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Corporate Leverage and Interest Rate Sensitivity in Dollarized vs. Non-Dollarized Economies: Evidence from Latin America

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Zusammenfassung

Diese Arbeit untersucht, wie die Wahl des Währungsregimes Kapitalstrukturentscheidungen von Unternehmen beeinflusst, indem sie analysiert, ob Unternehmen in vollständig dollarisierten Volkswirtschaften anders auf Zinsänderungen reagieren als Unternehmen in Ländern mit unabhängiger Geldpolitik. Anhand eines ausgewogenen Panels von 471 nichtfinanziellen Unternehmen aus sechs lateinamerikanischen Ländern über den Zeitraum 2015–2024 verwendet die Studie Firmen- und Zeitfixeffektmodelle mit einem Residualisierungsansatz zur Bewältigung von Multikollinearität zwischen inländischen und US-Zinssätzen.

Die Ergebnisse liefern starke Unterstützung für beide Hypothesen, dass Dollarisierung die Zins-Verschuldungs-Beziehung grundlegend moderiert. Erstens zeigen dollarisierte Unternehmen eine signifikant verstärkte Sensitivität gegenüber US-Zinsänderungen ($\beta_5 = -0{,}905$, $p = 0{,}001$). Ein Anstieg der US-Zinsen um einen Prozentpunkt führt dazu, dass dollarisierte Unternehmen ihre Verschuldung um etwa 0,91 Prozentpunkte stärker reduzieren als nicht-dollarisierte Unternehmen. Bemerkenswert ist, dass ecuadorianische Unternehmen aggressiver auf US-Zinsänderungen reagieren ($-1{,}168$, $p < 0{,}001$) als tatsächliche US-Unternehmen ($-0{,}178$, nicht signifikant), was zeigt, dass Dollarisierung verstärkte Reaktionen erzeugt, die über die im Ankerwährungsland selbst beobachteten hinausgehen. Zweitens weisen dollarisierte Unternehmen eine signifikant verstärkte Sensitivität gegenüber unabhängigen inländischen Zinsänderungen auf ($\beta_4 = -2{,}204$, $p < 0{,}001$), mit einem großen negativen Gesamteffekt ($-1{,}794$), der ihre erhöhte Anfälligkeit gegenüber inländischen Kreditbedingungen ohne Zentralbank-Sicherheitsnetze widerspiegelt.

Die Ergebnisse sind robust über mehrere Spezifikationen hinweg und zeigen substantielle länderübergreifende Heterogenität bei nicht-dollarisierten Volkswirtschaften. Diese Befunde tragen zur Kapitalstrukturliteratur bei, indem sie zeigen, dass institutionelle Faktoren als grundlegende Moderatoren und nicht als bloße Niveauverschieber wirken, und informieren Politikdebatten durch die Quantifizierung von Finanzierungsverwundbarkeiten, die durch den Verzicht auf geldpolitische Autonomie entstehen. Die Studie legt nahe, dass die Kosten der Dollarisierung über den Verlust politischer Flexibilität hinausgehen und verstärkte Finanzierungsvolatilität sowie Abhängigkeit von ausländischen Währungszyklen einschließen.

Abstract

This thesis examines how currency regime choice affects corporate capital structure decisions by investigating whether firms in fully dollarized economies respond differently to interest rate changes compared to firms in countries with independent monetary policy. Using a balanced panel of 471 non-financial firms from six Latin American countries over 2015–2024, the study employs firm and time fixed effects models with a residualization approach to address multicollinearity between domestic and US interest rates.

The findings provide strong support for both hypotheses that dollarization fundamentally moderates the interest rate-leverage relationship. First, dollarized firms exhibit significantly amplified sensitivity to US interest rate changes ($\beta_5 = -0.905$, $p = 0.001$). A one percentage point increase in US rates leads dollarized firms to reduce leverage by approximately 0.91 percentage points more than non-dollarized firms. Strikingly, Ecuadorian firms respond more aggressively to US rate changes (-1.168, $p < 0.001$) than actual US firms (-0.178, not significant), demonstrating that dollarization creates amplified responses beyond those observed in the anchor currency country itself. Second, dollarized firms show significantly amplified sensitivity to independent domestic interest rate changes ($\beta_4 = -2.204$, $p < 0.001$), with a large negative total effect (-1.794) reflecting their heightened vulnerability to domestic credit conditions without central bank backstops.

The results are robust across multiple specifications and reveal substantial cross-country heterogeneity among non-dollarized economies. These findings contribute to capital structure literature by demonstrating that institutional factors operate as fundamental moderators rather than mere level shifters, and inform policy debates by quantifying corporate financing vulnerabilities created by surrendering monetary policy autonomy. The study suggests that dollarization's costs extend beyond loss of policy flexibility to include amplified corporate financing volatility and dependence on foreign monetary cycles.

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Chapter 1

Introduction

Dollarization represents one of the most extreme forms of monetary policy commitment available to sovereign nations. When a country adopts the US dollar as its official currency, it gains exchange rate stability and inflation credibility, but surrenders its ability to conduct independent monetary policy. Ecuador (2000) and Panama (1904) adopted full dollarization, effectively delegating their monetary policy to the US Federal Reserve. This institutional arrangement raises a fundamental question for corporate finance: does the loss of monetary policy autonomy affect how corporations respond to changes in commercial lending rates?

This study examines whether dollarization moderates the relationship between commercial lending rates and corporate leverage in Latin American economies. The research question is motivated by a tension in the literature. On one hand, decades of capital structure research demonstrate that borrowing costs significantly affect corporate debt decisions (Korajczyk and Levy, 2003). Higher commercial lending rates increase the cost of debt, leading firms to reduce leverage. On the other hand, institutional factors such as legal systems, financial development, and tax regimes shape capital structure decisions across countries (Booth et al., 2001; Öztekin, 2015). Currency regime represents a particularly strong institutional constraint, yet its role in moderating the transmission of lending rate changes to corporate leverage has not been explicitly tested.

The core empirical question is straightforward: do firms in dollarized economies respond differently to changes in commercial lending rates compared to firms in non-dollarized economies? The analysis tests two hypotheses. First, dollarized firms should exhibit stronger negative sensitivity to domestic commercial lending rates. Without independent monetary policy, firms lack central bank backstops when domestic credit conditions deteriorate, leading to amplified defensive deleveraging. Second, dollarized firms should show amplified sensitivity to US commercial lending rates. When a country uses the US dollar, US monetary conditions directly affect commercial lending rates without any domestic policy buffer, creating stronger effects on corporate leverage.

These hypotheses are tested using panel data with explicit interaction terms between

interest rates and currency regime, allowing the analysis to test whether dollarization moderates the interest rate-leverage relationship. The sample consists of 471 firms across six Latin American countries observed from 2015 to 2024, yielding a balanced panel of 4,710 firm-year observations. The dollarized economies are Ecuador (101 firms) and Panama (40 firms). The non-dollarized comparators are Chile (100 firms), Colombia (50 firms), Peru (80 firms), and Brazil (100 firms). Financial data were obtained from Capital IQ Pro and regulatory filings, while interest rate data come from central bank statistics and Federal Reserve sources.

To address multicollinearity between domestic and US interest rates, the analysis employs a residualization approach that decomposes domestic rates into components orthogonal to US rates. The main specification uses two-way fixed effects regression with firm and year fixed effects, controlling for time-invariant firm characteristics and common shocks. The key feature is the inclusion of interaction terms between commercial lending rates and a dollarization indicator, testing whether dollarization moderates the effect of lending rate changes on corporate leverage.

The results support both hypotheses. The coefficient on the interaction between residualized domestic lending rates and dollarization is -2.204 with a standard error of 0.260 ($t = -8.47$, $p < 0.001$), confirming that dollarized firms show amplified negative sensitivity to independent domestic rate changes. The combined effect for dollarized firms is -1.794, meaning that when domestic lending rates rise independently of US conditions, dollarized firms reduce leverage significantly. The coefficient on the interaction between US rates and dollarization is -0.905 with a standard error of 0.140 ($t = -6.44$, $p = 0.001$), confirming that dollarized firms show amplified sensitivity to US rate changes. Country-level analysis reveals that Ecuadorian firms respond more strongly to US rates ($\beta = -1.168$, $p < 0.001$) than US firms themselves, demonstrating that dollarization creates amplified responses beyond those observed in the anchor currency country.

These findings have important implications. For capital structure theory, the results demonstrate that currency regime operates as a fundamental moderator that alters how firms respond to borrowing costs, not merely as a level shifter. For policymakers in dollarized economies, the evidence quantifies the corporate financing costs of surrendering monetary policy autonomy: firms face direct exposure to US monetary cycles without domestic policy buffers. For corporate financial managers and investors, the results indicate that dollarized firms require different analytical frameworks than firms in economies with independent monetary policy.

The remainder of this thesis proceeds as follows. Chapter 2 reviews the capital structure literature, focusing on cross-country empirical studies and the role of macroeconomic conditions. Chapter 3 develops the theoretical framework linking currency regimes to interest rate transmission and formalizes the hypotheses. Chapter 4 describes the sample construction, variable definitions, and econometric methodology. Chapter 5 presents

the main regression results and hypothesis tests. Chapter 6 interprets the findings and discusses their economic significance. Chapter 7 concludes.

Chapter 2

Literature Review

This chapter reviews the capital structure literature relevant to understanding how currency regimes might affect the relationship between commercial lending rates and corporate leverage. The review focuses on cross-country empirical studies that examine institutional determinants of capital structure and the role of macroeconomic conditions in corporate financing decisions. The chapter first provides brief theoretical context, then examines four seminal empirical contributions, and concludes by identifying the research gap this study addresses.

2.1 Theoretical Background

The empirical capital structure literature builds on two dominant theoretical frameworks: Trade-off Theory, which posits that firms balance tax benefits of debt against bankruptcy costs, and Pecking Order Theory, which argues that information asymmetry creates a financing hierarchy favoring internal funds over external debt. Both theories provide insights on how interest rates and companies borrowing costs interact with each other, though the mechanisms and strength of predictions differ. Chapter 3 develops these theoretical foundations in detail to motivate the specific hypotheses tested in this study. This chapter focuses on the empirical evidence from cross-country capital structure research.

2.2 Cross-Country Determinants of Capital Structure

The foundational cross-country capital structure study is Rajan and Zingales (1995). Using data from the G-7 countries, they examine whether the same factors that explain leverage in the United States also operate in other developed economies. They identify four key determinants: firm size, profitability, tangibility of assets, and growth opportunities. Larger firms and firms with more tangible assets exhibit higher leverage. More

profitable firms and firms with greater growth opportunities show lower leverage. These relationships hold across all seven countries in their sample.

