

“Corporate financial leverage during Vietnam’s 2022 Interest Rate Subsidy Program: Evidence from a bank-based emerging economy”

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CORPORATE FINANCIAL LEVERAGE DURING VIETNAM'S 2022 INTEREST RATE SUBSIDY PROGRAM: EVIDENCE FROM A BANK-BASED EMERGING ECONOMY

Abstract

In bank-based emerging economies, firms' financing decisions are closely linked to bank credit conditions and government interventions intended to reduce borrowing costs. Interest rate subsidies may ease access to external finance, yet borrowing responses need not be uniform when firms differ in their financing conditions. This study examines changes in corporate financial leverage during the implementation of Vietnam's 2022 Interest Rate Subsidy Program and whether these changes vary with firm size. The analysis draws on 1,160 firm-year observations from non-financial firms listed on the Ho Chi Minh City and Hanoi stock exchanges between 2016 and 2024. A two-way fixed-effects model with firm-clustered robust standard errors is used, alongside supplementary analyses. The main estimates show that, for a firm of average size, financial leverage was lower in 2022 than in the reference year of 2016. The decline was greater among larger firms, indicating that leverage adjustments differed by firm size. Profitability is negatively associated with leverage, whereas firm size is positively associated with it. The supplementary analyses are consistent with the negative direction of the main association but provide less consistent evidence of size-related differences. These results suggest that lower borrowing costs alone may not be sufficient to increase firms' use of debt when credit demand and business conditions remain weak. The study adds firm-level evidence on financing behavior during a credit-support intervention in a bank-based emerging economy, although the findings reflect changes during the policy period rather than the standalone effect of the subsidy program.

Keywords

corporate financial leverage, interest rate subsidy program, firm size, credit support, bank lending, Vietnam

JEL Classification

G32, G38, D22, G21

INTRODUCTION

In bank-based emerging economies, financial leverage is closely tied to firms' access to bank credit and the conditions under which external finance is supplied. Firms' capital structure decisions are shaped by both firm-specific characteristics and broader financial and institutional conditions, rather than by a single determinant. In such settings, changes in bank lending conditions can have a particularly strong influence on borrowing behavior and the process of capital structure adjustment.

Vietnam provides a relevant setting for examining this issue. As a bank-based emerging economy, external financing is dominated by bank lending, and credit allocation remains closely linked to government policy priorities. This institutional structure makes firms' financing decisions particularly sensitive to government interventions in credit markets.

The period from 2020 to 2022 was marked by significant economic disruptions associated with the COVID-19 pandemic, affecting firms' operations and financing conditions. In response, the Vietnamese government introduced an interest rate subsidy program in 2022 aimed at supporting economic recovery by reducing borrowing costs and improving firms' access to credit. Changes in borrowing conditions under the program may alter firms' financing incentives and influence their capital structure decisions.

However, firms may not respond uniformly to policy-driven credit support. While reduced borrowing costs may relax financing constraints and encourage greater use of debt, access to subsidized credit may differ across firms, potentially leading to heterogeneous responses. Increased borrowing under favorable conditions may also raise concerns about rising leverage and financial risk.

In this context, this study examines changes in the financial leverage of listed non-financial firms during the implementation of Vietnam's 2022 Interest Rate Subsidy Program. It also investigates whether the extent of these changes varies with firm size, given differences in firms' capacity to access bank credit and expand debt financing. Understanding these differences is important for assessing the implications of credit-support policies for corporate financing decisions in bank-based emerging economies.

1. LITERATURE REVIEW AND HYPOTHESES

Firms' capital structure decisions are shaped jointly by their internal characteristics and the financial environment in which they operate. A substantial body of empirical research has shown that profitability, firm size, asset tangibility, and growth opportunities are important factors commonly associated with firms' financial leverage (Rajan & Zingales, 1995). Synthesizing evidence from multiple countries, Frank and Goyal (2009) similarly identify these as the most robust factors explaining differences in capital structure across firms. Beyond firm-specific characteristics, capital structure is also significantly influenced by the level of financial system development and the institutional environment (Booth et al., 2001; Deesomsak et al., 2004). Accordingly, country-level factors not only directly affect debt financing decisions but also interact with firm characteristics in shaping capital structure (De Jong et al., 2008). In emerging economies, global financial conditions may also significantly influence corporate leverage dynamics (Alter & Elekdag, 2020). Evidence from Vietnam is broadly consistent with these findings, showing that the capital structure decisions of listed firms reflect the joint influence of firm characteristics and financial market conditions (Nguyen et al., 2014; Vo, 2017), while banking system uncertainty may reduce firms' propensity to use debt financing (Huynh & Phan, 2024).

