table 1. Variable definition

Variable	Definition
Dependent variable	
LEVERAGE	The ratio of total debt over the market value of total assets.
Independent variables	
CORRUPTION	Corruption perception index (CPI).
CREDITOR_RIGHTS	Creditor rights index.
Control variables	
SIZE	The natural logarithm of the market value of total assets.
ROA	The ratio of EBIT over the market value of total assets.
MB	The ratio of the market value of equity over the book value of equity.
INFLATION	The inflation of countries.

3.3. Research methodology

To test our hypothesis, we regress the following regression model.

$$LEVERAGE_{it} = \beta_0 + \beta_1 CORRUPTION_{it} + \beta_2 CREDITOR\_RIGHTS_{it} + \beta_3 CORRUPTION_{it} * \\ CREDITOR\_RIGHTS_{it} + \beta_4 SIZE_{it} + \beta_5 ROA_{it} + \beta_6 MB_{it} + \beta_7 INFLATION_{it} + \varepsilon_{it}$$

(1)

where *i* and *t* indicate firm and year, respectively, β_0 to β_7 are the parameters estimated in the equation, and ε is the error term.

We include the industry dummy variables to capture the impact of industry on firms' capital structure. The standard errors are adjusted for heteroscedasticity and clustered at the firm level.

4. EMPIRICAL RESULTS AND DISCUSSION

4.1. Descriptive statistics

We provide the descriptive statistics of all variables in Table 2.

Table 2. Summary statistics

Variable	N	Mean	SD	Min	Max
LEVERAGE	120,368	0.260	0.257	0.000	0.949
CORRUPTION	120,368	45.680	10.307	28.000	67.000
CREDITOR_RIGHTS	120,368	2.096	0.607	0.000	3.000
SIZE	120,368	19.125	2.015	14.215	23.769
ROA	120,368	0.036	0.085	-0.334	0.290
MB	120,368	2.529	3.434	-1.115	23.923
INFLATION	120,368	3.057	3.754	-2.093	50.623

The mean of firm leverage is 0.26 with a range from 0.00 to 0.95, indicating that some firms in our sample do not use any debt whereas other firms employ a remarkably high level of debt. The corruption index has a mean value of 45.67 and varies from 28 to 67. This suggests the existence of within-country variation in corruption. The result also reports that the mean of creditor rights is about 2.10 with a minimum value of 0 and a maximum value of 3. The mean values of *SIZE, ROA,* and *MB* are 19.12, 0.04, and 2.530, respectively.

Table 3 reports the univariate analysis comparing the leverage of firms in low-corruption

countries with the leverage of firms in high-corruption countries. The result shows that firms in high-corruption countries have higher leverage than firms in high-corruption countries. Table 3 also presents the mean difference of other variables between high and low-corruption countries. We find that countries with high levels of corruption have weaker creditor rights and higher inflation than those with low levels of corruption. Firms in high-corruption countries are bigger and more profitable than those in low-corruption countries. The former also has more growth opportunities than the latter.

Table 3. Univariate results

Variable	High corruption		Low corruption		Mean difference (2) - (4)
	N	Mean	N	Mean	
	(1)	(2)	(3)	(4)	
LEVERAGE	66,782	0.271	53,586	0.246	0.025***
CORRUPTION	66,782	37.809	53,586	55.489	-17.679***
CREDITOR_RIGHTS	66,782	1.858	53,586	2.393	-0.535***
SIZE	66,782	19.262	53,586	18.954	0.308***
ROA	66,782	0.038	53,586	0.033	0.005***
MB	66,782	2.879	53,586	2.093	0.786***
INFLATION	66,782	4.335	53,586	1.465	2.870***

Note: ***, **, and * indicate the significant level of 1%, 5%, and 10%, respectively.

Table 4 reports the correlation matrix between variables employed in our study. The result shows that the correlation coefficient between firm leverage and the corruption index is negative, implying a positive association between firm leverage and the level of corruption. The results in this table indicate that all the correlation coefficients between the right-hand side variables are lower than 0.7. This suggests that our regression model does not have the problem of collinearity.

Table 4. Correlation matrix

Variable	LEVERAGE	CORRUPTION	CREDITOR_RIGHTS	SIZE	ROA	MB	INFLATION
LEVERAGE	1.000						
CORRUPTION	-0.074	1.000					
CREDITOR_RIGHTS	-0.061	0.353	1.000				
SIZE	-0.017	-0.107	-0.011	1.000			
ROA	-0.044	-0.065	-0.034	0.117	1.000		
MB	-0.328	-0.099	-0.041	0.222	-0.089	1.000	
INFLATION	0.135	-0.463	-0.222	-0.126	0.116	-0.029	1.000

4.2. Regression results

Table 5 shows the POLS regression results of the impact of corruption and creditor rights on capital structure. The dependent variable is the ratio of total debt over the market value of total assets. In the first column, both the left and right-hand side variables are in the same year. The result shows significantly negative coefficients on the corruption and creditor rights variables. This suggests that when the corruption and creditor rights indexes increase, the firm leverage can be reduced. In other words, when the level of corruption in a country increases, firms in this country may use more leverage. And when the creditor rights in a country increase, firms in this country might use less leverage. The coefficient of interest in this column is the coefficient on the interaction term between the corruption and creditor rights indexes. This coefficient is positive and significant at the 1% level in the first column. This result indicates that an increase in creditor rights can weaken the impact of corruption on firm leverage. In economic terms, a one-unit increase in the creditor rights index can reduce the positive impact of corruption on firm leverage by around 50%. In the second column of Table 5, we use a one-year lag for the right-hand side variables to mitigate the problem of endogeneity. The results are qualitatively similar to the results of the first column. Overall, the results support our hypothesis that strong creditor rights can dampen the impact of corruption on firm leverage.