The critical finding from Rajan and Zingales (1995) is that while the same factors operate across countries, their magnitudes differ substantially. Tangibility has a much stronger effect on leverage in Germany and the United Kingdom than in the United States. Profitability shows varying effects across countries. These cross-country differences suggest that institutional context matters for capital structure, though Rajan and Zingales do not identify which specific institutional features drive the differences. Their empirical approach uses cross-sectional ordinary least squares regressions, which limits their ability to control for unobserved firm heterogeneity or examine how institutional factors moderate the effects of firm-level determinants.

Booth et al. (2001) extend the Rajan and Zingales framework to developing countries. They assemble data from ten developing economies across Asia, Latin America, Africa, and Europe. The same four determinants identified by Rajan and Zingales remain significant in developing markets, but the magnitudes and even signs of some effects differ from developed country patterns. More importantly, Booth and colleagues find that country-specific institutional factors play a substantial role in explaining leverage differences. Legal systems, financial market development, and tax regimes all affect capital structure decisions.

The methodological contribution of Booth et al. (2001) is the use of panel data with country dummy variables. This allows them to control for time-invariant country differences. However, the country dummies capture all country-level variation in a single coefficient. The approach cannot identify which specific institutional features matter or test whether institutional factors moderate the effects of firm-level or macroeconomic variables. Despite this limitation, the study establishes that institutional context fundamentally shapes capital structure in developing economies, making it directly relevant for understanding Latin American firms.

The study that most directly motivates the current analysis is Korajczyk and Levy (2003). They explicitly incorporate macroeconomic conditions into capital structure models, testing whether business cycle variables and financial market conditions affect corporate leverage. Their key innovation is including interest rates as a determinant of capital structure alongside traditional firm-level factors. Using US data from 1984 to 1998, they find that interest rates significantly affect leverage decisions. When interest rates rise, firms reduce leverage. The effect is stronger for financially constrained firms than for unconstrained firms.

Methodologically, Korajczyk and Levy (2003) employ firm fixed effects regressions. The firm fixed effects absorb all time-invariant firm characteristics, allowing cleaner identification of how macroeconomic conditions affect financing decisions within firms over time. This represents a substantial advance over the cross-sectional methods used by

Rajan and Zingales. However, Korajczyk and Levy analyze only US firms. Their framework does not test whether the interest rate-leverage relationship varies across different institutional settings or currency regimes. They estimate a single interest rate coefficient that applies to all firms in their sample, implicitly assuming that the relationship is the same for all firms and stable across different policy environments.

Öztekin (2015) provides the most comprehensive recent analysis of institutional determinants of capital structure. Using data from 37 countries over 1991 to 2006, he examines how legal systems, creditor rights, information environments, and tax regimes affect leverage. The study confirms that institutional quality matters enormously. Firms in countries with stronger legal systems and better creditor protection use more debt. Information asymmetry affects the speed of adjustment toward target leverage ratios. Tax benefits of debt are more valuable in countries with higher corporate tax rates.

The methodological approach in Öztekin (2015) uses dynamic panel generalized method of moments (GMM) estimation. This technique addresses two important econometric issues: it accounts for the dynamic nature of capital structure decisions (firms adjust gradually toward target leverage), and it handles potential endogeneity of some explanatory variables. The institutional variables enter the model as direct determinants of leverage levels. However, like prior studies, Öztekin does not test whether institutional factors moderate the effects of other determinants such as interest rates. The institutional variables affect the intercept of the leverage equation but are not interacted with macroeconomic or firm-level variables to test whether they change the slope of these relationships.

2.3 Research Gap and Contribution

The literature reviewed above establishes three key findings relevant to this study. First, capital structure determinants operate globally, but their effects vary significantly across countries (Rajan and Zingales, 1995; Booth et al., 2001). Second, macroeconomic conditions, particularly interest rates, significantly affect corporate leverage decisions (Korajczyk and Levy, 2003). Third, institutional factors such as legal systems and financial development fundamentally shape capital structure (Öztekin, 2015).

Despite these advances, no prior study has tested whether currency regime moderates the relationship between interest rates and leverage. Previous research has controlled for country differences using dummy variables or institutional quality indices, but these approaches assume that institutional factors affect the level of leverage rather than changing how firms respond to macroeconomic conditions. The implicit assumption is that the interest rate-leverage relationship has the same slope across all institutional environments, with only the intercept varying.

This assumption is implausible for currency regime. Dollarization represents a funda-

mental constraint on monetary policy autonomy. When a country cannot conduct independent monetary policy, the transmission mechanism from policy rates to commercial lending rates is fundamentally altered. Domestic monetary authorities lose the ability to influence lending conditions, while US monetary policy gains direct transmission to dollar-denominated lending rates. This suggests that the interest rate-leverage relationship should have a different slope in dollarized versus non-dollarized economies, not just a different intercept.

The methodological innovation required to test this hypothesis is the inclusion of explicit interaction terms between interest rates and currency regime indicators. The coefficient on the interaction term directly tests whether dollarization moderates the interest rate effect. This approach builds on the firm fixed effects framework of Korajczyk and Levy (2003), which allows identification of how macroeconomic conditions affect leverage within firms over time. The interaction term specification tests whether the institutional factor (currency regime) changes the slope of the macroeconomic relationship rather than simply shifting the intercept.

The evolution from cross-sectional analysis (Rajan and Zingales, 1995) to panel methods with firm fixed effects (Korajczyk and Levy, 2003) to dynamic models (Öztekin, 2015) reflects increasing methodological sophistication in the capital structure literature. This study contributes to this methodological progression by testing whether institutional factors moderate the effects of macroeconomic conditions on capital structure. The explicit interaction term approach allows a direct test of whether currency regime fundamentally alters how firms respond to changes in borrowing costs, addressing a question that prior studies could not answer with their empirical specifications.

Chapter 3

Theoretical Framework and Hypotheses

This chapter develops the theoretical framework linking currency regimes to corporate leverage decisions through interest rate transmission mechanisms. Section 3.1 describes how interest rates affect corporate borrowing costs differently in dollarized and non-dollarized economies. Section 3.2 reviews capital structure theories and their predictions regarding interest rate effects. Section 3.3 establishes currency regime as an institutional moderator. Section 3.4 derives the testable hypotheses.

3.1 Interest Rate Transmission Mechanisms

Interest rates affect corporate capital structure by changing the cost of debt financing. The transmission mechanism differs fundamentally between dollarized and non-dollarized economies. In non-dollarized economies with independent monetary policy, central banks set policy rates that influence commercial bank lending rates, which in turn affect corporate borrowing costs. When central banks raise rates to combat inflation or stabilize the currency, firms face higher debt costs and typically reduce leverage.

Dollarized economies operate under a different mechanism. By adopting the US dollar as legal tender, these countries surrender the ability to conduct independent monetary policy. They have no central bank that can adjust interest rates in response to domestic economic conditions. Instead, commercial lending rates track US Federal Reserve policy rates, with adjustments primarily reflecting local credit risk premiums and banking sector competition. When the Federal Reserve raises rates to address US economic conditions—which may be misaligned with conditions in dollarized Latin American economies—firms in dollarized countries face higher borrowing costs regardless of their domestic economic needs. This institutional difference creates the central empirical question: does surrendering monetary policy autonomy change how firms respond to interest

rate movements?

3.2 Capital Structure Theory and Interest Rate Effects

Two main theories explain how interest rates affect corporate leverage. Trade-off theory (Kraus and Litzenberger, 1973) posits that firms balance the tax benefits of debt against bankruptcy costs. Higher interest rates have ambiguous effects under this theory: they increase debt service costs and bankruptcy risk (encouraging deleveraging), but may also increase the present value of tax shields (encouraging leverage). Empirical evidence from Korajczyk and Levy (2003) suggests the cost effect typically dominates, with firms reducing leverage when rates rise.

Pecking order theory (Myers and Majluf, 1984) offers a clearer prediction. Firms prefer internal financing to external financing due to information asymmetries, and prefer debt to equity when external financing is needed. When interest rates rise, debt becomes more expensive relative to internal funds, strengthening the preference for internal financing and reducing observed leverage. Unlike trade-off theory, pecking order theory unambiguously predicts a negative relationship between interest rates and leverage.

Both theories were developed for firms operating with independent monetary policy, where interest rate changes reflect domestic economic conditions and policy responses. Neither theory explicitly considers how the relationship might change when monetary policy autonomy is surrendered. If the institutional environment changes the nature of interest rate variation, the standard predictions may not hold.

3.3 Institutional Framework: Currency Regime as a Moderating Factor

Currency regime affects capital structure by changing not just the level of interest rates, but the entire relationship between rates and firm leverage decisions. Prior research has typically included institutional variables as additive controls, capturing level effects. For instance, Booth et al. (2001) find that institutional quality affects average leverage levels across countries, while Öztekin (2015) shows that legal and financial system characteristics influence capital structure choices.

This study treats currency regime as a moderating variable that changes the slope of the interest rate-leverage relationship rather than merely shifting the intercept. An intercept effect would imply that dollarized firms simply have higher or lower leverage on average. A slope effect implies that dollarized firms respond differently to interest

rate changes—that the fundamental relationship between borrowing costs and financing decisions operates differently under different monetary regimes.

The moderating role of currency regime operates through several channels. First, dollarized firms face interest rate changes mechanically imported from US monetary policy rather than reflective of domestic conditions. A rate increase driven by US inflation concerns may occur precisely when the dollarized economy needs monetary stimulus. Second, dollarized economies lack a lender of last resort in domestic currency, potentially making firms more sensitive to interest rate shocks. Third, banking sectors in dollarized economies may transmit rate changes differently due to different competitive structures or risk assessment frameworks.

3.4 Hypothesis Development

3.4.1 Hypothesis 1: Altered Domestic Interest Rate Response

The first hypothesis concerns how dollarized firms respond to domestic lending rate changes that are independent of US monetary policy. Even in dollarized economies, domestic lending rates contain variation beyond what is explained by US Federal Reserve policy. This independent variation reflects local banking sector dynamics, credit risk conditions, and regulatory changes.

For non-dollarized firms, changes in domestic lending rates reflect coordinated monetary policy responses to domestic economic conditions. When rates rise, firms understand this as deliberate policy tightening aimed at cooling an overheating economy or stabilizing the currency. Empirical evidence shows firms typically reduce leverage when rates rise, consistent with pecking order predictions and the empirical findings of Korajczyk and Levy (2003).

For dollarized firms, the interpretation is different. Independent variation in domestic lending rates (after removing the US component) reflects primarily banking sector pricing decisions rather than policy signals. These rate changes occur without the coordinating framework of central bank policy and without the implicit backing of a lender of last resort. Rate increases in dollarized economies may signal deteriorating credit conditions, reduced bank lending capacity, or increased perceived risk—factors to which firms should respond even more defensively by reducing leverage. Moreover, dollarized firms lack the policy buffers available to non-dollarized firms. When domestic conditions deteriorate in non-dollarized economies, central banks can lower rates to provide accommodation. In dollarized economies, no such accommodation is available.

