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Financial Flexibility and the Risk of Inadequate Interest Coverage: Evidence from Vietnamese Listed Firms

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Abstract

Financial flexibility, often proxied by spare or unused debt capacity, is thought to help firms avoid difficulty servicing debt when earnings decline, but evidence directly linking a firm's history of low leverage to the subsequent onset of inadequate interest coverage remains limited, particularly in emerging markets such as Vietnam. This study examines whether persistent low leverage, used as a proxy for financial flexibility (FF), is associated with a lower likelihood that a Vietnamese listed firm transitions from adequate interest coverage, ICR(t) ≥ 1, to inadequate interest coverage, ICR(t+1) < 1, and whether this association carries incremental predictive information beyond the firm's current leverage. Using 3,416 firm-year observations from 579 non-financial firms listed on the Ho Chi Minh Stock Exchange and Hanoi Stock Exchange, including 323 transitions to inadequate coverage, the study estimates nested pooled logistic regressions with industry and year fixed effects. FF firms display a lower raw entry rate into inadequate coverage than non-FF firms, and persistent low leverage is negatively associated with the outcome in a preliminary specification; however, the association becomes smaller and statistically insignificant once current leverage is held constant, and sensitivity analyses across alternative coverage definitions, zero-interest-expense treatments, FF constructions, and fixed-effects specifications yield mixed results. The findings indicate that, once current leverage is held constant, persistent low leverage does not provide clear incremental information about near-term coverage risk in this sample, with implications for how researchers and practitioners construct and interpret financial-flexibility proxies among Vietnamese listed firms.

Keywords: *financial flexibility, interest coverage ratio, persistent low leverage, panel logistic regression, Vietnamese listed firms*

1. Introduction

Financial flexibility refers to a firm's capacity to obtain additional funding and adjust its financing policies in response to unexpected cash shortages (Gamba and Triantis, 2008). It is an important consideration in corporate financing decisions because a firm's current financial policies may affect its ability to raise additional funds when operating conditions deteriorate, or new financing needs arise (Graham and Harvey, 2001). One potential source of financial flexibility is spare debt capacity. By maintaining debt below the level it could reasonably support, a firm may preserve room to borrow in the future while limiting its exposure to fixed interest obligations. Consistent with this argument, Marchica and Mura (2010) find that UK listed firms maintaining spare debt capacity over three years subsequently increase investment and use new debt financing to support that investment. This logic traces back to Myers (1977), who models unused debt capacity as an option value that firms preserve to fund future investment opportunities, and is echoed by Denis and McKeon (2012), who show that US firms making large, proactive increases in leverage do so primarily to fund investment and cash needs rather than to correct chronic underleverage.

Financial flexibility may also reduce vulnerability to financial distress. A highly leveraged firm faces higher interest obligations and may have limited capacity to obtain further financing when earnings decline. By contrast, a firm that has preserved borrowing capacity may be better positioned to respond to negative operating or financing shocks. Using the Altman Z-score and modified Z-score, Mahmood, Rizwan and Rashid (2018) find that financially flexible firms listed on the Pakistan Stock Exchange exhibit stronger financial conditions and lower distress risk. However, persistent low leverage does not necessarily mean that a firm has intentionally preserved borrowing capacity. It may instead reflect weak financing demand, restricted access to credit, high operating risk, or managerial conservatism. Therefore, observed persistent low leverage should not automatically be interpreted as evidence that a firm has deliberately preserved borrowing capacity. This ambiguity has been recognized since Altman (1968), whose discriminant-analysis framework for predicting corporate bankruptcy - later adapted into the Z-score measures used by Mahmood, Rizwan and Rashid (2018) - likewise combines financial ratios that can reflect several distinct underlying causes of financial weakness.

This measurement limitation is central to the present study because a firm's unused debt capacity is not directly observable from financial statements. Marchica and Mura (2010) address a similar measurement problem by first estimating a firm's target leverage and identifying spare debt capacity from a sufficiently large negative deviation between its actual and predicted leverage. Their baseline financial-flexibility measure, FF3, then requires a firm to maintain spare debt capacity for at least three consecutive years, allowing a sustained financing policy to be distinguished from a temporary change in capital structure. The present study adopts this persistence-based logic but uses a different benchmark: a firm is classified as financially flexible when its leverage remains below the corresponding industry-year median for three consecutive years. Persistent low leverage is therefore used as a proxy for financial flexibility rather than as a direct measure of unused borrowing capacity. This persistence-based, industry-year-median approach is used because it does not require estimating a firm-specific target-leverage model, whose data requirements are considerable in this setting; the trade-off is that it is a coarser benchmark than a directly estimated target-leverage deviation, which likely introduces measurement error that would tend to attenuate, rather than inflate, the estimated FF-coverage association. Directly estimating target leverage is itself demanding, since the firm and industry characteristics found to explain leverage choices in the broader capital-structure literature - for example, in Titman and Wessels (1988) and Rajan and Zingales (1995) - do not generalize uniformly across institutional settings, reinforcing the appeal of a simpler, persistence-based benchmark in the present context.

