PROFIT, FIRM’S SIZE, MARKET CONDITION AND CAPITAL STRUCTURE

Hanny Oentoro
Universitas Pelita Harapan (UPH) Surabaya

Abstract: The trade-off theory of capital structure predicts that more profitable firms ought to borrow more and have higher leverage. While the most telling evidence against the theory is the strong inverse correlation between profitability and financial leverage. This study disagrees with the second statement and will revisit the profits & capital structure relationship. In addition, this study will discuss the relationship of capital structure with firm’s size and market condition.

Keyword: Capital Structure, Profit, Financial Leverage

INTRODUCTION

All firms need operating capital to support their sales and achieve optimal profit. To acquire that operating capital, funds must be raised, usually as a combination of equity and debt or capital structure. The trade-off theory of capital structure predicts that more profitable firms ought to borrow more and have higher leverage. While the most telling evidence against the theory is the strong inverse correlation between profitability and financial leverage. This study disagrees with the second statement and will revisit the profits & capital structure relationship. In addition, this study will discuss the relationship of capital structure with firm’s size and market condition.

The discussion regarding trade-off theory of capital structure are related and limited to profits of the firm, firm’s size and market’s condition or market’s timing. This study used conventional data sources, using manufacturing company listed in Indonesia Stock Exchange, exclude firms involved in major mergers and firms with missing book value of assets with year observations from 2000 – 2010.
The framework shows the relationship of profit of the firm, firm’s size, and market condition with debt and equity.

Figure 1: Framework of study

1. Relationship of firm’s profit and equity

- More Profitable Firm
  - Increase the book value of equity
  - Increase the market value of equity

Figure 2: Relationship of firm’s profit and equity

2. Relationship of firm’s profit, debt, and equity

- High Profit Firm
  - Issue Debt
  - Repurchase Equity

- Low Profit Firm
  - Reduce Debt
  - Issue Equity

Figure 3: Relationship of firm’s profit, debt, and equity
3. Relationship of firm’s size, debt and equity

![Diagram showing relationship between firm's size, debt, and equity]

**Figure 4. Relationship of firm’s size, debt and equity**

4. Market condition

![Diagram showing market condition and finance strategies]

**Figure 5. Market Condition**

**Review of Literature**

It is well known that in a leverage regression, profits are negatively related to leverage. Several literatures (e.g., Myers, 1993; Fama and French, 2002) consider this to be a key rejection of the trade-off theory. Frank & Goyal (2009) disagree and considered this as a misinterpretation of the evidence as a result of the wide-spread use of familiar but empirically misleading, leverage ratio.

Empirically, the response has been to argue that leverage and profitability are negatively related because firms passively accumulate profits (Kayhan & Titman, 2007). The profitability variable (defined as earnings before interest, taxes and depreciation) plays multiple roles in trade off models. First, more profitable firms are likely to be better positioned to take advantage of the debt tax shield and may be perceived as less risky, suggesting a positive relationship between profitability and the debt ratio. In addition, a positive relation between profitability and leverage may arise as a mechanism to offset the tendency of managers of firms with significant free cash flows to overinvest.
Finally, profitability may be an indication of market power. Gomes and Philips (2007) show that lower profitability are more likely to issue equity than debt in both private and public markets and highly profitable firms are indeed more likely to issue debt. Koufopoulos (2007) stated that the higher the proportion of low-profitability (bad) firms, the higher the fraction of funds raised through equity.

The generic formula of leverage ratio is as follows:

\[ L = \frac{D}{D+E}. \]

Notes: \( L \) = Leverage ratio; \( D \) = Debt; \( E \) = Equity.

The empirical methodology has focused on leverage ratios, but interpreted them as if they were the result of debt market actions. In fact, the equity component is very important when considering the impact of profits on firm capital structure empirically. This is true both for book and for market based definitions of \( E \). The total values of debt and equity are only partly a result of issuing decisions. The book value of equity depends on accumulated profits from operations. The market value of equity depends on market anticipation of future profits. Frank & Goyal (2011) emphasize that the rejection could arise for a number of other reasons too. It could come from debt or from equity. It could come from corporate inaction, action in the wrong direction, or simply action that is in the right direction but not strong enough. The standard interpretation is that the regression result is due to more profitable firms borrowing less and this is actually incorrect.

Welch (2010), makes the important point that changes in debt and equity values and changes in debt ratios are conceptually different. Welch stresses the idea that non-financial liabilities should not be implicitly mistreated as if they were equity by paying excessively narrow attention to financial liabilities in a leverage ratio. Second, equity issuing activity should not be viewed as equivalent to capital structure changes. The correlation between equity issuing activity and capital structure changes is either insignificant or outright perverse (firms issuing equity on average increase their leverage).
Since the objective is to trace the source of the ‘incorrect’ sign on profits, Frank & Goyal (2009) begin with simple sorts: firm size and profits and obtain the general pattern. The general pattern is that more profitable firms tend to issue more debt and are much more likely to repurchase equity. On the contrary, the lowest profit firms tend to retire debt and raise more equity capital. These basic patterns are very much in line with the traditional interpretation of the static trade-off theory.

Frank & Goyal (2009) find that the defect is not with the theory, but with the use of scaled measures of leverage in which profitability can affect both the numerator and the denominator of the ratio. This makes the sign of the relationship between leverage and profitability theoretically ambiguous. Similarly, according to Frydenberg (2004), that leverage and profitability are linked both ways and that the causal direction is uncertain.