Formally, the marginal effect of independent domestic rates on leverage is β_1 for non-dollarized firms and $\beta_1+\beta_4$ for dollarized firms, where β_4 captures the differential response.

The first hypothesis predicts:

$$H_1 : \beta_4 < 0 \tag{3.1}$$

A negative β_4 indicates that dollarized firms exhibit stronger negative sensitivity to independent domestic rate changes compared to non-dollarized firms, reflecting their heightened vulnerability to credit conditions without central bank backstops.

3.4.2 Hypothesis 2: Amplified US Interest Rate Sensitivity

The second hypothesis concerns differential sensitivity to US interest rates. Non-dollarized firms face US rate changes indirectly through capital flows, exchange rate pressures, and the partial synchronization of domestic monetary policy with US policy. These firms have some insulation from US monetary policy through their own central banks' policy responses.

Dollarized firms face US rate changes directly and mechanically. When the Federal Reserve raises rates, commercial lending rates in dollarized economies rise almost immediately, with minimal buffering or policy accommodation. Dollarized firms cannot rely on offsetting domestic policy actions to cushion the impact. Moreover, dollarized economies lack a lender of last resort in domestic currency, potentially making firms more cautious about maintaining high leverage when US rates rise.

Hypothesis H2 predicts that dollarized firms exhibit amplified sensitivity to US interest rates relative to non-dollarized firms. Formally:

$$H_2 : \beta_5 < 0 \tag{3.2}$$

where β_5 captures the differential US interest rate sensitivity of dollarized firms. The negative sign indicates that dollarized firms exhibit a stronger negative response to US interest rate increases compared to non-dollarized firms. This amplified sensitivity reflects the mechanical linkage between dollarized economies' borrowing costs and US Federal Reserve policy. When US rates rise, dollarized firms face higher borrowing costs without the offsetting benefit of domestic monetary policy accommodation, leading to larger leverage reductions than their non-dollarized counterparts.

3.5 Summary

This chapter establishes the theoretical framework for understanding how currency regimes moderate the relationship between interest rates and corporate leverage. The framework recognizes currency regime as a fundamental moderator of how firms respond to borrowing cost changes rather than merely a level shifter. The two hypotheses predict that dollarized firms exhibit stronger negative sensitivity to independent domestic rate changes ($\beta_4 < 0$)

and amplified negative sensitivity to US rate changes ($\beta_5 < 0$), reflecting the different institutional context in which their financing decisions occur.

Chapter 4

Data and Methodology

This chapter describes the data sources, sample construction, variable definitions, and econometric methodology. Section 4.1 details the sample selection process and data sources. Section 4.2 defines the dependent and independent variables. Section 4.3 presents descriptive statistics. Section 4.4 addresses the multicollinearity challenge between domestic and US interest rates through a residualization approach. Section 4.5 presents the econometric specification.

4.1 Sample Construction and Data Sources

4.1.1 Sample Selection

The sample consists of 471 non-financial firms from six Latin American countries over the period 2015–2024, yielding a balanced panel of 4,710 firm-year observations. The countries include two fully dollarized economies (Ecuador and Panama) and four non-dollarized economies with independent monetary policy (Chile, Colombia, Peru, and Brazil). These countries provide variation in both currency regimes and stages of economic development while maintaining sufficient market integration to ensure cross-country comparability.

Sample selection follows three criteria. First, firms must have complete financial data for all ten years (2015–2024) to ensure a balanced panel. Second, firms must report total debt of at least ten thousand US dollars in at least half of the sample period (five or more years) to ensure meaningful leverage ratios. This threshold excludes firms with persistently negligible debt levels while accommodating normal deleveraging episodes. Third, financial institutions (banks, insurance companies, and other financial intermediaries classified under ISIC Section K) were excluded from the sample, as their capital structure decisions follow fundamentally different regulatory and operational constraints compared to non-financial corporations.

Within each country, firms are selected by revenue ranking using 2024 revenues to ensure the sample captures the largest and most economically significant firms in each

economy. The final sample includes 101 firms from Ecuador, 40 from Panama, 100 from Chile, 50 from Colombia, 80 from Peru, and 100 from Brazil. Table 4.1 summarizes the sample composition.

Table 4.1: Sample Composition

Country	Currency Regime	Firms	Observations
Dollarized Economies			
Ecuador	Dollarized	101	1,010
Panama	Dollarized	40	400
Non-Dollarized Economies			
Chile	Non-Dollarized	100	1,000
Colombia	Non-Dollarized	50	500
Peru	Non-Dollarized	80	800
Brazil	Non-Dollarized	100	1,000
Total		471	4,710

Note: This table reports the number of firms and firm-year observations by country. All firms have complete data for 2015–2024, creating a balanced panel. Ecuador and Panama adopted full dollarization in 2000 and 1904, respectively.

4.1.2 Data Sources

Financial statement data for Chile, Colombia, Panama, Peru, and Brazil come from Capital IQ Pro, which provides standardized financial statements for publicly traded and large private companies across Latin America. For Ecuador, financial data come from the Superintendencia de Compañías (Supercias), the country's securities regulator, which maintains comprehensive financial statement databases for all registered companies. Using regulatory filings ensures data quality and consistency with international accounting standards.

Commercial lending rate data come from each country's central bank statistical database. These rates represent the actual cost of borrowing for non-financial corporations, not policy rates set by central banks. For Ecuador, lending rates come from the Banco Central del Ecuador's weekly active lending rate series for productive credits with 2–4 year maturities, averaged annually. For Panama, Chile, Colombia, Peru, and Brazil, lending rates come from each central bank's commercial lending rate statistics. US commercial lending rates come from the Federal Reserve's statistical releases on bank lending terms. These rates capture the true borrowing costs faced by firms and are more relevant for capital structure decisions than policy rates, which primarily signal monetary policy stance.

Macroeconomic control variables come from the World Bank's World Development Indicators database, which provides consistent cross-country data on GDP growth and

inflation. Corporate tax rates come from the OECD Tax Database and national tax authorities, reflecting statutory rates applicable to corporate income.

4.2 Variable Definitions

4.2.1 Dependent Variable

The dependent variable is the leverage ratio, defined as:

$$\text{LEV}_{it} = \frac{\text{Total Debt}_{it}}{\text{Total Assets}_{it}} \tag{4.1}$$

where Total Debt includes all interest-bearing debt, both short-term and long-term. This measure captures the overall debt financing intensity and is standard in corporate finance research.

4.2.2 Independent Variables

Interest rate variables. DOMESTIC_RATE is the commercial lending rate in country c in year t, measured as a decimal. US_RATE is the US commercial lending rate in year t. These rates represent actual borrowing costs for non-financial corporations.

Currency regime indicator. DOLLARIZED is a dummy variable equal to one for firms in Ecuador and Panama, and zero otherwise. This variable captures the institutional constraint of surrendered monetary policy autonomy.

Interaction terms. The key variables of interest are the interactions between interest rates and the dollarization indicator: DOMESTIC_RATE $\times$ DOLLARIZED and US_RATE $\times$ DOLLARIZED. These interactions test whether the sensitivity of leverage to interest rate changes differs between dollarized and non-dollarized firms.

Control variables. LOG_TOTAL_ASSETS is the natural logarithm of total assets, controlling for firm size. ROA is return on assets (net income divided by total assets), controlling for profitability. INFLATION is the annual consumer price inflation rate, controlling for general price level changes. GDP_GROWTH is the annual real GDP growth rate, controlling for macroeconomic conditions. TAX_RATE is the statutory corporate income tax rate, controlling for the tax advantage of debt.

4.3 Descriptive Statistics

Table 4.2 presents descriptive statistics for the full sample. The mean leverage ratio is 31.5%, with substantial cross-sectional variation (standard deviation of 20.7 percentage points). Firm size, measured by log total assets, averages 13.6, corresponding to approximately \$800 million in total assets at the sample mean. Return on assets averages 3.7%,

reflecting the inclusion of firms across diverse industries and economic conditions. Domestic commercial lending rates average 10.6%, ranging from 3.6% to 21.8% across countries and years, while US commercial lending rates average 4.9% over the sample period.

Table 4.2: Summary Statistics

Variable	Obs	Mean	Std Dev	Range
Leverage Ratio	4,710	0.315	0.207	[0.000, 1.574]
ROA	4,710	0.037	0.201	[-12.226, 0.566]
Log(Total Assets)	4,710	13.644	1.905	[8.790, 19.341]
Domestic Rate	4,710	0.106	0.046	[0.036, 0.218]
US Rate	4,710	0.049	0.018	[0.033, 0.083]
Inflation	4,710	0.038	0.029	[-0.016, 0.117]
GDP Growth	4,710	0.019	0.050	[-0.178, 0.165]
Tax Rate	4,710	0.284	0.041	[0.220, 0.350]

Note: This table reports summary statistics for the full sample of 471 firms over 2015–2024. Leverage Ratio is total debt divided by total assets. ROA is return on assets. Domestic Rate and US Rate are commercial lending rates. All rates are expressed as decimals.

Table 4.3 compares firm characteristics across currency regimes. Dollarized firms exhibit significantly lower average leverage (26.0%) compared to non-dollarized firms (33.8%), consistent with reduced access to debt financing in economies without lender-of-last-resort facilities. Dollarized firms are also substantially smaller, with mean assets of $550 million versus $5.68 billion for non-dollarized firms. This size differential reflects both the smaller economies of Ecuador and Panama and the sample composition, which includes Brazil's large industrial conglomerates.

Table 4.4 presents country-level statistics. Commercial lending rates vary considerably across countries, from 6.6% in Panama to 17.6% in Brazil, reflecting differences in monetary policy frameworks, inflation histories, and banking sector competitiveness. Ecuador's low average leverage (15.2%) stands out even among dollarized economies, likely reflecting its history of financial crises and sovereign debt defaults. Panama, by contrast, exhibits the highest average leverage in the sample (53.4%), consistent with its status as a regional financial hub with well-developed banking infrastructure.

4.4 The Multicollinearity Problem and Residualization Approach

4.4.1 Identifying the Problem

A key empirical challenge is the strong correlation between domestic and US interest rates in several countries. Table 4.5 presents variance inflation factors (VIFs) and correlation

Table 4.3: Descriptive Statistics by Currency Regime

	Non-Dollarized	Dollarized
Number of firms	330	141
Number of observations	3,300	1,410
Leverage and Profitability		
Mean leverage ratio	0.338	0.260
SD leverage ratio	0.188	0.237
Mean ROA	0.046	0.014
Interest Rates		
Mean domestic rate	0.110	0.096
Mean US rate	0.049	0.049
Firm Size		
Mean log(total assets)	14.4	11.8
Mean total debt (millions USD)	2,000	190
Mean total assets (millions USD)	5,680	550

Note: Descriptive statistics for the full sample by currency regime. Non-dollarized economies include Chile, Colombia, Peru, and Brazil (330 firms). Dollarized economies include Ecuador and Panama (141 firms). Domestic rate is the commercial lending rate in each country. US rate is the US commercial lending rate (same for all countries). All values calculated over the 2015–2024 period.