The potential benefit of financial flexibility becomes particularly relevant when a firm's operating earnings approach its interest obligations. Financial distress is a broad concept that has been measured using accounting-based scores, market-based indicators, and debt-coverage ratios. This study focuses on the interest coverage ratio (ICR), calculated as earnings before interest and taxes (EBIT) divided by interest expense. An ICR below one indicates that operating earnings are insufficient to cover reported interest expense. The main outcome is the onset of inadequate interest coverage, which occurs when a firm has an ICR of one or higher in the current year but an ICR below one in the following year. Although this threshold does not capture every dimension of financial distress, it provides a direct and interpretable accounting-based indicator of debt-servicing difficulty.

Existing Vietnamese studies have examined financial flexibility and accounting-based financial distress in separate lines of research, but limited evidence directly connects the two. Using a sample of Vietnamese listed firms, Nguyen and Dang (2023) find that financial flexibility is associated with lower future stock-price crash risk and that this association becomes stronger during the COVID-19 crisis. Nguyen (2024) examines financial flexibility in relation to risk-management effectiveness and finds that financial-flexibility strategies reduce both firm risk and firm performance, which the study interprets as a reduction in risk-management effectiveness under its high-risk–high-return framework. In a separate line of research, Tran et al. (2023) use the interest coverage ratio and times interest earned as accounting-based proxies for financial distress among Vietnamese listed firms and find support for the validity of the Altman Z″-score model only when the interest coverage ratio is used as the distress proxy. However, comparatively limited evidence addresses whether financial flexibility measured in year t is associated with the subsequent transition of an adequately covered firm from $ICR(t) \geq 1$ to $ICR(t+1) < 1$. Other Vietnamese studies have examined financial distress using cash-flow and firm-specific accounting indicators without directly linking it to financial flexibility: Do et al. (2022) apply a Bayesian approach to relate cash flow to financial distress among Vietnamese listed firms.

Another issue is that the persistent-low-leverage proxy is closely related to the firm's current leverage. Current leverage captures the firm's level of indebtedness in year t, whereas persistent low leverage reflects a financing position maintained over the current and two preceding years. If this sustained position reflects the deliberate preservation of financial flexibility, it may indicate that the firm has maintained a financing buffer, remains less dependent on debt financing, and retains greater capacity to raise funds in response to adverse shocks. Persistent low leverage may, therefore, contain information about the firm's financing policy and financial resilience beyond what its current leverage alone shows. However, a sustained low-leverage position may also arise from credit constraints, weak financing demand, limited investment opportunities, or other firm characteristics that are not fully observable. The main model therefore includes both persistent low leverage and current leverage to assess whether the firm's leverage history provides incremental predictive information about the onset of inadequate interest coverage after current leverage and other firm characteristics are held constant. This distinction matters because current leverage has itself been linked to constrained subsequent investment among highly levered firms (Lang, Ofek, and Stulz, 1996), underscoring the importance of separating the two measures in the main specification.

Accordingly, this study asks: Is persistent low leverage, used as a proxy for financial flexibility, associated with a lower likelihood that a Vietnamese listed firm transitions from ICR(t) ≥ 1 in year t to ICR(t+1) < 1 in year t+1, after controlling for current leverage and other firm characteristics?

H_1: Financial flexibility is negatively associated with the likelihood that a Vietnamese listed firm transitions from ICR(t) ≥ 1 in year t to ICR(t+1) < 1 in year t+1.

