





ISSN: 2617-6548

URL: [www.ijirss.com](http://www.ijirss.com)



## External governance mechanisms and capital structure: A cross-country analysis

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### Abstract

This paper seeks to examine how external governance mechanisms related to shareholder protection and creditor rights affect the choice of corporate leverage. The main objective of the study is to examine the relationship between country-level investor protection and the choice of capital structure at the firm level. The sample includes 7490 companies from 40 countries. Data were collected from all publicly listed companies between the years 2013 and 2022, listed in the Van Dijk ORBIS Bureau, based on the fiscal year 2022. This paper opts for the panel data methodology. The results suggest that companies leverage themselves consistently with the Pecking Order Theory. It was observed that the mechanisms associated with the protection of both classes of investors (i.e., shareholders and creditors) significantly influence the capital structure of the companies. The results were robust to several variations in the model studied and indicate that greater investor protection makes firms less likely to use third-party capital. The opposition of insiders (executives and majority shareholders) to debt's moderating role at their managerial discretion may be the driving force behind this. The differential of the study lies in the distinction between the mechanisms that affect the protection of minority shareholders and those that affect the rights of creditors.

**Keywords:** Capital structure, Creditor rights, External governance mechanisms, Investor protection, Leverage, Shareholders.

**DOI:** 10.53894/ijirss.v6i4.2216

**Funding:** This research is supported by Arab Open University, Saudi Arabia (Grant number: AOURG-2023-018).

**History: Received:** 19 June 2023/**Revised:** 17 August 2023/**Accepted:** 27 September 2023/**Published:** 12 October 2023

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**Authors' Contributions:** All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

**Competing Interests:** The authors declare that they have no competing interests.

**Transparency:** The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

**Institutional Review Board Statement:** The Ethical Committee of the Arab Open University, Saudi Arabia has granted approval for this study (Ref. No. 524008).

**Publisher:** Innovative Research Publishing

### 1. Introduction

The fruitful finance literature [1] proposes that the development and structure of capital markets, as well as the decisions of investors and firms, depend to some extent on the institutions that guarantee their rights and make it possible to enforce contracts. However, most of this literature treats investor protection as homogeneous within each country. In this

paper, we propose to expand and refine this literature by separating institutions that protect creditor rights from institutions that protect minority shareholders over the capital structure of firms. In this way, the paper contributes to the literature studying the relationship between national institutions and corporate leverage.

The irrelevance of the capital structure theory of Miller [2] suggests that, in a perfect market, the value of the firm is independent of its leverage and there is no optimal level of debt. However, several studies indicate that capital structure alters firm value through the potential presence of agency conflicts, information asymmetry, transaction costs, and bankruptcy costs [3-6].

Titman and Wessels [7], for instance, indicate that agency issues have an impact on capital structure because they can lead to conflicts of interest between executives, shareholders, and creditors. Even within the group of shareholders, potential conflicts of interest exist between minority shareholders and majority shareholders [8]. Moreover, several studies (e.g., [9-11]) indicate that corporate governance and investor protection mechanisms, both at the firm and country level, are crucial to containing the potential expropriation of wealth from outsiders (i.e., minority shareholders and creditors) by insiders (i.e., majority shareholders and executives).

The nature of the legal duties that CEOs have to investors, as well as the differences in how the legal system interprets and enforces these commitments, account for a large portion of the differences between countries' governance systems [10]. According to La Porta, et al. [1], the legal system, which is made up of the laws' content and how well they are enforced, determines how contracts might be used to reduce these incentive difficulties. According to D'Amato [12], the resolution mechanisms employed by countries to address potential conflicts of interest between individuals within and outside and organizations have a substantial impact on the financial strategies adopted by firms, including their use of leverage. Even more, institutional variations are argued to be just as significant in determining the degree of debt as business factors by Ariss [13] and Ali and Anwar [14].

Building on this literature, this paper investigates how the level of investor protection affects leverage decisions. Particularly important, a distinction is made between governance mechanisms external to the firm (for convenience, we call them External Governance Mechanisms, or simply EGMs) that guarantee shareholder protection and those that guarantee creditor rights. Thus, this paper seeks to answer the following research question: how do the EGMs related to shareholder protection and creditor rights affect the choice of corporate leverage?

The main objective of this paper is to examine the relationship between country-level investor protection and the choice of capital structure at the firm level. It focuses on decisions about leverage because they are important to the company's financial strategy and show how shareholders feel about the financial risk that is taken [15]. These decisions also affect the company's growth by protecting creditor's rights [16]. That said, the present paper conducts a multi-country analysis and studies the leverage decisions of 7490 firms distributed in 40 countries between the years 2013 and 2022.

This paper has similarities with Cho, et al. [15]; Breuer, et al. [17] and Hang, et al. [18], but with an important contribution. In contrast to previous work, which considered investor protection to be one-dimensional, this paper distinguishes between EGMs that act on creditor rights and those that act on shareholder protection. Consistent with previous studies on financial leverage (e.g., [12, 13, 15, 17, 19]), this research examines the joint effect between (a) firm-level characteristics and (b) country-level EGMs on the firm's capital structure decision. In this work, EGMs that ensure the protection of minority shareholders are distinguished from those that protect the rights of creditors. This distinction is important to more appropriately capture cross-country differences in leverage decisions within a context of potential asymmetric information among shareholders, creditors, and executives. We assert that corporate leverage is influenced by the EGMs that facilitate external monitoring and enforcement of financial contracts, i.e., corporate leverage depends on the combination of the level of shareholder protection and creditor rights in each country.

## **2. Theoretical Framework**

The corporate capital structure refers to the way a company finances itself through its own capital (shareholders) and third-party capital (creditors). Among the main theories that deal with these decisions are Agency, Market Timing, Static Trade-off, and Pecking Order theories. In each of these theories, the choice between equity capital and third-party capital depends on both firm-specific and institutional factors [13]. The firm-level and institutional-level factors that influence firms in their capital structure decisions have been a matter of debate for decades among academics (e.g., [12, 13, 15, 19-21]).