Table 4.4: Descriptive Statistics by Country

Country	Regime	Firms	Obs	Leverage	ROA	Assets (M)	Dom Rate
Dollarized Economies							
Ecuador	Dol	101	1,010	0.152	0.006	146	0.108
Panama	Dol	40	400	0.534	0.035	1,560	0.066
Non-Dollarized Economies							
Brazil	Non-Dol	100	1,000	0.399	0.052	10,700	0.176
Chile	Non-Dol	100	1,000	0.339	0.037	5,150	0.083
Colombia	Non-Dol	50	500	0.325	0.044	3,610	0.099
Peru	Non-Dol	80	800	0.271	0.051	1,310	0.069

Note: This table reports country-level summary statistics. Leverage is the mean leverage ratio. ROA is mean return on assets. Assets (M) is mean total assets in millions of USD. Dom Rate is the mean domestic commercial lending rate. All firms have complete data for 2015–2024.

coefficients for each country. Chile, Colombia, and Panama exhibit severe multicollinearity, with VIFs exceeding 13 and correlations above 0.70. This multicollinearity inflates standard errors and makes it difficult to separately identify the effects of domestic and US interest rate changes on leverage.

Table 4.5: Multicollinearity Diagnostics by Country

Country	VIF (Domestic Rate)	Correlation	Assessment
Chile	13.81	0.714	Severe
Colombia	22.28	0.788	Severe
Panama	14.67	0.936	Severe
Peru	2.87	0.469	Moderate
Brazil	1.11	0.182	Acceptable
Ecuador	2.93	0.487	Moderate

Note: VIF is the variance inflation factor from regressing DOMESTIC_RATE on US_RATE and other controls. Correlation is the bivariate correlation between DOMESTIC_RATE and US_RATE. VIF > 10 indicates severe multicollinearity.

The high correlation reflects the fact that central banks in non-dollarized countries partially synchronize their monetary policies with US Federal Reserve decisions due to capital flow considerations and exchange rate stability objectives. However, this synchronization is not perfect, and each country retains some monetary policy independence. The econometric challenge is to separate the component of domestic interest rates that moves independently of US rates from the component that simply tracks US monetary policy.

4.4.2 Residualization Procedure

The residualization approach decomposes domestic interest rates into two orthogonal components: the part explained by US interest rates and the independent domestic component. For each country c, the procedure consists of three steps:

Step 1: Country-specific auxiliary regression. For each country, regress domestic rates on US rates:

$$\text{DOMESTIC\_RATE}_{ct} = \alpha_c + \beta_c \cdot \text{US\_RATE}_t + \varepsilon_{ct} \tag{4.2}$$

where β_c measures the degree of synchronization between country c's lending rates and US rates.

Step 2: Extract residuals. The residuals $\hat{\varepsilon}_{ct}$ represent the component of domestic lending rates that varies independently of US monetary policy. Define:

$$\text{DOMESTIC\_RES}_{ct} = \hat{\varepsilon}_{ct} \tag{4.3}$$

Step 3: Verify orthogonality. By construction, DOMESTIC_RES is orthogonal

to US_RATE, eliminating the multicollinearity problem. Table 4.6 confirms that correlations between residuals and US rates are essentially zero while substantial domestic rate variation is preserved.

Table 4.6: Variation Preserved After Residualization

Country	Corr(Residual, US Rate)	Variation Retained	Assessment
Ecuador	0.000	80.2%	High
Peru	0.000	79.3%	High
Brazil	0.000	97.2%	Very High
Chile	0.000	71.4%	Good
Colombia	0.000	64.8%	Adequate
Panama	0.000	35.3%	Sufficient

Note: Correlation measures the correlation between DOMESTIC_RES and US_RATE, which is zero by construction (values shown are numerical precision artifacts). Variation Retained is the ratio of the standard deviation of residuals to the standard deviation of original domestic rates.

The variation retained ranges from 35.3% (Panama) to 97.2% (Brazil). Even in Panama, where synchronization with US monetary policy is strongest, more than one-third of domestic rate variation remains after removing the US component. This independent variation is sufficient to identify the domestic rate coefficient in the regression.

4.4.3 Economic Interpretation

The residualized domestic rate (DOMESTIC_RES) has a clear economic interpretation: it captures country-specific monetary policy decisions and banking sector dynamics that are independent of US Federal Reserve policy. In dollarized economies, this residual primarily reflects changes in bank lending spreads driven by local credit risk conditions, competitive dynamics, and regulatory changes, rather than monetary policy actions (which do not exist). In non-dollarized economies, the residual captures both independent monetary policy decisions and local banking sector factors.

This decomposition is essential for testing the hypotheses. If dollarized firms show amplified negative sensitivity to the independent domestic component (H1), this confirms that surrendering monetary policy autonomy fundamentally changes how firms respond to local lending rate changes.

4.5 Econometric Specification

The baseline specification uses a two-way fixed effects model:

$$\begin{aligned} \text{LEV}_{it} =& \beta_1 \cdot \text{DOMESTIC\_RES}_{ct} + \beta_2 \cdot \text{US\_RATE}_t \\ &+ \beta_3 \cdot \text{DOLLARIZED}_i + \beta_4 \cdot (\text{DOMESTIC\_RES}_{ct} \times \text{DOLLARIZED}_i) \\ &+ \beta_5 \cdot (\text{US\_RATE}_t \times \text{DOLLARIZED}_i) \\ &+ \gamma' \mathbf{X}_{it} + \alpha_i + \delta_t + \varepsilon_{it} \end{aligned} \tag{4.4}$$

where LEV_{it} is the leverage ratio of firm i in year t, DOMESTIC_RES_{ct} is the residualized domestic lending rate for country c in year t, US_RATE_t is the US lending rate in year t, DOLLARIZED_i is the currency regime indicator, $\mathbf{X}_{it}$ is a vector of firm-level and macroeconomic controls (log assets, ROA, inflation, GDP growth, and tax rate), α_i are firm fixed effects, δ_t are year fixed effects, and ε_{it} is the error term.

The firm fixed effects (α_i) absorb all time-invariant firm characteristics, including the DOLLARIZED dummy and unobserved factors such as industry, ownership structure, and management quality. The year fixed effects (δ_t) absorb common time shocks, including the US_RATE main effect in the two-way specification. Critically, the interaction terms remain identified even when their constituent main effects are absorbed by fixed effects, as the interactions vary both across firms and over time.

The coefficients of interest are β_4 and β_5. The coefficient β_4 measures the differential sensitivity of dollarized firms to independent domestic lending rate changes. The total effect of independent domestic rates on dollarized firms is $\beta_1 + \beta_4$. Hypothesis H1 predicts $\beta_4 < 0$, implying that dollarized firms exhibit amplified negative responses to domestic lending rate variation that is independent of US monetary policy.

The coefficient β_5 measures the differential sensitivity of dollarized firms to US lending rates. In the firm fixed effects specification (which does not absorb US_RATE), the total effect of US rates on dollarized firms is $\beta_2 + \beta_5$. Hypothesis H2 predicts $\beta_5 < 0$, indicating that dollarized firms exhibit amplified negative sensitivity to US monetary conditions relative to non-dollarized firms. A negative β_5 implies that when US rates increase, dollarized firms reduce leverage more aggressively than non-dollarized firms, consistent with their direct exposure to US monetary policy without domestic policy buffers. In the two-way fixed effects specification, β_2 is absorbed by year effects, but β_5 remains identified and captures the differential US rate sensitivity of dollarized firms.

Standard errors are clustered at the country level to account for within-country correlation in residuals. With six countries, this clustering approach is conservative but appropriate given the nature of the monetary policy variation, which occurs at the country-year level.

For comparison, the analysis also estimates specifications using raw domestic rates

(DOMESTIC_RATE instead of DOMESTIC_RES) and alternative fixed effects structures (pooled OLS with no fixed effects, and firm fixed effects only without year effects). These alternative specifications help assess the robustness of the findings to different treatments of multicollinearity and unobserved heterogeneity.

Chapter 5

Results

This chapter presents the empirical results testing the hypotheses developed in Chapter 3. Section 5.1 presents baseline regression estimates comparing original and residualized specifications across three fixed effects structures. Section 5.2 focuses on the preferred specification with firm and time fixed effects using residualized rates, and formally evaluates both hypotheses. Section 5.3 discusses robustness checks and alternative specifications.

5.1 Baseline Regression Results

Table 5.1 presents regression results using raw domestic interest rates across three fixed effects structures: pooled OLS, firm fixed effects only, and firm and time fixed effects. These specifications illustrate the baseline relationship before addressing multicollinearity concerns. Across all specifications, the interaction terms show consistent patterns, though standard errors are inflated due to the high correlation between domestic and US rates documented in Chapter 4.

The pooled OLS specification (Column 1) estimates a positive coefficient of 0.766 on the DOLLARIZED dummy, indicating that after controlling for other factors, dollarized firms maintain higher average leverage. The domestic rate interaction (DOMESTIC_RATE × DOLLARIZED) is negative and highly significant (-9.556, $p < 0.001$), suggesting substantially altered domestic rate sensitivity. The US rate interaction is positive and significant (1.490, $p = 0.012$), though this counterintuitive sign likely reflects the multicollinearity problem rather than the true relationship. These estimates do not account for firm-level unobserved heterogeneity or common time shocks.

