



Corporate risk and formal institutions: Is Latin America different?☆

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ABSTRACT

This study investigates the relationship between institutional quality and corporate risk in Latin America. Using a sample of 725 firms from Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Peru, and Uruguay over the period 2013–2022, we find that firms operating in countries with stronger formal institutions –as measured by the World Bank's Worldwide Governance Indicators– exhibit lower levels of corporate risk, as captured by reduced Z-scores and market volatility. These results are robust to the use of a composite index based on the six dimensions of the governance indicators and to various empirical techniques. Furthermore, our results suggest that capital market integration –measured through participation in the Latin American Integrated Market (MILA)– reinforces the risk-reducing effect of institutional quality. Moreover, the moderating influence of the MILA is particularly relevant in financially constrained firms.

1. Introduction

Corporate risk is a double-edged sword, as it can serve both as a means to achieve higher business performance and stock returns or lead to an increased likelihood of bankruptcy. Accordingly, corporate risk policies play a crucial role in creating shareholder value and in fostering national economic development. Although this topic has long been central to finance research, recent geopolitical and trade tensions, heightened market volatility, and growing concerns over regulatory and compliance burdens have brought it to the forefront of business priorities (BNP Paribas, 2025; Clyde & Co, 2024).

Firms that take on excessive risk may expose themselves to high levels of volatility, potentially resulting in substantial financial losses. Conversely, overly conservative risk management strategies can lead to missed opportunities and stagnation. By carefully evaluating potential returns relative to associated risks, firms can thus make informed

decisions that support their strategic objectives and enhance shareholder value (Faccio et al., 2016).

Most existing research has analysed the effect of firm-level factors on risk-taking, such as corporate governance mechanisms (Alzayed et al., 2024) or managerial personal characteristics (Salehi et al., 2021). Nevertheless, relatively little is known about what impact the broader business environment has on corporate risk (Frijns et al., 2022). Shen et al. (2023) are among the few exceptions, having documented robust evidence of a negative relationship between corporate risk-taking and the stringency of competition laws, with this effect being more pronounced among financially constrained firms. Similarly, the limited literature on this topic remains inconclusive. While Acharya et al. (2011) identify a negative association between stronger creditor rights and corporate risk-taking, Boubakri et al. (2013) find that sound political institutions are positively associated with corporate risk-taking.

Given the scarcity and inconclusiveness of studies on the

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macroeconomic determinants of risk in non-financial firms, we investigate whether country-level institutional quality affects corporate risk in Latin America. Rather than conducting a direct comparison with developed markets, this study focuses on Latin America to provide a context-specific analysis of institutional effects within a region characterized by substantial institutional variation. This region offers a unique setting, as these countries have historically experienced high levels of economic volatility and political instability (Kaplan, 2018). Over the past decade, corporate risk in the region has been shaped by both macroeconomic challenges and regulatory developments aimed at promoting sustainable business practices and at mitigating excessive risk exposure. For example, Brazil's 2020 bankruptcy reform reshaped corporate risk behaviour, particularly for firms with concentrated ownership (Castro Martins, 2020). Similarly, Mexico's 2018 Fintech Law provided a legal framework for crowdfunding platforms, electronic payment funds, and cryptocurrency exchanges, aiming to foster innovation while ensuring financial stability by reducing legal uncertainties. In such environments, firms tend to adopt suboptimal risk-related strategic decisions as they are less likely to engage in profitable or innovative investments due to the unpredictability and higher costs associated with such projects.¹ Moreover, in emerging countries with weaker institutions, firms often face constraints in terms of financial resources and market access, thereby further hindering risk-return decision-making (Hartwell, 2013; Liu et al., 2024).

Capital market integration also plays a critical role in enhancing the quality of formal institutions within countries (Zeqiraj et al., 2022). By promoting financial liberalization and enabling cross-border capital flows, integrated markets introduce both pressures and incentives for institutional reform, increased transparency, and improved governance (Stepanyan, 2011). The presence of foreign institutional investors in integrated capital markets encourages the adoption of global corporate governance standards and positively influences corporate risk-taking (Huang et al., 2023). Furthermore, integrated capital markets reduce dependence on local funding, thereby alleviating financial constraints, diversifying financial risks, and fostering institutional improvements (Holder et al., 2001). The Latin American Integrated Market (MILA), which includes the stock exchanges of Chile, Colombia, Peru, and later Mexico, illustrates how capital market integration can influence and strengthen institutional quality in participating countries. By harmonizing regulations and fostering cross-border collaboration, MILA enhances transparency, efficiency, and investor confidence, all of which are fundamental to the development of strong formal institutions.

Using a large sample of 725 firms from nine Latin American countries, we document that firms operating in countries with stronger formal institutions –measured through the World Bank's Worldwide Governance Indicators (WGI)– exhibit lower levels of corporate risk, as measured by the Z-score and market volatility. The results are robust to the use of a composite index of the six WGIs and to alternative empirical techniques. Furthermore, our results indicate that participation in the MILA helps reduce corporate risk. However, when the quality of formal institutions is higher, this risk-reducing effect remains significant only for financially constrained firms.

¹ Countries such as Brazil, Mexico, and Argentina have faced persistent challenges related to institutional fragility, which can deter corporate investment and increase operational risks. In Brazil, recent political instability has raised concerns about the continuity and reliability of regulatory policies, which has undermined corporate confidence in long-term investment planning. In Mexico, entrenched corruption and the influence of organized crime contribute to elevated business risks, discouraging firms from expanding into potentially profitable but risk-prone sectors such as technology and infrastructure. In contrast, countries with stronger institutions –such as Chile– offer more stable economic and regulatory environments, where firms are more inclined to undertake controlled risk, supported by greater institutional reliability.

This paper makes several contributions. First, it addresses a significant gap in the literature by examining the relationship between institutional quality and corporate risk in Latin America. Our study sheds light on how institutional quality shapes firm-level risk in a region characterized by weak and heterogeneous institutional frameworks. Notably, we underscore the specificities of these emerging markets by demonstrating that both the magnitude and the channels through which institutions influence risk differ in Latin America when compared to developed markets. Second, the study reveals that membership of the MILA significantly reduces corporate risk, highlighting the role of regional financial integration in mitigating risk exposure. Third, the paper adopts a dual approach to measuring corporate risk –using both Z-scores (as indicators of financial stability) and market volatility– and thus provided a more comprehensive understanding of how institutional quality influences different dimensions of firm-level risk.

The remainder of the paper is structured as follows: Section 2 reviews the relevant literature on formal institutions, corporate risk taking and financial constraints, and presents the research hypotheses. Section 3 describes the empirical methodology and data. Section 4 reports the estimation results and additional analyses. Section 5 concludes.

2. Formal institutional quality and corporate risk: a theoretical approach

2.1. Theoretical setting

A country's formal institutional² quality plays a significant role in shaping companies' corporate risk behaviour. Strong legal and regulatory institutions tend to promote transparency, enforce ownership rights, and mitigate corruption, thus creating a stable business environment. Institutions that provide strong investor protection –such as clear disclosure requirements, robust shareholder rights, and effective legal frameworks– create an environment that is conducive to responsible risk (Wang et al., 2023). Countries with higher levels of investor protection often experience lower corporate risk, as firms are less likely to engage in opportunistic behaviour when their stakeholders are safeguarded against expropriation (La Porta et al., 1999; Mesure & Leca, 2009). Robust institutional frameworks foster risk-return related investments by resolving agency conflicts through governance mechanisms that align incentives, curb opportunism, and enhance investor confidence (Aghion et al., 2021; Shleifer & Vishny, 1997). Prior research has shown that firms in such environments are more likely to engage in more profitable activities, given that the predictability of outcomes due to clear enforcement mechanisms reduces the uncertainty involved. For instance, well-established legal frameworks ensure that firms are protected against expropriation, which encourages them to pursue innovative and lucrative projects (Caprio et al., 2013). Similarly, the rule of law, which reflects societal adherence to legal standards and contract enforcement, is also decisive. Strong rule-of-law environments correlate with reduced corporate risk, since firms operate under predictable legal conditions that discourage reckless investment behaviours. This reinforces the idea that institutional quality not only mitigates risks associated with high-stakes decisions but also promotes overall economic growth by fostering a stable investment climate (Mesure & Leca, 2009).

In line with this framework, existing studies on the relationship between the quality of formal institutions and corporate risk have approached this issue from a variety of theoretical perspectives. Institutional theory emphasizes the role of formal rules, regulations, and norms in shaping corporate behaviour (Putnam & Mumby, 2013). For instance, research focusing on the Middle East and North Africa region

² Following North (2005, 2016) and Lauth (2015) formal institutions in a country can be defined as “the rules of the game”, which includes legal frameworks, regulatory bodies, and political systems.

shows that stronger regulatory environments encourage firms to increase their value-creating investments due to increased market competition and greater regulatory certainty (Haque, 2018; Otero et al., 2020). Moreover, formal institutions influence corporate governance mechanisms, which are crucial for moderating risk. In this vein, in emerging markets where there is greater institutional quality, firms are more willing to engage in risk-return-oriented investments, since strong institutions reduce the likelihood of expropriation and facilitate access to external financing (Tang, 2021; Uddin et al., 2020).

From the perspective of the resource-based view, the quality of formal institutions provides firms with critical resources, such as legal protection, access to capital, and favourable regulatory environments, that influence corporate risk (Peng et al., 2008). Firms in emerging markets with stronger institutions can leverage these resources to undertake riskier projects with potentially higher returns. Similarly, access to stable and reliable financial systems – enabled by high-quality institutions – allows firms to diversify their investments, potentially reducing firm-level risk (Enriquez-Perales et al., 2023). Conversely, in countries with low institutional quality, firms face higher transaction costs and greater uncertainty, which may translate into elevated corporate risk (Le et al., 2021). For example, Brazilian firms operating in well-regulated sectors exhibit lower default risk due to improved financing conditions (de Carvalho & Pennacchi, 2012). Within this framework, financial conditions may act as a key transmission channel through which the institutional environment affects corporate risk. Greater attention should therefore be paid to the role of financial constraints. In sum, we expect higher institutional quality in Latin American countries to be associated with lower corporate risk, as stronger formal institutions reduce agency conflicts, regulatory uncertainty, financial constraints, and will enhance investor confidence. Based on these arguments, the following hypothesis is proposed:

H1. *Higher institutional quality in Latin American countries is associated with lower corporate risk.*

However, Latin America's distinctive institutional landscape –including political volatility, legal fragmentation, reliance on informal networks, and commodity-dependent economies –introduces complexities that may weaken or reshape the baseline relationship between institutional quality and corporate risk relative to other regions. While the core premise remains valid, the impact of institutions on corporate risk in Latin America is thus likely to be contingent upon additional institutional factors, thereby warranting a more context-sensitive analysis.

