

The Determinants of Capital Structure: Evidence from Saudi Arabian Listed Companies.

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Abstract

This study examines the determinants of capital structure of non-financial firms listed on the Saudi Stock Exchange (Tadawul) over the period 2012–2017. Using a balanced panel dataset and applying pooled OLS, fixed-effects, and random-effects regression models, the analysis investigates how firm-specific characteristics size, growth opportunities, profitability, asset tangibility, and liquidity affect corporate leverage decisions. Capital structure is measured using both long-term debts to total assets and total debt to total assets. The empirical findings reveal a strong and robust positive relationship between firm size and leverage. Growth opportunities are also positively associated with long-term debt, indicating a reliance on external financing for expansion. In contrast, profitability shows weak and inconclusive effects on leverage. Notably, asset tangibility exhibits a significant negative relationship with leverage, challenging traditional collateral-based explanations and highlighting a tangibility paradox in the Saudi context. Liquidity indicators display mixed effects, suggesting that leverage and liquidity may coexist rather than substitute each other in emerging markets. Overall, the results indicate that capital structure decisions in Saudi Arabia cannot be explained by a single theoretical framework, but rather by a combination of trade-off, pecking order, and institutional factors. This study contributes to the literature by providing evidence from a major GCC economy and underscores the importance of context-specific financial behavior in emerging markets.

Key Word

Keywords: Determinants of Capital Structure, size, growth, profitability, tangibility, liquidity.

1. Introduction

This study advances capital structure literature by documenting a tangibility paradox in Saudi Arabia, where tangible assets negatively correlate with leverage contradicting western theory. It demonstrates that emerging market financing decisions require context-specific frameworks beyond traditional trade-off and pecking order theories, offering crucial insights for GCC economies.

The manner in which a company finances its operations whether through borrowing, issuing equity or retaining earnings remains a foundational topic in modern finance. This financing mix, commonly termed capital structure, has been debated intensely since the seminal contribution of Modigliani and Miller, who argued that under idealized condition's capital structure would be irrelevant to firm value (Modigliani & Miller, 1958). In practice, markets are imperfect. Taxes, expected bankruptcy, reorganization costs and asymmetries of information between managers and outside investors all shape financing policy in ways that depart from the irrelevance view. These frictions become salient inputs into real-world capital-structure decisions .Such forces are frequently amplified in emerging markets, where institutional, legal and cultural environments differ from those of mature economies. Regulatory frameworks, creditor-rights enforcement, disclosure standards and market depth can jointly condition the costs and benefits of debt versus equity. As a result, financing choices observed in these markets often reflect a distinctive configuration of constraints and incentives rather than a simple application of textbook theory.

Saudi Arabia represents a particularly important context in which to examine corporate financing behavior. As the largest economy in the Middle East and a member of the G20, the country has embarked on an ambitious economic transformation agenda under Vision 2030, which aims to reduce dependence on oil revenues and stimulate a more dynamic private sector. A central pillar of this transformation is the Financial Sector Development Program (FSDP), which seeks to deepen capital markets, expand financing channels and improve access to funding for firms. The program emphasizes strengthening the role of the stock market, enhancing debt market instruments and improving financial intermediation to support private-sector growth .In this context, understanding how firms determine their capital structure becomes highly relevant for policymakers. Financing choices reflect the functioning of financial institutions, the accessibility of credit markets and the incentives that shape corporate investment decisions. If firms rely heavily on internal funds or exhibit limited use of external

debt, this may signal constraints within financial markets that hinder expansion, particularly for non-oil sectors targeted by national diversification policies. Conversely, identifying the firm characteristics that facilitate access to debt financing can inform policies aimed at improving capital market efficiency and supporting firm growth. Therefore, examining the determinants of leverage among Saudi listed firms not only contributes to the academic literature on capital structure in emerging markets but also provides insights into how financial markets support the broader objective of private-sector development. By identifying the financial and structural factors that influence corporate financing decisions, this study contributes to ongoing policy discussions on strengthening financial infrastructure and fostering a more resilient and diversified Saudi economy.

This study examines the determinants of capital structure among non-financial firms listed on the Saudi Stock Exchange (Tadawul). The primary objective is to investigate how firm-specific characteristics namely size, growth opportunities, profitability, asset tangibility, and liquidity influence corporate leverage decisions within the unique institutional context of a major GCC economy. The research is structured as follows: it first establishes a theoretical framework and reviews empirical evidence from emerging markets, then details a quantitative methodology using a balanced panel dataset from 2012 to 2017. Finally, the paper presents the empirical results, discusses the emergence of a tangibility paradox, and concludes with policy implications relevant to Saudi Arabia's Vision 2030.