The firm fixed effects specification (Column 2) absorbs the DOLLARIZED dummy along with all time-invariant firm characteristics. The domestic rate interaction remains large and negative (-1.626, $p = 0.004$), while the US rate interaction turns negative but loses statistical significance (-0.700, $p = 0.127$). The specification with firm and time fixed effects (Column 3) additionally absorbs year effects, including the US_RATE main

Table 5.1: Regression Results: Original Specifications

	Dependent Variable: Leverage Ratio		
	Pooled OLS	Firm FE	Two-Way FE
	(1)	(2)	(3)
Interest Rate Variables			
Domestic Rate	0.777	-0.146	0.319
	(0.315)	(0.319)	(0.313)
US Rate	-0.402	-0.028	[Absorbed]
	(0.296)	(0.372)	
DOLLARIZED	0.766***	[Absorbed]	[Absorbed]
	(0.046)		
Domestic × Dollarized	-9.556***	-1.626**	-2.122***
	(0.812)	(0.314)	(0.222)
US Rate × Dollarized	1.490*	-0.700	-0.289
	(0.387)	(0.383)	(0.337)
Control Variables			
Log(Total Assets)	0.001	0.050*	0.049*
	(0.014)	(0.013)	(0.013)
ROA	-0.028	-0.013	-0.010
	(0.018)	(0.014)	(0.013)
Inflation	-0.338	0.036	-0.013
	(0.235)	(0.352)	(0.189)
GDP Growth	-0.016	-0.061	0.070
	(0.032)	(0.037)	(0.066)
Tax Rate	0.043	0.410	0.148
	(0.275)	(0.351)	(0.154)
Model Statistics			
Observations	4,710	4,710	4,710
Adjusted R^2	0.256	0.836	0.839
Within R^2	—	0.048	0.037
Firm Fixed Effects	No	Yes	Yes
Year Fixed Effects	No	No	Yes
Clustering	Country (6)	Country (6)	Country (6)

Note: This table reports regression results using raw domestic interest rates. Standard errors clustered at the country level in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. DOLLARIZED dummy and US_RATE main effect are absorbed by firm and year fixed effects respectively in columns (2) and (3).

effect. The domestic rate interaction strengthens to -2.122 ($p < 0.001$), while the US rate interaction remains negative but insignificant (-0.289, $p = 0.430$). Standard errors remain large due to multicollinearity.

Table 5.2 presents the preferred specifications using residualized domestic rates (DOMESTIC_RES), which decompose domestic rates into components orthogonal to US rates. This approach eliminates multicollinearity while preserving substantial identifying variation, as documented in Table 4.6.

Table 5.2: Regression Results: Residualized Specifications

	Dependent Variable: Leverage Ratio		
	Pooled OLS	Firm FE	Two-Way FE
	(4)	(5)	(6)
Interest Rate Variables			
Independent Domestic Rate	0.155	-0.074	0.410
	(0.631)	(0.311)	(0.307)
US Rate	-0.101	-0.148	[Absorbed]
	(0.191)	(0.117)	
DOLLARIZED	0.039	[Absorbed]	[Absorbed]
	(0.109)		
Independent Dom × Dol	-1.377	-1.698**	-2.204***
	(0.653)	(0.313)	(0.260)
US Rate × Dollarized	-0.813**	-0.919**	-0.905**
	(0.149)	(0.173)	(0.140)
Control Variables			
Log(Total Assets)	0.015	0.051*	0.048*
	(0.008)	(0.014)	(0.013)
ROA	-0.011	-0.012	-0.010
	(0.018)	(0.014)	(0.013)
Inflation	-0.279	-0.015	0.045
	(0.766)	(0.317)	(0.128)
GDP Growth	0.224	-0.054	0.092
	(0.220)	(0.032)	(0.066)
Tax Rate	0.856	0.395	0.213
	(0.573)	(0.392)	(0.155)
Model Statistics			
Observations	4,710	4,710	4,710
Adjusted R^2	0.064	0.836	0.839
Within R^2	—	0.048	0.038
Firm Fixed Effects	No	Yes	Yes
Year Fixed Effects	No	No	Yes
Clustering	Country (6)	Country (6)	Country (6)

Note: This table reports regression results using residualized domestic interest rates. Independent Domestic Rate is the residual from regressing DOMESTIC_RATE on US_RATE for each country. Standard errors clustered at the country level in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. Column (6) is the preferred specification.

The residualized specifications yield more precise estimates with substantially reduced standard errors. The pattern of coefficients remains consistent with the original specifications, but the improved precision allows for stronger statistical inference. Notably, the US rate interaction now emerges as consistently negative and highly significant across all three specifications, with coefficients ranging from -0.813 to -0.905. The specification with firm and time fixed effects using residualized rates (Column 6) represents the preferred specification, as it controls for both firm-level unobserved heterogeneity and common time shocks while addressing the multicollinearity problem.

5.2 Main Results: Firm and Time Fixed Effects with Residualized Rates

This section focuses on the preferred specification: firm and time fixed effects with residualized domestic rates. The detailed coefficient estimates are presented in Column (6) of Table 5.2, with standard errors clustered at the country level.

5.2.1 Interest Rate Effects

The coefficient on DOMESTIC_RES ($\beta_1 = 0.410$, SE $= 0.307$, $p = 0.240$) captures how non-dollarized firms respond to independent domestic interest rate changes—the component of domestic rates that varies independently of US Federal Reserve policy. The estimate indicates that a one percentage point increase in independent domestic rates is associated with a 0.41 percentage point increase in leverage for non-dollarized firms, though this effect is not statistically significant at conventional levels. This positive sign is unexpected and inconsistent with standard capital structure theories, which predict negative relationships between borrowing costs and leverage. The lack of significance suggests this may reflect sampling variation or confounding factors rather than a systematic relationship.

The coefficient on DOMESTIC_RES $\times$ DOLLARIZED ($\beta_4 = -2.204$, SE $= 0.260$, $p < 0.001$) measures the differential response of dollarized firms to independent domestic rate changes. This coefficient is large, negative, and highly significant. The total effect of independent domestic rates on dollarized firms is $\beta_1 + \beta_4 = 0.410 - 2.204 = -1.794$, which is significantly different from zero ($t = -10.448$, $p0.001$). A one-sided t-test of $\beta_4 < 0$ yields $t = -8.465$ ($p < 0.001$), strongly supporting H1 at any conventional significance level.

This large negative total effect is economically sensible once we recognize what independent domestic rate variation represents in dollarized economies. Without a central bank setting policy rates, variation in commercial lending rates stems primarily from banking sector pricing decisions, changes in perceived credit risk, and adjustments to

lending standards. When banks raise rates in dollarized economies, it signals deteriorating credit conditions or reduced lending capacity—conditions to which firms rationally respond by sharply reducing leverage. The absence of a lender of last resort amplifies this defensive response, as dollarized firms cannot rely on central bank intervention to stabilize credit conditions.

The coefficient on US_RATE × DOLLARIZED ($\beta_5 = -0.905$, SE = 0.140, $p = 0.001$) captures the differential US rate sensitivity of dollarized firms. In the specification with firm and time fixed effects, the US_RATE main effect is absorbed by year fixed effects, so β_5 directly measures how dollarized firms' leverage responds differently to US rate changes compared to non-dollarized firms. The estimate is negative and highly significant, supporting H2. The economic magnitude is substantial: a one percentage point increase in US lending rates is associated with a 0.91 percentage point larger reduction in leverage for dollarized firms compared to non-dollarized firms. Given that the mean leverage ratio for dollarized firms is 26.0%, this represents a 3.5% relative change in leverage from a one percentage point rate shock. A one-sided t-test of $\beta_5 < 0$ yields $t = -6.444$ ($p = 0.001$). Over the sample period, US rates varied by approximately 5 percentage points (from 3.25% to 8.31%), implying that dollarized firms experienced differential leverage responses of approximately 4.5 percentage points due to US rate variation alone.

This finding confirms that dollarized firms face amplified exposure to US monetary policy cycles. When the Federal Reserve tightens policy to address US economic conditions, dollarized firms in Latin America reduce leverage more aggressively than their non-dollarized counterparts, even though the rate increase may be completely misaligned with domestic economic needs in dollarized countries.

To test whether dollarization significantly moderates the interest rate–leverage relationship more broadly, a joint F-test of the null hypothesis $H_0 : \beta_4 = \beta_5 = 0$ yields $F = 59.938$ ($p < 0.001$), strongly rejecting the null. This confirms that currency regime fundamentally alters both domestic and US rate sensitivities, rather than producing mere level shifts in leverage.

5.2.2 Control Variables

Among control variables, LOG_TOTAL_ASSETS shows a positive and significant relationship with leverage ($\beta = 0.048$, $p = 0.015$), consistent with larger firms having greater debt capacity and better access to credit markets. ROA exhibits a small negative coefficient (-0.010) that is not statistically significant, suggesting that after controlling for firm fixed effects, within-firm variation in profitability does not strongly predict leverage changes.

The macroeconomic controls (INFLATION, GDP_GROWTH, TAX_RATE) show mixed patterns but are generally insignificant. INFLATION has a small positive coeffi-

cient (0.045, $p = 0.738$), GDP_GROWTH is positive (0.092, $p = 0.220$), and TAX_RATE is positive (0.213, $p = 0.228$). The lack of significance for these variables likely reflects that year fixed effects absorb much of the common variation in macroeconomic conditions, leaving only country-specific deviations from the common time trends.

The model achieves an adjusted R-squared of 0.839, indicating strong overall explanatory power. The within R-squared is 0.038, suggesting that the time-varying covariates explain 3.8% of the within-firm variation in leverage after accounting for firm and year fixed effects.

5.3 Robustness Checks and Alternative Specifications

5.3.1 Comparison Across Fixed Effects Structures

Comparing results across the three fixed effects structures in Tables 5.1 and 5.2, the interaction coefficients show remarkable consistency in sign and statistical significance. For the domestic rate interaction, coefficients range from -1.377 to -9.556 in the original specifications and from -1.377 to -2.204 in the residualized specifications. The US rate interaction is consistently negative across firm and time fixed effects specifications once multicollinearity is addressed.

While the pooled OLS specification may suffer from omitted variable bias (evidenced by the large coefficient magnitudes), and the firm fixed effects specification does not control for common time shocks, all specifications point to consistent patterns regarding dollarization's moderating effects. The specification with firm and time fixed effects is preferred because it most thoroughly addresses potential confounding factors, but the robustness to alternative specifications strengthens confidence in the main findings.

5.3.2 Original vs. Residualized Specifications

Comparing the original specifications (Table 5.1) with residualized specifications (Table 5.2), the coefficient magnitudes remain similar for the domestic rate interaction, but standard errors are substantially reduced in the residualized specifications. For the key interaction terms, the domestic interaction maintains strong significance across specifications. More importantly, the US rate interaction, which showed inconsistent signs and weak significance in the original specifications, emerges as consistently negative and highly significant in all residualized specifications.

This pattern confirms that multicollinearity was both inflating standard errors and obscuring the true relationship between US rates and leverage for dollarized firms. The residualization approach successfully addresses the collinearity problem while preserving the essential variation needed to identify the effects of interest. The consistency of the US rate interaction across pooled OLS (-0.813, $p = 0.003$), firm FE (-0.919, $p = 0.003$),

and firm and time FE (-0.905, $p = 0.001$) specifications provides strong evidence for the robustness of Hypothesis H2.

5.3.3 Multicollinearity Diagnostics

Table 5.3 compares variance inflation factors before and after residualization. The VIF for domestic rates falls from 1.77 to 1.48, representing a 16.5% reduction. The VIF for US rates falls from 1.08 to 1.02, a 5.8% reduction. Both measures remain well below the conventional threshold of 10, indicating that multicollinearity, while present, was not severe in the aggregate sample. However, the country-level analysis in Chapter 4 revealed that multicollinearity was severe in specific countries (Chile, Colombia, and Panama), with VIFs exceeding 13. The residualization approach successfully addresses these country-specific collinearity issues.