Although firm characteristics and the financial environment help explain differences in capital structure, firms' financing decisions are also significantly influenced by financial market frictions. These frictions increase the cost of external finance and affect firms' choices between internal funds and debt financing, particularly under conditions of information asymmetry (Fama & French, 2002). The two main sources of financial frictions are agency costs among stakeholders (Jensen & Meckling, 1976) and information asymmetry between firms and capital providers (Myers & Majluf, 1984). When financial institutions lack sufficient information to assess firms' quality and risk, they may restrict credit supply even to firms willing to accept higher interest rates, which constitutes credit rationing (Stiglitz & Weiss, 1981). Evidence from relationship lending suggests that longer banking relationships can partly mitigate this problem by reducing borrowing costs and collateral requirements (Berger & Udell, 1995). Therefore, access to external finance depends not only on firms' demand for credit but also on the conditions governing the supply of credit in the market. Empirical studies further confirm the role of credit supply in capital structure decisions. Evidence shows that firms with access to public debt markets maintain higher levels of leverage (Faulkender & Petersen, 2006), while firms with access to bond markets tend to shift toward bond issuance when bank credit is tightened rather than continuing to rely on bank borrowing (Becker &

Ivashina, 2014). These findings indicate that financial frictions not only affect access to credit but also create differences across firms in their choice of financing sources, depending on their access to different financing channels. This implies that the conditions under which financial institutions supply credit play an important role in firms' debt financing decisions.

In economies where firms rely heavily on bank credit, changes in monetary policy are transmitted to the corporate sector through changes in the supply and terms of credit provided by commercial banks, thereby affecting firms' access to debt financing (Bernanke & Gertler, 1995). Empirical studies generally confirm the important role of the bank lending channel in the transmission of monetary policy. Specifically, when monetary policy is tightened, banks tend to reduce their lending, limiting firms' access to new loans (Jiménez et al., 2012). Monetary policy also affects banks' risk-taking, lending composition, and lending activities, thereby influencing credit allocation across firms (Jiménez et al., 2014; Pamungkas et al., 2025). Evidence from Vietnam similarly indicates that the bank lending channel remains an important mechanism for monetary policy transmission, although its effectiveness may vary during periods of financial crisis and the COVID-19 pandemic (Loi & Dang, 2023). Taken together, the evidence suggests that policies directly affecting the lending capacity and credit terms of the banking system may alter firms' access to debt financing and, consequently, influence their debt financing decisions. This provides a basis for examining the role of government credit support programs implemented through the banking system.

Building on the transmission mechanism through the bank lending channel, many governments have implemented credit support programs to alleviate firms' constraints in accessing finance, particularly during periods of economic downturn or crisis. These programs encompass various instruments, including credit guarantees, preferential lending, interest rate subsidies, and other forms of financial support, designed to maintain the flow of credit to the corporate sector, support liquidity, and encourage banks to continue providing finance during economic downturns (Didier et al., 2021; Haque & Varghese, 2021). Empirical evi-

dence suggests that credit support programs may help ease financial constraints, improve access to finance, and sustain firms' operations during adverse economic conditions (Deghi et al., 2021). Overall, this evidence indicates that credit support programs may facilitate firms' access to debt financing through the banking system.

Among government credit support instruments, interest rate subsidies are used to reduce borrowing costs and help firms maintain or expand investment activities through credit financing. Theoretically, lower borrowing costs may increase the attractiveness of debt financing, thereby encouraging firms to use more debt and adjust their capital structures toward higher financial leverage. Consistent with this argument, several studies have shown that changes in prevailing interest rates are associated with firms' financing decisions and leverage levels (Karpavičius & Yu, 2017; Zhao & Han, 2025). Reducing borrowing costs through interest rate subsidy programs may also improve firms' access to credit and help them sustain investment activities, particularly when the economy is affected by major shocks (Liu & Wang, 2025). However, firms' responses to changes in financing conditions may vary depending on the degree of financial constraints they face. Less financially constrained firms are generally able to adjust their capital structures more flexibly over the business cycle (Korajczyk & Levy, 2003), whereas more financially constrained firms are more sensitive to changes in access to credit (Gertler & Gilchrist, 1994; Beck et al., 2008) and may increase their leverage to a greater extent during the implementation of credit support policies (Xie, 2025). In addition, banks' market power may influence the effectiveness of subsidized loan allocation (Ornelas et al., 2024). Therefore, the relationship between interest rate subsidy policies and firms' debt financing decisions may vary across firms as well as across institutional and financial contexts.

In addition to policy-related factors, capital structure decisions are also influenced by firms' internal characteristics. According to the Pecking Order Theory, highly profitable firms generally prefer to use internal funds before seeking external finance, thereby reducing their reliance on debt (Myers, 1984; Myers & Majluf, 1984). Consistent with this argument, numerous empirical studies

have documented a negative relationship between profitability and financial leverage across different institutional contexts (Rajan & Zingales, 1995; Fama & French, 2002). Similar findings have also been reported in emerging economies, including Vietnam (Vo, 2017), while Frank and Goyal (2009) identify profitability as one of the most robust determinants of firms' capital structure decisions. Firm size is also considered an important characteristic associated with capital structure decisions because it reflects differences in information asymmetry, collateral capacity, and access to external finance. Numerous empirical studies have documented a positive relationship between firm size and financial leverage in both developed and emerging economies (Huang & Song, 2006; Nguyen et al., 2014). However, this relationship, as well as capital structure adjustment dynamics, is not uniform across countries or groups of firms because of differences in financing conditions and institutional environments (Mateev et al., 2013; Jõeveer, 2013; Zeitun et al., 2017; Sahin, 2018). Therefore, the effect of interest rate subsidy policies on financial leverage may vary with firm size.

