

Evaluating firm value of public pharmaceutical companies in Vietnam: A capital structure assessment approach

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Key words:

Firm value, capital structure, pharmaceutical companies, Vietnam

Abstract:

Vietnam is a large and fast growing pharmaceutical market, with population expected to reach 96 million by 2019. After a period of sustained and high economic growth during the years 2005-2007, since 2008, many Vietnamese pharmaceutical companies have planned to restructure themselves to survive and grow in the context of intensive economic integration. Capital restructuring is among many choices in the restructuring process of Vietnamese companies. This paper reviews literature on impact of capital structure on firm value and some empirical evidences in cases of public pharmaceutical companies in Vietnam.

Introduction:

Vietnam is a large and fast growing population, which is expected to reach 96 million by 2019. Rising pharmaceutical products consumption and government investment in pharmaceutical industry make Vietnam an attractive pharmaceutical market in the region. Under WTO commitments, the pharmaceutical industry has opened the door for foreign companies to open branches and factories in Vietnam since 2009 and this market open has led to a bigger competition among domestic and foreign companies in the sector. According to the Business Monitor International (2012), Vietnam is one of the fastest growing pharmaceutical markets in Asia. Vietnam's drug market is expected to grow at a rate of more than 20 percent through 2017. Vietnam ranks 13 of 175 countries for the fastest growing global markets in drug spending.

After a period of sustained and high economic growth during the years 2005-2007, since 2008, the Vietnamese economy has faced with difficulties and depression due to the impact of the global economic downturn and internal economic sectors. Facing economic and financial challenges, many Vietnamese companies have planned to restructure themselves to survive and grow. Capital restructuring is among many choices in the restructuring process of Vietnamese companies. In general, capital structure refers to the way a corporation finances its assets through some combination of equity, debt, or hybrid securities. Optimizing capital structure is a solution, under which companies have minimal capital cost and highest share prices. An appropriate capital structure is important to every business because it affects their ability to gain benefits

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from related individuals and organizations. As most drug manufacturing firms in Vietnam had modest capital scale, ranging from \$1-5 billion and the lack of capital and human resources contributed to the inability of local firms to compete with international groups in the domestic market, capital.

This paper reviews literature on impact of capital structure on firm value and some empirical evidences in cases of public pharmaceutical companies in Vietnam.

1. Literature review

1.1. Firm value and capital structure:

Capital structure is one of most important topics in corporate finance theory. There are also different methods to review literature on capital structure.

The chronological review display relevant theories from the “Modigliani and Miller” or “MM” theory in 1958 to the “agency cost” theory in 1970s, then the “pecking order” in 1980s and the recent theory on “market timing” in 2000s.

MM theory

Chronologically, modern theory of capital structure was first put forward by Modigliani and Miller (1958). These two authors proposed the capital structure irrelevance theory, which states that under the assumption of a perfect capital market, capital structure has no influence on firm value. A perfect capital market does not have corporate tax or transaction costs, and when information asymmetry is not a concern, a firm’s value is determined by its ability to create value, no matter whether the capital it uses is from internal or external source. But when they considered the effect of corporate tax in an imperfect market later, they revised their earlier statement and recognized the relationship between capital structure and firm’s value (Modigliani and Miller, 1963).

Modigliani-Miller (MM) theorem

Modigliani-Miller (MM) theorem is broadly accepted capital structure theory because it is the origin theory of capital structure theory which had been used by many researchers. It is used as the guiding theory for our study.

There are two simulation for the relationship between capital structure and firm value in the MM theory. The first one it MM no tax case and the second one is MM with corporate tax as described in the table 1.

Table 1: MM no tax case and MM with tax case

| | Modigliani and Miller – No Tax Case | Modigliani and Miller – with corporate tax |
|--|--|---|
| | | |