Among the institutional factors, investor protection is perhaps the main determinant of the ownership structure of companies [15, 17]. For Rombouts [10], the difference in capital structure between countries is a function of how well protected by legislation investors (both minority shareholders and creditors) are from expropriation by insiders. For the authors, the legal approach is better for understanding corporate governance than the traditional distinction between bank-based and market-based markets. According to Rombouts [10], in addition to the relationship with ownership structure, investor protection stimulates the development of financial markets. That is, as investors are better protected from expropriation by insiders, they are willing to pay a premium for the firm's securities, reducing its cost of capital. This makes it attractive for the firm to issue financial securities to the market.

In countries with low shareholder protection, however, the attractiveness of raising funds by issuing securities to foreign investors decreases, which increases the likelihood that the ownership structure of firms is concentrated. As a result, there is an agency conflict between minority shareholders and controlling partners in companies with a lot of shareholders [8]. This conflict could be lessened by making shareholders' rights more protected by the law [1]. Additionally, in countries

with less investor protection, financial markets tend to be smaller and less developed [16]. Therefore, any comparative governance analysis should account for the effect of governance at the country level.

Much of the difference between countries' systems of legal protection is due to differences in (a) the nature of the legal obligations that executives have to outside investors and (b) how the courts interpret and enforce these obligations Gyimah, et al. [22]. Rombouts [10] finds that both the legal extent and protection of shareholders' voting rights vary widely across countries.

In addition, the literature suggests that country-level governance mechanisms improve information transparency and mitigate agency conflicts [23]. To secure financing from minority shareholders and creditors, the firm needs to commit, through legal contracts, to mitigate the opportunistic behaviors of its executives and majority shareholders. The effectiveness of these contracts depends both on the firm's characteristics and on governance mechanisms external to the firm that facilitate external monitoring and compliance with the law. According to this literature, one can say that EGMS are all those things that are not inherent to the firm but are inherent to the protection of investors by means external to the firm. In other words, they are formal institutions at the country level, such as laws and regulations, jurisprudence, economic and political rules, codes of conduct, and values, among others.

For example, higher levels of creditor protection provide them with greater power in situations of liquidation or bankruptcy [24]. With this, they have greater power to force payment of the debt, receive the assets that have been used as collateral, and take control of the firm in the event of bankruptcy. All this lowers the credit risk, so the creditor will demand less interest on the debt. However, there is no guarantee that lowering the credit risk will protect minority shareholders. According to Ashraf and Zheng [25], for example, some countries have agency conflicts related to ownership concentration due to weak minority shareholder protection and, at the same time, have low agency costs associated with strong protection of creditor rights.

A study by De Miguel and Pindado [26], using a sample of firms from nine Eastern European countries to look into leverage variation, finds that known macroeconomic and institutional factors explain about half of the variation in leverage. Non-measurable institutional differences, such as laws and compliance, explain the other half. The particular determinants of leverage at the company level differ among nations, according to Breuer, et al. [17]. Additionally, the role of firm-specific factors in the selection of the capital structure is influenced by country-specific factors. Rombouts [10], in turn, documents that firms in countries with high shareholder protection have low shareholder concentration and better access to external finance than compared to countries with low shareholder protection. One can also cite the results of Belkhir, et al. [27], who studied 43 developed and emerging countries and found that institutional differences among these countries explain the variation in the use of long-term debt, and of Ali and Anwar [14], who found that the financing policy of firms is influenced by both their institutional environment and their international operations.

Although variation in the determinants of leverage has already been widely studied across countries (e.g., [13, 28-30]), this literature does not distinguish between governance factors at the country level by separating minority shareholder protection from creditor rights. Among these studies, there seems to be no consensus on systematic differences in how debt decisions are affected by country-specific factors. For example, D'Amato [12] finds a significant impact of the origin of the country's legal system, bankruptcy codes, and tax system on capital structure. Ariss [13] studies 10 developing countries to see if the variables affecting capital structure are the same as in developed countries. They find that there are specific differences between countries that affect leverage, such as differences in taxes, investor protection, and institutional environments. Breuer, et al. [17], on the other hand, analyze the role of the firm's characteristics and institutional differences in the capital structure of 45 countries, focusing on the differences between the protection of investors in the countries and using as a proxy for the protection of investors the anti-director indices and creditor rights scores developed in La Porta, et al. [1]. Nevertheless, they do not analyze situations in which countries exhibit an imbalance between the levels of shareholder protection and creditor protection.

To the best of our knowledge, Cho, et al. [15] and Breuer, et al. [17] are the only ones to study corporate leverage associated with institutional investor protection factors. These authors incorporate country-specific variables, including the creditor and shareholder protection indices defined by La Porta, et al. [1], but do not control for overlap between the protection levels of the two types of investors.

### 3. Hypotheses

The conventional understanding of the literature suggests that greater investor protection is a conduit for capital market development and economic growth and development [1, 10]. Therefore, as EGMS improve, more capital will be available for firms to use in terms of debt and equity. However, this literature does not distinguish effects on creditors from effects on minority shareholders, even though national institutions do not protect them in a balanced or homogeneous way; some countries privilege one group more than another. Thus, the literature is not able to offer unequivocal predictions about the relationship between debt and equity in companies. The separation of these two groups of outsider investors, on the other hand, allows predictions to be made about the capital structure of firms.