2.2. MILA and the integration of capital markets

Capital market integration refers to the process whereby capital markets from different regions or countries become interconnected, thus facilitating the seamless flow of capital across borders (Khan, 2025). This integration promotes the convergence of market risk and asset prices, ultimately enhancing the efficiency of capital allocation (Tan et al., 2024). Integrated capital markets are characterized by minimal barriers to international financial flows, thereby enabling firms to access global investment and funding sources (Solnik & Zuo, 2017). As a result, integration can reduce the cost of capital and incentivize firms to pursue riskier but potentially high-return projects. Heller (2024) has shown that firms operating in well-integrated markets exhibit higher levels of investment in innovation and expansion, driven by improved liquidity and fewer financing constraints.

Integrated capital markets play a pivotal role in shaping corporate strategies, particularly in emerging markets (Bruner et al., 2008). By facilitating cross-border investment and granting access to a diversified pool of financial resources, market integration enables firms to manage risks more effectively and to seize growth opportunities. Moreover, integration supports international risk-sharing among investors (Chari & Henry, 2004). Diversified ownership structures help mitigate

firm-specific risks, thereby encouraging managers to undertake projects with uncertain yet potentially lucrative outcomes (John et al., 2008). The availability of advanced financial instruments in integrated markets further enhances corporate risk management by offering tools to hedge against risks such as currency fluctuations and commodity price volatility (Ben Rejeb & Boughrara, 2015).

However, the relationship between capital market integration and firm-level corporate risk is complex. On the one hand, broader access to global capital can encourage firms to pursue more ambitious strategies, particularly in innovation and international expansion, which may increase their risk exposure (Tian et al., 2022). On the other hand, the heightened scrutiny imposed by international investors may prompt firms to adopt more conservative approaches to risk management (Settembre-Blundo et al., 2021). In this context, integration may exert a disciplining effect on managerial behaviour, compelling firms to balance growth initiatives with financial prudence.

Launched in May 2011, the MILA is a financial integration initiative aimed at linking the stock exchanges of several Latin American countries. Its primary objectives include enhancing regional financial integration, facilitating cross-border investments, increasing market liquidity, and attracting international investors. Initially comprising the stock markets of Chile, Colombia, and Peru, MILA expanded in 2014 to include Mexico, following substantial technological and regulatory adjustments (Mongrut & Winkelried, 2019). These countries sought to pool resources and harmonize trading platforms in order to strengthen their competitiveness in global capital markets. Integration is virtual in nature; while the participating markets remain institutionally independent, their systems are interconnected to enable seamless cross-border transactions (Escobari et al., 2017).

MILA has broadened investment opportunities by offering access to a wide range of financial instruments, including equities, bonds, and derivatives. The resulting increase in market liquidity has played a key role in attracting foreign capital, which is vital for the economic development of member countries (Espinosa-Méndez et al., 2017). Furthermore, by presenting a unified regional market, MILA has enhanced the bloc's bargaining power in international financial negotiations (Delgado-Domonkos & Zeng, 2023). This is particularly advantageous for smaller economies, who may face challenges in attracting large-scale foreign investment when acting individually. In addition, regulatory harmonization and the reduction of cross-border barriers have lowered transaction costs and improved market efficiency, thereby increasing the attractiveness of MILA for both institutional and retail investors (Hardy et al., 2018). Integration also offers a degree of protection against external financial shocks by enabling capital to circulate more freely within the bloc –a particularly relevant feature in the aftermath of the 2008 global financial crisis (Espinosa-Méndez et al., 2017).

Previous research indicates that MILA has contributed to reduced market volatility and contagion risk, while increasing trading volumes and cross-border transactions (Muñoz Mendoza et al., 2020). These developments may encourage firms to adopt more strategic, risk-return-oriented decision-making by leveraging enhanced market efficiency and reduced systemic risk. Access to broader and more efficient capital markets may incentivize firms to undertake calculated risks, particularly in initiatives requiring significant investment in research and development or in market expansion (Delgado-Domonkos & Zeng, 2023). Accordingly, we formulate our second hypothesis as follows:

H2. *Capital market integration (MILA) is associated with lower corporate risk.*

The effect of institutional quality can be influenced by the financial constraints faced by firms. High-quality formal institutions facilitate the development and efficiency of financial markets through mechanisms such as improved contract enforcement, stronger investor protection, and more effective dispute resolution systems (Beck et al., 2005). These institutions help reduce information asymmetries and ensure that lenders and investors can recover their investments, thereby lowering

the cost of external financing. As a result, firms –particularly those with limited internal funds– are better able to access financial resources to undertake innovative and high-risk projects that would otherwise be unattainable. Moreover, there exists a dynamic feedback loop between institutional quality and the degree of financial constraints that firms face (Kabbach-de-Castro et al., 2023). While strong institutions are generally associated with a more supportive environment for firm growth, their positive effects may be moderated when firms are subject to high levels of financial constraint, and prior research has shown that the benefits of institutional quality are not evenly distributed across firms. For instance, Ayyagari et al. (2021) emphasize that financial constraints limit firms' capacity to grow, regardless of improvements in the external institutional environment. Accordingly, we posit that financial constraints moderate the relationship between institutional quality and corporate risk-taking, potentially dampening the risk-reducing effect of strong institutions.

3. Research design

3.1. Sample selection

We construct our sample using multiple data sources. Firm-level financial data, including indicators of financial constraints, are obtained from *Refinitiv Eikon*. Country-level independent variables measuring the quality of formal institutions quality –captured by the World Governance Indicators– as well as macroeconomic control variables, are sourced from the World Bank database.

The data selection process was as follows. First, we included all Latin American countries, excluding those classified as tax havens.³ To construct our sample, we initially selected all listed companies from the Thomson Reuters Business Classification (TRBC), excluding financial firms, for the period 2013–2022. After removing firms with missing values for the key variables used in the empirical analysis, the final dataset comprises 725 unique firms from Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Peru, and Uruguay, resulting in an unbalanced panel with 5856 firm-year observations.

Table 1, Panel A, presents the distribution of the sample by country. As expected, the largest share corresponds to Brazil (40.1%), followed by Chile (17.2%), and Mexico (14.9%). Panel B shows the distribution of firms by industry, based on the TRBC classification. With the exception of the energy and healthcare sectors, the sample is relatively balanced across industries.

3.2. Variables

3.2.1. Dependent variable: corporate risk

The primary objective of this study is to examine whether –and through which mechanisms– the quality of a country's formal institutions affects firm-level corporate risk. Accordingly, our first key dependent variable is the Z-score, a widely used measure of firm stability and risk, particularly in the context of financial distress or insolvency (Bao & Cardoza, 2023; Laeven & Levine, 2009; Li et al., 2017). The Z-score indicates the number of standard deviations by which a firm's return on assets (ROA) would need to decline to exhaust its equity. It is computed as follows:

$$Zscore = \frac{ROA + CAR}{\sigma ROA} \quad (1)$$

where ROA denotes return on assets (i.e., the firm's average

Table 1

Sample distribution by country and industry.

Country	No of observations	No of firms	%
Argentina	584	67	9.2%
Brazil	2119	291	40.1%
Chile	1131	125	17.2%
Colombia	310	38	5.2%
Costa Rica	27	4	0.6%
Ecuador	2	2	0.3%
Mexico	910	108	14.9%
Peru	751	86	11.9%
Uruguay	22	4	0.6%
Total	5856	725	100.0%
TRBC sector	No of observations	No of firms	%
Basic materials	1091	124	17.1%
Consumer cyclicals	1098	135	18.6%
Consumer non-cyclicals	1105	132	18.2%
Energy	181	26	3.6%
Healthcare	160	23	3.2%
Industrials	854	105	14.5%
Real state	612	94	13.0%
Technology	755	86	11.9%
Total	5856	725	100.0%

This table reports the distribution of the sample by country and industry, based on 5856 firm-year observations for the period 2013–2022. Industry classification follows the Thomson Reuters Business Classification (TRBC), excluding financial firms.

profitability), CAR represents the capital-to-asset ratio (i.e., the equity buffer against losses), and σROA is the standard deviation of ROA over time (i.e., the volatility of returns). A higher Z-score indicates a lower risk of insolvency, as it reflects greater profitability and/or a stronger equity position. Conversely, a lower Z-score is typically associated with higher risk, as firms operate closer to their solvency threshold (Laeven & Levine, 2009). To ensure consistency in the interpretation of coefficients relative to our alternative risk measure, we compute the inverse of the Z-score. Accordingly, throughout the analysis, a higher (inverted) Z-score reflects higher corporate risk.

Alternatively, we employ a proxy for firm-level market risk, specifically the volatility of daily stock returns (John et al., 2008; Nguyen, 2011). The variable *Market risk* is computed as the annual sum of the standard deviations of a company's daily stock returns. Daily returns are calculated as follows

$$Return_i = \left(\frac{P_t - P_i}{P_i} \right) \times 100 \quad (2)$$

where P_t represents the share price at the end of the day, and P_i denotes the initial price. Only trading days –days on which the share is actively traded– are considered in the calculation.

3.2.2. Independent variables: formal institutional quality

Building on prior research, we use data on governance quality and institutional frameworks sourced from the Worldwide Governance Indicators (WGI) provided by the World Bank, complemented by insights from the Global Entrepreneurship Monitor survey (Golovko & Sahin, 2021; Matemilola et al., 2019). The WGI offers aggregated governance measures across six dimensions, derived from perception-based surveys of enterprises, citizens, and experts across countries (Kaufmann et al., 2011).

