THE RISK LEVEL OF VIET NAM MEDICINE AND MEDICAL EQUIPMENT INDUSTRIES UNDER FINANCIAL LEVERAGE DURING AND AFTER THE GLOBAL CRISIS 2007-2009

Dinh Tran Ngoc Huy

MBA, PhD candidate, Banking University, HCMC – GSIM, International University of Japan, Japan
E-mail: dtnhuy2010@gmail.com

Abstract

Purpose- *This research paper evaluates the impacts of external financing on market risk for the listed firms in the Vietnam medical industry as it becomes necessary, esp. after the financial crisis 2007-2009.*

Design/methodology/approach- *First, by using quantitative and analytical methods to estimate asset and equity beta of total 10 listed companies in Viet Nam medical industry with a proper traditional model. Second, we used three scenarios. Finally, leverage changed in three scenarios.*

Findings- *We found out that the beta values, in general, for many institutions are acceptable. Under 3 different scenarios of changing leverage (in 2011 financial reports, 30% up and 20% down), we recognized that the risk level, measured by equity and asset beta mean, decreases when leverage increases to 30% and it increases in case leverage down to 20%. Third, by changing leverage in 3 scenarios, we recognized the dispersion of risk level, measured by equity beta var, increases if the leverage increases to 30%. Compared to the results of other industries, we see that asset beta var in here increases when leverage up to 30% as well as that in consumer good industry.*

Originality/value- *Finally, this paper provides some outcomes that could provide companies and government more evidence in establishing their policies in governance.*

Research Paper

Keywords: Equity beta, Financial structure, Financial crisis, Risk, External financing, Medical industry
Reference to this paper should be made as follows: Huy, D.T.N. (2014). "The Risk Level of Viet Nam Medicine and Medical Equipment Industries Under Financial Leverage During and After The Global Crisis 2007-2009", Journal of Entrepreneurship, Business and Economics, Vol. 2, No. 1, pp. 74–87.

Introduction

Together with the development of the financial system, throughout many recent years, Viet Nam medicine and medical equipment industry is considered as one of active economic sectors, which has some positive effects for the economy.

This paper is organized as follow. The research issues and literature review will be covered in next sessions 2 and 3, for a short summary. Then, methodology and conceptual theories are introduced in session 4 and 5. Session 6 describes the data in empirical analysis. Session 7 presents empirical results and findings. Next, session 8 covers the analytical results. Then, session 9 presents analysis of risk. Lastly, session 10 will conclude with some policy suggestions. This paper also supports readers with references, exhibits and relevant web sources.

Research Issues

We mention some issues on the estimating of impacts of external financing on beta for listed medicine and medical equipment companies in Viet Nam stock exchange as following:

> *Issue 1: Whether the risk level of medicine and medical equipment firms under the different changing scenarios of leverage increase or decrease so much.*
> *Issue 2: Whether the disperse distribution of beta values become large in the different changing scenarios of leverage estimated in the medicine and medical equipment industry.*

Literature review

Black (1976) proposes the leverage effect to explain the negative correlation between equity returns and return volatilities. Merton (1974), Leland (1994), and Toft (1996) in capital structure models, pointed financial leverage variation is the only source of variation in equity return volatility because these models assume constant volatility for the asset return.

Lucas (1998) described the role of finance in the growth process as overstated hwile Robinson (1952) argued that financial development primarily follows economic growth.

Peter and Liuren (2007) mentions equity volatility increases proportionally with the level of financial leverage, the variation of which is dictated by managerial decisions on a company's capital structure based on economic conditions. And for a company with a fixed amount of debt, its financial leverage increases when the market price of its stock declines.

Reinhart and Rogoff (2009) pointed the history of finance is full of boom-and-bust cycles, bank failures, and systemic bank and currency crises. Adrian and Shin (2010) stated a company can also proactively vary its financial leverage based on variations on market conditions.

Then, Thorsten (2011) found that there reasing the likelihood of a financial crisis rather than reducing it. Marginal rates in corporate and top personal income declined has stopped.

Finally, financial leverage can be considered as one among many factors that affect business risk of consumer good firms.

Conceptual theories

The impact of financial leverage on the economy

A sound and effective financial system has positive effect on the development and growth of the economy. This system include many channels for a firm who wants to use financial leverage or FL, which refers to debt or to the borrowing of funds to finance a company's assets. Compared to equity, using debt could increase the firm's risk of bankruptcy but in many cases, it could increases ROE.

In a specific industry such as medicine and medical equipment industry, on the one hand, using leverage with a decrease or increase in certain periods could affect tax obligations, revenues, profit after tax and technology innovation and compensation and jobs of the industry.

Different from accounting leverage (total assets divided by total assets minus total liabilities), financial leverage could be calculated by taking ROE divided by ROA (ROE/ROA).