Table 5.3: Variance Inflation Factors: Before and After Residualization

Variable	Original	Residualized	Improvement
Domestic Rate / Residual	1.77	1.48	16.5%
US Domestic Rate	1.08	1.02	5.8%
Log(Total Assets)	1.86	1.86	0.0%
ROA	1.03	1.03	0.0%
Inflation	1.79	1.72	3.9%
GDP Growth	1.09	1.07	1.8%
Tax Rate	2.34	2.29	2.1%

Note: This table compares variance inflation factors (VIFs) before and after residualizing domestic interest rates. VIFs are calculated from OLS regressions of leverage on all independent variables. The residualization procedure reduces VIFs for interest rate variables while leaving control variable VIFs unchanged. All VIFs remain well below the threshold of 10, indicating that multicollinearity is not a severe problem in the aggregate sample, though country-level analysis revealed severe multicollinearity in specific countries (see Table 4.5).

5.3.4 Country-Specific Regressions

As a robustness check, Table 5.4 presents separate regressions for each country using firm fixed effects. Unlike the pooled specification with firm and time fixed effects, country-specific regressions include only firm fixed effects to preserve the time-series variation in interest rates needed to identify rate coefficients. Within each country, interest rates do not vary across firms in a given year, so adding time fixed effects would absorb the variation we seek to examine. These regressions use non-residualized interest rates, providing an alternative specification that complements the main residualized results.

The country-specific estimates reveal substantial heterogeneity in interest rate sensitivity across countries. Among non-dollarized economies, domestic rate coefficients are

Table 5.4: Country-Specific Regressions: Firm Fixed Effects

		Interest Rates		Controls			
Country	Dollarized	Domestic	US Rate	Log Assets	ROA	Obs	R^2
Non-Dollarized Economies							
Chile	No	-0.674***	0.597**	0.052***	-0.844***	1,000	0.166
		(0.185)	(0.224)	(0.012)	(0.080)		
Colombia	No	-1.135*	0.536	0.036*	-0.689***	500	0.107
		(0.534)	(0.543)	(0.014)	(0.114)		
Peru	No	0.094	-0.254	0.004	-0.287***	800	0.023
		(0.417)	(0.382)	(0.012)	(0.078)		
Brazil	No	-0.829***	1.224**	0.063***	-0.653***	1,000	0.145
		(0.239)	(0.454)	(0.010)	(0.099)		
Dollarized Economies							
Ecuador	Yes	-0.496	-1.168***	0.035*	0.002	1,010	0.161
		(0.417)	(0.234)	(0.012)	(0.007)		
Panama	Yes	-2.918	-0.215	-0.008	0.189	400	0.042
		(3.121)	(0.524)	(0.017)	(0.245)		
Benchmark: United States							
USA	—	-0.178	—	0.015	-2.851***	6,000	0.612
		(0.200)		(0.010)	(0.034)		

Note: This table reports firm fixed effects regressions estimated separately for each country using non-residualized interest rates. Robust standard errors in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. Time fixed effects are not included to preserve time-series variation in interest rates within each country. For USA, DOMESTIC_RATE and US_RATE are identical, so only one coefficient is reported. Additional controls (GDP Growth, Inflation, Tax Rate) included but not reported for space.

negative in three of four countries, with Chile (-0.674, $p < 0.001$), Colombia (-1.135, $p = 0.034$), and Brazil (-0.829, $p < 0.001$) showing significant negative responses to domestic interest rate increases. Peru shows a small positive but insignificant coefficient (0.094, $p = 0.822$). This heterogeneity likely reflects differences in financial market development, monetary policy credibility, and firm-level adjustment mechanisms across countries.

The US rate coefficients in non-dollarized countries show unexpected positive signs in Chile (0.597, $p = 0.008$) and Brazil (1.224, $p = 0.007$). These counterintuitive results likely reflect the severe multicollinearity documented in Chapter 4, where domestic and US rates are highly correlated in these countries (correlations of 0.96 and 0.73 respectively). When both rates move together due to policy synchronization, the econometric separation of their individual effects becomes problematic, leading to unstable coefficient estimates. This reinforces the importance of the residualization approach used in the main specifications.

For dollarized economies, the patterns are more consistent with theoretical predictions. Ecuador shows a strong negative US rate coefficient (-1.168, $p < 0.001$) while the domestic rate coefficient is negative but insignificant (-0.496, $p = 0.235$). This pattern aligns with the hypothesis that dollarized firms are highly sensitive to US monetary policy. Panama shows large coefficients for both domestic and US rates, but neither is statistically significant, likely due to the small sample size (40 firms, 400 observations) and correspondingly large standard errors.

The United States benchmark regression provides a crucial reference point. US firms show a negative but insignificant response to US interest rates (-0.178, $p = 0.373$). This weak relationship may reflect that US firms have access to diverse financing alternatives—including equity markets, commercial paper, and international borrowing—that buffer them from domestic interest rate shocks. The striking finding is that dollarized firms in Ecuador exhibit significantly stronger negative responses to US rates (-1.168) than actual US firms (-0.178). This amplified sensitivity suggests that dollarization creates direct exposure to US monetary policy without the offsetting benefits of deep, liquid US financial markets or the diversified financing options available to US corporations.

The heterogeneity across countries underscores several important points. First, the negative domestic rate coefficients in most non-dollarized countries (Chile, Colombia, Brazil) support standard capital structure theory predictions, even when examined country-by-country. Second, the strong US rate sensitivity in Ecuador confirms that dollarized firms face heightened exposure to US monetary policy, responding more aggressively than even US firms themselves. Third, the instability of coefficients in countries with severe multicollinearity (positive US rate effects in Chile and Brazil) validates the residualization approach used in the main specifications. Fourth, the comparison with US firms demonstrates that dollarization's effects go beyond simple monetary policy transmission—

dollarized firms lack the institutional infrastructure and financing alternatives that allow US firms to buffer interest rate shocks.

5.4 Summary

The empirical results provide strong support for both hypotheses. Hypothesis H1, predicting amplified negative sensitivity to independent domestic interest rate changes for dollarized firms ($\beta_4 < 0$), is strongly supported by the data ($\beta_4 = -2.204$, $p < 0.001$). The total effect for dollarized firms ($\beta_1 + \beta_4 = -1.794$) is significantly negative, confirming that dollarized firms exhibit stronger negative responses to independent domestic rate changes compared to non-dollarized firms.

Hypothesis H2, predicting amplified US interest rate sensitivity for dollarized firms ($\beta_5 < 0$), is strongly supported. The coefficient of -0.905 ($p = 0.001$) indicates that dollarized firms exhibit substantially larger leverage reductions in response to US rate increases compared to non-dollarized firms. This finding is robust across all specifications and confirms that surrendering monetary policy autonomy creates direct exposure to US monetary policy cycles.

The findings are robust across alternative specifications and econometric approaches. The residualization approach successfully addresses multicollinearity concerns while preserving sufficient variation to identify the effects of interest. Country-specific regressions reveal that dollarized firms in Ecuador respond more strongly to US rates than even US firms themselves, highlighting the amplified nature of dollarization's effects. The next chapter discusses the interpretation and implications of these results, particularly the unexpected finding that dollarized firms show strong negative responses to independent domestic rate variation.

Chapter 6

Discussion

This chapter interprets the empirical findings and discusses their implications for theory and practice. Section 6.1 interprets the main findings regarding both hypotheses. Section 6.2 explores alternative explanations for unexpected patterns. Section 6.3 situates the findings within the existing literature. Section 6.4 acknowledges the study's limitations and suggests directions for future research.

6.1 Interpretation of Main Findings

6.1.1 Amplified US Interest Rate Sensitivity

The finding that dollarized firms exhibit amplified sensitivity to US interest rates ($\beta_5 = -0.905$, $p = 0.001$) confirms Hypothesis H2 and aligns with theoretical predictions. The economic magnitude is substantial: over the sample period, US commercial lending rates varied by approximately 5 percentage points, implying that dollarized firms experienced differential leverage adjustments of approximately 4.5 percentage points due solely to US monetary policy cycles. For dollarized firms with mean leverage of 26.0%, this represents nearly a 20% relative change in leverage driven entirely by external monetary policy decisions.

The country-specific analysis provides compelling evidence of amplification. Ecuadorian firms show a US rate coefficient of -1.168 ($p < 0.001$), responding more aggressively to US rate changes than actual US firms (-0.178, $p = 0.373$). This comparison demonstrates that dollarization does not simply transplant US monetary conditions to Latin America, but rather amplifies the leverage response beyond what is observed in the US itself.

Several mechanisms likely contribute to this amplification. First, dollarized firms lack access to the deep, liquid capital markets available to US corporations. When US rates rise, US firms can turn to equity markets, commercial paper, or international borrowing as alternatives to bank debt. Dollarized firms in Ecuador and Panama have far more

limited financing alternatives, making them more dependent on bank lending and thus more sensitive to rate changes. Second, dollarized economies lack a lender of last resort in domestic currency, increasing precautionary deleveraging when rates rise. Third, banking sectors in dollarized economies may transmit rate increases more fully to borrowers due to different competitive structures or risk assessment frameworks compared to US banks.

6.1.2 Altered Domestic Interest Rate Response

The findings regarding domestic interest rate sensitivity confirm Hypothesis H1 and reveal the economic mechanisms through which dollarization affects corporate financing. The differential coefficient ($\beta_4 = -2.204$, $p < 0.001$) confirms that dollarized firms exhibit amplified negative sensitivity to independent domestic rate changes compared to non-dollarized firms. The total effect for dollarized firms ($\beta_1 + \beta_4 = -1.794$, $p < 0.001$) is large, negative, and highly significant.

This pattern makes economic sense once we properly interpret what independent domestic rate variation represents. The residualized domestic rate (DOMESTIC_RES) captures interest rate variation that is independent of US Federal Reserve policy. In non-dollarized economies, this independent variation primarily reflects domestic monetary policy decisions—central bank responses to domestic inflation, growth, or exchange rate pressures. Empirical evidence from Korajczyk and Levy (2003) shows firms typically reduce leverage when rates rise, consistent with pecking order predictions, though the positive (and insignificant) coefficient for non-dollarized firms ($\beta_1 = 0.410$) in our sample is unexpected.

In dollarized economies, independent domestic rate variation has a fundamentally different interpretation. Without a central bank setting policy rates, variation in commercial lending rates stems primarily from banking sector pricing decisions, competitive dynamics, and perceived credit risk. When banks raise rates in dollarized economies, it reflects either deteriorating credit conditions, increasing default risk, or reduced lending capacity—signals to which firms rationally respond by reducing leverage.

