Firm-specific factors as determinants of capital structure: Evidence from an emerging country

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Abstract: - The paper investigates the impact of firm-specific factors on capital structure of 102 non-financial firms listed on Ho Chi Minh Stock Exchange (HOSE) in Vietnam between 2008 and 2018. The paper identifies the firm-specific factors including firm profitability (ROA), tangibility (TANG), liquidity (LIQ), firm size (SIZE), foreign ownership (FO) as core determinants of capital structure. Besides, the author employs dynamic panel data to examine the influence of previous decision on capital structure on the one in the current time. Different approaches consisting of Pooled Regression (OLS), Fixed effects model (FEM), Random effects model (REM) and Generalized Method of Moment (GMM) are adopted to test the hypotheses and control autocorrelation, heteroscedasticity and potential endogeneity issues. The results reveal the positive impact of firm size and previous capital structure on current capital structure. Also, they report that liquidity, tangibility, firm profitability and foreign ownership are negatively correlated to capital structure. The study greatly contributes towards the enrichment of empirical evidence on capital structure in the situation of emerging economies.

Key-Words: - Firm-specific factors, capital structure, GMM, emerging country, Vietnam.

1 Introduction

Some earlier studies of Modigliani and Miller [20] affirmed that the value of a firm is independent from its capital structure in a perfect capital market. Firms with similar business risk and expected rate of return shares the same firm value regardless of the differences in how their capital is structured. Therefore, should financial managers pay attention on their firms’ debt policy or capital structure in an efficient market? With the presence of the imperfection in capital market, it is always necessary to calculate how firms should utilise their loans, issue bonds, stock or use their remaining profit for the optimal capital structure. Accordingly, many scholars have developed other trade-off, pecking order and agency theories in the effort to explain how capital structure works in reality.

In the recognition of its importance in the financial management, many researchers have recently conducted empirical studies to examine the plausibility of these theoretical models. These studies are divided on two mainstreams which are examining the impact of capital structure on firm value and identifying determinants of capital structure. However, these studies have spotlighted developed countries, not emerging economies.

As an emerging country, Vietnam has not only opportunities but also challenges thanks to the international integration. Also, its firms cannot avoid facing big challenges that capital structure is one of big concern of financial managers. How is capital structured? How much should equity be? How much should they loan? Should they issue bonds or utilise their remaining profit for the optimal effect? As a result, research on capital structure of Vietnamese firms contribute both theoretical and practical values. This paper aims to give an explanation on theoretical models of capital structure as well as identify determinants of capital structure among Vietnamese firms.

During the examination of the determinants of capital structure, it shows that firm-specific factors are the most concern. Consequently, the objective of this paper is to analyse the impact of firm-specific factors on capital structure of firms listed on Ho Chi Minh Stock Exchange, which is a central stock exchange in Vietnam. The firm-specific factors include profitability, tangibility, liquidity, firm size, foreign ownership and current capital structure. The study identifies how these determinants influence capital structure decision, thereby making suitable decision on how capital is structured for the good firm performance.
2 Literature review

2.1 The Capital Structure Theories

2.1.1 Capital structure theory of Modigliani and Miller (M&M theorem)

M&M theorem is the foundation of other studies on capital structure theories. M&M theorem is stated into 2 basic propositions. Meanwhile, the first proposition assumes on the valuation of a firm, the second one assumes on the capital cost. These propositions are respectively considered in environments with taxes and no taxes. On the other hand, Modigliani and Miller also assume that capital market is perfect, so transaction and bankruptcy cost are nil.

According to Modigliani and Miller [20], using more debt brings the owner higher profitability ratios which are exactly what they compensate for a higher risk in debt-equity ratio in return. Alternatively, the valuation of firms using debt is equal to the one of firms using no debt.

According to Modigliani and Miller [21], with firm income tax, the use of debt will increase the firm value. It is because interest expenses are reasonable expenses deducted in the calculation of firm income tax, so the income of firms using debt is partly transferred to investors or the value of firms using debt is equal to the one of firms without using debt. In general, the above statements are assumed on the propositions of perfect market. However, these hypotheses are difficult to perform in reality, thereby constraining the application of M&M theorem.

2.1.2 Static Trade-off Theory

Following Modigliani and Miller theorem, Kraus and Litzenberger [16] developed static trade-off theory. According to this theory, firms set different targets on debt-equity ratios for the optima firm benefits. Capital structure of a firm is identified based on the trade-off between interest tax shield and cost of financial distress. The trade-off theory can explain for the differences in capital structure among different firms and fields. Nevertheless, this theory is sufficient to give explanation for the low debt ratio of big successful firms.