During and after financial crises such as the 2007-2009 crisis, there raises concerns about the role of financial leverage of many countries, in both developed and developing markets. On the one hand, lending programs and packages might support the business sectors. On the other hand, it might create more risks for the business and economy.

Methodology

For estimating systemic risk results and leverage impacts, in this study, we use the live data during the crisis period 2007-2011 from the stock exchange market in Viet Nam (HOSE and HNX and UPCOM).

In this research, analytical research method is used, philosophical method is used and specially, leverage scenario analysis method is used. Analytical data is from the situation of listed medicine and medical equipment firms in VN stock exchange and current tax rate is 25%.

Finally, we use the results to suggest policy for both these enterprises, relevant organizations and government.

General Data Analysis

The research sample has total 10 listed firms in the medical market with the live data from the stock exchange.

Firstly, we estimate equity beta values of these firms and use financial leverage to estimate asset beta values of them. Secondly, we change the leverage from what reported in F.S 2011 to increasing 30% and reducing 20% to see the sensitivity of beta values. We found out that in 3 cases, asset beta mean values are

estimated at 0,171, 0,146 and 0,188 which are negatively correlated with the leverage. Also in 3 scenarios, we find out equity beta mean values (0,246, 0,198 and 0,281) are also negatively correlated with the leverage. Leverage degree changes definitely has certain effects on asset and equity beta values.

Empirical Research Findings and Discussion
In the below section, data used are from total 10 listed medical companies on VN stock exchange (HOSE and HNX mainly). In the scenario 1, current financial leverage degree is kept as in the 2011 financial statements which is used to calculate market risk (beta). Then, two (2) FL scenarios are changed up to 30% and down to 20%, compared to the current FL degree.

Market risk (beta) under the impact of tax rate, includes: 1) equity beta; and 2) asset beta.

Scenario 1: *current financial leverage (FL) as in financial reports 2011*

In this case, all beta values of 10 listed firms on VN medicine and medical equipment market as following:

Table 1. *Market risk of listed companies on VN medicine and medical equipment market*

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage
1	AMV	0,248	0,232	DBM as comparable	9,7%
2	APC	0,617	0,535	DBT as comparable	8,6%
3	DBM	0,268	0,089	APC as comparable	63,4%
4	DBT	0,661	0,180		70,9%
5	DCL	0,838	0,393		55,4%
6	DDN	-1,575	-0,286		82,8%
7	DHG	0,618	0,262		27,2%
8	DHT	0,491	0,175		58,8%
9	DNM	0,254	0,129	APC as comparable	66,6%
10	JVC	0,039	0,003	DNM as comparable	88,5%
				Average	53,2%

Scenario 2: *financial leverage increases up to 30%*
If leverage increases up to 30%, all beta values of total 10 listed firms on VN medicine and medical equipment market as below:

Table 2. *Market risks of listed medicine and medical equipment firms (case 2)*

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage (30% up)
1	AMV	0,121	0,113		12,6%
2	APC	0,604	0,523	DLV as comparable	11,2%
3	DBM	0,134	0,044	PGT as comparable	82,4%
4	DBT	0,661	0,180	PGT as comparable	92,2%
5	DCL	0,838	0,393	PGT as comparable	72,1%
6	DDN	-1,575	-0,286		107,7%
7	DHG	0,618	0,262		35,3%
8	DHT	0,491	0,175		76,4%
9	DNM	0,109	0,056	APC as comparable	86,6%
10	JVC	-0,024	-0,002	DNM as comparable	115,0%
				Average	69,2%

Scenario 3: *tax rate decreases down to 20%*

If leverage decreases down to 20%, all beta values of total 10 listed firms on the medicine and medical equipment market in VN as following:

Table 3. *Market risk of listed medicine and medical equipment firms (case 3)*

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage (20% down)
1	AMV	0,332	0,310		7,8%
2	APC	0,626	0,542	DLV as comparable	6,9%
3	DBM	0,353	0,117	PGT as comparable	50,7%
4	DBT	0,661	0,180	PGT as comparable	56,8%
5	DCL	0,838	0,393	PGT as comparable	44,3%
6	DDN	-1,575	-0,286		66,2%
7	DHG	0,618	0,262		21,7%
8	DHT	0,491	0,175		47,0%
9	DNM	0,340	0,173	APC as comparable	53,3%
10	JVC	0,124	0,009	DNM as comparable	70,8%
				Average	42,6%

All three above tables and data show that values of equity and asset beta in the case of increasing leverage up to 30% or decreasing leverage degree down to 20% have certain fluctuation.