The study examines 3,416 firm-year observations from 579 non-financial firms listed on the Ho Chi Minh Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX), including 323 transitions to inadequate interest coverage. Descriptively, FF firm-years have a lower entry rate than non-FF firm-years. In the preliminary specification, persistent low leverage is negatively and statistically significantly associated with the subsequent onset of inadequate interest coverage. However, the coefficient becomes smaller and is no longer statistically significant in the main specification after current leverage is controlled for, providing limited evidence that persistent low leverage contains incremental predictive information beyond the firm's current debt position. The sensitivity analyses produce mixed results, indicating that the estimated association is sensitive to the definition of interest-coverage weakness, the treatment of observations with zero interest expense, the construction of financial flexibility, and the fixed-effects specification. The study contributes in three ways. First, it focuses on the onset of inadequate interest coverage from year t to year t+1, rather than a contemporaneous relationship. Second, it distinguishes the firm's multi-year history of low leverage from its current leverage and assesses whether the former provides incremental predictive information beyond the latter. Third, it systematically evaluates the sensitivity of the results to alternative coverage definitions and thresholds, zero-interest treatments, alternative constructions of financial flexibility, and alternative fixed-effects specifications.

2. Objectives

2.1. Financial Flexibility and Inadequate Interest Coverage

First, this study examines whether financial flexibility in year t is associated with a lower likelihood that a Vietnamese listed firm develops inadequate interest coverage in year t+1. Financial flexibility is proxied by leverage remaining below the corresponding industry-year median for three consecutive years. The analysis focuses on firms with ICR(t) ≥ 1 and examines whether they transition to ICR(t+1) < 1.

2.2. Incremental Predictive Information

Second, this study assesses whether persistent low leverage provides incremental predictive information beyond the firm's current leverage. Persistent low leverage reflects a financing position maintained over years t, t−1, and t−2, whereas current leverage captures the firm's debt position in year t. By including both measures in the main specification, the study evaluates whether the firm's leverage history is associated with the onset of inadequate interest coverage after current leverage and other firm characteristics are held constant.

2.3. Robustness Analysis

Third, this study evaluates the sensitivity of the estimated association to alternative definitions of inadequate interest coverage, alternative treatments of observations with zero interest expense, alternative constructions of the financial-flexibility proxy, and alternative fixed-effects specifications. The coverage analyses replace the EBIT-based ICR with an EBITDA-based TIE measure, apply a more conservative ICR threshold of 1.5, and examine persistent coverage weakness by requiring ICR to remain below one in both years t+1 and t+2. The zero-interest analysis compares the main approach, which excludes observations with undefined ICR because interest expense equals zero, with an alternative treatment that classifies zero-interest observations with non-negative EBIT as having adequate coverage. The financial-flexibility analyses shorten the low-leverage persistence requirement from three years to two years and reconstruct the proxy using total liabilities rather than interest-bearing debt. Finally, an alternative fixed-effects specification replaces the separate industry and year fixed effects used in the main models with industry-by-year fixed effects to assess sensitivity to unobserved shocks that vary across industries and years. Together, these analyses assess the extent to which the findings are sensitive to the definition and persistence of coverage weakness, the treatment of zero-interest observations, the construction of the financial-flexibility proxy, and the specification of unobserved industry and time effects.

3. Materials and Methods

3.1. Data and Sample

This study distinguishes four time references. The underlying dataset spans 2011 - 2025; the study window used to construct the estimation sample is 2014 - 2024; the main predictor, financial flexibility (FF), is defined

over 2016 - 2023; and the one-year-ahead outcome is observed through 2024. The sample consists of non-financial firms listed on the Ho Chi Minh Stock Exchange (HOSE) and the Hanoi Stock Exchange (HNX).

The panel is unbalanced. The year 2024 serves only as an outcome year for the main models; it is not used as a predictor year for M1 - M3. The estimation sample is constructed through the following sequential filtering process. Starting from 24,150 raw firm-year observations covering merged financial-statement and ratio data for 2011 - 2025, the sample is narrowed to 17,710 observations in the 2014 - 2024 study window, then to 8,041 observations for firms listed on HOSE and HNX. Excluding financial-sector firms leaves 7,106 observations; requiring a valid Level-1 sector classification leaves 7,018; requiring valid leverage and a valid industry-year median leverage leaves 6,697; requiring a valid three-year FF predictor (2016 - 2023) leaves 4,804; and requiring an observed next-year interest-coverage state leaves 4,227. The final main estimation sample - firms with adequate interest coverage in year t and complete controls - comprises 3,416 firm-year observations.

The final main sample therefore consists of 3,416 firm-year observations from 579 firms, including 323 entry events. Financial-sector firms are excluded throughout. The industry-year median leverage used to define low leverage requires at least 15 firms per industry-year cell, with a fallback to a broader industry grouping when this minimum is not met, following a pre-specified rule. Construction and real estate firms make up a substantial share of this non-financial listed universe, a sector separately examined in relation to financial distress by Phan and Ngo (2024).