Although prior research suggests that credit support policies and interest rate subsidies may improve access to finance and influence firms' financing decisions, three gaps remain. First, most research has examined credit support instruments in general or unconventional monetary policies, leaving limited empirical evidence on interest rate subsidy programs as a distinct policy instrument. Second, the available evidence comes primarily from developed economies or countries with well-developed capital markets, with relatively little attention paid to bank-based emerging economies such as Vietnam. Third, while earlier studies have documented differences in firms' responses to changing financing conditions, little is known about the role of firm size in the relationship between interest rate subsidy programs and corporate financial leverage.

To address these gaps, this study examines the relationship between Vietnam's 2022 Interest Rate Subsidy Program and the financial leverage of listed non-financial firms, while also investigating whether this relationship varies with firm size. The study thereby adds empirical evidence from a bank-based emerging economy.

Study hypotheses are as follows:

- H1: *Firms' financial leverage changes during the implementation of Vietnam's 2022 Interest Rate Subsidy Program.*
- H2: *The extent of change in firms' financial leverage during the implementation of Vietnam's 2022 Interest Rate Subsidy Program varies with firm size.*

2. METHODOLOGY AND DATA

The study employs a panel dataset of non-financial firms listed on the Ho Chi Minh City Stock Exchange (HOSE) and the Hanoi Stock Exchange (HNX) over the period 2016–2024. This period covers both the pre-policy years and the implementation of Vietnam's 2022 interest rate subsidy program, providing an appropriate setting for examining firms' leverage responses to changes in financing conditions during the program period in borrowing costs. Firm-level financial data are obtained from audited financial statements and related corporate disclosures.

The sample selection follows several criteria. Firms operating in the financial sector, including banks, insurance companies, and securities firms, are excluded because their capital structures are subject to industry-specific regulations and differ substantially from those of non-financial firms. Observations with missing financial information required for constructing the study variables are also removed. To align the analysis with the policy context, the sample focuses on firms operating in sectors eligible for support under Decree No. 31/2022/ND-CP. After applying these screening procedures, the final sample consists of 1,160 firm-year observations.

The study employs corporate financial leverage (Leverage) as the dependent variable, measured as the ratio of interest-bearing debt, including both short-term and long-term debt, to total assets. The key explanatory variable is the 2022 interest rate subsidy program (Policy), represented by a dummy variable that takes a value of 1 in 2022 and 0 otherwise. This variable is designed to capture the

2022 policy period associated with the introduction of the government's post-COVID-19 interest rate subsidy program under Decree No. 31/2022/ND-CP and its implications for firms' financing conditions.

Firm size (*SIZE*), measured as the natural logarithm of total assets, is included both as a control variable and as a moderating variable. Before constructing the interaction term, *SIZE* is mean-centered by subtracting its sample mean from each observation. As a control variable, *SIZE* captures differences in firm scale, borrowing capacity, and access to external finance. As a moderating variable, it is interacted with the policy variable to examine whether the relationship between the subsidy program and financial leverage varies across firms. Profitability (*Profit*), measured as net profit after tax divided by total assets, is also included as a control variable to account for firms' internal financing capacity. For robustness purposes, the study additionally employs alternative leverage measures, which are discussed in the empirical strategy section.

Figure 1 summarizes the research procedure employed in this study. The analysis begins with the collection and screening of firm-level data, fol-

lowed by variable construction, descriptive statistics, and diagnostic tests. The empirical analysis comprises a two-way fixed-effects model, quantile regressions, and a robustness test using an alternative leverage measure. The final stage interprets the findings and discusses their implications for firms' financing decisions.

To examine changes in corporate financial leverage during the implementation of the 2022 Interest Rate Subsidy Program, the study employs a two-way fixed-effects regression model. Firm fixed effects control for unobserved time-invariant firm characteristics that may influence leverage decisions, while year fixed effects account for common macroeconomic shocks. Standard errors are clustered at the firm level to address potential heteroskedasticity and serial correlation.

The empirical specification estimates the association between the 2022 policy period and corporate financial leverage after controlling for firm size and profitability. To assess whether this association varies with firm size, the model incorporates an interaction term between *Policy* and *SIZE*. This specification allows the study to examine whether changes in financial leverage during the policy period differ with firm size.