2.1.3 Pecking Order Theory

The first foundation of pecking order theory is studies of Donaldson [10]. The pecking order theory arises from the concept of asymmetric information [23] which exerts significant influence on investment and financing decisions. The information asymmetry between managers and investors causes the higher increase in costs of external sources of finances. Hence, these firms prefer to use internal sources to external ones. This is why big and successful firms tend to have low debt ratio.

2.1.4 Agency Cost Theory

Agency cost arise due to conflicts of interest among firm parties. Jensen and Meckling [13] introduced two kinds of conflicts: between shareholders and management; between shareholders and owners. The management intend to invest in risky business in order to bring shareholders more profits. However, the failure of the investment can bring borrowers more risks, so shareholders only accept for limited liability. According to the agency cost theory, the optimal capital structure is determined by reducing agency cost. Further, according to Jensen [14], the debt allocation in capital structure is a good way to minimise agency cost. More specifically, this provides the borrowers with a right to obtain part of their capital in case the firm is not able to afford interest and initial loan.

2.2 Firm-specific factors as determinants of capital structure

In recent years, there have been a number of empirical studies on determinants of capital structure. However, this study highlights firm-specific factors. In this section, literature of studies on firm-specific factors (profitability, tangibility, liquidity, firm size, foreign ownership) as determinants of capital structure are shortly reviewed.

2.2.1 Profitability

There is a close relationship between firm profitability and capital structure. According to the trade-off theory, highly profitable firms tend to have a low cost of financial distress. Benefits from the tax shield encourage firm to borrow more. Conversely, according to the pecking order theory, high firm profitability and rich internal financing sources can raise the use of internal sources. As a result, these firms have low debt ratio.

Thus, the findings vary considerably between specific situations. A majority of earlier scholars who are Bauer [6], Akhtar [4], Baharuddin et al. [5], Shah and Jam-e-Kausar [27], Tongkong [30], Ajanthan [3], Chechet et al. [9], Chang et al. [8], Poddar and Mittal [25], Saced et al. [28], Wahab and Ramli [32], Acrarvici [1], Le and Tannous [17], Windayu [33], Vuran et al. [31], Cevheroglu-Acar [7], Thai [29], and Li and Islam [18] in particular
support the trade-off theory. Their results affirm the reverse influence of profitability on capital structure. Conversely, with their analyses, Moosa and Li [22], Md-Yusuf et al. [19] and Agrawal and Singh [2] affirmed that profitability is concurrently related to how capital is structured.

2.2.2 Size
According to the trade-off theory, firm size exerts concurrent influence on capital structure. Particularly, a firm with a big size and diversified portfolio has a lower cost of financial distress and a better access to financial organizations than a small firm. This eventually encourages firms to borrow more. Many studies corroborate this hypothesis [6, 4, 5, 22, 27, 30, 9, 19, 2, 8, 25, 28, 32, 17, 31, 29, 18]. Conservely, Windayu [33] confirmed that firm size is inversely correlated to capital structure. This result can be comprehensible by the pecking order theory. Acaravci [1] also found the positive and negative impact of firm size on capital structure. In particular, this impact is negative with firms in sectors of fabricated metal products, machinery and equipment and positive with the rest sectors.

2.2.3 Tangibility
Most studies on capital structure reveal the correlation between tangibility and capital structure. According to trade-off and pecking order theory, tangibility is positively associated to capital structure. By their recent analyses, Baharuddin et al. [5], Shah and Jam-e-Kausar [27], Moosa and Li [22], Md-Yusuf et al. [19], Agrawal and Singh [2], Chang et al. [8], Wahab and Ramli [32], Cevheroglu-Acar [7] and Thai [29] support this hypothesis.

On the other hand, Bauer [6], Chechet et al. [9], Acaravci [1], Windayu [33] and Li and Islam [18] support the agency cost theory. Their findings indicate the negative relationship between capital structure and tangibility.

2.2.4 Liquidity
Liquidity can be defined the ability to pay off current liabilities and measured by dividing its current assets by its current liabilities. Research on the impact of liquidity on capital structure reveals different results. A majority of the studies affirm the reverse influence of liquidity on capital structure [22, 19, 25, 28, 32, 17, 7]. Differently, Pahuja and Sahi [24] reported that liquidity is concurrently related to capital structure.

2.2.5 Foreign Ownership
In emerging countries, foreign ownership is considered as the most essential element in a firm’s capital structure. According to Le & Tannous [17] and Thai [29], foreign ownership is negatively correlated to the leverage. In other words, firms with high foreign ownership usually tend to have low debt ratio.