The existing literature suggests that the asymmetry of information between outsiders and insiders generates uncertainty about the return for external investors, and this directly influences the choices of companies between equity capital and third-party capital [4]. National investor protection institutions, which allow for greater monitoring and enforcement of financial contracts, can mitigate the information asymmetry among agents in the economy. Consequently, institutional quality decreases frictions in markets so that outsider investors (minority shareholders and creditors) are more likely to provide capital to the firm since there is greater protection of their rights [16, 31]. In countries with high creditor protection,

Samargandi and Kutan [16] document that the credit market grows, which increases the supply of third-party capital in the economy and increases the financial development of countries. Breuer, et al. [17] suggest that firms in countries with high shareholder protection should take on less debt relative to firms in countries with lower protection.

Therefore, an improvement in the EGMs would make credit and equity capital more abundant and consequently cheaper, reducing the cost of capital for firms. From the perspective of the Pecking Order Theory [4], firms would choose the source of capital that offers the lowest agency costs. According to the theory, there is a hierarchy in the use of capital sources: the company would give preference to internal financing, and if it needs external financing, the sequence would be the issuance of debt and, finally, the issuance of stock. Therefore, the capital structure would depend on which group of outsider investors would be relatively better protected (creditors or minority shareholders), since the agency costs would derive from the quality of the EGM. This argument leads to the following hypotheses:

**H1a:** Higher creditor protection is positively related to leverage.

**H1b:** Higher shareholder protection is negatively related to leverage.

On the other hand, Acharya, et al. [32] show that, as a way to protect themselves from external takeover, internal agents (executives and/or majority shareholders) become more risk-averse when the legal protection of creditors increases. In such situations, they would seek to avoid the burden of external monitoring by relying more heavily on the company's internally generated resources. This leads to the intuition that increased protection for external investors would lead the firm to draw less on external resources. If the inhibiting effect of monitoring imposes too high a cost on internal agents, they may choose to use less third-party capital as creditor protection increases. Similar reasoning in the case of minority shareholder protection would lead to greater use of debt. The leverage of the firm, again, would depend on the relative cost between the two sources of funds, along the lines of the Pecking Order Theory. This leads to the following hypotheses:

**H2a:** Higher creditor protection is negatively related to leverage.

**H2b:** Higher shareholder protection is positively related to leverage.

Note that the sets of hypotheses H1 and H2 are competing. Which of these hypotheses will prevail is the empirical question that this paper seeks to answer.

## 4. Method

### 4.1. Sample Description

The initial sample selection was composed of the 49 countries that are included in La Porta, et al. [1]. This choice was made because the work of these authors includes country-level information on creditor and shareholder protection. Next, data were collected from all publicly listed companies between the years 2013 and 2022, listed in the Van Dijk ORBIS Bureau, based on the fiscal year 2022. The data used are from the company's financial statements, with annual observations. The information on the macroeconomic level was taken from the World Bank website (inflation rate and GDP per capita) and the Trading Economics website (Corporate Income Tax Rate, <https://tradingeconomics.com>).

Following Hovakimian and Titman [33], companies were excluded from the sample: (a) financial; (b) with negative net worth; (c) with share capital lower than US\$ 5 million; (d) with growth in total assets and gross sales revenue greater than 100% or less than -100% from one year to the next; (e) with Tobin's Q negative or greater than 10; and (f) that did not have a minimum of three consecutive years of information. The results reported in this study are those obtained after these exclusions, but the findings are robust when these firms are not excluded (results omitted but available upon request to the authors).

Based on these criteria, all companies from Chile, Uruguay, and Venezuela were excluded. Due to a lack of information on creditor protection, firms from six more countries were eliminated from the sample: India, Kenya, Nigeria, Pakistan, Taiwan, and Zimbabwe. The final sample consists of the remaining 40 countries and comprises a total of 7490 firms and 59,588 observations. The way we dealt with outliers was to weight 1% of each extreme of the dependent variable and independent variables ROA, Growth Opportunities, and Tangibility (see description of the variables below).

### 4.2. Definition of Variables

The dependent variable is the degree of financial leverage measured as follows:

$$Leverage_{it} = \frac{Total\ Debt_{it}}{Total\ Assets_{it}} = \frac{Short\ Term\ Debt_{it} + Long\ Term\ Debt_{it}}{Total\ Assets_{it}} \quad (1)$$

Based on the capital structure literature (e.g., [12, 13, 15, 17, 19]), we select six firm characteristics that are correlated with leverage: growth opportunities, firm size, profitability, business uncertainty, asset tangibility, and industry sector. Furthermore, we add industry dummies using the [34] 30-industry classification. In addition, we include country-level variables following Belkhir, et al. [27]; Breuer, et al. [17] and D'Amato [12], namely: gross domestic product (GDP) growth, annual inflation rate, corporate income tax rate, the tax treatment of losses (loss carry back), as well as the creditor and shareholder protection indicators that are defined below.

Table 1 summarizes the variables used, and Table 2 contains the correlation coefficients between all variables. One can notice the high standard deviation of some variables, suggesting high heterogeneity in the sample. It is also observed that the average leverage is close to 41.3%. Moreover, the correlation between variables is generally low, so multicollinearity problems should not be present in the estimations. In terms of representativeness, about 17.50% of the firms are from Japan, and 13.76% are from South Korea. Turkey was the least represented country, with only 0.05% of the total (values omitted, but available upon request).