Comparing statistical results in 3 scenarios of changing leverage:

Table 4. *Statistical results (FL in case 1)*

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	0,838	0,535	0,3038
MIN	-1,575	-0,286	-1,2892
MEAN	0,246	0,171	0,0747
VAR	0,4688	0,0488	0,4200
Note: Sample size : 10			

Table 5. *Statistical results (FL in case 2)*

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	0,838	0,523	0,3155
MIN	-1,575	-0,286	-1,2892
MEAN	0,198	0,146	0,0518
VAR	0,4736	0,0496	0,4240
Note: Sample size : 10			

***Table 6.** Statistical results (FL in case 3)*

| Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	0,838	0,542	0,2960
MIN	-1,575	-0,286	-1,2892
MEAN	0,281	0,188	0,0932
VAR	0,4681	0,0500	0,4181
Note: Sample size : 10			

Based on the above results, we find out:

Equity beta mean values in all 3 scenarios are low (< 0,3) and asset beta mean values are also small (< 0,2). In the case of reported leverage in 2011, equity beta value fluctuates in an acceptable range from -1,575 (min) up to 0,838 (max) and asset beta fluctuates from -0,286 (min) up to 0,535 (max). If leverage increases to 30%, equity beta moves in the same range and asset beta moves from -0,286 (min) up to 0,523 (max). Hence, we note that there is a decrease in asset beta max value. When leverage decreases down to 20%, equity beta value varies in the same range and asset beta changes from -0,286 (min) up to 0,542 (max). So, there is a small increase in asset beta max value when leverage decreases in scenario 3.

Beside, Exhibit 5 informs us that in the case 30% leverage up, average equity beta value of 10 listed firms decreases down to -0,048 while average asset beta value of these 10 firms decreases to -0,025. Then, when leverage reduces to 20%, average equity beta value of 10 listed firms increase to 0,035 and average asset beta value of 10 firms up to 0,016.

The below chart 1 shows us : when leverage decreases down to 20%, average equity and asset beta values increase slightly (0,281 and 0,188) compared to those at the initial leverage (0,246 and 0,171). Then, when leverage increases up to 30%, average equity beta decreases more to 0,198 and average asset beta value decreases more (to 0,146). However, the fluctuation of equity beta value (0,474) in the case of 30% leverage up is higher than (>) the results in the rest 2 leverage cases.

Chart 1. *Comparing statistical results of three (3) scenarios of changing tax rate*
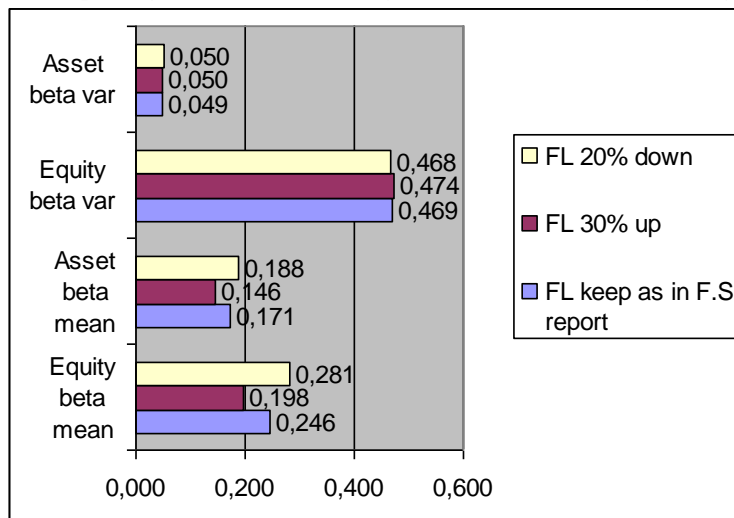
Risk analysis

In short, the using of financial leverage could have both negatively or positively impacts on the financial results or return on equity of a company. The more debt the firm uses, the more risk it takes. If a company's ROA is not higher than (>) the interest or cost of FL, the ROE and profitability of a company will be declined.

On the other hand, in the case of increasing leverage, the company will expect to get more returns. The financial leverage becomes worthwhile if the cost of additional financial leverage is lower than the additional earnings before taxes and interests (EBIT). Hence, the company might want to keep the optimal capital structure when making financing decisions to increase the firm value.

Conclusion and Policy suggestion

In summary, the government has to consider the impacts on the mobility of capital in the markets when it changes the macro policies. Besides, it continues to increase the effectiveness of building the legal system and regulation supporting the plan of developing medicine and medical equipment market. The Ministry of Finance continue to increase the effectiveness of fiscal policies and tax policies which are needed to combine with other macro policies at the same time. The State Bank of Viet Nam continues to increase the effectiveness of capital providing channels for medicine and medical equipment companies although we could note that in this study when leverage is going to increase up to 30%, the risk decreases little more while the asset beta var or risk dispersion increases, compared to the case it is going to decrease down to 20%.