The Political Stability and Absence of Violence/Terrorism indicator (*Pol_stab*) assesses the likelihood of government destabilization or overthrow through unconstitutional or violent means. Rule of Law (*Rule_law*) evaluates confidence in societal rules, particularly regarding contract enforcement, property rights, law enforcement, and judicial processes. Regulatory Quality (*Reg_qual*) captures perceptions of the government's ability to formulate and implement sound policies that

³ The main tax havens in Latin America are located in the Caribbean, particularly among the British Overseas Territories, such as the Cayman Islands, the British Virgin Islands, and Montserrat, as well as some former British colonies that have gained independence, such as the Bahamas. In addition, Panama, Guyana, and Suriname are also commonly classified as tax havens.

promote private sector development. The Voice and Accountability dimension (*Voice_account*) reflects perceptions about citizens' ability to participate in selecting their government, freedom of expression, association, and media independence. Control of Corruption (*Control_corrup*) measures perceptions of the extent to which public power is exercised for private gain. Lastly, Government Effectiveness (*Gov_effec*) assesses perceptions of the quality of public services, civil service independence from political pressures, and the effectiveness of policy implementation. Governance scores range from −2.5 (weak governance) to 2.5 (strong governance). In addition, we construct a composite index (*WGI_index*) using principal component analysis to aggregate the six WGI dimensions.⁴ Higher values of this index indicate stronger governance mechanisms and, consequently, better quality of formal institutions.

While perception-based measures like the WGI have been subject to criticism, Kaufmann et al. (2011) argue that perception data provides valuable insights into governance quality. Decision-making by economic agents, including firms, often depends on perceived governance, which influences investment decisions and the use of public services. Certain governance attributes—such as corruption levels—are inherently difficult to measure objectively and are thus better captured through perceptions. Moreover, subjective measures tend to align more closely with actual practices, whereas objective measures may reflect formal procedures that do not necessarily correspond to effective implementation.

3.2.3. Control variables

We also control for a comprehensive set of firm and macro-level factors, including firm size, leverage, capital expenditures, market-to-book ratio, as well as national GDP growth, inflation, and foreign direct investment. Firm size (*Size*) is measured as the natural log of the book value of assets, and its impact on corporate risk has been widely documented as negative in prior literature, including studies focusing on emerging markets (Tran, 2020). Larger firms typically possess more substantial financial resources, which enhances their resilience to the consequences of risky decisions. This financial capacity allows them to invest in innovative and uncertain projects while better managing potential losses (Bastos et al., 2015). Furthermore, they benefit from economies of scale and greater access to external financing, which further reduces the perceived risk associated with high-stakes investments (Damanpour, 1991). In addition, managerial incentives in larger firms may foster risk-averse behaviour. Given the broader range of stakeholders involved, managers may prioritize stability and sustained profitability over risky yet potentially high-reward opportunities. By contrast, in smaller firms, owner-managers often display a greater propensity for risk-taking, driven by their direct personal stake in the firm's success and their limited ability to mitigate risk through diversification (John et al., 2008).

Second, we expect financial leverage (*Lev*) to be positively associated with corporate risk, as higher leverage generally increases the likelihood of financial distress. Moreover, elevated leverage often intensifies agency conflicts between debtholders and equity holders. In such situations, equity holders may pursue riskier projects to maximize their residual claim, particularly when the downside risks are primarily borne by creditors (Jensen & Meckling, 1976). The relationship between firm capital expenditures (*Capex*) and corporate risk depends on the

characteristics of the assets created. Investments in tangible or productive assets can serve as collateral, thereby reducing perceived risk by enhancing the firm's creditworthiness and stability (Wang & Zhang, 2021).

The market-to-book ratio (*MtoB*) captures investor expectations regarding a firm's growth prospects relative to its current book value. A high *MtoB* ratio typically signals strong market confidence in the firm's future earnings potential, which may incentivize managers to pursue riskier, innovation-intensive strategies (Armstrong et al., 2019). In contrast, firms with low market-to-book ratios are more likely to adopt conservative strategies focused on safeguarding existing assets and on ensuring short-term stability (Baker & Wurgler, 2002).

As far as the macro-level control variables are concerned, we anticipate that GDP growth (*GDP*), inflation (*Inflation*), and foreign direct investment (*FDI*) will significantly influence corporate risk-taking behaviour (Enriquez-Perales et al., 2023). Robust GDP growth may encourage risk-taking by improving market conditions and revenue expectations. Conversely, high inflation can increase uncertainty and financing costs, thereby elevating risk. Meanwhile, greater FDI inflows may signal a stable investment environment, potentially reducing perceived corporate risk through improved access to capital and spillovers of managerial and technological know-how.

3.2.4. Firms' financial constraints

Latin American companies often experience higher levels of financial constraints compared to firms in other regions due to a combination of structural, institutional, and macroeconomic factors (Aguinis et al., 2020). Latin America's financial systems are underdeveloped when compared to advanced economies, which limits credit access, especially for small and medium-sized enterprises. Many firms rely on internal funding, since external financing through banks or capital markets is scarce. High borrowing costs, driven by elevated interest rates, banking inefficiencies, and weak legal frameworks, only serve to worsen these constraints. Moreover, tax policies, including some of the world's highest corporate tax rates, discourage reinvestment and growth, while bureaucratic hurdles further restrict financing options (Fernández-Rodríguez et al., 2021). Economic volatility, such as exchange rate fluctuations and inflation, heightens risk premiums, and so reduces credit availability (Benigno et al., 2012).

Financial constraints limit a firm's ability to allocate resources to risky but potentially high-return projects, with firms who face significant constraints often preferring low-risk investments in an effort to maintain liquidity and solvency (Hutchinson, 1995). Such constraints are more pronounced for smaller firms or those with limited access to external financing due to information asymmetry or inadequate collateral.

Our primary proxy for financial constraints is the Kaplan and Zingales index (*KZ_index*) (Kaplan & Zingales, 1997, 2000; Kim et al., 2021; Zhang et al., 2021). Given its sensitivity to firms' internal financial conditions and its ability to reflect broader economic and market development contexts, the *KZ_index* serves as a valuable tool for assessing the degree of financial constraints faced by firms. The *KZ_index* is computed as follows:

$$KZ_index_t = -1.002 \times \left(\frac{Cash\ Flow}{PPE_{t-1}} \right) + 0.283 \times Q_t + 3.139 \times Leverage_{t-1} - 39.368 \times \frac{Dividends_t}{PPE_{t-1}} - 1.315 \times \frac{Cash\ Holdings_t}{PPE_{t-1}} \quad (3)$$

where *Q* is defined as (Market Capitalisation + Total Shareholder Equity_{*t*} - Book Value of Common Equity_{*t*} - Deferred Tax Assets_{*t*})/Total Shareholder Equity_{*t*} and *PPE* stands for Property, Plant and Equipment. This index offers a quantifiable measure that helps predict firm behaviour under varying economic conditions. Firms with higher *KZ_index* values typically have limited internal cash flow relative to their

⁴ Multicollinearity issues may arise if the six governance dimensions are included simultaneously in the estimations (see Table 4). We thus employ principal component analysis (PCA), as suggested by Hartwell (2013). First, we extract eigenvalues, which indicate the amount of variance explained by each principal component (PC). Eigenvectors determine the weights assigned to each original variable—in this case, the six WGI indicators—in the PC. We next verify whether the PC has an eigenvalue greater than one, which implies that it explains more variance than any single original variable. Finally, the principal component—referred to as the *WGI_index*—is used as an explanatory variable in the regression models.

investment opportunities and rely more heavily on external financing. Such financing is often more expensive and less accessible, particularly during periods of economic downturn. Consequently, these firms are more susceptible to financial shocks and are more likely to reduce investment and growth activities under financial stress.

We also employ the index developed by Hadlock and Pierce –commonly referred to as the Size-Age index (*HP_index*)– to capture the likelihood of a firm being financially constrained (Cloyne et al., 2023; Hadlock & Pierce, 2010; Pinto, 2024; Schauer et al., 2019). Higher values of the index indicate greater financial constraints.⁵ The *HP_index* is calculated using the following equation:

$$HP_index_t = -0.737 \times Size + 0.043 \times Size^2 - 0.040 \times Age \quad (4)$$

where Age is the number of years the firm has been listed with a non-missing stock price.

The definitions, notation, and data sources for all the variables are summarized in Table 2.

3.3. Empirical method

We initially conduct a descriptive analysis to present the main characteristics of the variables and to assess whether the data aligns with findings from earlier studies. This analysis provides preliminary insights into the relationship between the quality of a country's formal institutions and corporate risk. We subsequently performed an explanatory analysis based on the following baseline model:

$$Corporate\ risk_{i,t} = \alpha_0 + \beta Formal\ institutional\ quality_{c,t} + \gamma' X_{i,t} + \theta' Y_{c,t} + \eta_i + \eta_c + \eta_t + \nu_{itc} \quad (5)$$

where X_{it} denotes firm-level and Y_{ct} macro-level control variables. Moreover, η_i , η_c and η_t stand for industry, country, and time-fixed effects, respectively. Finally, ν_{itc} stands for the error terms.

First, we employ ordinary least squares (OLS) estimations. As a robustness check, we apply the system estimator of the generalized method of moments (GMM) approach. While controlling for unobserved fixed effects (captured by the term ν_{itc}), this method also addresses potential endogeneity issues (Blundell & Bond, 2000; Bond, 2002). The validity of the estimates depends on the absence of second-order serial correlation, which is assessed using the m_2 test. Additionally, the Hansen test for overidentifying restrictions is used to evaluate the validity of the selected instruments. Both statistics are reported in Tables 7 and 8. Additionally, we employ the two-step instrumental variables (IV) approach to also address endogeneity concerns.