**Table 1.**  
Descriptive statistics of the variables and proxy used.

| Variable                  | Proxy   | Minimum | Average | Median | Maximum | D.P.  | Obs.  |
|---------------------------|---|---------|---------|--------|---------|-------|-------|
| Leverage                  | $\frac{Total\ Debt_t}{Total\ Assets_t}$                             | 0.040   | 0.413   | 0.418  | 0.829   | 0.185 | 59588 |
| Growth opportunity        | $\frac{Mkt\ Cap_t}{Shareholders\ Equity_t}$                         | 0.205   | 1.623   | 1.214  | 6.920   | 1.298 | 59588 |
| Size                      | $Log(sales_t)$  | 8.403   | 19.603  | 19.422 | 27.038  | 1.943 | 59588 |
| Profitability             | $ROA = \frac{Net\ Income_t}{Total\ Assets_t}$                       | -0.299  | 0.057   | 0.055  | 0.322   | 0.088 | 59588 |
| Business uncertainty      | $\sqrt{\frac{\sum_{t=1}^N (ROA_{it} - \overline{ROA}_t)^2}{N - 1}}$ | 0.000   | 0.053   | 0.043  | 0.273   | 0.037 | 59588 |
| Tangibility               | $\frac{Permanent\ Assets_t}{Total\ Assets_t}$                       | 0.005   | 0.303   | 0.271  | 0.892   | 0.218 | 59588 |
| Loss carryback            | Dummy equals 1 if the country allows Loss Carryback                 | 0.000   | 0.236   | 0.000  | 1.000   | 0.424 | 59588 |
| Corporate income tax rate | Corporate income tax rate   | 0.125   | 0.301   | 0.296  | 0.407   | 0.070 | 59588 |
| GDP growth                | Annual GDP growth of the country                                    | -9.132  | 2.281   | 2.292  | 15.240  | 2.953 | 59588 |
| Inflation                 | Country's annual inflation  | -0.060  | 0.020   | 0.016  | 0.293   | 0.033 | 59588 |

**Table 2.**  
Correlation table.

|                                      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | 11    | 12 |
|--------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|----|
| Leverage                             | 1      |        |        |        |        |        |        |        |        |        |       |    |
| Growth opportunities                 | 0.074  | 1      |        |        |        |        |        |        |        |        |       |    |
| Size                                 | 0.316  | 0.098  | 1      |        |        |        |        |        |        |        |       |    |
| Profitability                        | -0.222 | 0.326  | 0.128  | 1      |        |        |        |        |        |        |       |    |
| Business uncertainty                 | -0.146 | 0.093  | -0.269 | -0.146 | 1      |        |        |        |        |        |       |    |
| Tangibility                          | -0.014 | -0.102 | 0.027  | -0.066 | -0.054 | 1      |        |        |        |        |       |    |
| Loss carryback                       | -0.062 | 0.164  | 0.103  | -0.003 | 0.150  | -0.005 | 1      |        |        |        |       |    |
| Corporate income Tax                 | 0.017  | -0.007 | 0.191  | -0.005 | -0.108 | -0.039 | 0.121  | 1      |        |        |       |    |
| GDP growth                           | -0.070 | 0.057  | -0.155 | 0.112  | 0.051  | 0.064  | -0.160 | -0.316 | 1      |        |       |    |
| Inflation                            | -0.022 | 0.074  | -0.135 | 0.106  | 0.071  | 0.115  | -0.015 | -0.206 | 0.333  | 1      |       |    |
| Protection for minority shareholders | -0.130 | -0.034 | -0.071 | -0.005 | 0.104  | 0.040  | 0.147  | -0.060 | 0.186  | -0.121 | 1     |    |
| Creditors' rights                    | -0.033 | -0.142 | 0.006  | -0.073 | -0.062 | -0.013 | -0.130 | -0.053 | -0.012 | -0.395 | 0.311 | 1  |

### 4.3. Calculation of Investor Protection Indicators

To consider the differences between investor protection, following Ashraf and Zheng [25], two indicators were created: one for the protection of creditor rights and the other for the protection of minority shareholders. To compose these indicators, indices available in the literature are used<sup>1</sup>.

The calculated indicators are the sum of five different seminal indexes. Some of these seminal indices were adjusted to vary between 0 and 1 so that the two calculated indicators would be between 0 and 5. The description of each index used, as well as the authors who developed them, is in Table 3. The pair wise correlation between the two indicators is approximately 0.3197, suggesting that the investor protection indicators measure distinct factors in country-level governance.

<sup>1</sup>The indicators proposed by La Porta, et al.[1] have been criticized in the literature due to the methodology employed in their construction (e.g., [35];[36]; [37]). However, for the benefit of comparability of the results of this research with contemporary international literature, we choose to use the original indicators rather than alternative ones as they are still the most widely used in the empirical literature today, despite question marks.

**Table 3.**

Indexes used to compose the indicators.

|                        | <b>Indices</b>                | <b>Description</b>  | <b>Indicator source</b>                   |
|------------------------|-------------------------------|---|---|
| Creditors' rights      | Legal reserve                 | The higher the legal reserve, the more protected the creditors are. This index varies between 0 and 1.  | <a href="#">Samargandi and Kutan [16]</a> |
|                        | Contract fulfillment          | Number of days required to solve an insolvency problem in court. We used $1/\ln(\#days)$ and changed the index so that it varies between 0 and 1.   | <a href="#">Breuer, et al. [17]</a>       |
|                        | Creditors' rights             | Index that aggregates different creditor rights. The original index ranges from 0 to 5, but has been modified so that it ranges from 0 to 1.  | <a href="#">Samargandi and Kutan [16]</a> |
|                        | Sharing of information        | Equals 1 if a public registry or private bureau operates in the country and 0 otherwise.  | <a href="#">La Porta, et al. [1]</a>      |
|                        | Debt fulfillment              | Estimated value of debt recovery through legal mechanisms. Varies between 0 and 1.  | <a href="#">Liang and Li [24]</a>         |
| Shareholder protection | Mandatory dividends           | Percentage of Net Profit that the company must distribute via dividends. Varies between 0 and 1.  | <a href="#">Nguyen and Tran [31]</a>      |
|                        | Disclosure requirements       | Level of mandatory disclosure about the company's activities. Varies between 0 and 1.   | <a href="#">Nguyen and Tran [31]</a>      |
|                        | Responsibility standard       | Measures the quality of regulation of the process of issuing new shares. Varies between 0 and 1.  | <a href="#">D'Amato [12]</a>              |
|                        | Anti-self-dealing             | Support minority shareholder protection against self-dealing by the controlling shareholder. Varies between 0 and 1.  | <a href="#">Nguyen and Tran [31]</a>      |
|                        | Index of anti-director rights | Aggregate index on shareholder rights, based on the original anti-directors rights index constructed by <a href="#">La Porta, et al. [1]</a> . The original index ranges from 0 to 5 but has been modified so that it ranges from 0 to 1. | <a href="#">La Porta, et al. [1]</a>      |