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| | | |
|-----------------------|---|---|
| Assumption | <p>No taxes No transaction costs Including no bankruptcy costs Investors can borrow/lend at the same rate (the same as the firm). No information asymmetries A fixed investment policy by the firm</p> | <p>With corporate taxes, Other things equal</p> |
| Proposition I | <p>Firm value is not affected by leverage</p> $V_L = V_U$ <p>V_L is the value of the levered firm and V_U is the unlevered firm</p> | <p>Firm value increases with leverage</p> $V_L = V_U + PV(\text{tax shield}), \text{ where}$ <p>V_L is the value of the levered firm and V_U is the unlevered firm. <i>PV (tax shield) is interest tax shields which increase the total value of the firm.</i></p> <p>In the simple case we will assume that the firm has 100% likelihood of using the income deduction, all the variables are constant forever, the interest shield $r(d)$ is the same as the discount $r(d)$ and the firm will renew the debt forever (the tax shield will last forever). With these assumptions the value of the tax shield is as follows:</p> <p>where D is the value of debt, r_D is the cost of debt and t_c is the corporate tax rate.</p> <p>In case there is financial distress, the value of the firm is now represented as follows:</p> $V_L = V_U + PV(\text{tax shields}) + PV(\text{financial distress cost})$ $(\text{TaxShield}) = \frac{r_D D t_c}{r_D} = D t_c$ <p><i>Financial distress costs including bankruptcy cost (direct cost, indirect cost); Agency cost. But these costs are generally difficult to measure.</i></p> |
| Proposition II | <p>Leverage increases the risk and return to stockholders <i>(The rate of return on the</i></p> | <p>Some of the increase in equity risk and return is offset by interest tax shield:</p> $r_S = r_0 + (B/S) \times (1 - T_C) \times (r_0 - r_B)$ |

| | |
|--|---|
| <p><i>equity of a firm increases in proportion to the debt to equity ratio (D/E)</i></p> $r_s = r_0 + (B / S) (r_0 - r_B)$ <p>r_B is the interest rate (cost of debt)</p> <p>r_s is the cost of equity for the levered firm</p> <p>r_0 is the cost of capital for the all-equity firm</p> <p>B is the value of debt</p> <p>S is the value of levered equity</p> | <p>r_B is the interest rate (cost of debt)</p> <p>r_s is the cost of equity for the levered firm</p> <p>r_0 is the cost of capital for the all-equity firm</p> <p>B is the value of debt</p> <p>S is the value of levered equity</p> <p>Tc: corporate tax rate</p> |
|--|---|

Since the MM theory, several theories have been developed to explain the difference in capital structure choice of firms.

Trade-off theory: The trade-off theory involves the trade-off between the tax advantage of debt and various leverage-related costs. Under trade-off theory, the firms with high growth opportunities should borrow less because it is more likely to lose value in financial distress (Xiaoyan Niu, 2008).

“Agency cost” theory:

In the 1970s, the Agency Theory proposed by Jensen and Meckling (1976) holds that agency problems arise from conflicts of interest between stakeholders, bondholders and managers. In general, there are two kinds of agency costs, including debt agency cost and equity agency cost. The first one come from the conflict between the managers and creditors. Although issuing debt can save tax, as the debt ratio increases creditors would ask for a higher lending rate and increase the restrictions of the debt contract, and so the debt agency cost between the manager and creditors also increases. The second one is the result of the conflict between managers and stakeholders. Agency Theory claims that when the total agency costs are minimized, firm value is maximized. When the margin benefit equals the margin cost, firm value reaches its maximum, and this is the optimal capital structure (Jensen & Meckling, 1976; Myers, 1977; Harris & Raviv, 1990).

Bankruptcy cost was first introduced by Stiglitz (1974), who stated that while issuing debt has a tax shield effect, as the debt increases the interest expense grows accordingly, and the possibility of encountering a financial crisis rises. Therefore, shareholders and creditors would require a higher return as compensation for the increasing risk, which increases the costs of both funding and bankruptcy.

“Pecking order” theory or asymmetry information

The “pecking order” theory that developed by Myers and Majluf (1984) argues that firms follow a financing hierarchy to minimize the problem of information asymmetry between the

firm’s managers-insiders and the outsiders shareholders. The theory states that the relation between capital structure and firm value can be attributed to information asymmetry, when the managers have more information than the creditors and equity investors. Therefore, when funds are needed undistributed earnings are used first, as there is no information asymmetry with internal funding. In this case, only when a firm is short of internal funds will it turn to debt financing and issue of new securities.

“Market timing” theory:

Recently, a new theory suggested by Baker and Wurgler (2002) “the market timing” theory of capital structure states that the current capital structure is the cumulative outcome of past attempts to time the equity market.

With another approach, in 1991, Milton Harris and Artur Raviv carried out a survey on the development of capital structure theories based on agency costs, asymmetric information, product/input market interactions, and corporate control considerations (but excluding tax-based theories). Their survey contributes to make clear the background of capital structure theoretical study. For each type of model, a brief overview of the papers surveyed and their relation to each other is provided. The results are collected and compared to the available evidence as follows: The literature that takes debt and equity as given is based on four important properties of the debt contract: Bankruptcy, i.e., debt provides for a costly takeover of the firm by debt-holders under certain conditions (Ross 1977, Grossman and Hart 1982, Titman 1984, Jensen 1986, Harris and Raviv 1988, Poitevin 1989, Stulz 1990). Cash flow to levered equity is a convex function of returns to the firm (Jensen and Meckling 1976, Sarig 1988, Diamond 1989). Leverage increases the manager’s equity ownership share. This effect works in two ways: it forces manager’s payoffs to be more sensitive to firm performance, and, since debt is nonvoting, it concentrates voting power (Jensen and Meckling 1976, Leland and Pyle 1977, Harris and Raviv 1988, Stulz 1988), and others. The value of debt is relatively insensitive to firm performance; debt is priced more accurately than equity in situations involving asymmetric information (Myers and Majluf 1984).