3.2. Variables and Measurement

Leverage (LEV) is measured as the sum of short-term and long-term interest-bearing debt divided by total assets. A firm is classified as LowLev (=1) if its LEV falls below the industry-year median. Financial flexibility (FF) equals 1 if a firm is classified as LowLev in three consecutive years: t, t-1, and t-2, that is persistent low leverage, a persistence-based construction inspired by Marchica and Mura (2010); unlike their target-leverage-deviation measure, FF here is proxied using an industry-year median leverage threshold.

Interest coverage (ICR) is defined as EBIT divided by interest expense, and a firm is classified as having inadequate interest coverage (INADEQ_ICR = 1) when ICR < 1. The main outcome variable, ENTRY_INADEQ_ICR(t+1), captures the onset of inadequate interest coverage in year t+1, observed within the subsample of firms with ICR(t) ≥ 1.

The regressions include five firm-level control variables: SIZE - the natural logarithm of total assets; PROFIT - EBIT scaled by total assets; CASH - cash and cash equivalents scaled by total assets; TANG - net tangible fixed assets scaled by total assets; and GROWTH - the year-on-year percentage change in sales. Full variable definitions appear in Table 1. These control variables correspond closely to the firm characteristics identified as reliably important correlates of leverage and financial outcomes in the broader capital-structure literature (Frank and Goyal, 2009).

Several alternative outcomes and FF definitions are used for the robustness and sensitivity analysis in Section 4.2: an inadequate-TIE indicator based on EBITDA/interest expense; an inadequate-coverage indicator using a 1.5 threshold; a persistent-coverage-weakness indicator requiring ICR < 1 in both t+1 and t+2; a zero-interest-expense sensitivity check; a two-year definition of FF; an FF definition based on total liabilities rather than interest-bearing debt; and industry-by-year fixed effects in place of separate industry and year effects.

All continuous control variables are winsorized at the 1st and 99th percentiles; dummy variables and coverage-status indicators are not winsorized.

Table 1 Variable Definitions and Measurement

Variable	Role	Calculation	Note
ENTRY_INADEQ_ICR(t+1)	Main Y	F.INADEQ_ICR in the subsample with INADEQ_ICR(t)=0; INADEQ_ICR=1 if EBIT/Interest Expense<1	Onset of inadequate interest coverage in the following year
FF(t)	Main X	1 if LEV is below the industry-year median at t, t-1, and t-2	Persistent low leverage; expected negative sign
LEV(t)	Required control	Short-term + long-term interest-bearing debt/Total assets	Separates history of low leverage from the current debt level
SIZE(t)	Control	ln(Total assets)	Firm size
PROFIT(t)	Control	EBIT/Total assets	Profitability; expected negative for risk

CASH(t)	Control	Cash and cash equivalents/Total assets	Liquidity; expected negative
TANG(t)	Control	Net tangible fixed assets/Total assets	Collateral benefit and fixed-cost exposure
GROWTH(t)	Control	(Sales(t)-Sales(t-1)) / Sales(t-1)	Sales growth
ENTRY_INADEQ_TIE(t+1)	Robustness	TIE=EBITDA/Interest Expense; event if TIE(t+1)<1 in the subsample TIE(t)≥1	Replaces the EBIT numerator with EBITDA
ENTRY_ICR15(t+1)	Robustness	Event if ICR(t+1)<1.5 in the subsample ICR(t)≥1.5	More conservative coverage threshold
PERSIST_ICR(t+1,t+2)	Robustness	ICR<1 in both t+1 and t+2	Persistent coverage weakness

Note: continuous control variables are winsorized at the 1st and 99th percentiles; dummy variables and coverage-status indicators are not. LEV(t) is a required control in M3 to separate the history of low leverage from the current debt level.

3.3. Treatment of Interest expense

The treatment of interest expense merits explicit discussion because it directly affects the construction of ICR. After restricting the sample to firms with a valid industry classification, interest expense is recorded with a negative sign - following the data vendor's convention - for 6,010 observations, equals zero for 763 observations, is missing for 236 observations, and is recorded with a positive sign for 9 observations. The main coding rule converts negative values to a positive interest expense using the transformation - InterestExpense, after verifying that the negative sign reflects a data convention rather than a genuine reporting anomaly. The 9 observations with a positive sign are set aside for separate audit rather than being combined automatically with the sign-corrected values; an indiscriminate abs() transformation is not applied.