[Figure 1](#) shows the distribution of countries according to the degree of protection for shareholders and creditors. The abscissa axis plots the minority shareholder protection indicator, and the ordinate axis plots the protection of creditor rights indicator. To classify the countries according to the level of protection given to each group of investors, the median of each indicator is used, and dummies are assigned to each quadrant, respectively. The quadrant denoted by HH (connoting *High-High*) includes countries that have high protection for both groups of investors (dummy  $D_{HH}$ ); the quadrant LL (connoting *Low-Low*) includes countries that have low protection for both groups of investors (dummy  $D_{LL}$ ); LH includes countries that have both low protection for shareholders and high protection for creditors (dummy  $D_{LH}$ ); and finally, the quadrant HL contains countries that have both high shareholder protection and low creditor protection (dummy  $D_{HL}$ ).

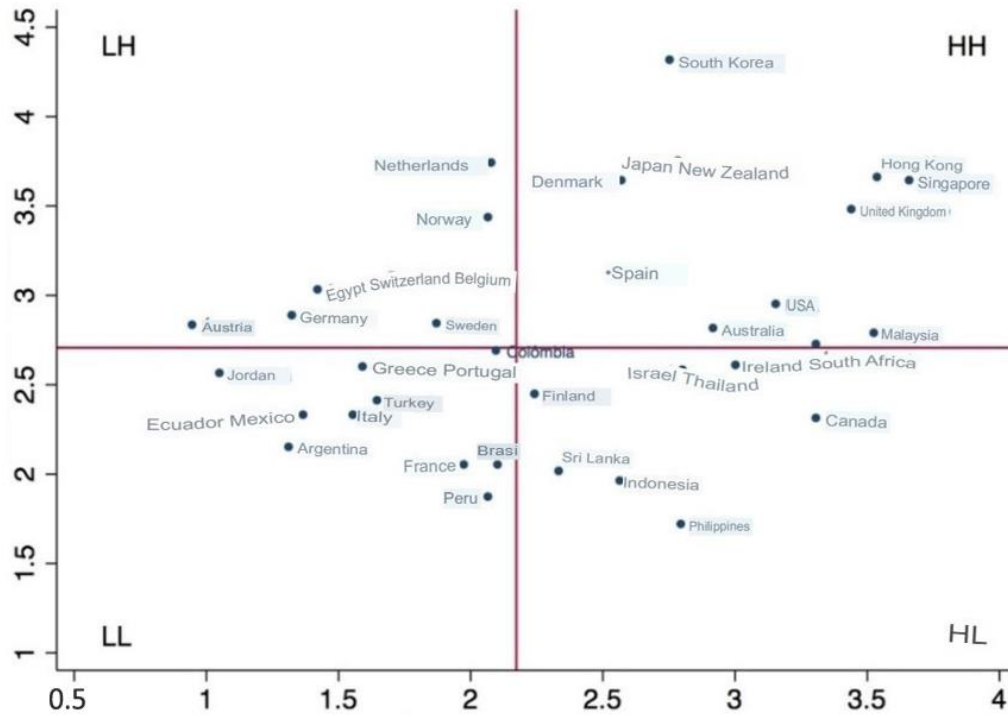


Figure 1. Dispersion of countries in relation to investor protection.

### 5. Model

In the literature, there is no unanimous model to analyze the capital structure and its determinants. This paper opts for the panel data methodology. The model is based on Breuer, et al. [17], but with adaptations related to investor protection in addition to macroeconomic variables and firm characteristics. The estimated model is represented by the equation below:

$$Leverage_{it} = \beta_0 + \alpha X + \gamma W + \beta_1 D_{HH} + \beta_2 D_{HL} + \beta_3 D_{LH} + \beta_4 Tangibility_{it} \times D_{HH} + \beta_5 Tangibility_{it} \times D_{HL} + \beta_6 Tangibility_{it} \times D_{LH} + \varepsilon_{it} \quad (2)$$

Where:

$$\alpha X = \alpha_1 Growth\ Opportunity_{it} + \alpha_2 Size_{it} + \alpha_3 Profitability_{it} + \alpha_4 Business\ Uncertainty_{it} + \alpha_5 Tangibility_{it} \quad (3)$$

and:

$$\gamma W = \gamma_1 Economic\ Development_{ct} + \gamma_2 Inflation_{ct} + \gamma_3 Corporate\ Income\ Tax\ Rate_{ct} + \gamma_4 Dummy\ Loss\ Carryback_c \quad (4)$$

Subscripts i, c, and t represent firm i in country c in period t. The interactions of the tangibility variable with the dummies of the quadrants according to the level of investor protection were necessary because, in countries with high protection of creditor rights, the enforcement of laws is higher [24], and it is possible that the level of indebtedness depends more on tangible assets. Similarly, in countries with low creditor protection, a high value of tangible assets may not have much influence on the leverage level. The regression model was estimated with unbalanced panel data, with year and industry fixed effects (FE), and with errors clustered at the country level.

Endogeneity is usually a central problem in any empirical investigation of corporate finance. It is understood that there may be endogeneity among the variables at the firm level, despite the mitigation usually offered by the panel data structure. Therefore, these variables are considered only as moderators or controls for the proposed model. It is not the intention of this paper to assert a causal relationship between these variables. However, the relationship of main interest in this research is between country-level investor protection indicators and firm-level leverage. Of course, this relationship is not subject to endogeneity, since the leverage of a firm would not affect the degree of investor protection in its country. The results will be discussed from this perspective.