To simplify the literature review, Almas Heshmati (2001) classified facts on capital structure in three important types. The first is based on financing patterns. The second is the accumulated debt-asset ratio and the last one is the existence of a correlation between leverage and firm factors like fixed assets.

1.2. How to assess impact of capital structure on firm value?

The impact of capital structure on firm value are among most disputable research topic in the financial world. There are different approaches for the assessment, which base on different concepts and measures for firm value and capital structure.

To analyze the impact of capital structure on firm value, Anup Chowdhury, Suman Paul Chowdhury (2010)³ built a model, which put **value of the firm (share price)** as dependent variable while firm size, profitability, public ownership in capital structure, dividend payout, asset and operating efficiency, growth rate, liquidity and business risk were independent variables. Firm size is represented by share capital, profitability is measured through EPS, public ownership is in percentage, capital structure is represented by the ratio of

³ Anup Chowdhury, Suman Paul Chowdhury (2010). Impact of capital structure on firm’s value: Evidence from Bangladesh. Volume 3 | Issue 3 | October 2010 |pp. 111-122

long term debt to total assets, dividend payout at actual, efficiency is measured through fixed asset turnover, growth rate is noted through sales growth rate, liquidity is measured by current ratio, and business risk is represented by operating leverage. All the variables used as independent variables were considered as proxy for the capital structure decision of respected firm. The equation for the model: “Price= a +b1EPS + b2dpratio + b3public + b4fato + b5 ldetas+ b6curatio + b7operlev + b8 salesgr + b9 sharecap + ei (Where, eps - earnings per share; dpratio - dividend payout ratio; public - % of public shareholding; fato- fixed asset turnover; ldetas- long term debt to total assets; curatio- current ratio; operlev- operating leverage; salesgr- sales growth; sharecap- share capital; α - constant, ϵ - residual component; i= 1, ... , 77; t- time 1, ... , 10.). Their analysis is based on financial ratios and parameters extracted from secondary data of publicly listed companies traded in Dhaka Stock Exchange (DSE) and Chittangong Stock Exchange (CSE) and used some statistical tools to analyze all the financial information. *The finding of their reserach suggests that maximizing the wealth of shareholders requires a perfect combination of debt and equity, whereas cost of capital has a negative correlation in this decision and it has to be as minimum as possible.*

With another approach, Ogbulu, Onyemachi Maxwell and Emeni, Francis Kehinde (2012)⁴ aimed to provide evidence on the impact of capital structure on a firm’s value. They carried out the research on a sample of 124 companies quoted on the Nigerian Stock Exchange (NSE) for the year ended 31st December 2007 and used the ordinary least squares method of regression. The model to be regressed in this study is presented in a relational form as follows: Firm value = f (capital structure) or Firm value = f (Equity, Debt) (With the linear expression of the model being: $FV = \alpha_0 + \beta_1 EQUITY + \beta_2 LTDEBT + \mu\epsilon$ (α_0 , β_1 and β_2 are parameters to be estimated. The apriori expectation is to follow the line of, $\beta_1 > 0$ and $\beta_2 > 0$. Where; FV = firm value EQUITY = equity capital. LTDEBT = Long- term debt; $\mu\epsilon$ = error term). The result of the study shows that in an emerging economy like Nigeria, equity capital as a component of capital structure is irrelevant to the value of a firm, while Long-term-debt is the major determinant of a firm’s value. From these findings, they suggested that corporate financial decision makers should employ more of long-term-debt than equity capital in financing their operations since it results in a positive firm value.