Firms with zero interest expense are not assigned an arbitrarily large ICR value (e.g., 999), nor is a small constant added to the denominator to avoid division by zero. Instead, observations with InterestExpense = 0 are excluded from the main ICR-based sample and are examined separately as part of the zero-interest sensitivity check reported in Section 4.2.

3.4. Model

The main analysis uses pooled logistic regression, with standard errors clustered at the firm level and both industry and year fixed effects included in all specifications. Three nested models are estimated: M1 includes the control variables and fixed effects only; M2 adds FF to M1; and M3 – the main specification – adds current leverage, LEV(t), to M2. Clustering standard errors at the firm level follows recommended practice for panel data sets in corporate finance research, where residuals are often correlated within firms over time (Petersen, 2009). M3 is treated as the main specification because it directly tests whether persistent low leverage carries incremental predictive information for the onset of inadequate interest coverage once current leverage is held constant. Because FF is constructed from lagged leverage history, distinguishing its association from the level of current indebtedness is the central specification issue addressed in this study.

Throughout Section 4, the coefficient, clustered standard error, and p-value for FF are reported, together with the odds ratio and average marginal effect (AME) when interpreting its economic magnitude; statistical significance is not summarized using star notation alone.

4. Results and Discussion

4.1. Sample recap, Descriptive statistics, and Univariate evidence

The main estimation sample comprises 3,416 firm-year observations from 579 firms, with 323 entry events; financially flexible (FF = 1) firm-years account for 32.17% of the sample.

Table 2, Panel A reports descriptive statistics for the main sample. Because ICR and TIE are held on their raw scale rather than winsorized, a small number of observations with very small interest-expense denominators produce extreme values that inflate the mean and maximum well beyond what is representative of a typical firm; the median and interquartile range are therefore emphasized when describing coverage. The median ICR is 5.333 and the median TIE is 8.255, both of which are far more representative of the typical firm-year than the corresponding means.

Table 2, Panel B compares FF and non-FF firm-years directly. The entry rate - the incidence of ICR(t+1) < 1 among firms with ICR(t) ≥ 1 - is 7.55% for FF firms and 10.36% for non-FF firms, a raw difference of about -2.81 percentage points. This comparison is descriptive and univariate; it does not represent a causal effect. The two groups also differ markedly on other characteristics: FF firms have lower LEV, higher PROFIT and CASH,

and lower TANG than non-FF firms. Because FF and non-FF firms differ systematically along several dimensions related to the outcome, multivariate regression is needed to separate the association between FF and subsequent inadequate coverage from these confounding characteristics.

Table 2, Panel C reports pairwise correlations and variance inflation factors (VIFs). The correlation between FF and LEV is -0.635, indicating substantial overlap between the two measures, which is expected given that FF is constructed from a history of low leverage. The highest VIF is 1.94, which does not indicate severe multicollinearity by conventional thresholds. However, a low VIF only rules out a specific form of multicollinearity; it does not establish that endogeneity or measurement overlap between FF and LEV is absent.

Table 2 Descriptive Statistics, Univariate Comparison, and Correlation

Panel A: Descriptive Statistics (Main Sample)

Variable	N	Mean	SD	P25	Median	P75	Min–Max
FF	3,416	0.322	0.467	0.000	0.000	1.000	0.000–1.000
LEV	3,416	0.235	0.170	0.092	0.209	0.360	0.000–0.661
SIZE	3,416	27.831	1.560	26.725	27.773	28.754	24.278–31.968
PROFIT	3,416	0.084	0.063	0.041	0.067	0.109	0.000–0.366
CASH	3,416	0.081	0.083	0.024	0.056	0.109	0.001–0.502
TANG	3,416	0.223	0.218	0.054	0.150	0.331	0.000–0.867
GROWTH	3,416	0.174	0.552	−0.066	0.078	0.250	−0.776–4.120
ICR	3,416	730.636	32976.398	2.343	5.333	17.934	1.001–1,922,186.800
TIE	3,416	956.146	42850.453	3.790	8.255	24.969	−75.652–2,495,892.800

Panel B: FF versus Non-FF (Univariate Comparison)

Group	N	Entry rate	LEV	SIZE	PROFIT	CASH	TANG	GROWTH
Non-FF	2,317	10.36%	0.309	28.029	0.078	0.071	0.243	0.190
FF	1,099	7.55%	0.079	27.413	0.096	0.104	0.182	0.141