### 6. Results

Table 4 presents the results of the estimation of Equation 2. The first column of this table corresponds to a model estimated by Ordinary Least Squares (OLS) with errors clustered by country, including the interaction between Tangibility and the quadrant dummies and, in the following three columns, adding year, industry, and both fixed effects (omitted for the sake of brevity but present in the estimation where indicated).

The results show a negative relationship between leverage and profitability, which suggests that indebtedness occurs after own resources are exhausted, and a positive relationship between indebtedness and investment opportunities, which indicates that firms that invest more have a higher indebtedness. Such results favor the predictions of the Pecking Order Theory [4].

**Table 4.**

Determinants of corporate leverage.

| Variables                     | (1) | (2) OLS              | (3) Fixed effects year | (4) Fixed effects industry | (5) Fixed effects year & industry |
|-------------------------------|-----|----------------------|------------------------|----------------------------|-----------------------------------|
| Growth opportunity            | +   | 0.02***<br>[8.12]    | 0.02***<br>[8.36]      | 0.02***<br>[8.17]          | 0.02***<br>[8.37]                 |
| Size                          | +   | 0.03***<br>[12.68]   | 0.03***<br>[12.69]     | 0.03***<br>[14.62]         | 0.03***<br>[14.58]                |
| Profitability                 |     | -0.72***<br>[-10.66] | -0.72***<br>[-10.75]   | -0.71***<br>[-10.78]       | -0.71***<br>[-10.86]              |
| Business uncertainty          |     | -0.55***<br>[-4.81]  | -0.55***<br>[-4.87]    | -0.36***<br>[-4.51]        | -0.36***<br>[-4.56]               |
| Tangibility                   | +   | -0.18***<br>[-9.24]  | -0.18***<br>[-9.49]    | -0.16***<br>[-7.81]        | -0.16***<br>[-7.88]               |
| Loss carryback                |     | -0.04**<br>[-2.81]   | -0.04**<br>[-2.97]     | -0.04*<br>[-2.70]          | -0.04**<br>[-2.89]                |
| Corporate income tax          |     | -0.09<br>[-1.41]     | -0.15*<br>[-2.03]      | -0.10<br>[-1.71]           | -0.16*<br>[-2.30]                 |
| GDP growth                    | +   | -0.00<br>[-0.66]     | -0.00<br>[-1.09]       | -0.00<br>[-0.68]           | -0.00<br>[-1.13]                  |
| Inflation                     | +   | 0.23*<br>[2.08]      | 0.17<br>[1.59]         | 0.24*<br>[2.46]            | 0.19<br>[1.94]                    |
| D <sub>LH</sub>               |     | -0.06**<br>[-3.04]   | -0.06**<br>[-3.18]     | -0.07***<br>[-3.79]        | -0.07***<br>[-3.96]               |
| D <sub>HL</sub>               |     | -0.04*<br>[-2.30]    | -0.04*<br>[-2.31]      | -0.05*<br>[-2.61]          | -0.05*<br>[-2.61]                 |
| D <sub>HH</sub>               |     | -0.10***<br>[-5.36]  | -0.10***<br>[-5.48]    | -0.11***<br>[-5.98]        | -0.11***<br>[-6.12]               |
| Tangibility x D <sub>LH</sub> |     | 0.18***<br>[3.78]    | 0.18***<br>[3.76]      | 0.18***<br>[4.01]          | 0.18***<br>[3.98]                 |
| Tangibility x D <sub>HL</sub> |     | 0.08**<br>[2.99]     | 0.09**<br>[3.06]       | 0.12***<br>[5.01]          | 0.12***<br>[5.22]                 |
| Tangibility x D <sub>HH</sub> |     | 0.21***<br>[5.29]    | 0.21***<br>[5.28]      | 0.22***<br>[5.70]          | 0.22***<br>[5.66]                 |
| Constant                      |     | -0.05<br>[-0.93]     | -0.02<br>[-0.35]       | -0.10*<br>[-2.09]          | -0.07<br>[-1.46]                  |
| Observations                  |     | 59,588               | 59,588                 | 59,588                     | 59,588                            |
| R-square                      |     | 0.23                 | 0.24                   | 0.28                       | 0.28                              |
| FE year                       |     | No                   | Yes                    | No                         | Yes                               |
| FE industry                   |     | No                   | No                     | Yes                        | Yes                               |

Note: Regression with panel data. The explained variable is financial leverage. The proxies used for the explanatory variables are described in Table 2. Values in brackets are t-statistics calculated with standard errors clustered by country.

\*, \*\* and \*\*\* denote significance at the 5%, 1% and 0.1% levels respectively.

The negative coefficients of the quadrant dummies indicate that, on average, firms in countries in the HH, HL, and LH quadrants are less indebted than firms in countries in the LL quadrant. The debt-disciplining factor introduced by [Cyert and Hedrick \[38\]](#) is a possible explanation for this result.

In this quadrant, with low investor protection, the minority shareholder ends up benefiting from the company's leverage since the debt has a disciplining effect on executive discretion. Within this particular quadrant, it can be deduced that the investors exhibit a higher level of a risk tolerance. This can be attributed to the company facing more significant challenges in obtaining external finance. Another possible explanation would be the transfer of risk to the creditor. If the company has exhausted all its internal resources and still needs capital, by the POT it should resort to creditors, which would lead to a higher level of leverage. Therefore, this result suggests that firms in this quadrant make capital structure decisions that follow POT.

According to the results of [Table 4](#), it is possible to establish the following order in terms of the degree of leverage between quadrants:  $DLL > DHL > DLH > DHH$ . Companies in quadrants with high protection of shareholder rights are, on average, less leveraged than companies in countries with low shareholder protection. This indicates that EGMs associated with shareholder protection influence the choice of the structure and capital of the company.