Several factors explain why dollarized firms show such strong negative responses to independent domestic rate changes. First, the absence of monetary policy credibility alters how firms interpret rate changes. In non-dollarized economies, rate increases are often accompanied by central bank communications about inflation targets, growth forecasts, and policy intentions, providing context that shapes firm expectations and responses. In dollarized economies, rate increases occur without this policy framework, creating greater uncertainty and more defensive firm responses.

Second, the lack of a lender of last resort amplifies defensive deleveraging. When credit conditions deteriorate in non-dollarized economies, central banks can provide liquidity support to banks and indirectly support corporate borrowing. In dollarized economies,

no such backstop exists. Rate increases that signal credit market stress naturally trigger sharper firm responses in the absence of policy buffers.

Third, the banking sector structure in dollarized economies may create different transmission mechanisms. Ecuador's banking sector experienced severe crises in the late 1990s, leading to dollarization in 2000. Banks in dollarized economies may be more fragile or risk-averse than banks in countries with lender-of-last-resort facilities, leading to sharper adjustments in lending standards when economic conditions deteriorate.

6.2 Unexpected Findings and Alternative Explanations

6.2.1 The Positive Domestic Rate Coefficient for Non-Dollarized Firms

The positive coefficient on independent domestic rates for non-dollarized firms ($\beta_1 = 0.410$), while not statistically significant, merits discussion. Empirical evidence typically shows firms reduce leverage when rates rise (Korajczyk and Levy, 2003). Several factors might explain this unexpected pattern.

First, the coefficient captures only the independent component of domestic rates after removing variation explained by US rates. This residual variation may reflect idiosyncratic factors that confound the rate-leverage relationship. For instance, periods of strong economic growth might simultaneously trigger both domestic rate increases (due to inflation pressures) and leverage increases (due to investment opportunities), creating a spurious positive correlation.

Second, the year fixed effects in the preferred specification absorb much of the common variation in macroeconomic conditions, leaving only country-specific deviations from common trends. The independent domestic rate variation may primarily capture relative monetary policy stances across countries rather than absolute rate levels, and the cross-sectional dimension may have different implications than the time-series dimension for leverage decisions.

The lack of statistical significance ($p = 0.240$) suggests this positive coefficient may simply reflect sampling variation rather than a systematic relationship. The key finding for Hypothesis H1 is the differential response (β_4), which is large, negative, and highly significant, indicating that dollarized firms show amplified negative responses compared to non-dollarized firms.

6.2.2 Cross-Country Heterogeneity in Non-Dollarized Economies

The country-specific regressions reveal that non-dollarized economies show heterogeneous responses to both domestic and US rates. Chile, Colombia, and Brazil show significant negative domestic rate coefficients consistent with empirical patterns, while Peru shows a small positive coefficient. This heterogeneity likely reflects differences in financial market development, monetary policy credibility, and integration with global financial markets.

6.3 Comparison to Existing Literature

6.3.1 Contribution to Capital Structure Literature

This study contributes to the capital structure literature by demonstrating that institutional factors operate not merely as level shifters but as fundamental moderators of how firms respond to economic conditions. Prior research, including Booth et al. (2001) and Öztekin (2015), has shown that legal systems, financial development, and institutional quality affect average leverage levels across countries. This study shows that currency regime goes further, changing the slope of the interest rate-leverage relationship.

The finding that dollarized firms exhibit amplified US rate sensitivity extends the literature on macroeconomic determinants of capital structure. Korajczyk and Levy (2003) show that macroeconomic conditions affect capital structure adjustments in US firms. This study shows that in dollarized economies, firms are forced to respond to foreign macroeconomic conditions even when those conditions are misaligned with domestic economic needs.

The residualization approach represents a methodological contribution for separating independent domestic policy variation from US-synchronized variation. This framework can be applied to other questions about monetary policy spillovers and international interest rate linkages.

6.3.2 Implications for Dollarization Literature

The findings quantify an additional cost of dollarization: amplified sensitivity to external monetary policy cycles that manifests in corporate financing decisions. Economic research on dollarization has focused primarily on inflation control, exchange rate stability, and trade facilitation as benefits, while acknowledging the loss of monetary policy flexibility as a cost.

The comparison with US firms is particularly significant. Ecuadorian firms respond more aggressively to US rate changes than US firms, suggesting that dollarization combined with less developed financial markets creates vulnerabilities beyond those faced by firms in the anchor currency country. For countries considering dollarization, these

financing vulnerabilities should enter cost-benefit calculations alongside the more commonly discussed inflation and trade benefits.

6.4 Limitations and Directions for Future Research

6.4.1 Sample and Measurement Limitations

The sample includes only two fully dollarized economies (Ecuador and Panama), limiting generalizability. The 141 dollarized firms provide reasonable statistical power, but additional dollarized economies would strengthen inferences. The sample focuses on large, established firms selected by revenue, which may differ from smaller firms in their access to financing and sensitivity to interest rate changes. The balanced panel requirement imposes survivorship bias, excluding firms that failed or delisted during 2015–2024.

Commercial lending rates represent averages across diverse loan types and may not perfectly capture borrowing costs faced by sample firms. The leverage measure does not distinguish between short-term and long-term debt, bank debt and bond financing, or domestic and foreign currency debt. The residualization approach involves a two-step procedure that may affect statistical inference, though the large sample size suggests bias is likely small.

6.4.2 Context and Generalizability

The sample period (2015–2024) encompasses specific conditions including the commodity price collapse, COVID-19 pandemic, and subsequent monetary tightening. Results may not fully generalize to other periods. The study focuses exclusively on Latin America, where dollarization occurred in specific historical contexts. Motivations for and consequences of dollarization may differ in other regions.

6.4.3 Directions for Future Research

Several promising directions emerge. First, examining other dollarized or pegged currency regimes would test generalizability. Second, exploring heterogeneous effects across firm characteristics would deepen understanding of mechanisms. Third, examining other dimensions of corporate financial policy beyond leverage would provide a more complete picture. Fourth, investigating welfare implications would inform policy debates by linking financing decisions to real outcomes such as investment and employment. Finally, extending the residualization approach to other questions about international policy spillovers would broaden contributions.

6.5 Summary

This chapter has interpreted the empirical findings and discussed their implications. The main findings confirm both hypotheses: dollarized firms exhibit amplified sensitivity to US monetary policy, responding more aggressively than even US firms themselves, and show amplified negative responses to independent domestic rate changes, reflecting heightened vulnerability to domestic credit conditions without central bank backstops. These findings contribute to capital structure literature by demonstrating that institutional factors operate as fundamental moderators of financing behavior and inform debates about dollarization by quantifying corporate financing vulnerabilities created by surrendering monetary policy autonomy.

Chapter 7

Conclusion

This thesis has examined how currency regime choice affects corporate capital structure decisions, focusing specifically on how dollarization alters the sensitivity of leverage to interest rate changes. Using a balanced panel of 471 non-financial firms from six Latin American countries over the period 2015–2024, the study tested whether firms in fully dollarized economies (Ecuador and Panama) respond differently to interest rate changes compared to firms in countries with independent monetary policy (Chile, Colombia, Peru, and Brazil).

7.1 Summary of Findings

The empirical analysis provides strong support for both hypotheses. First, dollarized firms exhibit significantly amplified sensitivity to US interest rate changes. The differential coefficient of $\beta_5 = -0.905$ ($p = 0.001$) indicates that a one percentage point increase in US commercial lending rates leads dollarized firms to reduce leverage by approximately 0.91 percentage points more than non-dollarized firms. Ecuadorian firms respond more aggressively to US rate changes (-1.168, $p < 0.001$) than actual US firms (-0.178, not significant), demonstrating that dollarization creates amplified responses beyond those observed in the anchor currency country itself.

Second, dollarized firms show significantly stronger negative sensitivity to independent domestic interest rate changes. The differential coefficient of $\beta_4 = -2.204$ ($p < 0.001$) confirms that dollarized firms respond more aggressively to domestic rate variation that is independent of US monetary policy. The total effect for dollarized firms ($\beta_1 + \beta_4 = -1.794$, $p < 0.001$) reflects their heightened vulnerability to domestic credit conditions without central bank backstops.

The findings are robust across multiple specifications and reveal substantial cross-country heterogeneity among non-dollarized economies. The residualization procedure successfully addresses severe multicollinearity while preserving sufficient variation to identify separate effects of domestic and US monetary policy.

7.2 Key Contributions

This study makes three main contributions. First, it demonstrates that institutional factors—specifically currency regime—operate as fundamental moderators that change the slope of the interest rate-leverage relationship, not merely as level shifters. This methodological insight applies broadly to research on institutional determinants of corporate finance.

Second, the residualization approach provides a framework for separating independent domestic monetary policy variation from foreign-synchronized variation in international samples, applicable to other questions about policy spillovers and international linkages.

Third, the finding that dollarized firms respond more aggressively to US rate changes than US firms themselves reveals an important cost of dollarization previously unquantified in the literature: amplified corporate financing volatility beyond simple policy transplantation.

7.3 Implications

For academic researchers, the study demonstrates the value of examining institutional factors as moderators rather than simple controls. For countries considering dollarization, the findings highlight corporate financing vulnerabilities that should enter cost-benefit analyses alongside inflation control and exchange rate stability benefits. For already-dollarized economies, the results underscore the importance of financial sector development to provide firms with alternatives to bank debt, potentially reducing sensitivity to external rate fluctuations.

For firms operating in dollarized economies, the findings suggest the importance of conservative leverage targets and diverse financing strategies to weather periods of external monetary tightening. For multinational corporations, the results indicate that leverage targets and financial management approaches should vary across jurisdictions based on currency regime.

7.4 Concluding Remarks

Currency regime choice is often analyzed primarily through the lens of inflation control, exchange rate stability, and trade facilitation. This study demonstrates that currency regimes have profound implications for corporate financing behavior that extend beyond these traditional considerations. By surrendering monetary policy autonomy through dollarization, countries fundamentally alter how their corporations respond to economic conditions, creating amplified sensitivity to external monetary policy and heightened vulnerability to domestic credit conditions without policy buffers.

The finding that Ecuadorian firms respond more aggressively to US interest rate changes than US firms themselves illustrates a broader pattern: institutional transplants do not simply replicate conditions in the source country but interact with local conditions to create unique dynamics. Dollarization imports US monetary policy into an environment with less developed financial markets, different regulatory frameworks, and distinct historical experiences, creating corporate financing patterns that differ from both the anchor country and countries with independent monetary policy. These financing patterns have real economic consequences through effects on investment, employment, and growth.

Despite limitations—including the small number of fully dollarized economies in the sample, potential survivorship bias, and the specific macroeconomic context of the 2015–2024 period—the findings provide robust evidence that currency regime choice profoundly affects corporate financing behavior. The consistency of results across multiple specifications, the robustness to alternative econometric approaches, and the economic plausibility of the patterns all support the conclusion that dollarization fundamentally alters the interest rate-leverage relationship.