To assess the moderating role of MILA membership in the relationship between the quality of a country's formal institutions and firm-level risk, we introduce a dummy variable –*MILA*– which takes the value of 1 if the country participates in the MILA, namely Chile, Colombia, Mexico, and Peru, and 0 otherwise. On this basis, we extend equation (5) as follows (country-level fixed effects are removed):

$$Corporate\ risk_{i,t} = \alpha_0 + \beta_1 WGI_index_{c,t} + \beta_2 MILA_{i,t} + \beta_3 WGI_index_{c,t} * MILA_{i,t} + \gamma' X_{i,t} + \theta' Y_{c,t} + \eta_i + \eta_t + \nu_{itc} \quad (6)$$

Additionally, we employ propensity score matching (PSM) to assess the extent to which membership in the MILA influences corporate risk. PSM is a statistical technique used to estimate causal treatment effects by balancing observed characteristics between treated and control groups. After matching, the balance of covariates is evaluated using standardized mean differences to ensure comparability between the two

Table 2
Definitions and data sources of variables.

Variables	Notation	Description	Data source
Dependent variables			
Z score	Zscore	(Return on assets + capital-to-asset ratio)/standard deviation of ROA	Refinitiv Eikon
Market risk	Market_risk	Yearly sum of the standard deviations of a firm's daily stock returns.	
Independent variables			
Political stability and absence of violence/terrorism	Pol_stab	Likelihood of government destabilization or overthrow through unconstitutional or violent means.	Worldwide Governance Indicators from the World Bank
Rule of law	Rule_law	Confidence in societal rules, regarding contract enforcement, property rights, law enforcement, and judicial processes.	
Regulatory quality	Reg_qual	Government's ability to design and enforce sound policies that foster private sector development.	
Voice and accountability	Voice_account	Citizens' ability to participate in government selection, freedom of expression, association, and media independence.	
Control of corruption	Control_corrup	The extent to which public power is misused for private gain.	
Government effectiveness	Gov_effec	Quality of public services, civil service independence from political pressures, and policy implementation effectiveness	
Worldwide Governance Indicators composite index	WGI_index	Composite index of the six WGI variables, using a principal component approach.	
Firm-level control variables			
Firm Size	Size	Natural logarithm of the book value of assets	Refinitiv Eikon
Leverage	Lev	Ratio of total debt to total assets	
Capital expenditures	Capex	Ratio of capital expenditures to total assets	
Market to book	MtoB	(Market value of common equity + preferred stock + book value of total liabilities)/Book value of total assets	
Macro-level control variables			
GDP growth	GDP	Real GDP growth rate (Annual %)	World Development Indicators from the World Bank
Inflation	Inflation	Inflation (Annual %)	
Foreing direct investment	FDI	Net capital inflow of foreign direct investment (% of GDP)	
Financial constraints			

(continued on next page)

⁵ Additionally, we considered the Whited Wu index (Whited & Wu, 2006). However, due to the unavailability of consistent data on firms' dividend policies, we were unable to include this measure in the final analysis.

Table 2 (continued)

Variables	Notation	Description	Data source
Kaplan & Zingales Index	KZ_index	$KZ\ Index_t = -1.002 \times (Cash\ Flow_t / Total\ Assets_{t-1}) + 0.283 \times Q_t + 3.139 \times Leverage_t - 39.368 \times (Dividends_t / Total\ Assets_{t-1}) - 1.315 \times (Cash\ Holdings_t / Total\ Assets_{t-1})$	Refinitiv Eikon
Hadlock & Pierce Index	HP_index	$HP\ Index_t = -0.737 \times Size + 0.043 \times Size^2 - 0.040 \times Age$	

This table displays the variables used in the analysis, their notation, description, and data source.

groups.

4. Results

4.1. Descriptive statistics

The summary statistics of all the variables used in the analysis are presented in Table 3. All variables have been winsorized at the 5% level. The average *Zscore* is -2.922 , with a minimum value of -11.066 and a maximum of 1.732 . The market risk measure has a mean of 2.204 with a standard deviation of 1.207 . These values are consistent with those reported in previous studies, both for the *Z-score* (Campbell et al., 2008; Chava & Jarrow, 2004) and for *Market risk* (Gerding et al., 2014). On average, just over half of the assets (59%) are financed with debt (*Lev*), and the market value of the firms is approximately 2.34 times their book value (*MtoB*). Regarding the variables that proxy for a country's formal institutional quality, we observe substantial variability across the countries in the sample.

Table 4 reports the pairwise correlation coefficients between the main variables. The six governance indicators show strong negative correlations with both measures of corporate risk, namely *Z-score* and *Market risk*. Although this relationship requires confirmation through the explanatory analysis, it suggests that higher institutional quality is associated with lower corporate risk. In addition, we observe high correlations among the governance indicators themselves. To mitigate multicollinearity concerns, each indicator is analysed separately. Nonetheless, we also construct a composite index (*WGI_index*) by aggregating the six dimensions of the WGI.

Table 3
Summary statistics.

	N	Mean	Median	Std. Dev.	Min.	Max.
Zscore	5856	-2.922	1.937	3.907	-11.066	1.732
Market_risk	5856	2.204	2.011	1.207	0.327	4.215
Pol_stab	5856	-0.0292	-0.360	0.398	-1.292	1.095
Rule_law	5856	-0.113	-0.300	0.589	-0.0866	1.349
Reg_qual	5856	0.214	0.060	0.583	-1.066	1.484
Voice_account	5856	0.407	0.300	0.351	-0.121	1.307
Control_corrup	5856	-0.205	-0.451	0.692	-1.020	1.610
Gov_effec	5856	-0.034	-0.230	0.471	-0.587	1.158
WGI_index	5856	-0.004	-0.218	0.472	-0.531	1.144
Size	5856	20.301	20.345	1.852	15.786	24.378
Lev	5856	0.590	0.558	0.304	0.080	2.196
Capex	5856	0.044	0.032	0.042	0.000	0.221
MtoB	5856	2.338	1.047	3.153	0.086	10.618
GDP	5856	1.507	1.970	4.195	-10.869	13.417
Inflation	5856	9.192	5.850	11.826	-0.399	69.471
FDI	5856	3.553	3.380	1.635	-0.897	11.974
KZ_index	2929	5.200	2.601	6.198	0.850	21.399
HP_index	5856	-34.503	-34.396	4.775	-52.091	-10.866

This table displays the summary statistics for all the variables used in the analysis. See Table 2 for the definition and calculation of each variable.

4.2. Baseline regressions

Columns 1 to 6 of Table 5 present the estimates of the relationship between each measure of institutional quality and *Zscore*, our proxy for corporate risk. All coefficients are negative and statistically significant. Consistent with our H1, these results suggest that higher institutional quality is associated with lower corporate risk. As shown in column 7, the effect remains robust when we use the composite index of the six governance indicators (*WGI_index*).

As regards the firm-level control variables, the coefficient of company size (*Size*) is significantly negative across all specifications. This finding may reflect the greater ability of larger firms to reduce risk through diversification. In contrast, firm leverage (*Lev*) shows a significant positive effect, possibly due to the increased financial risk associated with debt. As expected, capital expenditures (*Capex*) are negatively associated with corporate risk, which likely reflects the lower risk profile of the assets generated by these investments.

As for country-level control variables, we find that higher levels of GDP growth are associated with reduced corporate risk. In contrast, increases in foreign direct investment (FDI) are linked to higher corporate risk, possibly because firms operating in FDI-intensive environments may be more inclined to undertake riskier projects. Inflation emerges as a significant macroeconomic driver of corporate risk, particularly in Latin American countries, where historical instability and currency mismatches heighten firms' sensitivity to inflationary shocks.

The baseline estimations for our alternative proxy of corporate risk (*Market risk*) are reported in Table 6. Our results are consistent with those previously obtained and corroborate that as a country's formal institutional quality improves, corporate risk is significantly reduced.

From a theoretical standpoint, our baseline results can be interpreted through the lenses of the institutional and the resource-based theories. Formal rules, regulations, and norms shape corporate behaviour, and stronger regulatory environments foster value-creating investments through enhanced competition and certainty. High-quality institutions strengthen corporate governance, reduce expropriation risks, and ease access to external financing, enabling firms in emerging markets to pursue risk-return-oriented investments. Moreover, institutions provide strategic resources—such as legal protection, access to capital, and stable financial systems—that enable firms to undertake riskier yet potentially more rewarding projects, while also facilitating investment diversification to mitigate firm-level risk. Conversely, weak institutions increase transaction costs and uncertainty, thereby heightening corporate risk.

We additionally test whether the negative relationship between institutional quality and corporate risk varies across industries. Firms operating in different sectors face heterogeneous production

Table 4
Correlation matrix.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) Zscore	1.000												
(2) Market_risk	0.302***	1.000											
(3) Pol_stab	−0.006	−0.055***	1.000										
(4) Rule_law	−0.076***	−0.187***	0.750***	1.000									
(5) Reg_qual	−0.148***	−0.424***	0.484***	0.820***	1.000								
(6) Voice_account	−0.014	−0.090***	0.887***	0.901***	0.623***	1.000							
(7) Control_corrup	−0.059***	−0.199***	0.802***	0.967***	0.793***	0.940***	1.000						
(8) Gov_effec	−0.116***	−0.341***	0.661***	0.862***	0.848***	0.774***	0.885***	1.000					
(9) WGI_index	−0.083***	−0.250***	0.811***	0.973***	0.855***	0.923***	0.984***	0.924***	1.000				
(10) Size	−0.188***	0.084	−0.150***	−0.047***	−0.029*	−0.106***	−0.091***	−0.063***	−0.083***	1.000			
(11) Lev	0.253***	0.356***	−0.056***	−0.069***	−0.181***	−0.046***	−0.092***	−0.147***	−0.112***	0.093***	1.000		
(12) Capex	−0.096***	−0.039***	0.012	−0.018	0.008	−0.021	−0.004	0.036**	0.002	0.117***	−0.015	1.000	
(13) MtoB	−0.080***	−0.047***	0.236***	0.341***	0.317***	0.304***	0.344***	0.339***	0.347***	0.153***	0.007	0.072***	1.000
(14) GDP	−0.065***	−0.161***	0.047***	0.045***	0.117***	−0.005	0.049***	0.054***	0.061***	−0.017	−0.057***	0.058***	0.009*
(15) Inflation	0.146***	0.229***	0.239***	−0.191***	−0.475***	0.089***	−0.070***	−0.121***	−0.130***	−0.130***	0.028**	0.041**	−0.059***
(16) FDI	−0.075***	−0.184***	0.317***	0.648***	0.590***	0.488***	0.610***	0.533***	0.598***	0.014	−0.051***	−0.005	0.120***
(17) KZ_index	−0.103***	−0.121***	0.263***	0.312***	0.314***	0.283***	0.318***	0.322***	0.325***	−0.001	−0.071***	−0.002	0.767***
(18) HP_index	0.191***	−0.073***	0.118***	0.035***	0.039***	0.077***	0.074***	0.055***	0.069***	−0.962***	−0.094***	−0.104***	−0.143***

Variables	(14)	(15)	(16)	(17)	(18)
(14) GDP	1.000				
(15) Inflation	−0.036***	1.000			
(16) FDI	0.190***	−0.357***	1.000		
(17) KZ_index	0.081***	−0.031*	0.191***	1.000	
(18) HP_index	0.022*	0.094***	−0.008	0.006	1.000

This table displays the Pearson correlations between the main variables used in the analysis. ***, ** and * refer to statistical significance at 0.01, 0.05 and 0.10 levels, respectively. See Table 2 for the definition and calculation of each variable.