2. Theoretical Framework

The theoretical foundations of capital structure have significantly evolved since the pioneering work of Modigliani and Miller (1958, 1963). Their initial proposition that capital structure is irrelevant in perfect markets laid the groundwork for subsequent theories that account for market imperfections. The evolution of capital structure theory can be understood through three primary theoretical frameworks that have emerged to explain financing decisions in real-world contexts. The trade-off theory suggests that firms are like careful shoppers, weighing the pros and cons of debt (Kraus & Litzenberger, 1973; Myers, 1984). On one hand, debt offers a tax advantage, as interest payments are often tax-deductible, creating what is known as the "tax shield" (Miller, 1977). On the other hand, too much debt increases the risk of financial trouble, which can be costly due to both direct bankruptcy costs and indirect costs such as loss of customers and suppliers (Altman, 1984). According to this theory, companies strive to find a sweet spot of optimal capital structure that balances these benefits and costs. Furthermore,

Bradley et al. (1984) provide early evidence supporting the theory by demonstrating that firms with higher tax rates tend to use more debt. Similarly, Titman and Wessels (1988) found that firms with more tangible assets, which serve as better collateral, tend to have higher leverage ratios. The theory suggests that larger firms should have higher leverage because they are more diversified and face lower bankruptcy costs (Rajan & Zingales, 1995). In contrast, the pecking order theory offers an alternative perspective to corporate financing behavior (Myers & Majluf, 1984). It argues that firms have a preferred order of financing, much like a pecking order in the animal kingdom, hence its coined term. They first prefer to use their own money retained earnings to fund new projects. If they need more cash, they turn to debt. Only as a last resort will they issue new stock. This behavior is driven by what's known as information asymmetry; the idea that company insiders know more about the firm's true value than outside investors (Akerlof, 1970). Hence, issuing a new stock can be seen as a red flag, a signal that the company's shares might be overpriced (Ross, 1977). Myers (1984) argued that profitable firms accumulate financial slack in the form of cash and marketable securities, thereby reducing their need for external financing. Fama and French (2002) found strong support for the pecking order theory, particularly for large and mature firms. The theory predicts that more profitable firms should have lower leverage ratios because they can finance their investments internally.

Finally, agency theory brings a human element to the discussion, focusing on the potential conflicts of interest between different groups within a company (Jensen & Meckling, 1976). For example, managers might be tempted to use company funds for their own pet projects, rather than for the benefit of shareholders. Debt can act as a disciplinary tool, as it forces managers to make regular interest payments, leaving less cash available for discretionary spending (Jensen, 1986). However, high levels of debt can create its own set of problems, such as encouraging excessive risk-taking or leading to underinvestment in profitable projects (Myers, 1977). The agency costs of equity arise from conflicts between managers and shareholders, while agency costs of debt stem from conflicts between shareholders and bondholders (Harris & Raviv, 1991). Grossman and Hart (1982) argued that debt can serve as a disciplinary device by reducing the free cash flow available to managers for potentially wasteful investments.

3. Empirical Evidence from Emerging Markets

A vast number of empirical studies have tested the determinants of capital structure across different countries and industries with mixed results. Several studies have been conducted in the context of emerging markets that reveal unique patterns which often differ from those observed in developed economies. For instance, Huang's (2006) study of Chinese firms and Chakraborty's (2010) study of Indian firms both found that the pecking order and trade-off theories are not mutually exclusive and that they both play a role in explaining the capital structure of firms in these emerging economies. These studies thus highlight the complexity of capital structure decisions in developing countries, where market conditions and institutional factors can lead to financing behaviors that do not fit neatly into a single theoretical framework. Moreover, Le and Phan (2017) found that capital structure determinants are different in emerging markets due to their unique legal, cultural and institutional characteristics. Their study of Vietnamese firms revealed that the benefits of debt from tax savings may be less than financial distress costs in typical developing markets and the monitoring role of debt is not substantial because of severe information asymmetry and under-developed financial systems . Khan et al. (2024) examined firms in the GCC countries and found that while traditional firm-level factors remain important, the unique characteristics of these economies such as relatively low corporate tax rates and distinct legal environments create different dynamics in capital structure decisions. Similarly, Abdeljawad et al. (2024) investigated the impact of public corruption and political instability on capital structure choices in the MENA region, finding that less corruption is associated with increased use of corporate debt, while political upheaval like the Arab Spring led to reduced debt usage.