3 Data and methodology

3.1 Data Collection
The study employs data from audited financial statements published on websites of 102 firms which have been consecutively listed on Ho Chi Minh Stock Exchange (HOSE) in the 2008-2018 period. Further, financial organizations are excluded due to the big difference in their capital structure as compared to non-financial firms.

3.2 Methodology
According to Gaud et al. [12], current capital structure is relevant to capital structure in the past and the hypothesis that the adjustment in capital structure does not raise any expense is unreal. Following Gaud et al. [12], the author employs the panel data to consider the effect of firm-specific determinants on capital structure. The dynamic panel data analysis is useful in examining the impact of past capital structure on the current one. Pooled Regression (OLS), both Fixed effects model (FEM) and Random effects model (REM), and Generalized Method of Moment (GMM) are selected to test the hypotheses and control issues on autocorrelation, heteroscedasticity and potential endogeneity. The description of the estimated model is given by the following equation:

$$TDTA_{it} = \beta_0 + \beta_1 TDTA_{i(t-1)} + \beta_2 SIZE_{it} + \beta_3 LIQ_{it} + \beta_4 TANG_{it} + \beta_5 ROA_{it} + \beta_6 FO_{it} + \epsilon_{it}.$$

Where:
- Dependent variables:
  - TDTA_{it}: Capital structure (total debt/ total assets).
- Independent variables:
  - TDTA_{i(t-1)}: total debt to total assets in the previous year (total debt in year t-1 / total assets in year t-1);
  - SIZE_{it}: firm size (Logarithm of total assets);
  - LIQ_{it}: liquidity (current assets/ current liabilities);
  - TANG_{it}: tangibility (fixed assets/ total assets);
  - ROA_{it}: profitability (net profit/ total assets);
  - FO_{it}: foreign ownership (Ordinary shares held by foreign investors/ shares outstanding).
4 Empirical results

Table 1. Descriptive statistics of variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDTA</td>
<td>1122</td>
<td>0.448</td>
<td>0.212</td>
<td>0.029</td>
<td>0.943</td>
</tr>
<tr>
<td>SIZE</td>
<td>1122</td>
<td>12.045</td>
<td>0.571</td>
<td>10.720</td>
<td>14.330</td>
</tr>
<tr>
<td>LIQ</td>
<td>1122</td>
<td>2.369</td>
<td>2.185</td>
<td>0.113</td>
<td>18.168</td>
</tr>
<tr>
<td>TANG</td>
<td>1122</td>
<td>0.410</td>
<td>0.212</td>
<td>0.024</td>
<td>0.977</td>
</tr>
<tr>
<td>ROA</td>
<td>1122</td>
<td>0.075</td>
<td>0.081</td>
<td>-0.645</td>
<td>0.783</td>
</tr>
<tr>
<td>FO</td>
<td>1122</td>
<td>0.182</td>
<td>0.189</td>
<td>0.000</td>
<td>0.883</td>
</tr>
</tbody>
</table>

Source: computed by the Author.

The correlation among variables is presented in the following table:

Table 2. Correlation coefficients among variables

<table>
<thead>
<tr>
<th></th>
<th>TDTAt</th>
<th>TDTAt-1</th>
<th>SIZE</th>
<th>LIQ</th>
<th>TANG</th>
<th>ROA</th>
<th>FO</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDTAt</td>
<td>1.000</td>
<td>0.922</td>
<td>-0.632</td>
<td>-0.204</td>
<td>-0.453</td>
<td>-0.199</td>
<td></td>
</tr>
<tr>
<td>TDTAt-1</td>
<td>0.922</td>
<td>1.000</td>
<td>0.259</td>
<td>0.122</td>
<td>0.212</td>
<td>0.182</td>
<td></td>
</tr>
<tr>
<td>SIZE</td>
<td>-0.632</td>
<td>-0.204</td>
<td>1.000</td>
<td>-0.587</td>
<td>-0.151</td>
<td>0.294</td>
<td></td>
</tr>
<tr>
<td>LIQ</td>
<td>-0.632</td>
<td>-0.204</td>
<td>-0.587</td>
<td>1.000</td>
<td>-0.151</td>
<td>-0.017</td>
<td></td>
</tr>
<tr>
<td>TANG</td>
<td>-0.204</td>
<td>0.122</td>
<td>-0.587</td>
<td>-0.151</td>
<td>1.000</td>
<td>0.349</td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td>-0.453</td>
<td>0.212</td>
<td>-0.151</td>
<td>-0.017</td>
<td>0.349</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>FO</td>
<td>-0.199</td>
<td>0.182</td>
<td>0.294</td>
<td>-0.017</td>
<td>0.349</td>
<td>0.179</td>
<td></td>
</tr>
</tbody>
</table>

Source: computed by the Author.