Table 5

Baseline results: OLS estimates (I).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Pol_stab	−0.988*** (0.193)						
Rule_law		−0.548*** (0.140)					
Reg_qual			−0.475*** (0.119)				
Voice_account				−0.770*** (0.243)			
Control_corrupt					−0.440*** (0.112)		
Gov_effec						−0.607*** (0.140)	
WGI_index							−0.642*** (0.152)
Size	−0.351*** (0.028)	−0.351*** (0.028)	−0.351*** (0.028)	−0.347*** (0.028)	−0.350*** (0.028)	−0.352*** (0.028)	−0.321*** (0.028)
Lev	3.216*** (0.160)	3.226*** (0.161)	3.223*** (0.161)	3.248*** (0.161)	3.226*** (0.161)	3.219*** (0.161)	3.218*** (0.161)
Capex	−5.333*** (1.142)	−5.346*** (1.143)	−5.308*** (1.143)	−5.426*** (1.143)	−5.337*** (1.143)	−5.329*** (1.143)	−5.326*** (1.143)
MtoB	−0.021 (0.016)	−0.024 (0.016)	−0.023 (0.016)	−0.026* (0.016)	−0.023 (0.016)	−0.022 (0.016)	−0.022 (0.016)
GDP	−0.070*** (0.023)	−0.068*** (0.024)	−0.069*** (0.024)	−0.078*** (0.023)	−0.071*** (0.024)	−0.069*** (0.024)	−0.069*** (0.024)
Inflation	0.032*** (0.011)	0.036*** (0.011)	0.035*** (0.011)	0.038*** (0.011)	0.036*** (0.011)	0.032*** (0.011)	0.035*** (0.011)
FDI	0.078* (0.041)	0.101** (0.046)	0.085* (0.082)	0.075* (0.045)	0.104** (0.047)	0.098** (0.045)	0.100** (0.045)
Constant	2.061*** (0.646)	2.168*** (0.646)	2.271*** (0.644)	2.581*** (0.646)	2.115*** (0.647)	2.113*** (0.647)	2.194*** (0.645)
Observations	5856	5856	5856	5856	5856	5856	5856
R-squared	0.176	0.174	0.173	0.173	0.174	0.174	0.174
F test	44.29***	43.82***	43.84***	43.59***	43.82***	43.97***	43.93***

Coefficients (std. errors) from the OLS regressions of WGI dimensions on corporate risk. The dependent variable is the Z-score. The independent variables are the six WGI dimensions (columns 1-6) and the composite index WGI_index (column 7). The firm-level control variables are firm size, leverage, capital expenditures, and market to book. The country-level control variables are GDP growth, inflation, and foreign direct investment. The definitions of all variables are provided in Table 2. We include industry, year, and country-fixed effects in all the models. We adjust the error terms for heteroscedasticity at the company level. Standard errors are displayed in parentheses. F test measures whether the explanatory variables in the model, taken together, have statistically significant explanatory power. Statistical significance at 1%, 5%, and 10% are indicated with ***, **, and *, respectively.

technologies, asset structures, regulatory exposure, and financing needs, all of which may influence how institutional quality affects their risk levels (Frijns et al., 2022; John et al., 2008). We adopt a twofold empirical strategy. First, we estimate the baseline model separately for each industry. This split-sample approach allows the coefficient on institutional quality (*WGI_index*) to vary freely across sectors, capturing potential differences in magnitude and significance. The results are reported in Panels A and B of Table 7 for the two alternative measures of corporate risk (*Z-score* and *Market_risk*). Second, we estimate a pooled regression including interaction terms between institutional quality and sector dummies. This specification provides a formal statistical test of whether the effect of institutional quality differs across industries. Panel C of Table 7 reports the coefficients of the interaction terms, along with a Wald test of their joint significance. All regressions include the same set of firm-level and macroeconomic controls, as well as year, country, and industry fixed effects, with standard errors clustered at firm level.

The results in Panels A and B confirm that the negative relationship between institutional quality and corporate risk identified in Tables 5 and 6 holds across all industries. The coefficient of *WGI_index* is negative and statistically significant in all sectors for both risk measures, reinforcing the robustness of our main findings. However, the magnitude of the effect varies across industries, particularly when corporate risk is measured using the Z-score. The strongest effects are observed in sectors such as energy (−3.919), healthcare (−1.284), consumer cyclicals (−1.205), and real estate (−1.142), while the effect is comparatively smaller in consumer non-cyclicals (−0.484), and technology (−0.411). These differences are consistent with the theoretical framework. Capital-

intensive sectors and those with greater dependence on external financing are more sensitive to institutional quality, since stronger institutions improve access to capital, reduce information asymmetries, and mitigate agency conflicts (Beck et al., 2005; Kabbach-de-Castro et al., 2023). In contrast, sectors characterized by a greater reliance on intangible assets or international markets –such as technology– may be less dependent on domestic institutional conditions, leading to a weaker estimated effect. When using *Market_risk* as the dependent variable (Panel B), the negative effect of institutional quality remains highly significant across all sectors, although the magnitude is more homogeneous. This suggests that financial markets incorporate institutional quality into risk pricing in a relatively uniform manner across industries, which is consistent with the notion that country-level governance has a broad effect on investor perception (Huang et al., 2023; Nguyen, 2011).

Panel C provides a formal test of whether these sectoral differences are statistically significant. The baseline coefficient on *WGI_index* remains negative and significant for both *Z-score* (−1.151) and *Market_risk* (−0.009), confirming the overall risk-reducing effect of institutional quality in the pooled sample. However, the interaction terms between *WGI_index* and sector dummies are not statistically significant, and the Wald test fails to reject the null hypothesis that all interaction coefficients are jointly equal to zero. From a statistical perspective, this indicates that the effect of institutional quality on corporate risk does not differ significantly across industries.

Taken together, these findings reinforce the notion that the negative relationship between institutional quality and corporate risk is a general pattern across industries rather than being driven by specific sectors.

Table 6

Baseline results: OLS estimates (II).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Pol_stab	−1.113*** (0.051)						
Rule_law		−0.947*** (0.036)					
Reg_qual			−0.772*** (0.031)				
Voice_account				−1.661*** (0.063)			
Control_corrupt					−0.761*** (0.029)		
Gov_effec						−0.943*** (0.036)	
WGI_index							−1.036*** (0.039)
Size	0.054*** (0.007)	0.048*** (0.007)	0.049*** (0.007)	0.053*** (0.007)	0.049*** (0.007)	0.048*** (0.007)	0.049*** (0.007)
Lev	0.940*** (0.042)	0.892*** (0.041)	0.897*** (0.042)	0.899*** (0.041)	0.893*** (0.041)	0.899*** (0.041)	0.890*** (0.042)
Capex	−0.396 (0.301)	−0.304 (0.296)	−0.260 (0.298)	−0.401 (0.296)	−0.287 (0.296)	−0.308 (0.297)	−0.292 (0.296)
MtoB	0.003 (0.004)	0.007* (0.004)	0.006 (0.004)	0.006 (0.004)	0.008** (0.004)	0.008** (0.004)	0.008** (0.004)
GDP	−0.016** (0.006)	−0.003 (0.006)	−0.006 (0.006)	−0.015** (0.006)	−0.008 (0.006)	−0.007 (0.006)	−0.006 (0.006)
Inflation	−0.000 (0.003)	0.003 (0.003)	0.002 (0.003)	0.008*** (0.003)	0.002 (0.003)	−0.002 (0.003)	0.002 (0.003)
FDI	−0.060** (0.011)	0.029** (0.012)	−0.008 (0.011)	0.016 (0.011)	0.034*** (0.012)	0.006 (0.011)	0.016 (0.012)
Constant	0.892*** (0.170)	0.873*** (0.167)	1.064*** (0.168)	1.665*** (0.167)	0.781*** (0.168)	0.827*** (0.168)	0.942*** (0.167)
Observations	5856	5856	5856	5856	5856	5856	5856
R-squared	0.297	0.309	0.305	0.310	0.310	0.310	0.310
F test	122.61***	133.34***	130.04***	134.03***	133.22***	132.98***	133.85***

Coefficients (std. errors) from the regressions of WGI dimensions on corporate risk. The dependent variable is the Market risk. The independent variables are the six WGI dimensions (columns 1-6) and the composite index WGI_index (column 7). The firm-level control variables are firm size, leverage, capital expenditures, and market to book. The country-level control variables are GDP growth, inflation, and foreign direct investment. The definitions of all variables are provided in Table 2. We include industry, year, and country-fixed effects in all the models. We adjust the error terms for heteroscedasticity at the company level. Standard errors are displayed in parentheses. F test measures whether the explanatory variables in the model, taken together, have statistically significant explanatory power. Statistical significance at 1%, 5%, and 10% are indicated with ***, **, and *, respectively.