Table 5. Baseline regression

Variables	Dependent variable: LEVERAGE	
	(1)	(2)
CORRUPTION	-0.003***	-0.003***
	(0.001)	(0.001)
CREDITOR_RIGHTS	-0.088***	-0.081***
	(0.014)	(0.015)
CORRUPTION * CREDITOR_RIGHTS	0.002***	0.001***
	(0.000)	(0.000)
SIZE	0.008***	0.010***
	(0.001)	(0.001)
ROA	-0.359***	-0.332***
	(0.018)	(0.019)
MB	-0.023***	-0.022***
	(0.001)	(0.001)
INFLATION	0.007***	0.006***
	(0.001)	(0.001)
Constant	0.418***	0.356***
	(0.037)	(0.038)
Observations	120,368	104,459
Industry dummy variables	Yes	Yes
R-squared	0.189	0.174

Note: The standard errors are presented in parentheses. ***, **, and * indicate the significant level of 1%, 5% and 10%, respectively.

Regarding the control variables, we find some noticeable results. First, the coefficient on firm size is positive and significant at the 1% level, suggesting that larger firms have higher leverage. This can be because larger firms may have less default risk and as a result can borrow more debt. Other studies also find a positive relationship between firm size and leverage, such as Singh (2017). Second, the coefficient on firm profitability is significantly negative, implying a negative association between firm profitability and firm leverage. This is consistent with the prediction of the pecking order theory and similar to the previous studies (Soekarno et al., 2016; Singh, 2017). Next, the result shows a significant and negative coefficient on firm growth. This indicates that firms with higher growth opportunities use less debt. Perhaps these firms want to avoid financial distress, so they can invest in investment opportunities. Soekarno et al. (2016) also find a negative relationship between a firm's growth opportunity and leverage. Finally, we find a positive relationship between inflation and firm leverage.

4.3. Robustness test

In this section, we employ alternative regression models to regress Eq. (1). The result is reported in Table 6. In the first column, the results are estimated from a fixed effects model. Using a fixed effects model can reduce the concern of endogeneity problems caused by omitted time-invariant variables. The results show that the coefficient on the corruption index is negative and significant at the 1% level. However, the coefficient on the interaction term between the corruption and creditor rights indexes is significantly positive, suggesting that strong creditor rights can alleviate the positive effects of corruption on firm leverage. In the second column, we employ a random effects model to estimate Eq. (1). Using a random effects model can increase the efficiency of the estimation. The results of the second column are qualitatively similar to the results of the first column.

Table 6. Fixed and random effects regression results

Variables	Dependent variable: LEVERAGE	
	Fixed effects	*Random effects*
	(1)	*(2)*
CORRUPTION	-0.003***	-0.003***
	(0.001)	(0.001)
CREDITOR_RIGHTS		-0.073***
		(0.012)
*CORRUPTION * CREDITOR_RIGHTS*	0.001*	0.001***
	(0.000)	(0.000)
SIZE	-0.008***	-0.003**
	(0.002)	(0.001)
ROA	-0.266***	-0.272***
	(0.011)	(0.011)
MB	-0.010***	-0.012***
	(0.000)	(0.000)
INFLATION	0.005***	0.006***
	(0.000)	(0.000)
Constant	0.520***	0.623***
	(0.041)	(0.038)
Observations	120,368	120,368
Industry fixed effects	No	Yes
R-squared	0.096	0.167

Note: The standard errors are presented in parentheses. ***, **, and * indicate the significant level of 1%, 5% and 10%.

5. CONCLUSION

In recent years, economists have paid much attention to how corruption affects capital structure. In corrupt countries, the government can abuse their political power and target taxation policies to expropriate firms' assets or control business activities (McChesney, 1987; Singh & Kannadhasan, 2020). Dealing with these problems, our study has shown that businesses are more likely to use more debt as an effective tool to avoid government expropriation. Using data from emerging markets, we find consistent evidence with extant literature (Fan et al., 2012; Chen et al., 2013; Singh & Kannadhasan, 2020) that corruption is positively related to firm leverage.

Moreover, previous studies indicated that high rates of CPI aggravate the default risk, information asymmetry and lack of transparency (Shleifer & Vishny, 1993; Chen et al., 2010). Hence, banks and other lenders are often quite hesitant about lending decisions to businesses. To guarantee the creditors' interests, previous studies have also shown that creditor rights can be considered as one of the effective methods. Accordingly, we also investigate the connection between creditor rights and firm leverage through the literature in two conflicting views of the demand side and the supply side. Our findings present that firms tend to issue fewer debt securities in the event of strong creditor rights. However, research on the combination of corruption, creditor rights and firm leverage is still very limited. Thus, our study specifies the results of this association in emerging market economies. Our result shows that the impact of corruption on capital structure is weakened in strong creditor rights countries.

We believe the results of this study can provide implications for policymakers and future research. The results show that strong creditor rights can weaken the impact of corruption on capital structure. This implies that strong creditor rights might be a good solution to reduce the country's level of corruption. Policymakers should be aware of this if they want to have a sound policy to deal with a high level of corruption. For future research, we suppose that creditor rights are not the only

institutional factor affecting the impact of corruption on capital structure. As a result, future research can investigate the impact of other institutional factors on the relationship between corruption and firm leverage.

Our paper is not without limitations. In this paper, we do not examine the potential effects of firm-level elements (i.e., firm size) on the relationship between corruption and capital structure. Bigger firms may have better corporate governance and, therefore, can affect the impact of corruption on the capital structure. However, we believe that this limitation does not change our empirical results because the correlation between countries' creditor rights and firm size is small in our sample.

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