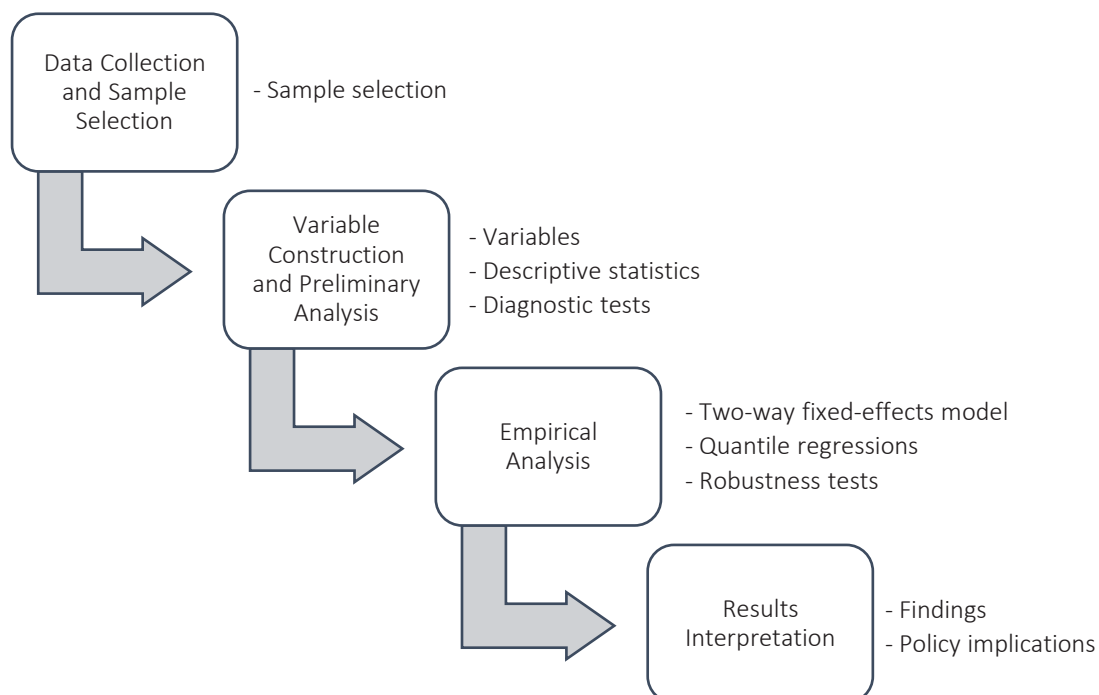


Figure 1. Flowchart of the research

$$\begin{aligned} \text{Leverage}_{i,t} = & \alpha_i + \lambda_t + \beta_1 \text{Policy}_t \\ & + \beta_2 (\text{Policy}_t \cdot \text{SIZE}_{i,t}) \\ & + \beta_3 \text{SIZE}_{i,t} + \beta_4 \text{Profit}_{i,t} + \varepsilon_{i,t}. \end{aligned} \quad (1)$$

A supplementary analysis is conducted to evaluate the robustness of the findings. The robustness test uses the ratio of interest-bearing debt to equity as an alternative measure of corporate financial leverage. This analysis helps assess the consistency of the estimated association across different leverage definitions.

3. RESULTS

Table 1 presents descriptive statistics for the variables used in the empirical analysis, based on the final sample of 1,160 firm-year observations over the 2016–2024 period.

Table 1. Descriptive statistics for the main variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Leverage	1,160	0.202	0.184	0	0.92
Policy	1,160	0.113	0.317	0	1
SIZE	1,160	0	0.06	−0.141	0.167
Profit	1,160	0.079	0.09	−0.344	0.552

Notes: This table reports summary statistics for the variables used in the empirical analysis. Leverage is measured as the ratio of interest-bearing debt to total assets. Policy is a dummy variable equal to 1 in 2022 and 0 otherwise. SIZE is the mean-centered natural logarithm of total assets. Profit is measured as net profit after tax divided by total assets.

The descriptive statistics indicate that financial leverage exhibits substantial cross-firm variation, with a mean of 0.202, indicating that interest-bearing debt accounts for approximately 20.2% of total assets on average. The policy dummy has a mean of 0.113, re-

flecting the relatively small proportion of observations in the policy year. Overall, the variables display sufficient variation to support panel estimation.

Table 2 presents the pairwise Pearson correlation coefficients among the main variables used in the empirical analysis. Several noteworthy relationships are observed.

Table 2. Pairwise Pearson correlation matrix

Variables	(1)	(2)	(3)	(4)
(1) Leverage	1.000			
(2) Policy	−0.018	1.000		
(3) Profit	−0.392*	0.009	1.000	
(4) SIZE	0.358*	0.033	0.009	1.000

Notes: This table reports pairwise Pearson correlation coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Leverage is negatively correlated with profitability and positively correlated with firm size, both at the 10% level. The correlation between leverage and the policy variable is small and statistically insignificant, suggesting that any policy effect is unlikely to be captured by simple bivariate relationships. The relatively low correlations among explanatory variables indicate that multicollinearity is unlikely to be a concern. The hypotheses are therefore tested using panel regressions reported below.

Table 3 reports two-way fixed-effects estimates of corporate financial leverage, where the dependent variable is measured as the ratio of interest-bearing debt to total assets.