Consistent with institutional theory and the financial constraints channel, stronger institutions reduce uncertainty and improve governance across all sectors, with somewhat larger effects in more financially dependent or regulated industries.

4.3. Additional analyses: endogeneity, MILA membership, and the role of financial constraints

We perform several checks to address potential endogeneity concerns. First, we use the system estimator of the GMM technique to re-estimate our baseline model (see Appendix I for technical estimation details). *Z-score* results are reported in Table 8, while those for *Market risk* appear in Table 9. Estimates confirm that improvements in a country's institutional quality are associated with lower corporate risk, as proxied by both *Z-score* and *Market risk*. Across all specifications, there is no evidence of second-order serial correlation, and the Hansen test supports the validity of the instruments.

We also employ an instrumental variable approach using two-stage least squares (2SLS), with the results presented in Table 10. Our instrument is the country's share of the informal economy (*Informal_econ*), as provided by the World Bank, which is widely used in the literature as a proxy for institutional quality (Elgin & Oztunali, 2014; Gërçxhani & Cichocki, 2023). In contexts where formal institutions are weak or inconsistent, informal economic norms may emerge as substitutes or competitors, creating a measurable contrast. Moreover, research on the shadow economy in emerging markets has linked its magnitude to institutional inefficiencies –such as tax evasion and informal labour

markets– which are often direct consequences of poor governance or regulatory frameworks (Raiser, 2001).

In the first stage of the 2SLS estimation, we regress the *WGI_index* against the exogenous instrument (*Informal_econ*), including all control variables and fixed effects for year, country, and industry (column 1). As expected, the instrument has a significant and negative effect on institutional quality. In the second stage, *Z-score* (column 2) and *Market risk* (column 3) are the dependent variables, with the predicted value of *WGI_index* used as the main independent variable. The results confirm that stronger institutional quality continues to significantly reduce firm-level corporate risk.

To examine whether membership of the MILA moderates the relationship between institutional quality and corporate risk, we estimate equation (6). The results are reported in Table 11.

First, columns 1 (for *Z-score*) and 3 (for *Market risk*) show that being part of the MILA helps to reduce corporate risk, which confirms our H2. In this sense, the MILA creates investment opportunities by providing access to diverse financial instruments, increasing liquidity, and attracting vital foreign capital for member countries' economic growth. By creating a unified regional market, MILA strengthens the bloc's bargaining power in international finance, particularly benefiting smaller economies, while regulatory harmonization and reduced cross-border barriers lower transaction costs and boost efficiency, making it attractive to both institutional and retail investors. Integration also mitigates external shocks by facilitating freer capital flows, reducing volatility and contagion risk while enhancing trading volumes and cross-border transactions, which may encourage firms to adopt more strategic, risk-

Table 7

Baseline results: OLS estimates by industry.

	Basic materials	Consumer cyclicals	Consumer non-cyclicals	Energy	Healthcare	Industrials	Real state	Technology
Panel A: Z score								
WGI_index	−1.073*** (0.330)	−1.205*** (0.333)	−0.484* (0.251)	−3.919*** (0.704)	−1.284*** (0.381)	−1.050** (0.423)	−1.142** (0.481)	−0.411* (0.231)
CONTROLS	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1091	1098	1105	181	160	854	612	755
R-squared	0.153	0.231	0.214	0.466	0.301	0.201	0.203	0.230
F test	9.21***	15.43***	14.01***	6.99***	2.99***	9.94***	7.17***	10.99***
Panel B: Market risk								
WGI_index	−0.012*** (0.001)	−0.011*** (0.001)	−0.010*** (0.001)	−0.016*** (0.003)	−0.011*** (0.002)	−0.012*** (0.001)	−0.008*** (0.001)	−0.008*** (0.001)
CONTROLS	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1091	1098	1105	181	160	854	612	755
R-squared	0.320	0.484	0.418	0.481	0.571	0.432	0.380	0.426
F test	23.91***	48.01***	37.04***	7.41***	9.26***	30.12***	17.22***	27.21***
Panel C: Interaction								
			Z score	Market risk				
WGI_index			−1.151** (0.529)	−0.009*** (0.002)				
WGI_index * Consumer cyclicals			0.827 (0.695)	0.000 (0.002)				
WGI_index * Consumer non-cyclicals			1.172 (0.719)	−0.000 (0.002)				
WGI_index * Energy			−1.038 (1.311)	−0.005 (0.002)				
WGI_index * Healthcare			0.376 (1.801)	−0.003 (0.003)				
WGI_index * Industrials			−0.236 (0.870)	−0.002 (0.002)				
WGI_index * Real state			0.328 (0.837)	−0.001 (0.002)				
WGI_inex * Technology			0.745 (0.809)	0.001 (0.002)				
CONTROLS			YES	YES				
Observations			5856	5856				
R-squared			0.178	0.393				
F test			13.44***	50.55***				
Wald F-test			0.85	1.66				

Coefficients (std. errors) from the OLS regressions of WGI dimensions on corporate risk by industries. The independent variable is the composite index WGI_index. The firm-level control variables are firm size, leverage, capital expenditures, and market to book. The country-level control variables are GDP growth, inflation, and foreign direct investment. The definitions of all variables are provided in Table 2. We include industry, year, and country-fixed effects in all the models. We adjust the error terms for heteroscedasticity at the company level. Standard errors are displayed in parentheses. F test measures whether the explanatory variables in the model, taken together, have statistically significant explanatory power. The Wald F-test of joint significance tests whether all specified coefficients in the interaction terms are simultaneously equal to zero. Statistical significance at 1%, 5%, and 10% are indicated with ***, **, and *, respectively.

oriented decisions (Heller, 2024). In columns 2 and 4, we test the moderating effect of MILA membership; that is, the extent to which institutional quality has an additional impact –either positive or negative– in MILA countries. Since the coefficient of the interaction term ($WGI_index * MILA$) is not statistically significant, we conclude that MILA membership has a direct effect on corporate risk, although this effect is not moderated by institutional quality.

To analyse the extent to which MILA membership affects corporate risk, we conduct a PSM analysis, with the results reported in Table 12 (See Appendix II for technical estimation details). Firms are divided into two subsamples based on whether or not their country is a member of the MILA. Companies from MILA countries constitute the treatment group, while the remaining firms form the control group. A binary indicator variable – $MILA$ – is created, taking the value of 1 for firms located in MILA member countries, and 0 otherwise. Propensity scores are estimated using a logistic regression in which $MILA$ is the dependent variable. The model includes all control variables from the main specification, as well as year and industry fixed effects, in order to estimate the likelihood of a firm being in the treatment group. Matching is performed using a calliper of 0.001, ensuring that each treated observation is matched to a control observation without replacement. Following the methodology proposed by Shipman et al. (2017), we conduct a

regression analysis using the matched sample. Presented in Panel A of Table 11, the results are consistent with our previous findings; i.e., Latin American market integration helps to significantly reduce firm-level corporate risk. Panel B reports the average treatment effects on the treated (ATT); if all firms were located in MILA countries, the average Z -score would be 0.646 points lower, and $Market_risk$ would be 1.012 points lower, compared to a scenario in which all firms were in non-MILA countries.

The results reported in Table 12 raise questions concerning the relevance of the MILA in the presence of strong institutional frameworks and under what circumstances integrated markets may influence corporate risk. To explore this issue further, we incorporate firm-level financial constraints into the analysis. Specifically, we divide the sample into two groups based on the median values of the KZ_index and HP_index . We then estimate equation (6). Results are reported in Table 13.

While MILA membership continues to exert a clear and significant direct effect on corporate risk –regardless of financial constraints– an intriguing moderating effect emerges depending on the severity of those constraints. The coefficient of the interaction term ($WGI_index * MILA$) is statistically significant in the two rightmost columns of both panels in Table 12 (i.e., for firms facing greater financial constraints), but not

Table 8
GMM estimations (I).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Pol_stab	−1.509* (0.903)						
Rule_law		−1.645* (0.924)					
Reg_qual			−1.610** (0.788)				
Voice_account				−2.179* (1.184)			
Control_corrup					−2.037* (1.075)		
Gov_effec						−1.235** (0.586)	
WGI_index							−2.727* (1.434)
Size	1.767** (0.836)	2.595*** (0.803)	1.923** (0.845)	0.821* (0.494)	2.675*** (0.843)	1.506*** (0.552)	2.028** (0.824)
Lev	18.273*** (4.745)	11.410*** (3.237)	18.338*** (4.692)	5.065*** (1.462)	22.269*** (5.217)	16.069*** (3.644)	19.272*** (4.817)
Capex	9.875 (15.416)	11.893 (9.987)	15.165 (15.184)	−35.002*** (15.023)	−4.855 (18.317)	4.639 (9.048)	8.424 (12.741)
MtoB	−0.563** (0.264)	−0.403* (0.222)	−0.312 (0.281)	−0.191 (0.178)	−0.451 (0.290)	−0.219 (0.180)	−0.270 (0.276)
GDP	−0.001 (0.027)	−0.018 (0.021)	−0.044 (0.028)	−0.064*** (0.024)	−0.055* (0.029)	−0.028 (0.019)	−0.024 (0.024)
Inflation	0.052*** (0.017)	0.038*** (0.013)	0.047*** (0.017)	0.0192 (0.018)	0.065*** (0.018)	0.047*** (0.014)	0.058*** (0.016)
FDI	−0.062 (0.131)	−0.038 (0.110)	−0.110 (0.136)	0.089 (0.095)	−0.088 (0.092)	−0.040 (0.097)	−0.076 (0.127)
Constant	−56.701*** (21.287)	−91.862*** (21.014)	−61.572*** (20.901)	−19.701 (9.313)	−83.526*** (21.844)	−50.420*** (13.764)	−65.970*** (21.046)
Observations	5856	5856	5856	5856	5856	5856	5856
Wald Test (d.f.)	91.83*** (28)	103.54*** (28)	110.56*** (28)	319.27*** (28)	105.03*** (28)	205.61*** (28)	101.37*** (28)
m ₂	−0.93	0.37	−1.02	−1.29	−1.19	0.15	−1.01
Hansen Test (d.f.)	20.30 (32)	35.74 (32)	19.57 (32)	30.08 (32)	22.02 (32)	29.42 (32)	21.71 (32)