Shun-Yu Chen and Li-Ju Chen (2011) study the effect of capital structure determinants on company value, with capital structure as mediating variable. The analysis is based on a sample of 647 companies listed on the Taiwan Stock Exchange (TSE) from 2005 to 2009. The findings of this study suggest that **firm size, profitability and asset structure can be considered explanatory variables of capital structure**. The firm size, profitability and capital structure affect book value. The determinants of market value are profitability and firm size. In addition, there are some differences in the capital structure among industry types. When the dependent variable is book value, firm size and growth opportunity have a greater impact on this in the electronic industry. Meanwhile, profitability and firm size have a greater impact on capital

4 OGBULU, Onyemachi Maxwell, EMENI, Francis Kehinde (2012). Capital Structure and Firm Value: Empirical Evidence from Nigeria. International Journal of Business and Social Science. Vol. 3 No. 19; October 2012

structure in non-electronic industries. When the dependent variable is market value, larger companies can borrow more debt and create more market value in the electronic industry. The capital structure negatively affects market value in electronic firms, but does not affect market value in non-electronic ones.

Oraluck Arsiraphongphisit and Mohamed Ariff (2005) take a new direction in research by using an idea of relative capital structure, which is defined as the change in capital structure, arising from a financing decision, relative to industry average ratio reports new findings of such a significant change in a firm’s value when relative capital structure changes by 10-40 per cent. Abnormal return to a firm adjusting its capital structure in value-enhancing financing decisions closer to the industry ratio is positive compared to the abnormal returns when the ratio is adjusted away from industry median. Their findings are consistent with theories and suggest that the industry relative ratio is a likely surrogate for optimal capital structure decisions for Australian firms.

In sum, there are different approaches of review the capital structure theories (chronological review, review in term of financial and operational pattern, or review based on agency costs, asymmetric information, product/input market interactions, and corporate control considerations). Research on determinants of capital structure, the relationships and impact of capital structure on firm value, using different methods (qualitative or quantitative-regression models) lead also to different conclusions. The results may vary across market conditions, countries, industries, firms and years.

2. Some empirical evidences in the case of pharmaceutical companies in Vietnam

In this section, the authors analyzed how did the firm value increase in case of pharmaceutical companies by using proxies of capital structure and firm value as in the Table 2.

Table 2: Proxies of capital structure and firm value

| Variables | Proxies | Abbreviation |
|-------------------|---------------------------------|---------------------|
| Capital structure | Long-term Debt to Capital | LDC |
| | Debt to Capital | DC |
| | Debt to Asset | DA |
| | Debt to Equity Market Value | DEMV |
| | Debt to Common Equity | DCE |
| | Long-term Debt to Common equity | LDCE |
| Firm value | Proxies | |
| | Earning per share | EPS |

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| | | |
|--|------------------------|-----|
| | Price earning ratio | PE |
| | Market value per share | MPS |

Of the 30 pharmaceutical companies and medical equipment listed on the Vietnamese stock market, Duoc Hau Giang JSC (stock market code is DHG) is the company having largest equity.

Table 3: Indicator of capital structures of DHG

| Year | Equity | LDC | DC | DA | DEMV | DCE | LDCE (Vietnam dong) |
|------|-----------|--------|--------|--------|--------|--------|---------------------|
| 2015 | 2,521,236 | 0.0241 | 0.3259 | 0.2503 | 0.1453 | 9659 | 715 |
| 2014 | 2,293,625 | 0.0294 | 0.5032 | 0.3414 | 0.1421 | 13,641 | 796 |
| 2013 | 1,981,365 | 0.0251 | 0.5320 | 0.3530 | 0.1451 | 16,537 | 779 |
| 2012 | 1,687,719 | 0.0124 | 0.3949 | 0.2856 | 0.1414 | 10,321 | 325 |
| 2011 | 1,381,546 | 0.0404 | 0.4183 | 0.3036 | 0.1650 | 9240 | 893 |
| 2010 | 1,280,322 | 0.0442 | 0.3962 | 0.2930 | 0.1643 | 19,719 | 2,197 |
| 2009 | 1,018,033 | 0.0138 | 0.4806 | 0.3277 | 0.1632 | 18,608 | 534 |

DHG recorded biggest debt in 2013 which was 35.3% of total assets (Debt to asset is 35.3%). It means that every one ordinary share had a debt burden of 16,537 Vietnam dong. However, the Debt to Equity Market Value was only 14.5%. Long-term debt ratio of DHG was very low, averaging less than 5% of working capital. Most of debts are short-term debts, such as liabilities, short-term debt for financing additional working capital.