All of the relationships found indicate that an increase in protection for any of the investors is associated with a decrease in leverage. That is, both the relationship  $DLL > DHL$  and the relationship  $DLL > DLH$  indicate that an increase in both shareholder protection and creditor protection is associated with less leverage. Moreover, the ratios  $DHLL > DHH$  and  $DLH > DHH$  indicate the same effect: increased protection decreases leverage.



Firms in countries in the HH and HL quadrants are less leveraged on average than firms in countries in the LH and LL quadrants, respectively. This is in line with the hypothesis that shareholder protection decreases the propensity of the firm to take on debt, which is in line with hypothesis H<sub>1b</sub>. Analogously, increased creditor protection has the same effect on the level of debt, from which it can be inferred, therefore, that when creditors have access to information and greater enforcement power, leverage is lower. This result corroborates [15] and is in agreement with hypothesis H<sub>2a</sub>.

In addition to the debt-disciplining factor introduced by [Cyert and Hedrick \[38\]](#) and the possible transfer of risk among investors, to analyze whether there is any other factor that may have led the companies in the LL quadrant to be more indebted, we proceeded to verify the average leverage in the countries in relation to all the countries in the sample. [Figure 1](#) reveals that in all quadrants, there is an almost homogeneous distribution among countries with leverage above or below the global average. This indicates that, in addition to the EGMs, factors at the firm level are decisive for the choice of debt and that there may be factors related to internal governance mechanisms that potentially have not yet been incorporated into the model and that may affect the firm's decision in choosing its capital structure.

The negative coefficient of tangibility is in line with what was found in [Breuer, et al. \[17\]](#). The interactions between tangibility and investor protection dummies showed positive and significant signs. This indicates that tangible assets are important to serve as debt collateral, especially in countries with higher investor protection. [Hovakimian and Titman \[33\]](#) found results along the same lines and concluded that assets that are more tangible support more external financing because these assets mitigate contracting problems: tangibility increases the value that can be captured by creditors in states of default. In countries with low creditor protection, enforcement power is low. In this scenario, the fact that the firm has tangible assets on hand to use as collateral does not carry a high weight since the creditor also has no enforcement power in a default situation.

Note that the coefficients of the interactions are higher precisely in the HH and LH quadrants, which represent countries with strong protection of creditor rights, which corroborates this interpretation. One can also notice that the positive effect of tangibility is greater for advances in creditor rights protection than for improvements in minority shareholder protection. This is consistent with the proposition that collateral is more valuable to creditors than to shareholders.

Finally, the coefficient of the loss carryback variable shows a negative sign, as expected. This suggests that firms in countries where loss carryback is allowed as a substitute for tax benefits use less debt. On the other hand, the coefficient of the corporate income tax rate variable is only significant in one of the regressions, and even then, it has low significance. [Rünger, et al. \[39\]](#) point out that, from an empirical point of view, the magnitude of the effect of taxes on the capital structure is not always large.

Furthermore, the coefficient of the corporate income tax rate shows a negative sign, which is different from what was expected. This may indicate, among other things, that corporate income tax is not the best proxy for the tax benefit of debt, but rather the proxy proposed by [Miller \[2\]](#), which includes personal taxes and therefore considers the marginal effect of the tax benefit of debt. Along these lines, [Jacob and Jacob \[40\]](#) find results indicating that both corporate and personal taxes are determinants of firms' capital structure choice. Finally, the positive and significant coefficient of inflation in the two models suggests that firms take advantage of the heated economy to issue debt and increase firm investment. This suggests that firms in countries with higher inflation rates are more willing to use debt than firms in countries with lower inflation rates.

## 7. Robustness Tests

To check the robustness of the model, different specifications for the baseline model are alternated. These results are presented in [Table 5](#). Since the creditor and minority shareholder protection variables are made up of investor protection indexes that combine macroeconomic data, it begs the question of whether the macroeconomic variables used in the model are taking in factors that explain the quadrant dummies. Therefore, a model without macroeconomic variables is estimated (column 2 of [Table 5](#)), and the results do not change substantially.

According to [Figure 1](#), it can be seen that emerging countries are mostly in the quadrants with low creditor protection. Because investor protection indicators potentially do not control for this fact, we include a dummy for emerging markets in [Equation 1](#) as a robustness test. The results (column 3 of [Table 5](#)) show no significant changes, indicating that the model is robust to this control variable.

The central argument of [La Porta, et al. \[1\]](#) and [Rombouts \[10\]](#) is that investor protection derives from the origin of the country's legal system. In this sense, the indicators of protection for creditors and shareholders' used in this research would only be proxies for those determinants. To investigate this possibility, we employ country-origin dummies in the model. The inclusion of these control dummies also does not change the main results substantially (see column 4 of [Table 5](#)). This suggests that the investor protection indicators incorporate new information into the model. Finally, we test the possibility that the results are driven by the countries with high representativeness in the sample (South Korea and Japan). Column 5 of [Table 5](#) presents the estimation results with the exclusion of these two countries. As can be seen, the main results do not change. Therefore, we conclude that the model used to analyze the degree of leverage among firms in relation to the level of investor protection is robust to these questions. Additionally, as a final robustness test, the models in [Table 4](#) were estimated using Weighted Ordinary Least Squares, weighting the observations by the inverse of their probability of inclusion in the sample. It was observed that the results remained similar to the original ones (results omitted for the sake of brevity but available upon request to the authors).