Policy carries a negative and statistically significant coefficient ($\beta = -0.087$, $p < 0.001$). Since SIZE is mean-centered, this estimate applies to a firm of

Table 3. Two-way fixed-effects estimates of corporate financial leverage

Leverage	Coef.	Std. Err.	t-value	p-value	[95% Conf	Interval]	Sig
Policy	−0.087	0.013	−6.77	0	−0.112	−0.061	***
SIZE	3.772	0.492	7.67	0	2.8	4.744	***
Policy × SIZE	−0.279	0.108	−2.59	0.011	−0.492	−0.066	**
Profit	−0.477	0.079	−6.01	0	−0.635	−0.32	***
Year fixed effects	Yes						
Firm fixed effects	Yes						
Mean dependent var		0.202		SD dependent var		0.184	
R-squared		0.289		Number of obs		1160	
F-test		9.156		Prob > F		0.000	
Akaike crit. (AIC)		−2,774.014		Bayesian crit. (BIC)		−2,718.396	

Note: Firm-clustered robust standard errors are reported. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

average size, whose financial leverage was 8.7 percentage points lower during the 2022 policy period than in the reference year, 2016. The finding supports *H1*, which predicts a change in financial leverage during the implementation of the program.

The coefficient on *Policy* $\times$ *SIZE* is also negative and statistically significant ($\beta = -0.279$, $p = 0.011$), showing that the difference in leverage between the 2022 policy period and the reference year becomes more negative as firm size increases. Larger firms therefore recorded a greater decline in leverage than smaller firms. This variation across firm sizes supports *H2*.

Among the control variables, Profit is negatively associated with leverage ($\beta = -0.477$, $p < 0.001$), whereas *SIZE* is positively associated with leverage ($\beta = 3.772$, $p < 0.001$). Thus, more profitable firms have lower leverage levels, while larger firms have higher leverage levels.

Table 4 presents the quantile regression estimates used to examine potential heterogeneity in policy effects across the distribution of financial leverage.

Table 4 reports the quantile regression estimates at the 25th, 50th, and 75th percentiles of the leverage distribution. The coefficient on *Policy* is negative across all three quantiles, ranging from -0.030 to -0.063 . It is statistically significant at the median (β

$= -0.063$, $p = 0.034$) but not at the 25th ($\beta = -0.030$, $p = 0.158$) or 75th percentile ($\beta = -0.061$, $p = 0.133$). Thus, the negative association observed during the 2022 policy period is evident at the middle of the conditional leverage distribution but is not statistically significant at its lower or upper quantiles. The interaction between *Policy* and *SIZE* is statistically insignificant at all three quantiles, providing no evidence that the relationship between the policy period and leverage varies with firm size at different points of the leverage distribution. By contrast, *SIZE* remains positively associated with leverage, while Profit remains negatively associated with leverage, across all quantiles ($p < 0.001$).

To assess the robustness of the main results, the two-way fixed-effects model is re-estimated using the ratio of interest-bearing debt to equity as an alternative measure of financial leverage. The results are reported in Table 5.

The coefficient on *Policy* remains negative and statistically significant ($\beta = -0.544$, $p < 0.001$), indicating that the negative association observed in the main analysis persists under the alternative leverage measure. *SIZE* is positively associated with debt-to-equity leverage ($\beta = 16.666$, $p = 0.035$), whereas Profit is negatively associated with it ($\beta = -6.507$, $p = 0.041$). The coefficient on *Policy* $\times$ *SIZE* is negative but statistically insignificant ($\beta = -5.600$, $p = 0.142$). Thus, the alternative speci-

Table 4. Quantile regression results across leverage distribution

Leverage		Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
$\tau = 0.25$	Policy	-0.03	0.021	-1.41	0.158	-0.071	0.012	
	Size	0.977	0.098	10.00	0	0.785	1.168	***
	Policy $\times$ SIZE	0.107	0.243	0.44	0.659	-0.37	0.585	
	Profit	-0.385	0.059	-6.54	0	-0.501	-0.27	***
	Constant	0.123	0.02	6.21	0	0.084	0.162	***
$\tau = 0.50$	Policy	-0.063	0.03	-2.12	0.034	-0.12	-0.005	**
	Size	1.362	0.112	12.15	0	1.142	1.582	***
	Policy $\times$ SIZE	-0.121	0.335	-0.36	0.717	-0.778	0.535	
	Profit	-0.694	0.069	-10.00	0	-0.83	-0.558	***
	Constant	0.263	0.024	11.15	0	0.217	0.31	***
$\tau = 0.75$	Policy	-0.061	0.041	-1.50	0.133	-0.141	0.019	
	Size	1.202	0.125	9.59	0	0.956	1.447	***
	Policy $\times$ SIZE	-0.239	0.616	-0.39	0.698	-1.447	0.97	
	Profit	-1.114	0.103	-10.78	0	-1.317	-0.912	***
	Constant	0.442	0.024	18.57	0	0.395	0.488	***
Mean dependent var			0.202	SD dependent var			0.184	