Table 4: Proxies of corporate performance and firm value of DHG

| Year | Equity | ROC | ROA | ROE | EPS | PE | MPS (Vietnam dong) |
|------|-----------|--------|--------|--------|--------|------|--------------------|
| 2015 | 2,521,236 | 0.2323 | 0.1762 | 0.2351 | 6,800 | 9.8 | 66,500 |
| 2014 | 2,293,625 | 0.2274 | 0.1533 | 0.2327 | 6,124 | 15.7 | 96,000 |
| 2013 | 1,981,365 | 0.2928 | 0.1937 | 0.2994 | 9,074 | 12.6 | 114,000 |
| 2012 | 1,687,719 | 0.2888 | 0.2080 | 0.2911 | 7,515 | 9.7 | 73,000 |
| 2011 | 1,381,546 | 0.2958 | 0.2116 | 0.3038 | 6,440 | 8.7 | 56,000 |
| 2010 | 1,280,322 | 0.2884 | 0.2117 | 0.2994 | 14,244 | 8.4 | 120,000 |
| 2009 | 1,018,033 | 0.3539 | 0.2393 | 0.3559 | 13,590 | 8.4 | 114,000 |

In 2009, when debt accounted for nearly 33% of total assets, the return on equity (ROE) was of nearly 36%, much higher than the rate of 23% by 2015 when the debt to asset (DA) was only 25% debt. In the 2009-2015 period, a clear trend is that when the company decreased its debt ratio, ROE also done down.

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The firm value of DHG is 5-10% higher in case of being levered than being unlevered. The difference is more clearly seen as in the following table.

Table 5: Difference in value of the levered firm and the unlevered firm

| Year | Equity (million dong) | R0 | Nopat | Vu | VI | Rs | VI/Vu |
|------|-----------------------|------|---------|-----------|-----------|------|-------|
| 2015 | 2,521,236 | 0.21 | 600,062 | 2,842,012 | 2,972,488 | 0.27 | 105% |
| 2014 | 2,293,625 | 0.21 | 537,321 | 2,554,600 | 2,871,484 | 0.29 | 112% |
| 2013 | 1,981,365 | 0.26 | 594,969 | 2,317,669 | 2,580,634 | 0.36 | 111% |
| 2012 | 1,687,719 | 0.25 | 493,485 | 1,983,676 | 2,091,882 | 0.33 | 105% |
| 2011 | 1,381,546 | 0.25 | 425,881 | 1,690,236 | 1,779,356 | 0.34 | 105% |
| 2010 | 1,280,322 | 0.24 | 386,341 | 1,597,507 | 1,660,074 | 0.33 | 104% |
| 2009 | 1,018,033 | 0.27 | 365,340 | 1,340,439 | 1,397,373 | 0.39 | 104% |

where

rs is the cost of equity for the levered firm

r0 is the cost of capital for the all-equity firm: $r_0 = EBIT * (Debt + Equity)$

Nopat = $EBIT * (1 - T_c)$.

Tc: corporate income tax

V_L is the value of the levered firm and V_U is the unlevered firm

$V_u = Nopat / R_0$

$V_l = V_u + total\ debt * T_c$.

The second evidence comes from the relationship between capital structure and firm value of 5 largest companies in the pharmaceutical sector of Vietnam in 2015. The firm value is 5-13% higher in case of being levered than being unlevered. The debt to asset of DHG, TRA and DMC is about 25%, contributed to the 6% higher in firm value than in case of being unlevered. In case of HAI in 2015, with the debt to asset of 40%, the firm value was 13% higher than being unlevered.

Table 6: Difference in value of the levered firm and the unlevered firm of 5 largest companies in pharmaceutical industry in Vietnam

| No | Companies | Code | Equity (million dong) | DA | ROE | Vu | VI | VI/Vu |
|----|----------------------------------|------|-----------------------|--------|--------|-----------|-----------|-------|
| 1 | Hau Giang Pharmaceutical company | DHG | 2,521,236 | 0.2503 | 0.1762 | 2,842,012 | 2,972,488 | 105% |

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| | | | | | | | | |
|---|---------------------------------|-----|-----------|--------|--------|-----------|-----------|------|
| 2 | Agri-Pharmaceutical company HAI | HAI | 1,293,825 | 0.4023 | 0.0568 | 1,642,462 | 1,852,536 | 113% |
| 3 | Traphaco | TRA | 966,855 | 0.2543 | 0.2106 | 1,036,255 | 1,102,433 | 106% |
| 4 | Domesco | DMC | 793,318 | 0.2255 | 0.1833 | 773,762 | 815,985 | 105% |
| 5 | Cửu Long Pharmaceutical company | DCL | 567,498 | 0.273 | 0.1068 | 603,033 | 651,518 | 108% |

Conclusion

In summary, the financial leverage tends to help increasing firm value through the tax shields. However, the loan comes with pressure to pay principal and interest loan, if the loan is out of the control of the enterprise, there are many potential risks and the operation of enterprises will no longer be defensible. Enterprises need to analyze and choose appropriate capital structure to specific characteristics of the sector and its businesses to obtain optimal capital structure and maximize the firm value.

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