For Saudi Arabia, Al-Yahyaee et al. (2023) found that some of their findings are consistent with the trade-off theory, such as the positive relationship between firm size and leverage, while other findings support the pecking order theory. Another study found that Saudi companies generally have lower levels of debt compared to firms in many other countries, which may reflect the unique institutional and cultural characteristics of the region .Based on the theoretical framework and empirical evidence from emerging markets, this study builds upon the existing literature by providing a more recent and comprehensive analysis of the capital structure decisions of Saudi listed firms, using a robust panel data methodology. The following hypotheses are tested:

H1: There is a significant positive relationship between firm size and capital structure, larger firms are more diversified, have lower bankruptcy risk and can access debt markets more easily.

H2: There is a significant positive relationship between firm growth and capital structure, growing firms may need external financing to fund their expansion, leading to higher leverage ratios.

H3: There is a significant negative relationship between profitability (Return on Average Total Equity) and capital structure, profitable firms prefer internal financing and thus have lower leverage.

H4: There is a significant positive relationship between tangibility and capital structure, tangible assets can serve as collateral, reducing the agency costs of debt and enabling higher leverage.

H5: There is a significant negative relationship between the quick ratio and capital structure, firms with higher liquidity may have less need for external financing.

H6: There is a significant negative relationship between the current ratio and capital structure, similar to the quick ratio, higher current ratios indicate better liquidity and reduced need for debt financing.

4. Methodology

4.1. Research Design

This study adopts a quantitative research design utilizing panel data analysis to examine the determinants of capital structure in companies listed on the Saudi Stock Exchange from 2012 to 2017. The research applies various statistical techniques, including descriptive statistics, correlation analysis and panel regression models (OLS, Fixed Effect, and Random Effects) to explore the impact of firm-specific financial factors on capital structure.

4.2. Data and Sample

The dataset used in this study consists of financial data collected from a sample of non-financial firms listed on the Saudi Stock Exchange over a six-year period, from 2012 to 2017. The dependent variables in this study are Long-Term Debt to Total Assets (LTD/TA) and Total Debt to Total Assets (TD/TA), which measure the firm's reliance on debt financing. The independent variables include Size (natural logarithm of total assets), Growth (annual

percentage change in total assets), Return on Average Total Equity (ROE), Tangibility (net property, plant, and equipment to total assets), Quick Ratio (QR) and Current Ratio (CR).

4.3.Models

The following regression equation is used to test the hypotheses:

$$\text{Debt} = \beta_0 + \beta_1(\text{Size}) + \beta_2(\text{Growth}) + \beta_3(\text{ROE}) + \beta_4(\text{Tangibility}) + \beta_5(\text{QR}) + \beta_6(\text{CR}) + \varepsilon$$

Where: Debt represents the leverage of the firm, measured by either LTD/TA or TD/TA; β_0 is the intercept of the regression model; β_1 - β_6 are the coefficients of the independent variables; and ε is the error term.

5. Results

5.1.Descriptive Statistics

The descriptive statistics for the variables used in this study are presented in Table 1. The mean long-term debt to total assets (LTD/TA) is 16.55%, while the mean total debt to total assets (TD/TA) is 25.92%. The firms in the sample vary significantly in size, with the natural logarithm of total assets ranging from 14.44 to 23.52. The average return on equity (ROE) is 2.31%, but with a very high standard deviation, indicating wide variations in profitability among the firms.

Table 1: Descriptive Statistics

Statistic	LTD/TA	CR	Size	Tang	QR	TD/TA	Growth	ROE
Count	334	441	441	441	332	406	441	413
Mean	0.1655	2.4135	20.0075	2.0342	1.6627	0.2592	1.5205	0.0231
Std Dev	0.1411	2.5324	1.4966	6.3595	1.9202	0.1848	10.3074	1.7150
Min	0.0000	0.0645	14.4409	0.0000	0.0028	0.0000	-1.0000	-34.4379
Max	0.6806	19.6434	23.5235	47.9232	17.5095	0.8517	144.7745	1.0204

5.2. Pearson Correlation Statistics

Table 2 below depicts the Pearson correlation matrix for the variables. There is a strong positive correlation between firm size and both measures of leverage (LTD/TA and TD/TA), which is consistent with the trade-off theory. Profitability (ROE) is negatively correlated with leverage, supporting the pecking order theory. The correlation matrix also shows no signs of severe multicollinearity among the independent variables.