Notes: This table reports quantile regression estimates at the 25th, 50th, and 75th percentiles of the leverage distribution. Standard errors are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5. Two-way fixed-effects estimates using debt-to-equity leverage

Leverage	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
Policy	−0.544	0.121	−4.49	0	−0.784	−0.304	***
SIZE	16.666	7.826	2.13	0.035	1.183	32.15	**
Policy × SIZE	−5.6	3.792	−1.48	0.142	−13.101	1.901	
Profit	−6.507	3.153	−2.06	0.041	−12.744	−0.27	**
Year fixed effects	Yes						
Firm fixed effects	Yes						
Mean dependent var	0.696			SD dependent var		2.660	
R-squared	0.034			Number of obs		1160	
F-test	3.200			Prob > F		0.001	
Akaike crit. (AIC)	5,268.185			Bayesian crit. (BIC)		5,323.803	

Notes: Firm-clustered robust standard errors are reported. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

cation confirms the negative association between the 2022 policy period and financial leverage but does not corroborate the size-related heterogeneity found in the main model.

4. DISCUSSION

The results indicate that firms' financial leverage changed significantly during the implementation of the 2022 Interest Rate Subsidy Program, thereby supporting *H1*. For a firm of average size, leverage was lower in 2022 than in the reference year of 2016. This direction differs from the expectation based on the negative relationship between interest rates and leverage, according to which lower interest rates are generally associated with greater use of debt (Zhao & Han, 2025).

Because Policy equals one only in 2022, its estimated coefficient reflects the general conditions prevailing during the program year rather than the standalone effect of the interest rate subsidy policy. As production and investment activities remained affected by the COVID-19 pandemic, the program may have helped reduce borrowing costs and improve firms' access to credit, but this support may not have been sufficient to offset weaker credit demand amid continued weakness in business conditions. Firms' ability to obtain credit also depended on banks' lending capacity, risk tolerance, and credit allocation decisions (Bernanke & Gertler, 1995; Jiménez et al., 2012). The negative coefficient on Policy therefore does not mean that the program reduced leverage; it may instead reflect the combined influence of credit demand, credit supply, and the economic conditions prevailing in 2022.

The interaction coefficient between Policy and SIZE is negative and statistically significant, indicating that the negative leverage differential in 2022 was greater among larger firms. This result supports *H2* in the main model but differs from the expectation that smaller firms are generally more sensitive to changes in credit conditions (Gertler & Gilchrist, 1994). One possible explanation is that, despite their financing needs, smaller firms continued to face greater obstacles in accessing bank credit and other sources of external finance (Beck et al., 2008). This finding highlights the role of firm size in explaining differences in leverage adjustments during the program's implementation.

The results for the control variables are broadly consistent with capital structure theory. Profitability is negatively associated with leverage, in line with the pecking order theory, which suggests that more profitable firms tend to rely primarily on internal funds (Myers & Majluf, 1984). By contrast, the positive relationship between firm size and leverage suggests that larger firms generally have greater borrowing capacity and better access to external finance.

The supplementary analyses provide relatively consistent evidence regarding the direction of the main association but do not clearly confirm the moderating role of firm size. In the quantile regressions, the Policy coefficient is negative at all three quantiles but statistically significant only at the median. When the ratio of interest-bearing debt to equity is used as an alternative measure, the Policy coefficient remains negative and statistically significant. However, the interaction between Policy and SIZE is insignificant in both analyses. Thus, the negative association between 2022 and leverage persists

across different approaches, whereas evidence of size-related differences appears primarily in the main model. The conclusion regarding H2 should therefore be interpreted with caution.

Taken together, the results provide stronger evidence of a change in leverage during the policy period than of systematic differences in that change by firm size.

CONCLUSION AND POLICY IMPLICATIONS

This study examines changes in firms' financial leverage during the implementation of Vietnam's 2022 Interest Rate Subsidy Program and assesses whether the extent of these changes varies with firm size. The results show that, for a firm of average size, financial leverage was lower in 2022 than in the reference year of 2016. In the main model, the negative leverage differential was greater among larger firms. However, this size-related difference was not consistently confirmed by the supplementary analyses.

The findings offer several policy implications. First, reducing borrowing costs may not be sufficient to encourage firms to increase their use of debt when business prospects remain weak, and credit demand is subdued. The design of interest rate subsidy programs should therefore consider not only borrowing costs but also firms' demand for credit and banks' capacity and willingness to lend. Monitoring program participation and the allocation of subsidized loans may help identify barriers that prevent eligible firms from accessing credit.

Second, the differences across firm-size groups suggest that a uniform credit-support policy may not produce similar financing responses across firms. Although the evidence regarding the moderating role of firm size is not consistent across all analyses, policy design should account for differences in access to credit, collateral capacity, and financial constraints. Particular attention should be given to smaller firms, which often face greater barriers to accessing formal bank credit.