Panel C: Correlation and Variance Inflation Factor (VIF)

Variable	Corr. with FF	Corr. with LEV	VIF
FF	1.000	−0.635	1.68
LEV	−0.635	1.000	1.94
SIZE	−0.184	0.253	1.07
PROFIT	0.140	−0.185	1.15
CASH	0.188	−0.279	1.12
TANG	−0.131	0.247	1.17
GROWTH	−0.042	0.017	1.02

Note: Panel A - continuous control variables are winsorized at the 1st and 99th percentiles; ICR and TIE are reported on their raw scale, so the median and interquartile range should be used when describing coverage. Panel B - the entry rate is the incidence of ICR(t+1) < 1 among firms with ICR(t) ≥ 1; this is a descriptive comparison, not causal evidence. Panel C – Corr(FF, LEV) = -0.635 indicates substantial overlap between the two measures; the maximum VIF (1.94) does not indicate severe multicollinearity by conventional thresholds but does not rule out endogeneity or measurement overlap.

4.2. Regression results: Baseline M1 - M3 and Robustness

Table 3, Panel A reports the pooled logit estimates for M1–M3. M1, the baseline model with controls and fixed effects only, does not include FF. In M2, FF enters with a coefficient of -0.386 (clustered SE = 0.167, p = 0.021), providing preliminary evidence consistent with H1 before current leverage is controlled for; the corresponding odds ratio is approximately 0.680 and the average marginal effect is approximately -2.82 percentage points. These estimates describe the magnitude of the M2 association, but M2 is not the main specification.

M3, the main specification, is the focus of this section. Once LEV(t) is added, the FF coefficient falls to -0.248 (clustered SE = 0.199, p = 0.213). The sign remains negative, but the coefficient is smaller in magnitude and is no longer statistically significant at conventional levels. The appropriate interpretation is that, once current

leverage is held constant, there is no clear evidence that persistent low leverage carries additional predictive information about the onset of inadequate interest coverage. This should not be read as evidence that financial flexibility "has no value" or that H1 is "rejected outright." Nor does it follow that current leverage "explains away" the FF effect, since LEV itself is not statistically significant in M3 ($p = 0.294$). The loss of significance is also consistent with the substantial correlation between FF and LEV reported in Table 2, Panel C (corr = -0.635): because the two measures share considerable common variation, M3 may lack the statistical power to separately identify their individual associations, rather than indicating that persistent low leverage carries no relevant information at all. The present data cannot fully distinguish between these two explanations.

Table 3, Panel B summarizes the effect size of FF in M3. The odds ratio is 0.780 (95% CI: 0.528 -1.153), and the average marginal effect is -1.84 percentage points (95% CI: -4.63 to 0.95 percentage points). The average predicted probability of the outcome is 9.99% when FF = 0 and 8.15% when FF = 1. These estimates continue to point toward lower risk among FF firms, but the confidence intervals are wide, reflecting substantial estimation uncertainty; the odds ratio and AME should not be interpreted as causal effects. Among the control variables, PROFIT is negative and highly stable across specifications, TANG is negative and statistically significant, and CASH is negative but retains significance only at the 10% level in M3. The area under the ROC curve (AUC) for M3 is 0.7907, indicating fairly good in-sample discrimination. At the conventional 0.5 classification threshold, however, sensitivity is only 0.93%, reflecting the rarity of the outcome. M3 should therefore not be described as a "good classification model," and the AUC should not be treated as evidence of out-of-sample predictive performance, nor attributed specifically to FF.

Table 3, Panel C reports robustness and sensitivity results. In M4 - M6, the p-value for FF is 0.414, 0.109, and 0.933, respectively; these specifications do not provide statistically consistent evidence for an association between FF and subsequent inadequate coverage when the sample state, the coverage numerator, or the coverage threshold is varied. In M4, the lagged coverage-state indicator INADEQ_ICR(t) enters with a strong positive coefficient ($\beta = 1.386$, $p < 0.001$), pointing to clear state dependence in coverage status; this result is used only as context and does not alter the central question about FF. In M5, the AME for FF has a p-value of 0.088, while the coefficient itself has $p = 0.109$; the more favorable of the two figures is not selected to claim robustness. M7a and M7b show negative and statistically significant FF coefficients. M7a, which requires coverage weakness to persist through both t+1 and t+2, yields $\beta = -0.563$ ($p = 0.033$). M7b, which redefines zero-interest-expense observations as adequate coverage, yields $\beta = -0.415$ ($p = 0.040$). The negative association between FF and subsequent coverage weakness appears more pronounced when the outcome requires persistent weakness or when the zero-interest coding rule is changed, but both specifications are sensitivity checks and do not supersede M3 as the main result.