Frank & Goyal (2009 & 2011) start with focusing on estimates using leverage ratios to start with a similar estimation to check whether the results match with previous study. Both book leverage ratio and market ratio used and the regressions include leverage factors: profitability, industry median leverage, market-to-book assets ratio, tangibility of assets and firm size. Industry median leverage is estimated as the median leverage of all other firms in the industry (excluding the firm under considerations). Firm size is defined as the natural log of asset. Conventional cross section leverage regression and quartile regression has been used to support the study.

Variable definition and measurement of variable being used by Frank & Goyal (2009 & 2011) are as follows:

1. Debt and equity
   a. Debt = long term debt + short term debt
   b. Debt issues include both long-term debt issuance and in increases in current debt.
      Debt repayments include reduction of long-term debt and decrease in current debt.
      - A firm is classified as ‘issuing debt’ if it issues debt in excess of 5% of the value of its assets.
      - A firm is classified as ‘retiring debt’ if it retires debt in excess of 5% of the value of its assets.
   c. Book equity = common shareholder equity;
      Market equity = number of outstanding shares (x) closing share price.
d. Equity issues include sale of common stock.
   Equity repurchase include purchase of common stock.
   - A firm is classified as ‘issuing equity’ if it issued equity in excess of 5% of the value of its assets.
   - A firm is classified as ‘repurchasing equity’ if it repurchase equity in excess of 5% of the value of its assets.

2. Book and Market Leverage
   Book leverage = Debt / (Debt + Book Equity)
   Market leverage = Debt / (Debt + Market Equity)

3. Profits
   Profitability = EBITDA / Total assets
   EBITDA : Earning Before Interest, Taxes, Depreciation & Amortization
   Assets = book asset.
   Tangibility = Net property plant and equipment.
   The Companies being taken as sample will be sorted to further define a list of high or low profit firms.

4. Firm’s size
   Firm’s size determined by book value of assets. The Companies being taken as sample will be sorted to further define a list of large or small firms.

5. Market’s condition
   Market-to-book ratio = Market value of assets (MVA)/ Assets
   MVA = Debt + Market Equity + Preferred-liq value – Deferred taxes.
a. An industry is defined as having ‘good times’ if the median firm in that industry has a market-to-book ratio that is higher than the 67th percentile of the time-series distribution of industry median market-to-book-ratio.
b. Conversely, an industry is defined as having ‘bad times’ if the median firm in that industry has a market-to-book ratio that is lower than the 33rd percentile of the time-series distribution of industry median market-to-book ratios.

Frank & Goyal (2009) main findings are as given below:

1. When a firm makes extra profit, this adds to the book value of equity unless the
Firm takes some type of offsetting action. Similarly, when a firm makes extra profits, unless there is some type of offsetting action, the market value of the firm's equity increases. Thus more profitable firms have both more book equity and more market value of equity.

2. Among the large firms, the highest profit firms increase their debt the most. Among the large firms, those with high profits experience great increases in both book and market value of equity. Among the large firms, the highest profit firms tend to repurchase equity while the lowest profit firms tend to issue more equity.

3. Among the small firms, the profit seems to have only a very minor effect on debt. Among the small firms, those with high profits experience some increases in both book and market value of equity. Those with low profits experience negative effects on market equity. Among the small firms there is a tendency to issue equity, with the lowest profit firms tending to issue the most equity.

4. Almost any optimizing model of an interior optimal capital structure will imply that the use of debt and of equity will vary as market conditions vary. Empirically there is time variation in corporate use of external financing. In good times there is more issuing of both net debt and of net equity when compared to bad times. In particular, issuing equity in bad times is more of problem than in good times. The negative effect of profits on equity issuing is much stronger in good times than in bad times.

To wrap up, please refer to figure 1 and figure 2.

To summarize the evidence:

a) More profitable firms really do borrow more, do repurchase equity, and experience an increase in both book value of equity and market value of equity.

b) Less profitable firms really do tend to reduce their debt and issue equity. Among the low profit firms there is more variation in the book equity and market equity.
## Debt

### Profits of the firm

1. Highly profitable firms do actually tend to issue debt.
2. The least profitable firms tend to reduce debt.

### Firm’s size

| Large firms tend to be more active in the public debt markets | Small firms tend to be relatively more active in the equity markets |

### Market’s Condition

a) Almost any optimizing model of an interior optimal capital structure will imply that the use of debt and of equity will vary as market conditions vary.

b) Empirically, there is time variation in corporate use of external financing. In good times there is more issuing of both net debt and net equity when compared to bad times.

## Equity

### Profits of the firm

1. Highly profitable firms do actually tend to repurchase equity
2. The least profitable firms and issue equity.
3. When a firm makes extra profit, this adds to the book value of equity unless the firm takes some type of offsetting action.
4. Similarly, when a firm makes extra profits, unless there is some type of offsetting action, the market value of the firm’s equity increases.

### Firm’s size

| Large firms tend to be more active in the public debt markets | Small firms tend to be relatively more active in the equity markets |

### Market’s Condition

a) In particular, issuing equity in bad times is more of problem than in good times.
The negative effect of profits on equity issuing is much stronger in good times than in bad times.

**Figure 7. The relationship between capital structures; firm’s profits, firm’s size and market condition sorted by capital structure (Debt & Equity)**

<table>
<thead>
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**Figure 8. The relationship between capital structure, firm’s size and firm’s profit sorted by firm’s size (large and small)**

**References**