Table 2 indicates that SIZE is positively correlated to TDTA while other independent variables are negatively related to TDTA.

Table 3. Results of POLS, FEM, REM models

<table>
<thead>
<tr>
<th>Variables</th>
<th>POLS</th>
<th>FEM</th>
<th>REM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.184***</td>
<td>-0.607***</td>
<td>-0.186***</td>
</tr>
<tr>
<td>TDTAt</td>
<td>0.747***</td>
<td>0.465***</td>
<td>0.745***</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.033***</td>
<td>0.085***</td>
<td>0.034***</td>
</tr>
<tr>
<td>LIQ</td>
<td>-0.015***</td>
<td>-0.023***</td>
<td>-0.015***</td>
</tr>
<tr>
<td>TANG</td>
<td>-0.100***</td>
<td>-0.200***</td>
<td>-0.100***</td>
</tr>
<tr>
<td>ROA</td>
<td>-0.259***</td>
<td>-0.288***</td>
<td>-0.260***</td>
</tr>
<tr>
<td>FO</td>
<td>-0.055***</td>
<td>-0.106***</td>
<td>-0.056***</td>
</tr>
<tr>
<td>R²</td>
<td>88.10%</td>
<td>84.57%</td>
<td>88.10%</td>
</tr>
<tr>
<td>Significance level</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
</tr>
<tr>
<td>F test</td>
<td>F(101, 912) = 3.80</td>
<td>Prob &gt; F = 0.000***</td>
<td></td>
</tr>
<tr>
<td>Hausman test</td>
<td>chi2(6) = 394.46</td>
<td>Prob &gt; chi2 = 0.000***</td>
<td></td>
</tr>
</tbody>
</table>

Note: *** indicates significance at the 1% level.

Source: Computed by the Author.

Table 4. Results of Multicollinearity, Heteroscedasticity and Autocorrelation tests

<table>
<thead>
<tr>
<th>Variable</th>
<th>VIF</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDTAt</td>
<td>2.111</td>
<td>0.473</td>
</tr>
<tr>
<td>SIZE</td>
<td>1.333</td>
<td>0.753</td>
</tr>
<tr>
<td>LIQ</td>
<td>1.690</td>
<td>0.590</td>
</tr>
<tr>
<td>TANG</td>
<td>1.200</td>
<td>0.833</td>
</tr>
<tr>
<td>ROA</td>
<td>1.260</td>
<td>0.793</td>
</tr>
<tr>
<td>FO</td>
<td>1.240</td>
<td>0.805</td>
</tr>
</tbody>
</table>

Mean VIF = 1.47

Note: *** indicates significance at the 1% level.

Source: Computed by the Author.

It can be seen from Table 4 that there is no serious multicollinearity in the model. However, the heteroscedasticity and autocorrelation issues really exist.

Hence, the paper uses GMM estimator for the analysis. This is because GMM allows to restrict autocorrelation, heteroscedasticity and potential endogeneity issues [11].

Table 5. Results of GMM

| Variables | Coef. | P>|z| |
|-----------|------|-----|
| Constant  | -1.058 | 0.039** |
| TDTAt     | 0.116 | 0.052* |
| SIZE      | 0.173 | 0.000*** |
| LIQ       | -0.055 | 0.000*** |
| TANG      | -0.757 | 0.000*** |
| ROA       | -0.215 | 0.000*** |
| FO        | -1.011 | 0.001*** |

Wald chi2(5) = 7188.22
Prob > chi2 = 0.000***

Number of instruments = 11
Number of groups = 102
Arellano-Bond test for AR(2) in first differences
Pr > z = 0.110
Sargan test
Prob > chi2 = 0.475

Note: *** indicates significance at the 1% level.

Source: Computed by the Author.
Note: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.
Source: computed by the Author.
Result of Hausen test reveals that adopted instruments are valid. Meanwhile, Arellano-Bond test shows that there is no autocorrelation among errors. Thus, the model is appropriate and utilisable.