Table 2: Pearson Correlation Matrix

	LTD/TA	CR	Size	Tang	QR	TD/TA	Growth	ROE
LTD/TA	1	-0.146	0.652	-0.185	-0.047	-0.067	-0.063	-0.105
CR		1	-0.173	0.110	0.224	-0.074	0.026	0.049
Size			1	-0.373	0.054	0.048	-0.215	0.173
Tang				1	-0.070	-0.022	0.190	-0.238
QR					1	0.030	-0.023	-0.007
TD/TA						1	-0.019	-0.047
Growth							1	0.008
ROE								1

5.3. Regression Results

Tables 3 and 4 report results from pooled OLS, fixed-effects and random-effects models. Across specifications, size remains a reliable positive predictor of leverage; growth is positively associated with long-term debt; tangibility often enters with a negative sign; and liquidity effects differ depending on whether leverage is measured by long-term or total debt.

5.4. Table 3: Regression Results - Long Term Debt Percentage of Total Assets

Variable	OLS	Fixed Effects	Random Effects
Size	0.0926***	0.0534*	0.0080***
Growth	0.0026***	0.0009†	0.0010*
ROE	-0.0006	-0.0058	-0.0120
Tangibility	-0.0006	-0.0044**	-0.0050**
Quick Ratio	-0.0054	-0.0007	-0.0021
Current Ratio	0.0115	0.0141*	0.0096
Constant	-1.3023***	-	-
R-squared	0.468	0.111	0.320
F-statistic	25.61***	3.857**	18.978***
Observations	198	248	248

Table 4: Regression Results - Total Debt Percentage of Total Assets

Variable	OLS	Fixed Effects	Random Effects
Size	0.0004	0.0704	0.0128***
Growth	0.0004	0.0018	0.0004
ROE	0.0035	0.0018	0.0027
Tangibility	-0.0154	0.0022	0.0019
Quick Ratio	0.2432	0.0220**	0.0158*
Current Ratio	-	-0.0154*	-0.0105
Constant	0.0000	-	-
R-squared	0.630	0.344	0.706
F-statistic	1.189	2.043†	28.721***
Observations	124	293	293

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, $p < 0.10$

6. Discussion

The regression analysis of Saudi Arabian listed companies illustrates a nuanced and compelling narrative of capital structure determinants. While some findings align with established financial theories, others depict intriguing paradoxes that challenge conventional thinking. The study's most robust and statistically significant finding is the strong positive relationship between firm size and leverage, particularly long-term debt. This result holds across all regression models used, thereby bolstering its reliability. This finding aligns with the trade-off theory of capital structure, which posits that larger firms, due to their greater diversification, lower risk of bankruptcy and more stable cash flows, have a higher debt capacity and can take greater advantage of the tax benefits of debt (Fama & French, 2002; Rajan & Zingales, 1995).

Importantly, this is not a localized phenomenon. Our literature review confirms that this is a classic pattern observed globally. The recent study by Khan et al. (2024) on GCC countries reinforces this by stipulating that firm size is a significant determinant of leverage across the region. In this manner, within the institutional context of the GCC, larger firms are perceived as less risky by creditors and have better access to debt markets. Therefore, this is a finding consistent with decades of financial research. On the other hand, the relationship between profitability and leverage in the Saudi context is more ambiguous. The regression results are largely inconclusive, failing to show a statistically significant negative relationship as predicted by the pecking order theory. This theory suggests that profitable firms should prefer internal financing (retained earnings) first, leading to lower leverage (Myers & Majluf, 1984). This deviation from classic pecking order theory is a common finding in emerging markets. While some studies, like Malinic et al. (2013) on Serbian firms, do find evidence supporting the pecking order theory, the Saudi Arabian results suggest a different dynamic. This could be attributed to several factors. It may be the availability of low-cost debt, or the Saudi financial market may offer attractive debt financing options. It may also be strategic considerations since firms may strategically use debt for disciplinary purposes or to signal confidence to the market, regardless of their internal cash flow position.