**Table 5.**  
Robustness Tests.

| Variables            | 1 | 2                    | 3                    | 4                    | 5                    |
|----------------------|---|----------------------|----------------------|----------------------|----------------------|
| Growth opportunity   | + | 0.02***<br>[6.72]    | 0.03***<br>[8.35]    | 0.02***<br>[7.89]    | 0.02***<br>[12.65]   |
| Size                 | + | 0.03***<br>[14.39]   | 0.03***<br>[14.79]   | 0.03***<br>[14.45]   | 0.03***<br>[14.28]   |
| Profitability        | - | -0.70***<br>[-10.16] | -0.71***<br>[-10.82] | -0.72***<br>[-10.89] | -0.65***<br>[-10.84] |
| Business uncertainty | - | -0.38***<br>[-4.07]  | -0.36***<br>[-4.59]  | -0.36***<br>[-4.49]  | -0.47***<br>[-6.33]  |
| Tangibility          | + | -0.15***<br>[-8.31]  | -0.14***<br>[-6.77]  | -0.15***<br>[-8.01]  | -0.15***<br>[-7.64]  |
| Loss carryback       | - |                      | -0.04**<br>[-3.07]   | -0.03*<br>[-2.14]    | -0.05**<br>[-3.14]   |
| Corporate income tax | - |                      | -0.14*<br>[-2.08]    | -0.15*<br>[-2.19]    | -0.05<br>[-0.41]     |
| GDP growth           | + |                      | -0.00<br>[-0.70]     | -0.00<br>[-0.74]     | -0.00<br>[-1.58]     |
| Inflation            | + |                      | 0.31***<br>[3.73]    | 0.08<br>[0.82]       | 0.09<br>[0.77]       |
| DLH                  |   | -0.08***<br>[-4.51]  | -0.07***<br>[-4.36]  | -0.05*<br>[-2.54]    | -0.06**<br>[-3.28]   |
| DHL                  |   | -0.05*<br>[-2.16]    | -0.05*<br>[-2.49]    | -0.03<br>[-1.36]     | -0.04<br>[-1.89]     |
| DHH                  |   | -0.12***<br>[-6.67]  | -0.11***<br>[-6.81]  | -0.07**<br>[-3.28]   | -0.07***<br>[-3.87]  |
| Tangibility x DLH    |   | 0.18***<br>[3.68]    | 0.17***<br>[3.72]    | 0.18***<br>[4.13]    | 0.17***<br>[3.65]    |
| Tangibility x DHL    |   | 0.09***<br>[4.44]    | 0.10***<br>[4.75]    | 0.12***<br>[5.27]    | 0.11***<br>[5.25]    |
| Tangibility x DHH    |   | 0.21***<br>[5.86]    | 0.20***<br>[5.21]    | 0.21***<br>[5.58]    | 0.14***<br>[4.07]    |
| Emerging             |   |                      | -0.02<br>[-1.87]     |                      |                      |
| French origin        |   |                      |                      | 0.04*<br>[2.27]      |                      |
| German origin        |   |                      |                      | -0.01<br>[-0.43]     |                      |
| Scandinavian origin  |   |                      |                      | 0.04<br>[1.80]       |                      |
| Constant             |   | -0.08<br>[-1.78]     | -0.07<br>[-1.50]     | -0.11*<br>[-2.15]    | -0.08<br>[-1.37]     |
| Observations         |   | 59,588               | 59,588               | 59,588               | 40,959               |
| R-Square             |   | 0.27                 | 0.28                 | 0.28                 | 0.31                 |

**Note:** Regression with panel data. The explained variable is financial leverage. The proxies used for the explanatory variables were described in Table 2. All regressions include year and industry fixed effects. Values in brackets are t-statistics calculated with standard errors clustered by country. \*, \*\* and \*\*\* denote significance at the 5%, 1% and 0.1% levels respectively.

## 8. Conclusion

This paper aims to investigate how external governance mechanisms impact corporate leverage in a sample of 7490 firms from 40 countries. Cross-country capital structure studies have the disadvantage that the peculiarities of certain countries are eventually ignored. Nevertheless, with this type of research, it is possible to investigate questions that could not be answered with the analysis of a single country. In particular, this research differs from previous ones by distinguishing between EGMs that affect the protection of minority shareholders and that affects creditors' rights.

Consistent with previous studies on financial leverage [12, 13, 15, 17, 19], this empirical research examines the joint effect between firm-level characteristics and country-level governance attributes on the firm's capital structure decision and further uses the distinction between levels of investor protection across countries to ascertain whether the choice for the degree of firm leverage is consistent with that predicted by Pecking Order Theory (POT).

The results were in line with what was predicted by the hypotheses. The coefficients of the firm-level control variables are consistent with those predicted by the POT. It is possible to establish the following order in terms of the degree of leverage among the quadrants:  $D_{LL} > D_{LH} > D_{HH} > D_{HL}$ . Firms in the quadrants with high shareholder rights protection are, on

average, less leveraged than firms in countries with low shareholder protection. This indicates that EGMs associated with shareholder protection influence the choice of the company's capital structure. The same happens when one analyzes the improvement in the protection of creditors' rights: a decrease in the use of debt is observed. The results are robust to different model specifications. This research suggests that greater investor protection makes firms less likely to use third-party capital. This may be motivated by the aversion of insiders (executives and majority shareholders) to the moderating role of debt at their managerial discretion. Thus, one managerial contribution that emanates from this research is the moderating role of debt in mitigating the agency conflicts inherent in joint stock companies. Likewise, the results discussed here suggest to regulators the importance of developing appropriate institutional mechanisms to protect the interests of both classes of investors: shareholders and creditors.

A limitation of this work is that the EGMs used to construct the indicators are static in time. Although, by definition, institutions are stable in the short run and institutional changes are rare, this limitation is legitimate. In future research, it is intended to use dynamic indicators of investor protection. The effect of institutional changes on corporate leverage is one aspect that may reveal new insights into this problem. Another limitation is the absence of controls for internal governance mechanisms. The effect of these variables and their interaction with the EGMs on corporate leverage is certainly an as-yet-unknown aspect. However, their empirical implementation still represents a challenge in terms of endogenous relationships.

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