As countries continue to debate optimal currency regimes and as the global economy becomes increasingly financially integrated, understanding these corporate financing dynamics becomes ever more important. The core insight—that institutional factors operate not merely as level shifters but as fundamental moderators of how firms respond to economic conditions—extends beyond the specific question of dollarization and capital structure to broader questions about how firms make financial decisions in diverse institutional environments.

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Appendix A

Diagnostic Tests

This appendix presents additional regression results and diagnostic tests that support the main analysis in Chapter 5. Section A.1 reports Hausman tests comparing fixed effects and random effects specifications. Section A.2 presents F-tests justifying the use of fixed effects over pooled OLS. Section A.3 examines variance inflation factors for multicollinearity diagnostics.

A.1 Hausman Test Results

Table A.1 presents Hausman test results for each country's firm fixed effects specification. The Hausman test compares fixed effects (FE) and random effects (RE) estimators to test whether unobserved firm heterogeneity is correlated with the regressors. Under the null hypothesis that individual effects are uncorrelated with regressors, both FE and RE are consistent, but RE is more efficient. Under the alternative hypothesis, FE is consistent while RE is inconsistent.

The results show mixed evidence across countries. Only Brazil strongly rejects the null hypothesis ($p = 0.011$), indicating that fixed effects must be preferred to ensure consistency. Chile shows marginal evidence ($p = 0.070$). Colombia, Peru, Ecuador, and Panama fail to reject the null hypothesis, suggesting that random effects could be justified on efficiency grounds for these countries.

Despite the limited statistical evidence in most countries, the main analysis uses fixed effects for all specifications on theoretical grounds. Firm-level unobserved heterogeneity (such as management quality, industry-specific factors, and access to capital markets) is likely correlated with firm size, profitability, and other regressors. Fixed effects eliminates this potential bias, even if the Hausman test does not always detect it with statistical significance. Moreover, employing a consistent specification across all countries facilitates direct comparison of results.

Table A.1: Hausman Test Results: Fixed Effects vs. Random Effects

Country	Chi-squared	df	p-value
Non-Dollarized Economies			
Brazil	16.693	6	0.011
Chile	13.074	7	0.070
Colombia	4.888	7	0.674
Peru	0.105	7	1.000
Dollarized Economies			
Ecuador	10.947	7	0.141
Panama	6.743	6	0.345

Note: The null hypothesis is that individual effects are uncorrelated with regressors (random effects is consistent). Rejection of the null ($p < 0.05$) indicates that fixed effects should be preferred. Only Brazil rejects the null hypothesis at conventional significance levels ($p = 0.011$), while Chile shows marginal evidence ($p = 0.070$). Despite mixed statistical evidence, fixed effects is employed throughout the analysis to control for potential correlation between firm-specific effects and regressors.

A.2 F-Tests for Fixed Effects

Table A.2 presents F-tests comparing firm fixed effects models to pooled OLS. The null hypothesis is that all firm-specific intercepts are zero (i.e., pooled OLS is appropriate). Rejection of the null indicates that firm fixed effects are necessary.

Table A.2: F-Tests for Fixed Effects vs. Pooled OLS

Country	F-statistic	df1	df2	p-value
Non-Dollarized Economies				
Brazil	38.762	99	894	< 0.001
Chile	44.269	99	893	< 0.001
Colombia	49.440	49	443	< 0.001
Peru	50.546	79	713	< 0.001
Dollarized Economies				
Ecuador	8.614	100	902	< 0.001
Panama	53.415	39	354	< 0.001

Note: The null hypothesis is that all firm-specific intercepts are equal to zero (pooled OLS is appropriate). All countries strongly reject the null hypothesis at $p < 0.001$, indicating that firm fixed effects are necessary to account for unobserved firm heterogeneity. The degrees of freedom (df1, df2) reflect the number of firms and residual observations in each country.

All countries strongly reject the null hypothesis at $p < 0.001$, providing overwhelming evidence that firm fixed effects are necessary. The F-statistics range from 8.614 (Ecuador) to 53.415 (Panama), all highly significant. This justifies the use of firm fixed effects in both the country-specific regressions and the pooled specifications presented in Chapter

5.

The relatively lower F-statistic for Ecuador (8.614) compared to other countries may reflect greater homogeneity among Ecuadorian firms or smaller within-firm variation over time. However, even this F-statistic decisively rejects pooled OLS in favor of fixed effects. Combined with the F-test results, the evidence strongly supports the fixed effects specification employed in the main analysis, even in cases where the Hausman test does not reject random effects.

A.3 Variance Inflation Factors

Table A.3 presents variance inflation factors (VIF) for each country to diagnose multicollinearity between domestic and US commercial lending rates. VIF values exceeding 10 indicate severe multicollinearity that can produce unstable coefficient estimates.

Table A.3: Variance Inflation Factors by Country

Country	Dollarized	Correlation (Dom, US)	VIF Domestic	VIF US	Max VIF	Severity Assessment
Countries with Severe Multicollinearity						
Chile	No	0.714	13.81	6.35	13.81	Severe
Colombia	No	0.788	22.28	7.01	22.28	Severe
Panama	Yes	0.936	13.62	14.67	14.67	Severe
Countries without Multicollinearity						
Peru	No	0.610	2.18	2.14	2.18	None
Brazil	No	0.236	2.00	2.66	2.66	None
Ecuador	Yes	0.598	1.84	2.62	2.62	None

Note: VIF < 5 indicates no multicollinearity, VIF 5–10 indicates moderate multicollinearity, and VIF > 10 indicates severe multicollinearity. Correlation refers to the correlation between domestic and US commercial lending rates. Chile, Colombia, and Panama exhibit severe multicollinearity requiring the residualization approach described in Chapter 4.

The results reveal that three countries (Chile, Colombia, and Panama) suffer from severe multicollinearity between domestic and US interest rates, with VIF values exceeding 10 and correlations ranging from 0.714 to 0.936. This multicollinearity motivates the residualization procedure employed in the main analysis, which decomposes domestic rates into components orthogonal to US rates.

Peru, Brazil, and Ecuador show acceptable VIF values below 5, indicating that multicollinearity is not problematic in these countries. However, to maintain a consistent econometric framework across all countries, the residualization approach is applied uniformly to all specifications in the main analysis.

Appendix B

Residualization Methodology

This appendix documents the residualization procedure used to address multicollinearity between domestic and US commercial lending rates. Section B.1 describes the methodology. Section B.2 presents the country-specific auxiliary regressions. Section B.3 verifies orthogonality after residualization.

B.1 Residualization Methodology

Severe multicollinearity between domestic and US commercial lending rates in three countries (Chile, Colombia, and Panama) creates unstable coefficient estimates when both variables are included in the same regression. To address this problem, the analysis employs a country-specific residualization approach that decomposes domestic rates into two orthogonal components:

1. The component synchronized with US monetary policy
2. The component representing independent domestic policy variation

For each country j, an auxiliary regression estimates:

$$\text{DOMESTIC\_RATE}_{jt} = \alpha_j + \beta_j \cdot \text{US\_RATE}_t + \varepsilon_{jt} \tag{B.1}$$

The residuals ε_{jt} capture domestic rate variation orthogonal to US rates. These residuals are used in the main specification, allowing separate identification of domestic and US interest rate effects without multicollinearity.

B.2 Country-Specific Auxiliary Regressions

Table B.1 presents the auxiliary regression results for each country. The coefficient β_j measures how much domestic rates synchronize with US rates (the pass-through coef-

ficient). The R^2 indicates what fraction of domestic rate variation is explained by US rates.

Table B.1: Auxiliary Regressions: Domestic Rate on US Rate by Country

Country	Dollarized	β	Std. Error	R^2	N
High Synchronization (Problems with multicollinearity)					
Chile	No	1.272	0.039	0.510	1,000
Colombia	No	1.621	0.057	0.620	500
Panama	Yes	0.188	0.004	0.876	400
Moderate Synchronization					
Peru	No	0.513	0.024	0.372	800
Ecuador	Yes	0.196	0.008	0.357	1,010
Low Synchronization					
Brazil	No	0.379	0.050	0.056	1,000

Note: Each row reports results from regressing domestic commercial lending rates on US commercial lending rates for that country. β measures the pass-through coefficient. R^2 indicates the proportion of domestic rate variation explained by US rates. High R^2 values indicate strong synchronization, creating multicollinearity problems in the original specification.

The results reveal substantial heterogeneity in monetary policy synchronization. Panama shows the highest synchronization ($R^2 = 0.876$), despite being dollarized. Chile and Colombia also exhibit high synchronization ($R^2 = 0.510$ and 0.620), consistent with their integration into global financial markets. Brazil shows the lowest synchronization ($R^2 = 0.056$), reflecting greater monetary policy independence.

The pass-through coefficients vary from 0.188 (Panama) to 1.621 (Colombia). Coefficients exceeding 1.0 indicate that domestic rates amplify US rate movements, while coefficients below 1.0 indicate dampened responses.

B.3 Orthogonality Verification

Table B.2 verifies that the residualization procedure successfully eliminates correlation between the residualized domestic rates and US rates. Perfect orthogonality is achieved when the correlation equals zero.

The residualization procedure achieves perfect orthogonality: all correlations between residualized domestic rates and US rates are essentially zero (maximum absolute value $< 10^{-15}$). This confirms that the two interest rate channels can be separately identified without multicollinearity.

The variation retained ranges from 35.3% (Panama) to 97.2% (Brazil). Countries with high synchronization (high R^2 in auxiliary regressions) retain less independent variation. Panama retains only 35.3% because 87.6% of its domestic rate variation is explained by US

Table B.2: Orthogonality Verification After Residualization

Country	Correlation (Residual, US)	SD Original	SD Residual	Variation Retained
Brazil	0.000	0.0291	0.0282	97.2%
Chile	0.000	0.0322	0.0225	70.0%
Colombia	0.000	0.0372	0.0229	61.6%
Ecuador	0.000	0.0059	0.0047	80.2%
Panama	0.000	0.0036	0.0013	35.3%
Peru	0.000	0.0152	0.0121	79.3%

Note: Correlation (Residual, US) shows the correlation between residualized domestic rates and US rates—all are effectively zero (maximum absolute value $< 10^{-15}$), confirming perfect orthogonality. SD Original shows the standard deviation of original domestic rates. SD Residual shows the standard deviation of residualized rates. Variation Retained shows what percentage of original variation is preserved after residualization. Countries with high R^2 in auxiliary regressions (Table B.1) retain less variation in the residuals.

rates. Brazil retains 97.2% because only 5.6% of its domestic rate variation is explained by US rates.

Despite these differences in retained variation, all countries preserve sufficient independent variation to estimate the differential effect of dollarization on domestic rate sensitivity.