Third, in bank-based economies, coordination between fiscal and monetary authorities, together with appropriate banking supervision, may improve the transmission of credit-support policies. Such coordination should facilitate access to finance while ensuring prudent credit allocation and maintaining financial stability.

This study has several limitations. First, the sample includes only listed firms and may not fully reflect the financing behavior of smaller or unlisted enterprises. Second, the Policy variable captures the timing of the program rather than firm-level participation or the intensity of support received. Because the variable also represents the year 2022, its estimated coefficient reflects the general conditions prevailing during the program year and cannot isolate the standalone effect of the Interest Rate Subsidy Program. Future research could extend the analysis to unlisted firms, use more direct measures of program participation, and examine the role of institutional factors, such as corporate governance and banking relationships, in policy transmission.

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REFERENCES

- Alter, A., & Elekdag, S. (2020). Emerging market corporate leverage and global financial conditions. *Journal of Corporate Finance*, 62, Article 101590. <https://doi.org/10.1016/j.jcorpfin.2020.101590>
- Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2008). Financing patterns around the world: Are small firms different? *Journal of Financial Economics*, 89(3), 467-487. <https://doi.org/10.1016/j.jfineco.2007.10.005>
- Becker, B., & Ivashina, V. (2014). Cyclicity of credit supply: Firm level evidence. *Journal of Monetary Economics*, 62, 76-93. <https://doi.org/10.1016/j.jmoneco.2013.10.002>
- Berger, A. N., & Udell, G. F. (1995). Relationship lending and lines of credit in small firm finance. *Journal of Business*, 68(3), 351-381. <https://doi.org/10.1086/296668>
- Bernanke, B. S., & Gertler, M. (1995). Inside the black box: The credit channel of monetary policy transmission. *Journal of Economic Perspectives*, 9(4), 27-48. <https://doi.org/10.1257/jep.9.4.27>
- Booth, L., Aivazian, V., Demirgüç-Kunt, A., & Maksimovic, V. (2001). Capital structures in developing countries. *The Journal of Finance*, 56(1), 87-130. <https://doi.org/10.1111/0022-1082.00320>
- De Jong, A., Kabir, R., & Nguyen, T. T. (2008). Capital structure around the world: The roles of firm- and country-specific determinants. *Journal of Banking & Finance*, 32(9), 1954-1969. <https://doi.org/10.1016/j.jbankfin.2007.12.034>
- Deesomsak, R., Paudyal, K., & Pescetto, G. (2004). The determinants of capital structure: Evidence from the Asia Pacific region. *Journal of Multinational Financial Management*, 14(4-5), 387-405. <https://doi.org/10.1016/j.mulfin.2004.03.001>
- Deghi, A., Seneviratne, D., Tsuruga, T., & Vandenbussche, J. (2021). *Corporate funding and the COVID-19 crisis* (IMF Working Paper No. 2021/086). International Monetary Fund. <https://doi.org/10.5089/9781513574158.001>
- Didier, T., Huneus, F., Larrain, M., & Schmukler, S. L. (2021). Financing firms in hibernation during the COVID-19 pandemic. *Journal of Financial Stability*, 53, Article 100837. <https://doi.org/10.1016/j.jfs.2020.100837>
- Fama, E. F., & French, K. R. (2002). Testing trade-off and pecking order predictions about dividends and debt. *Review of Financial Studies*, 15(1), 1-33. <https://doi.org/10.1093/rfs/15.1.1>
- Faulkender, M., & Petersen, M. A. (2006). Does the source of capital affect capital structure? *Review of Financial Studies*, 19(1), 45-79. <https://doi.org/10.1093/rfs/hhj003>
- Frank, M. Z., & Goyal, V. K. (2009). Capital structure decisions: Which factors are reliably important? *Financial Management*, 38(1), 1-37. <https://doi.org/10.1111/j.1755-053X.2009.01026.x>
- Gertler, M., & Gilchrist, S. (1994). Monetary policy, business cycles, and the behavior of small manufacturing firms. *Quarterly Journal of Economics*, 109(2), 309-340. <https://doi.org/10.2307/2118465>
- Haque, S. M., & Varghese, R. (2021). *The COVID-19 impact on corporate leverage and financial fragility* (IMF Working Paper No. 2021/265). International Monetary Fund. <https://doi.org/10.5089/9781589064126.001>
- Huang, G., & Song, F. M. (2006). The determinants of capital structure: Evidence from China. *China Economic Review*, 17(1), 14-36. <https://doi.org/10.1016/j.chieco.2005.02.007>
- Huynh, J., & Phan, T. M. H. (2024). Uncertainty in banking and debt financing of firms in Vietnam. *PLOS ONE*, 19(7), Article e0305724. <https://doi.org/10.1371/journal.pone.0305724>
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360. [https://doi.org/10.1016/0304-405X\(76\)90026-X](https://doi.org/10.1016/0304-405X(76)90026-X)
- Jiménez, G., Ongena, S., Peydró, J.-L., & Saurina, J. (2012). Credit supply and monetary policy: Identifying the bank balance-sheet channel with loan applications. *American Economic Review*, 102(5), 2301-2326. <https://doi.org/10.1257/aer.102.5.2301>
- Jiménez, G., Ongena, S., Peydró, J.-L., & Saurina, J. (2014). Hazardous times for monetary policy: What do twenty-three million bank loans say about the effects of monetary policy on credit risk-taking? *Econometrica*, 82(2), 463-505. <https://doi.org/10.3982/ECTA10104>
- Jøeveer, K. (2013). Firm, country and macroeconomic determinants of capital structure: Evidence from transition economies. *Journal of Comparative Economics*, 41(1), 294-308. <https://doi.org/10.1016/j.jce.2012.05.001>
- Karpavičius, S., & Yu, F. (2017). The impact of interest rates on firms' financing policies. *Journal of Corporate Finance*, 45, 262-293. <https://doi.org/10.1016/j.jcorpfin.2017.05.007>
- Korajczyk, R. A., & Levy, A. (2003). Capital structure choice: Macroeconomic conditions and