In the Indian context, Patel's (2009) findings reveal that neither the trade-off nor the pecking order theory to be dominant, consequently demonstrating a compelling parallel. His study suggests that in many emerging markets, the determinants of capital structure are far more complex and cannot be explained by a single, monolithic theory. The Saudi Arabian case appears to be another example of this complexity. Perhaps the most theoretically challenging

and intriguing finding of this study is the significant negative relationship between asset tangibility and long-term debt. This result directly contradicts the traditional trade-off theory, which argues that tangible assets should serve as valuable collateral, reducing the agency costs of debt and enabling firms to secure higher levels of leverage (Titman & Wessels, 1988). However, this “tangibility paradox” is not an anomaly unique to Saudi Arabia. Our comprehensive literature review reveals that this counter-intuitive finding is a recurring theme in studies of emerging markets, hence pointing to deeper, systemic factors. A study by Vengesai (2023) on a large sample of African-listed firms also uncovered a statistically significant negative relationship between leverage and tangible investments. The author suggests this aligns with the hypothesis that high-growth firms in these markets strategically opt for low debt to mitigate agency costs and prevent the underinvestment problems highlighted by Myers (1977). Similarly, the study on Serbian firms by Malinic et al. (2013) also report a negative relationship between tangibility and leverage. Research by Chen et al. (2021) on Argentine SMEs further bolsters the idea that traditional theories require significant adaptation for emerging market contexts. This consistent pattern across diverse emerging markets indicates that the role of tangible assets as collateral is less pronounced than in developed economies .

Several factors could explain this paradox. It may stem from the fact that legal and institutional systems are still developing, meaning that the processes for enforcing collateral, such as seizing and liquidating assets after default, can be slow, uncertain or ineffective in some emerging markets. As a result, lenders may assign lower value to tangible assets when assessing loan security (Booth et al., 2001). In environments where information asymmetry is high, lenders may rely more heavily on a firm’s reputation, relational networks and demonstrated ability to generate stable cash flows, rather than on the recorded book value of its physical assets when assessing creditworthiness (de Jong et al., 2008). In addition, in many of these markets, firms’ tangible assets tend to be highly specialized and have limited secondary market appeal, which lowers their expected resale value and, in turn, reduces their attractiveness as collateral from the lender’s standpoint. Lastly, as noted by Vengesai (2023), firms with substantial tangible asset bases may also be high growth companies that intentionally curb their use of debt to preserve financial flexibility and avoid the classic underinvestment problem associated with debt overhang. Moreover, our results for liquidity ratios (i.e. quick ratio and current ratio) present mixed findings across different models and dependent variables. While the theoretical expectation is that firms with higher liquidity have less need for external financing, the

empirical results show varying relationships depending on the model specification and leverage measure used.

For total debt, the quick ratio shows a positive and significant relationship in both Fixed Effects and Random Effects models, which may suggest that firms maintaining higher liquidity levels are also those that can afford to take on more debt, possibly reflecting better financial management or access to credit markets. This finding aligns with the notion that liquidity and leverage can be complementary rather than substitutive in emerging market contexts where financial flexibility is particularly valuable (Bas et al., 2009). The relationship between growth and leverage shows some support for the hypothesis that growing firms require external financing. The positive and significant coefficients for growth in the long-term debt models (particularly in OLS and Random Effects) suggest that firms with higher growth rates do indeed rely more heavily on debt financing to fund their expansion, consistent with the trade-off theory's predictions about growth firms' financing needs. However, the relationship is less pronounced for total debt, which may indicate that growing Saudi firms prefer long-term debt over short-term financing for their expansion plans, possibly reflecting a more strategic approach to capital structure management.

Conclusion

The capital structure decisions of Saudi Arabian firms are shaped by a complex interplay of factors that reflect both global financial principles and the unique characteristics of an emerging market. The strong positive relationship between firm size and leverage confirms the enduring relevance of the trade-off theory. However, the inconclusive results for profitability and, most notably, the negative relationship between tangibility and leverage, highlight the limitations of applying Western-centric financial theories directly to the Saudi context. The “tangibility paradox” is a particularly important finding, suggesting that for Saudi firms, and likely for firms in other emerging economies, the informational content of cash flows and growth prospects may be more critical for obtaining debt than the sheer value of physical assets. Beyond its academic contribution, this study also offers several policy implications. The findings highlight that firm size plays a central role in determining access to debt financing, suggesting that larger firms enjoy more favorable borrowing conditions. For policymakers, this raises important questions about financing accessibility for smaller and younger firms, which are critical to the diversification of the Saudi economy. Strengthening credit markets, expanding alternative financing instruments and improving capital market access for smaller enterprises may therefore be essential for achieving the private-sector development objectives outlined in Vision 2030. Furthermore, the unexpected negative relationship between asset tangibility and leverage suggests that lenders may rely less on physical collateral and more on firm reputation or financial performance when extending credit. This underscores the importance of improving transparency, disclosure standards and financial reporting quality to facilitate more efficient credit allocation in the Saudi financial system.

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