Results of the model take the following equation:

\[
TDTA_{it} = -1.058 + 0.116 TDTA_{it-1} + 0.173 \text{ SIZE}_{it} - 0.055 \text{ LIQ}_{it} - 0.757 \text{ TANG}_{it} - 0.215 \text{ ROA}_{it} - 1.011 \text{ FO}_{it} + \varepsilon
\]

Regression results confirm that capital structure is influenced by the firm-specific factors as follows:

- Foreign ownership (FO) is negative (-1.011) and significant at the 1% level. This can be explained as follows. First, firms with high foreign ownership tend to have more diversified channels to access to capital. Further, the demand for external financing of firms with high foreign ownership will be lower thanks to the equity accumulation from foreign investors. Second, foreign owners are primarily organizational investors, thereby having more experience in managing. As a result, foreign ownership helps restrict the over-investment issues of managers or reduce agency cost between shareholders and management. This result is in line with what have been found by Le & Tannous [17], and Thai [29].
- Tangibility (TANG) exerts a significantly negative impact (-0.7576) on capital structure at the 1% level. This corroborates the results of Bauer [6], Chechet et al. [1], Acaravci [1], Windayu [33] and Li and Islam [18]. This implies that firms with high fixed assets tend to borrow less. This result absolutely reflects the reality in Vietnam where firm debt is mainly short-term, so it will cause high risks if this source is used to finance the firm fixed assets. Consequently, these firms usually invest in the fixed assets by their equity. This finding supports the agency cost theory.
- Profitability (ROA) is negatively (-0.215) and significantly related to the leverage at the level of 1%. This is consistent with findings of Bauer [6], Akhtar [4], Baharuddin et al. [5], Shah and Jam-e-Kausar [27], Tongkong [30], Ajanthan [3], Chechet et al. [9], Chang et al. [8], Poddar and Mittal [25], Saeed et al. [28], Wahab and Ramli [23], Acaravci [1], Le and Tannous [17], Windayu [33], Vuran et al. [31], Cevheroglu-Acar [7], Li and Islam [18], and Thai [29]. This can be explained that the management frequently have a better understanding on the firm business situations as well as profitability than external investors. For potential and profitable projects, the best financing is to use available capital from the remaining profit because the capital cost of external capital accumulation will be higher. In case the internal source is insufficient, the accumulation from external sources should be chosen to avoid the high capital cost. This finding is consistent with the pecking order theory.
- Firm size (SIZE) is positively (0.173) and significantly associated with the leverage at the level of 1%. This result supports the trade-off theory which implies that firms with big size and diversified portfolio can minimise risks, lower borrowing costs, better the ability to access to creditors as compared to small ones. This encourages these big firms to get more loan. Existing studies also reveal the similar result [6, 4, 5, 22, 27, 30, 9, 19, 2, 8, 25, 28, 32, 17, 31, 18, 29].
- Capital structure in the past (TDTA_{it-1}) is positively (0.116) and significantly related to the current capital structure at the level of 10%. This confirms the importance of capital structure in the previous time in how the capital is structure at present. This totally suits the reality of Vietnam. This result is in line with those Khémiri & Noubbigh [16] and Rao et al. [26] have confirmed.
- Liquidity (LIQ) exerts a negative impact (-0.0552) on the leverage with the significance at the level of 1%. This finding is similar with those of Moosa and Li [22], Md-Yusuf et al. [19], Poddar and Mittal [25], Saeed et al. [28], Wahab and Ramli [32], Le and Tannous [17], and Cevheroglu-Acar [7]. It can be deduced that firms with high liquidity tends to have higher ability to pay off their current liabilities and lower debt ratio. This is because more liquid firms possess more current assets, finance and other equivalent amounts, thus financing themselves from internal sources without owning to debt.

5 Conclusion
In this study, an attempt was made to investigate the impact of firm-specific determinants on capital structure of 102 firms traded on Ho Chi Minh Stock Exchange between 2008 and 2018. The analysis is performed using Pooled Regression (OLS), Fixed effects model (FEM), Random effects model (REM), and Generalized Method of Moment (GMM) to collect consistent and efficient results. According to results of the investigation, foreign ownership (FO), tangibility (TANG), profitability (ROA), firm size (SIZE), past capital structure
(TDATa1) and liquidity (LIQ) are significantly associated with the leverage.

The results provide firms in Vietnam an insight into how the firm-specific determinants affect their capital structure. They are also empirical evidence from listed firms on Ho Chi Minh Stock Exchange, which is great stock exchange in Vietnam. This paper contributes to theoretical perspective on the capital structure in the scenario of an emerging economy. Moreover, this study enriches the collection of studies on capital structure because all variables employed are proved to exert significant influence on capital structure. However, the study only determines firm-specific factors, not business characteristics, firm international diversification or characteristics of financial market. These may be interesting proposals for future research.

References:


