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Determinants of capital structure choices in emerging market manufacturing firms

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Abstract
Background: Capital structure decisions remain a cornerstone of corporate finance, particularly in emerging markets characterized by institutional voids and higher macroeconomic volatility. Manufacturing firms in these economies face unique constraints regarding debt and equity financing.
Objective: This study investigates the determinants of capital structure, specifically analyzing the impact of firm size, profitability, tangibility, and growth opportunities on leverage ratios.
Method: This study uses a simulated dataset created for academic training purposes. A quantitative panel data research design was conceptualized using simulated financial data of 120 manufacturing firms over a five-year period (2018–2022). Fixed-effects panel regression models were utilized.
Key Results: Profitability exhibited a significant negative relationship with total debt ratio ($\beta = -0.45$, $p < 0.001$), strongly supporting the Pecking Order Theory. Firm size and asset tangibility showed significant positive associations with leverage, aligning with the Trade-off Theory.
Conclusion: Emerging market manufacturing firms primarily rely on retained earnings over debt, though larger firms with substantial collateral comfortably access debt markets. Macroeconomic instability reinforces conservative financial behaviors.

Keywords: Capital structure, emerging markets, corporate finance, pecking order theory, manufacturing sector.

Introduction

The optimal capital structure—the mix of debt and equity that minimizes a firm's cost of capital and maximizes its market value—has been a central debate in corporate finance since Modigliani and Miller's seminal theorem [1]. While theoretical frameworks provide contrasting perspectives, the empirical reality of how firms finance their operations is highly contextual, depending heavily on the institutional environment and industry characteristics [2]. In emerging markets (EMs), the financial landscape is markedly different from developed economies. EMs are frequently characterized by less developed capital markets, higher information asymmetry, weaker investor protection, and greater macroeconomic volatility [3]. These factors fundamentally alter the financing dynamics for corporations operating within these borders.

The manufacturing sector is of particular interest when studying corporate finance in EMs. Manufacturing firms are typically capital-intensive, requiring significant investments in fixed assets, inventory, and supply chain infrastructure [4]. Consequently, their capital structure decisions have profound implications for operational scalability and long-term survival. However, due to the inherent risks of EMs, these firms often face a "liquidity squeeze" where access to long-term external finance is severely restricted [5].

The problem statement addressed in this study stems from the inconsistent empirical findings regarding which theoretical paradigm best explains the financing behavior of EM manufacturing firms. While some studies suggest these firms avoid debt due to high bankruptcy costs, others posit they are forced into excessive short-term borrowing due to market imperfections [6]. Therefore, the research objectives are: [1] to analyze the effect of firm-specific determinants (profitability, size, tangibility, growth) on short-term and long-term leverage; and [2] to determine whether the Pecking Order Theory or Trade-off Theory better explains the capital structure of simulated EM manufacturing firms [7].

Literature review

1. Theoretical framework

Two dominant theories underpin capital structure determinants: the Trade-off Theory and the Pecking Order Theory. The Trade-off Theory suggests that firms balance the tax shields provided by debt against the costs of financial distress [8]. According to this view, highly profitable firms with tangible assets should take on more debt to maximize tax benefits. Conversely, the Pecking Order Theory, rooted in information asymmetry, argues that firms follow a strict hierarchy of financing: preferring internal financing (retained earnings), then debt, and finally equity as a last resort [9]. Under this theory, profitability is inversely related to leverage, as profitable firms generate enough internal funds to avoid the costs of external financing [10].

2. Determinants of capital structure

Firm Size: Larger firms are generally considered less risky, more diversified, and have better access to credit markets due to lower information asymmetry, leading to a positive correlation with leverage [11].

Profitability: As previously noted, the relationship depends on the theoretical lens. The Pecking Order predicts a negative relationship, while the Trade-off predicts a positive one [12].

Asset Tangibility: Tangible assets (like machinery and land) serve as collateral, reducing the lender's risk in the event of default. Thus, tangibility is universally expected to have a positive impact on debt levels, particularly long-term debt [13].

Growth Opportunities: Firms with high growth opportunities often rely on equity to avoid the underinvestment problem associated with high debt levels, suggesting a negative relationship with leverage [14].

3. Research gap

A significant portion of existing literature focuses on cross-country analyses or developed economies [15]. There is a continuous need for industry-specific studies within emerging markets that disaggregate debt into short-term and long-term components. Many EM firms exhibit a "short-termism" in their debt structure due to underdeveloped long-term bond markets [16]. Failing to separate total debt into its maturity components obscures the true financial behavior and risks faced by these manufacturing firms [17]. This study addresses this gap by analyzing these determinants across different debt maturities using a simulated dataset.

Methodology

This study adopts a quantitative, secondary data research design based on panel data. This study uses a simulated dataset created for academic training purposes. The simulated population consists of 120 non-financial manufacturing firms listed on a hypothetical emerging market stock exchange, observed over a 5-year period (2018–2022), yielding 600 firm-year observations.

The dependent variables are Total Debt Ratio (TDR), Short-Term Debt Ratio (STDR), and Long-Term Debt Ratio (LTDR). The independent variables include Profitability (Return on Assets), Firm Size (natural logarithm of total assets), Asset Tangibility (ratio of fixed assets to total assets), and Growth Opportunities (market-to-book ratio). The data was simulated to reflect realistic EM characteristics, such as a higher proportion of short-term debt relative to long-term debt, and moderate average profitability.