Coefficients (std. errors) from the GMM estimations of WGI dimensions on corporate risk. The dependent variable is the Z score. The independent variables are the six WGI dimensions (columns 1–6) and the composite index WGI index (column 7). The firm-level control variables are firm size, leverage, capital expenditures, and market to book. The country-level control variables are GDP growth, inflation, and foreign direct investment. The definitions of all variables are provided in Table 2. We include industry, year, and country-fixed effects in all the models. We adjust the error terms for heteroscedasticity at the company level. Standard errors are displayed in parentheses. Statistical significance at 1%, 5%, and 10% are indicated with ***, **, and *, respectively. The Wald test is for the joint significance of the independent variables, the m₂ test is for the lack of second order serial correlation, and the Hansen test is for the validity of the instruments.

significant in the first two columns (i.e., for firms with fewer financial constraints). Consequently, the moderating effect of a country's MILA membership on the relationship between corporate risk and institutional strength depends on the degree of financial constraints and is significant only for firms operating under tighter financial constraints. Specifically, the firms that benefit most from financial integration through MILA are those most affected by financial constraints. Since investment, cash management, and risk profiles in such firms are disproportionately sensitive to external financing conditions (Kabbach-de-Castro et al., 2023), the reduction in corporate risk associated with stronger institutional quality is amplified by MILA's role in expanding the investor base, thus enhancing liquidity, and lowering the cost of capital (Delgado-Domonkos & Zeng, 2023; Espinosa-Méndez et al., 2017). MILA membership therefore has a dual effect: a direct negative impact on corporate risk, and an indirect negative impact on firms most tightly constrained by financial frictions.

5. Conclusion

While prior research has explored the influence of institutional quality on corporate governance and investment decisions in more developed countries, the mechanisms through which a country's institutional environment affects corporate risk in emerging markets remain insufficiently understood. In this study, we analyse a sample of 725 firms from nine Latin American countries over the period 2013–2022 and find that firms operating in countries with stronger formal institutions –measured using the World Bank's Worldwide Governance Indicators–

exhibit lower levels of corporate risk. These results are robust to the use of a composite index of institutional quality and a range of econometric techniques. Furthermore, we find that international integration –in the form of participation in the MILA stock exchange network– helps to reduce corporate risk. However, the positive role of the MILA in mitigating risk in the presence of strong country formal institutions is only relevant among firms facing financial constraints.

Our findings offer several important practical implications for both policymakers and firm managers. For policymakers, the results highlight the importance of strengthening formal institutions to reduce corporate risk and enhance financial stability. This can be achieved through several concrete actions such as improving the enforcement of legal frameworks, particularly in areas related to contract enforcement, investor protection, and anti-corruption measures, increasing transparency and accountability in public institutions, for instance through digitalization of administrative processes and enhanced disclosure standards, promoting financial inclusion by expanding access to credit, especially for smaller and financially constrained firms, by developing credit registries, alternative financing channels, and more efficient banking systems, and by fostering capital market development and regional financial integration initiatives –like the MILA– to improve market liquidity, diversifying funding sources, and reducing dependence on domestic financing. For corporate managers, the findings suggest that risk management strategies should be aligned with the institutional environment. Firms operating in weaker institutional contexts may need to adopt more conservative financial policies and strengthen internal governance mechanisms, while those in stronger

Table 9
GMM estimations (II).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Pol_stab	−0.500*** (0.098)						
Rule_law		−1.340** (0.604)					
Reg_qual			−1.310*** (0.589)				
Voice_account				−1.469* (0.871)			
Control_corrup					−1.214* (0.674)		
Gov_effec						−1.010*** (0.488)	
WGI_index							−2.017** (1.081)
Size	−0.539** (0.215)	−0.205 (0.589)	−0.428 (0.426)	−0.767** (0.366)	−1.945*** (0.534)	−0.723 (0.468)	−1.702*** (0.512)
Lev	4.179*** (1.013)	1.081 (0.820)	4.052*** (1.042)	4.264*** (1.500)	0.892 (1.054)	2.696* (1.584)	0.450 (1.063)
Capex	2.197 (6.681)	9.820 (6.157)	−4.286 (5.352)	−4.894 (5.364)	−2.064 (4.184)	−1.095 (6.059)	−0.409 (4.054)
MtoB	0.080 (0.105)	−0.071 (0.143)	0.078 (0.098)	0.037 (0.093)	0.064 (0.078)	0.081 (0.103)	0.041 (0.078)
GDP	0.039*** (0.014)	0.033*** (0.012)	0.028*** (0.009)	0.035*** (0.011)	0.026*** (0.009)	0.054*** (0.009)	0.026*** (0.009)
Inflation	−0.019 (0.020)	−0.041** (0.019)	−0.037 (0.027)	−0.010 (0.013)	−0.004 (0.012)	−0.041*** (0.013)	−0.010 (0.012)
FDI	−0.038 (0.074)	−0.069 (0.056)	−0.052 (0.063)	−0.033 (0.045)	−0.058 (0.039)	−0.049* (0.039)	−0.144*** (0.047)
Constant	11.037 (12.959)	−8.641 (13.103)	14.148 (13.864)	16.063 (10.628)	31.912** (13.713)	12.733 (12.221)	27.321** (12.604)
Observations	5856	5856	5856	5856	5856	5856	5856
Wald Test (d.f.)	224.60*** (27)	194.02*** (27)	2524.23*** (27)	236.31*** (27)	337.10*** (27)	2552.68*** (27)	337.80*** (27)
m ₂	−0.96	−0.72	−0.68	−1.14	0.28	−1.02	0.59
Hansen Test (d.f.)	26.66 (36)	40.39 (36)	42.27 (36)	35.92 (36)	37.49 (36)	45.35 (36)	38.75 (36)

Coefficients (std. errors) from the GMM estimations of WGI dimensions on corporate risk. The dependent variable is Market risk. The independent variables are the six WGI dimensions (columns 1–6) and the composite index WGI_index (column 7). The firm-level control variables are firm size, leverage, capital expenditures, and market to book. The country-level control variables are GDP growth, inflation, and foreign direct investment. The definitions of all variables are provided in Table 2. We include industry, year, and country-fixed effects in all the models. We adjust the error terms for heteroscedasticity at the company level. Standard errors are displayed in parentheses. Statistical significance at 1%, 5%, and 10% are indicated with ***, **, and *, respectively. The Wald test is for the joint significance of the independent variables, the m₂ test is for the lack of second order serial correlation, and the Hansen test is for the validity of the instruments.

Table 10
Instrumental variable estimations.

	First stage (Dep. var.: WGI_index)	Second stage Z score	Second stage Market risk
Informal_econ	−0.025*** (0.000)		
WGI_index		−0.658*** (0.209)	−10.601*** (4.111)
Size	0.000 (0.001)	−0.025*** (0.016)	0.110*** (0.001)
Lev	−0.005 (0.005)	3.206*** (0.161)	1.209*** (0.202)
Capex	−0.004 (0.037)	−5.313*** (1.140)	−0.345 (1.084)
MtoB	0.003*** (0.001)	−0.658*** (0.209)	−0.304** (0.103)
GDP	−0.008*** (0.001)	−0.066*** (0.024)	−0.211*** (0.103)
Inflation	0.010*** (0.000)	0.034*** (0.012)	0.157** (0.001)
FDI	0.029*** (0.001)	0.081* (0.047)	1.507*** (0.602)
Constant	1.307*** (0.024)	2.156*** (0.626)	−6.110** (2.410)
Observations	5856	5856	5856
F-stat	3277.77***		
R-squared	0.94	0.17	0.31
Wald Test (d. f.)		1226.80*** (28)	2666.07*** (28)

Coefficients (std. errors) from the IV estimations of the WGI index on corporate risk. The dependent variables are *Zscore* (column 2) and *Market risk* (column 3). The independent variable is the IV estimation of the WGI index using the variable percentage of informal economy in the first stage estimation (column 1). The firm-level control variables are firm size, leverage, capital expenditures, and market to book. The country-level control variables are GDP growth, inflation, and foreign direct investment. The definitions of all variables are provided in Table 2. We include industry, year, and country-fixed effects in all the models. We adjust the error terms for heteroscedasticity at the company level. Robust t-statistics are displayed in parentheses. Statistical significance at 1%, 5%, and 10% are indicated with ***, **, and *, respectively. The F-stat test is for the validity of the first stage estimation, and the Wald test is for the joint significance of the independent variables.

institutional settings can better leverage improved access to external financing to undertake value-enhancing investments. Overall, coordinated improvements in institutional quality and financial inclusion can support more efficient risk-taking and contribute to sustainable economic growth.

Our results also highlight the importance of firm-level factors, such as financial constraints. Improving institutional quality alone may not be sufficient to promote better risk management in the firms in the region. Reducing financial barriers by improving access to credit, increasing financial market transparency, and fostering financial inclusion can help firms implement more effective risk strategies. In addition, targeted interventions such as government-backed loans, the development of venture capital networks, and initiatives to enhance financial literacy are vital to alleviating financial constraints. These efforts would allow firms to take full advantage of institutional improvements and pursue more ambitious, growth-oriented risk strategies, thereby ultimately fostering innovation and economic progress in the region.

Our study does evidence several limitations that open up promising avenues for future research. First, the measurement of institutional quality relies on perception-based indicators from the Worldwide Governance Indicators which, although widely used, may not fully capture the complexity or informal dimensions of institutional environments. Second, despite incorporating a comprehensive set of firm-level and macroeconomic controls, unobserved factors, such as firm-specific governance practices or country-specific regulatory nuances,

Table 11
MILA membership effect.

	Zscore	Market_risk		
MILA	−0.472*** (0.115)	−0.495*** (0.138)	−1.101*** (0.036)	−0.967*** (0.035)
WGI_index		0.207 (0.435)		−0.697*** (0.112)
WGI_index * MILA		−0.517 (0.447)		0.629 (0.615)
Size	−0.375*** (0.027)	−0.383*** (0.027)	0.046*** (0.006)	0.047*** (0.007)
Lev	3.160*** (0.161)	3.156*** (0.161)	0.8140*** (0.038)	0.884*** (0.041)
Capex	−5.400*** (1.144)	−5.454*** (1.144)	−0.214 (0.327)	−0.326 (0.295)
MtoB	−0.043*** (0.015)	−0.037** (0.015)	0.009** (0.003)	0.009** (0.004)
GDP	−0.043* (0.023)	−0.043* (0.023)	−0.005 (0.006)	−0.006 (0.006)
Inflation	0.030*** (0.005)	0.032*** (0.005)	0.003*** (0.001)	0.003*** (0.001)
FDI	0.031 (0.0034)	0.089** (0.044)	0.003 (0.012)	0.002 (0.011)
Constant	3.026*** (0.635)	2.996*** (0.648)	1.411*** (0.211)	1.154*** (0.167)
Observations	5.856	5856	5856	5856
R-squared	0.17	0.17	0.39	0.40
F test	42.60***	42.73***	143.27***	146.66***

Coefficients (std. errors) from the regressions of WGI_index, MILA, and their interaction on corporate risk. The dependent variables are the Z score (columns 1 and 2) and the Market risk (column 3 and 4). The firm-level control variables are firm size, leverage, capital expenditures, and market to book. The country-level control variables are GDP growth, inflation, and foreign direct investment. The definitions of all variables are provided in Table 2. We include industry, year, and country-fixed effects in all the models. We adjust the error terms for heteroscedasticity at the company level. Standard errors are displayed in parentheses. F test measures whether the explanatory variables in the model, taken together, have statistically significant explanatory power. Statistical significance at 1%, 5%, and 10% are indicated with ***, **, and *, respectively.

Table 12
Propensity score matching. MILA membership effect.

Panel A. Regression results		
WGI_index	Z score	Market Risk
	−1.378*** (0.091)	−1.480** (0.089)
Controls	Yes	Yes
Industry fixed effects	Yes	Yes
Time fixed effects	Yes	Yes
Country fixed effects	No	No
Observations	5856	5856
Pseudo R squared	0.506	0.496
Panel B. psmatch significance		
	Coef.	p-value
Z_score	−0.646 (0.117)	−5.54***
Market_risk	−1.012 (0.214)	−4.72***

This table displays the findings from the propensity score matched sample. Panel A reports the results from the regression analysis, being the dependent variables Z score (column 1) and the Market risk (column 2). Panel B reports the average treatment effect from observational data by propensity score matching. The firm-level control variables are firm size, leverage, capital expenditures, and market to book. The country-level control variables are GDP growth, inflation, and foreign direct investment. The definitions of all variables are provided in Table 2. Standard errors are displayed in parentheses. Statistical significance at 1%, 5%, and 10% are indicated with ***, **, and *, respectively.

Table 13
Moderating role of firm financial constraints.

Panel A. KZ_index				
	Low Financial Constraints		High Financial Constraints	
	Z score	Market risk	Z score	Market risk
MILA	−1.354*** (0.400)	−0.918*** (0.091)	−0.241*** (0.055)	−0.971*** (0.041)
WGI_index	−2.509* (1.383)	−0.525* (0.260)	−0.300*** (0.057)	−0.712*** (0.122)
WGI_index * MILA	−3.069 (2.615)	0.257 (0.367)	−0.332*** (0.071)	−0.694*** (0.126)
CONTROLS	YES	YES	YES	YES
Observations	1465	1465	5856	4391
R-squared	0.16	0.45	0.21	0.39
F test	10.35***	46.23***	40.30***	106.44***

Panel B. HP_index				
	Low Financial Constraints		High Financial Constraints	
	Z score	Market risk	Z score	Market risk
MILA	−1.172*** (0.323)	−0.975*** (0.125)	−0.375** (0.153)	−0.915*** (0.036)
WGI_index	1.008*** (0.175)	−1.280*** (0.453)	−0.203*** (0.047)	−0.629*** (0.110)
WGI_index * MILA	−1.008 (1.215)	1.121 (0.969)	−0.154* (0.083)	−0.567*** (0.113)
CONTROLS	YES	YES	YES	YES
Observations	1214	1214	5856	4642
R-squared	0.23	0.48	0.21	0.38
F test	13.88***	42.24***	30.86***	107.25***

Coefficients (std. errors) from the regressions of WGI_index, MILA, and their interaction on corporate risk by firm-level median of financial constraints (KZ_index in Panel A and HP_index in Panel B). The firm-level control variables are firm size, leverage, capital expenditures, and market to book. The country-level control variables are GDP growth, inflation, and foreign direct investment. The definitions of all variables are provided in Table 2. We include industry, year, and country-fixed effects in all the models. We adjust the error terms for heteroscedasticity at the company level. Standard errors are displayed in parentheses. F test measures whether the explanatory variables in the model, taken together, have statistically significant explanatory power. Statistical significance at 1%, 5%, and 10% are indicated with ***, **, and *, respectively.

may still influence corporate risk. Finally, our analysis focuses exclusively on Latin American countries and does not include benchmark economies such as the United States. While this allows for a more in-depth examination of institutional heterogeneity within the region, future research could extend the analysis by incorporating developed markets to provide a direct cross-regional comparison.

Future research could address these limitations by incorporating alternative and more granular measures of institutional quality, as well as explicitly accounting for the role of informal institutions. In addition, it would be valuable to further examine firm-level heterogeneity by exploring how institutional frameworks interact with corporate governance characteristics, such as ownership structure or board composition, and with firms' international exposure. Additional avenues include analysing the potential complementarity or substitutability between formal and informal institutions, as well as the long-term effects of institutional reforms. Finally, given the dual nature of corporate risk, future studies could assess how firms optimize the risk-return trade-off within different institutional settings. These extensions would contribute to a more comprehensive understanding of how institutional quality shapes corporate risk and supports sustainable economic development in emerging markets.

Declaration of competing interest

The authors declare that they have no known financial or personal relationships with any individuals or organizations that could

inappropriately influence, or be perceived to influence, the work reported in this paper.

Appendix I. System GMM estimation details

This appendix provides additional details on the implementation of the system GMM estimator used in Tables 8 and 9. We estimate a two-step system GMM model to address potential endogeneity concerns. Following standard practice, selected variables (GDP, Inflation, Leverage and Size) are treated as endogenous and instrumented using their lagged values (lags 4 to 6). The remaining variables are treated as exogenous and included as standard instruments. In the differenced equation, lagged levels are used as instruments, while lagged differences are employed in the level equation.

The number of instruments (61) is kept below the number of cross-sectional units (725), mitigating concerns related to instrument proliferation. Alternative specifications using a larger instrument set lead to a deterioration in diagnostic tests, reinforcing the importance of restricting the instrument count.

The Arellano-Bond tests indicate no evidence of second-order serial correlation, supporting the validity of the model specification. The Hansen test of over-identifying restrictions consistently fails to reject the null hypothesis, suggesting that the instruments are valid, although results should be interpreted with caution given the potential weakening of the test in the presence of multiple instruments.

Appendix II. Propensity Score Matching (PSM) estimation details

This appendix provides detailed information on the propensity score matching (PSM) estimations reported in Table 12.

A. Propensity score specification

The propensity score is estimated using a probit model in psmatch2, where the treatment variable is MILA. The specification includes firm-level characteristics (Size, Lev, Capex, MtoB), macroeconomic variables (GDP, Inflation, FDI), and institutional quality (WGI), along with sector (S1–S8) and year fixed effects (Y2013–Y2022).

The model exhibits strong explanatory power ($LR \chi^2 = 4094.66$, $p < 0.001$; pseudo $R^2 = 0.506$), indicating that the selected covariates effectively explain treatment assignment. As a robustness check, an alternative specification excluding sectoral and time dummies is estimated, yielding consistent results (pseudo $R^2 = 0.418$).

B. Matching procedure and sample characteristics

Matching is implemented using nearest-neighbour propensity score matching (one-to-one). The estimation is conducted on a balanced panel of 5856 observations, comprising 3102 treated firms and 2754 control firms. The common support condition is satisfied for all observations, ensuring comparability between treated and untreated groups.

C. Treatment effects

Before matching, treated firms exhibit substantially higher Z score than control firms (difference = 1.933, $t = 10.25$), indicating strong initial imbalance. After matching, the average treatment effect on the treated (ATT) decreases to 0.821 and becomes statistically insignificant ($t = 0.78$), suggesting that observable differences largely explain the pre-matching gap.

In contrast, the average treatment effect (ATE), estimated using *teffects*, is negative and statistically significant (-0.646 , $z = -5.54$, $p < 0.01$), indicating that MILA participation is associated with a reduction in Z score at the population level.

For Market risk, treated firms initially display lower values than

controls (difference = -0.01496 , $t = -37.33$). After matching, the ATT remains negative and statistically significant (-0.0067 , $t = -2.70$), indicating that MILA participation reduces Market risk among treated firms.

The ATE confirms this result, showing a negative and highly significant effect (-0.0126 , $z = -21.56$, $p < 0.01$), consistent with a robust reduction in Market risk across the full sample.

D. Covariate balance diagnostics

Covariate balance improves following the matching procedure, although not perfectly. The pseudo R^2 decreases from 0.506 before matching to 0.196 after matching, and the mean standardized bias is reduced from approximately 20.0 to 17.6. However, some imbalance persists, as reflected in relatively high Rubin's B statistics and variance ratios outside the recommended range for certain variables.

At the variable level, balance improves for several covariates (e.g., inflation and WGI), while others (notably MtoB, GDP, and some sectoral indicators) remain partially imbalanced. These results suggest that matching substantially reduces, but does not fully eliminate, observable differences between treated and control groups.

E. Methodological considerations

Standard errors reported by psmatch2 do not account for the estimation of the propensity score and should therefore be interpreted with caution. To address this issue, ATE estimates are additionally obtained using *teffects*, which provides analytically robust standard errors.

Overall, the PSM results indicate that MILA participation has a consistent and statistically significant negative effect on Market risk, while the evidence for Z score is less robust and sensitive to model specification.

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