- financial constraints. *Journal of Financial Economics*, 68(1), 75-109. [https://doi.org/10.1016/S0304-405X\(02\)00249-0](https://doi.org/10.1016/S0304-405X(02)00249-0)
24. Liu, F., & Wang, Z. (2025). Can green credit interest subsidy policy promote corporate green innovation? From the perspective of fiscal and financial policy coordination. *Sustainability*, 17(21), Article 9750. <https://doi.org/10.3390/su17219750>
 25. Loi, M. T., & Dang, V. D. (2023). The bank lending channel of monetary policy transmission in Vietnam: Impacts of the COVID-19 pandemic and the financial crisis. *Cogent Business & Management*, 10(1), Article 2199485. <https://doi.org/10.1080/23311975.2023.2199485>
 26. Mateev, M., Poutziouris, P., & Ivanov, K. (2013). On the determinants of SME capital structure in Central and Eastern Europe: A dynamic panel analysis. *Research in International Business and Finance*, 27(1), 28-51. <https://doi.org/10.1016/j.ribaf.2012.05.002>
 27. Myers, S. C. (1984). The capital structure puzzle. *The Journal of Finance*, 39(3), 575-592. <https://doi.org/10.1111/j.1540-6261.1984.tb03646.x>
 28. Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2), 187-221. [https://doi.org/10.1016/0304-405X\(84\)90023-0](https://doi.org/10.1016/0304-405X(84)90023-0)
 29. Nguyen, D. T. T., Diaz-Rainey, I., & Gregoriou, A. (2014). Determinants of the capital structure of listed Vietnamese companies. *Journal of Southeast Asian Economies*, 31(3), 412-431. <https://doi.org/10.1355/ae31-3e>
 30. Ornelas, J. R. H., Pedraza, A., Ruiz-Ortega, C., & Silva, T. C. (2024). Market power and the transmission of loan subsidies. *The Review of Corporate Finance Studies*, 13(4), 931-965. <https://doi.org/10.1093/rcfs/cfae015>
 31. Pamungkas, P., Septianto, F., Trinugroho, I., Ab-Rahim, R., Ridhwan, M. M., & Sergi, B. S. (2025). Monetary policy via bank lending channel: Evidence from lending decomposition. *Journal of Risk and Financial Management*, 18(5), Article 249. <https://doi.org/10.3390/jrfm18050249>
 32. Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance*, 50(5), 1421-1460. <https://doi.org/10.1111/j.1540-6261.1995.tb05184.x>
 33. Sahin, O. (2018). Firm-specific and macroeconomic determinants of capital structure: Evidence from Fragile Five countries. *Eurasian Journal of Business and Economics*, 11(22), 61-81. <https://doi.org/10.17015/EJBE.2018.022.03>
 34. Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *American Economic Review*, 71(3), 393-410. Retrieved from <https://www.jstor.org/stable/1802787>
 35. Vo, X. V. (2017). Determinants of capital structure in emerging markets: Evidence from Vietnam. *Research in International Business and Finance*, 40, 105-113. <https://doi.org/10.1016/j.ribaf.2016.12.001>
 36. Xie, L. X. (2025). Do financially constrained companies increase more leverage during COVID-19? *Open Journal of Business and Management*, 13(6), 3828-3837. Retrieved from <https://www.semanticscholar.org/paper/Do-Financially-Constrained-Companies-Increase-More-Xie/0da00fabcc1404b4c96ab975be236921385da363>
 37. Zeitun, R., Temimi, A., & Mimouni, K. (2017). Do financial crises alter the dynamics of corporate capital structure? Evidence from GCC countries. *Quarterly Review of Economics and Finance*, 63, 21-33. <https://doi.org/10.1016/j.qref.2016.05.004>
 38. Zhao, J., & Han, Y. (2025). Interest rate fluctuations and corporate financial leverage. *Finance Research Letters*, 80, Article 107344. <https://doi.org/10.1016/j.frl.2025.107344>