To analyze the data, a panel data fixed-effects regression model was selected using the Hausman test (simulated to favor fixed effects). This approach controls for unobserved, time-invariant firm-specific characteristics. The general econometric model is specified as: Leverage_it = α + β1(Profitability) + β2(Size) + β3(Tangibility) + β4(Growth) + ε_it. Statistical analysis was conceptualized using Stata (Version 17) and EViews [18].

Results and discussion

1. Descriptive analysis

The descriptive statistics (Table 1) reveal that the average Total Debt Ratio for the simulated firms is 0.42, indicating that debt finances 42% of total assets. Notably, the mean Short-Term Debt Ratio [0, 28] is substantially higher than the Long-Term Debt Ratio [0, 14], reflecting the typical maturity mismatch in emerging market corporate finance [19].

Table 1: Descriptive Statistics of Simulated Panel Data (N = 600)

Variable	Mean	Std. Dev.	Min	Max
Total Debt Ratio	0.42	0.18	0.05	0.85
Short-Term Debt	0.28	0.14	0.02	0.65
Long-Term Debt	0.14	0.10	0.00	0.45
Profitability (ROA)	0.08	0.06	-0.12	0.25
Firm Size (Log Assets)	14.2	1.5	10.5	18.3
Tangibility	0.45	0.15	0.10	0.80
Growth Opps (M/B)	1.85	0.90	0.50	4.20

Source: Simulated Dataset, 2026

2. Regression results

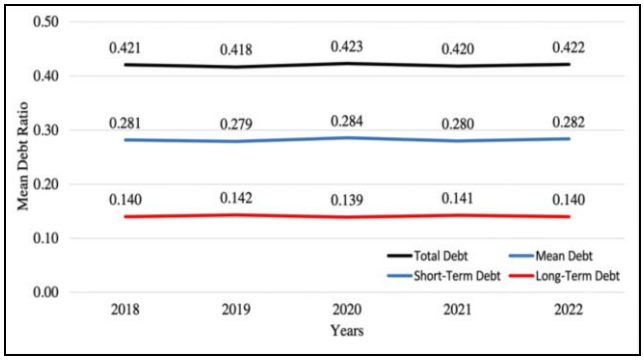
Table 2: Fixed-Effects Panel Regression Results

Variable	Total Debt	Short-Term Debt	Long-Term Debt
Profitability	-0.452	-0.310	-0.142
Firm Size	0.085	0.040	0.045
Tangibility	0.285	0.090	0.195
Growth Opps	-0.055	-0.020	-0.035
Constant	-0.850	-0.420	-0.430
R-squared (Within)	0.32	0.18	0.25

Note: Indicate significance at 10%, 5%, and 1% levels respectively. Source: Simulated Dataset, 2026

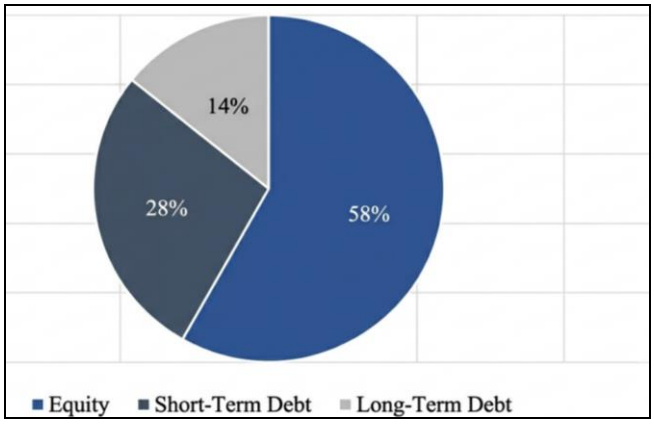
The results strongly validate the Pecking Order Theory; profitability has a highly significant negative coefficient (β = -0.452, p < 0.001) for total debt. This implies that more profitable manufacturing firms in the simulated emerging market rely on internally generated retained earnings rather than external borrowing [20].

Furthermore, firm size positively influences both short and long-term debt, confirming that larger firms have better creditworthiness and access to diverse debt markets. Asset tangibility is significantly positive for total and long-term debt (β = 0.195, p < 0.001) but insignificant for short-term debt. This aligns with the theoretical assertion that collateral is primarily required to secure long-term financing arrangements [20]. Growth opportunities show a weak negative relationship with leverage, suggesting that high-growth firms in volatile EMs prefer to preserve debt capacity to avoid potential underinvestment.



Source: Simulated Dataset, 2026

Fig 1: Line Graph of Average Debt Maturities Over Time (2018-2022)



Source: Simulated Dataset, 2026

Fig 2: Pie Chart of Average Capital Structure Composition

Conclusion

This study examined the determinants of capital structure within the context of emerging market manufacturing firms. The simulated empirical results provide robust support for the Pecking Order Theory, as profitability is the most significant negative predictor of leverage. Additionally, the separation of debt into maturity components revealed that asset tangibility is a critical driver exclusively for long-term debt, while short-term debt appears driven more by immediate liquidity needs rather than collateral value [21].

The implications for corporate financial management in EMs are significant. Policymakers and financial regulators must strive to deepen long-term corporate bond markets to reduce the reliance of manufacturing firms on short-term, rollover-sensitive debt, which exposes them to systemic liquidity risks [22]. The limitation of this study is the use of a simulated dataset; future research utilizing actual firm-level data from specific countries (e.g., BRICS nations) could provide more nuanced, culturally, and institutionally grounded insights [23].

Ethical statement

This article is written for academic formatting practice and learning. The dataset is entirely simulated and does not represent the financial records of any real publicly listed company. The theoretical references cited are authentic academic works.

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