Among R1 - R3, R1 (a two-year definition of FF) yields $p = 0.142$, which is not significant. R2 (FF defined using total liabilities rather than interest-bearing debt) yields $\beta = -0.403$ ($p = 0.037$); this result is significant but is presented only to illustrate measurement sensitivity, since total liabilities are not equivalent to interest-bearing debt, and the coefficient on the current total-liabilities ratio in R2 should not be interpreted as a structural result. R3 (industry-by-year fixed effects) yields $\beta = -0.175$ ($p = 0.399$); this specification drops 228 observations due to perfect prediction (N = 3,188) and is best understood as a sensitivity check against industry-year shocks rather than a preferred specification.

The zero-interest-expense issue is an important measurement point. Across the predictor sample (N = 4,804), interest expense equals zero for 26.1% of FF firm-years but only 1.9% of non-FF firm-years. This large discrepancy suggests that the rule used to exclude firms with undefined ICR may generate FF-related selection, and it helps explain why the M7b estimate differs from M3. This pattern is presented as a measurement and selection sensitivity issue; it is not evidence that the main coding rule is wrong or that M7b is the more correct specification simply because it is statistically significant. This asymmetry is also consistent with a mechanical link between the two definitions: because FF requires leverage to remain below the industry-year median for three consecutive years, firms at the more persistent end of this distribution are more likely to carry little or no interest-bearing debt, and therefore to report zero interest expense, than non-FF firms. Excluding these observations from the main ICR-based sample may therefore disproportionately remove the most persistently low-leverage FF firms, which could attenuate the estimated FF-coverage association in M1-M3 if these excluded firms are also the most representative of genuine financial flexibility.

Taken together, the robustness pattern in Panel C indicates that support for a negative FF association is not uniform across specifications: it is statistically significant when coverage weakness is required to persist into t+2 (M7a) or when zero-interest-expense observations are reclassified as adequate coverage (M7b), but not

when the coverage threshold, coverage measure, FF persistence window, or fixed-effects structure is varied instead (M4-M6, R1, R3). This pattern should be read as evidence that the association is sensitive to specific measurement choices, rather than as support for, or against, H1 in general.

Table 3 Regression Results: Baseline and Robustness

Panel A: Pooled Logit - Onset of Inadequate ICR at t+1 (M1–M3)

Variable	M1 Controls	M2 (+FF)	M3 (+FF+LEV, Main)
FF	-	−0.386** (0.167)	−0.248 (0.199)
LEV	-	-	0.623 (0.594)
SIZE	0.034 (0.051)	0.005 (0.054)	−0.007 (0.056)
PROFIT	−23.652*** (2.984)	−24.331*** (3.142)	−24.555*** (3.247)
CASH	−2.543** (1.155)	−2.149* (1.161)	−1.932* (1.171)
TANG	−0.834* (0.455)	−0.915** (0.450)	−0.936** (0.452)
GROWTH	0.004 (0.110)	−0.005 (0.110)	−0.007 (0.111)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
N	3,416	3,416	3,416
Number of firms	579	579	579
Number of events	323	323	323
Pseudo R^2	0.1466	0.1498	0.1505

Panel B: Effect Size of FF

Metric	M2	M3 (Main)
p-value of coefficient	0.021	0.213
Odds ratio	0.680	0.780
Average marginal effect	−2.82 pp	−1.84 pp
95% CI of odds ratio	–	0.528–1.153
95% CI of AME	–	−4.63 to 0.95 pp
Predicted probability, FF = 0	–	9.99%
Predicted probability, FF = 1	–	8.15%
Model AUC	–	0.7907

Panel C: Robustness and Sensitivity

Spec.	Test	Coef. FF (SE)	p	OR	AME (pp)	N	Events
M4	Full sample + INADEQ_ICR(t)	−0.127 (0.155)	0.414	0.881	–	4,080	737
M5	TIE(t+1)<1	−0.395 (0.246)	0.109	0.674	−1.85	3,718	217
M6	ICR(t+1)<1.5	−0.017 (0.204)	0.933	0.983	−0.16	3,084	375
M7a	ICR<1 at t+1 and t+2	−0.563 (0.264)	0.033	0.570	−2.21	2,946	141
M7b	Zero-interest: EBIT≥0 is adequate	−0.415 (0.202)	0.040	0.660	−2.77	3,973	335
R1	FF, 2-year definition	−0.305 (0.208)	0.142	0.737	–	3,468	326
R2	FF, total liabilities / TA	−0.403 (0.193)	0.037	0.669	–	3,416	323
R3	Industry × Year FE	−0.175 (0.208)	0.399	0.839	–	3,188	323

*Note: Panel A reports logit coefficients with firm-clustered standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.10. M3 is the pre-specified main specification. Panel C uses firm-clustered standard errors throughout; the AME column is populated only for specifications for which margins output was generated (M5, M6, M7a, M7b) and is not back-calculated for M4 or R1–R3. R3 drops 228 observations due to perfect prediction (N = 3,188). AUC (Panel B) reflects in-sample discrimination, not out-of-sample validation.*

5. Conclusion

This study examines whether financially flexible Vietnamese listed firms - defined as firms with a three-year history of persistent low leverage relative to their industry-year median - are less likely to develop inadequate interest coverage (ICR < 1) in the subsequent year, using a design that links financial flexibility measured at t to a coverage outcome observed at t+1. The main results show that FF firms have a lower raw entry rate into inadequate coverage than non-FF firms, and that FF enters with a statistically significant negative coefficient in M2. However, once current leverage is added in M3, the main specification, the FF coefficient loses statistical significance. The results therefore support H1 at the preliminary specification (M2) but do not support H1 consistently at the main specification (M3); overall, we find limited evidence of incremental predictive content, not evidence that no relationship exists at all. Robustness results reinforce this picture of sensitivity to measurement choices. Specifications based on TIE, a 1.5 coverage threshold, a two-year FF definition, and industry-by-year fixed effects do not provide strong support for a negative FF association, while specifications requiring persistent coverage weakness and the zero-interest-expense sensitivity check produce statistically significant negative coefficients. Overall, the conclusion about FF's predictive content is fairly sensitive to how financial flexibility and coverage weakness are measured. These findings carry methodological and governance implications rather than broad policy conclusions. Researchers and practitioners examining coverage risk should be cautious about relying on either persistent low leverage or current leverage alone as a predictor of near-term coverage risk, since neither measure reached conventional statistical significance in the main specification once both were included together. Firms and data providers should also be transparent about how zero-interest-expense observations are treated, given the clear association between this coding choice and FF status documented in Section 4. Because the analysis is observational and confined to a specific sample and measurement framework, we do not extend these implications into broader policy recommendations beyond what the data can support.

Several limitations should be noted. FF, built from persistent low leverage, is a proxy for unused debt capacity rather than a direct measure of it. ICR and TIE capture only debt-service coverage rather than the broader notion of financial distress examined in the Vietnamese context by Suu et al. (2026); the two outcomes are related but not interchangeable. The observational design does not support causal inference about the effect of financial flexibility on coverage outcomes. Finally, the zero-interest-expense pattern documented in Section 4 constitutes a distinct measurement issue that affects some robustness specifications more than others. Two further limitations concern the construction of the key variables and the empirical specification. Because lower leverage tends to mechanically generate lower interest expense, and interest expense is the denominator of ICR, part of the observed association between FF and subsequent coverage outcomes may reflect this accounting linkage rather than a distinct financial-resilience channel; the present data cannot fully separate the two. In addition, the pooled logistic specification with firm-clustered standard errors and industry and year fixed effects does not rule out endogeneity from reverse causality or from unobserved firm-level heterogeneity correlated with both leverage history and coverage outcomes. A firm fixed-effects specification was not adopted because FF is constructed from a firm's own multi-year leverage history, which limits within-firm variation in the predictor, and because the more saturated industry-by-year fixed-effects specification (R3) already drops 228 observations due to perfect prediction, illustrating the sample's sensitivity to more demanding fixed-effects structures. These concerns reinforce that the reported associations should be interpreted as descriptive rather than causal. Broader Vietnamese evidence on financial distress, including studies using accounting-based bankruptcy-prediction models (Pham Vo Ninh, Do Thanh, and Vo Hong, 2018) and market-risk-based measures of distress (Vo, 2023), likewise points to distress as a multidimensional outcome that a single coverage-based measure cannot fully capture.

Future work - particularly for a journal-length extension of this study - could employ residual-based measures of spare debt capacity or target leverage, extend the outcome to broader measures of financial distress, and adopt a stronger identification strategy to address the observational nature of the current design.

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