Furthermore, the entire efforts among many different government bodies need to be coordinated.

Finally, this paper suggests implications for further research and policy suggestion for the Viet Nam government and relevant organizations, economists and investors from current market conditions.

References

1. ADB and Viet Nam Fact Sheet, 2010

2. Agarwal, S., & Mohtadi, H. (2004). Financial markets and the financing choice of firms: evidence from developing countries. Global Finance Journal, 15(1), 57-70.

3. Ang, A., & Chen, J. (2007). CAPM over the long run: 1926–2001. Journal of Empirical Finance, 14(1), 1-40.

4. Baker, H. K., Singleton, J. C., & Veit, E. T. (2010). Survey Research in Corporate Finance: Bridging The Gap Between Theory and Practice. Oxford University Press.

5. Dutt, T., & Humphery-Jenner, M. (2013). Stock return volatility, operating performance and stock returns: International evidence on drivers of the 'low volatility'anomaly. Journal of Banking & Finance, 37(3), 999-1017.

6. Fama, E. F., & French, K. R. (2004). The capital asset pricing model: theory and evidence. Journal of Economic Perspectives, 25-46.

7. Flifel, K. (2012). Financial Markets between Efficiency and Persistence: Empirical Evidence on Daily Data. Asian Journal of Finance & Accounting, 4(2), 379-400.

8. Grullon, G., Lyandres, E., & Zhdanov, A. (2012). Real options, volatility, and stock returns. The Journal of Finance, 67(4), 1499-1537.

9. Hai, N.M.., Hien, P.T., & Huyen. L.D, (2013). Phân tích tác động của phá giá tiền tệ đến tăng trưởng kinh tế VN thời kỳ 2000-2012, Journal of Economic Development

10. Huy, Dinh T.N., (2012). Estimating Beta of Viet Nam listed construction companies groups during the crisis, Journal of Integration and Development.

11. Kowalski, T., & Shachmurove, Y. (2011). The financial crisis: what is there to learn?. Global Finance Journal, 22(3), 238-247.

12. Ling, Amy., (2013). Tax Issues Relating to Intangibles, Asia-Pacific Tax Bulletin.

13. Lu, W., & Whidbee, D. A. (2013). Bank structure and failure during the financial crisis. Journal of Financial Economic Policy, 5(3), 281-299.

14. Maria, A. P. (2012). The Impact of Social Factors on Economic Growth: Empirical Evidence for Romania and European Union Countries. Romanian Journal of Fiscal Policy, 3(2), 1-16.

15. Vasiliou, D., & Daskalakis, N. (2009). Institutional characteristics and capital structure: a cross-national comparison. Global Finance Journal, 19(3), 286-306.

Other web sources

http://www.ifc.org/ifcext/mekongpsdf.nsf/Content/PSDP22

http://www.mofa.gov.vn/vi/

http://www.hsx.vn/hsx/

www.tuoitre.com.vn;

www.saigontimes.com.vn;

www.mof.gov.vn *;*

www.vneconomy.com.vn *;*

www.sbv.gov.vn.

Exhibit

Exhibit 1. *Interest rates in banking industry during crisis*
(source: Viet Nam commercial banks)

Year	Borrowing Interest rates	Deposit Rates	Note
2011	18%-22%	13%-14%	
2010	19%-20%	13%-14%	*Approximately*
2009	9%-12%	9%-10%	*(2007: required reserves ratio at SBV is changed from 5% to 10%)*
2008	19%-21%	15%-16,5%	
2007	12%-15%	9%-11%	*(2009: special supporting interest rate is 4%)*

Exhibit 2. *Basic interest rate changes in Viet Nam*
(source: State Bank of Viet Nam and Viet Nam economy)

Year	Basic rate	Note
2011	9%	
2010	8%	
2009	7%	
2008	8,75%-14%	*Approximately, fluctuated*
2007	8,25%	
2006	8,25%	
2005	7,8%	
2004	7,5%	
2003	7,5%	
2002	7,44%	
2001	7,2%-8,7%	*Approximately, fluctuated*
2000	9%	

Exhibit 3. *Inflation, GDP growth and macroeconomics factors*
(source: Viet Nam commercial banks and economic statistical bureau)

Year	Inflation	GDP	USD/VND rate
2011	18%	5,89%	20.670
2010	11,75% (Estimated at Dec 2010)	6,5% (expected)	19.495
2009	6,88%	5,2%	17.000
2008	22%	6,23%	17.700
2007	12,63%	8,44%	16.132
2006	6,6%	8,17%	
2005	8,4%		
Note		approximately	

Exhibit 4*. GDP growth Việt Nam 2006-2010* <small>*(source: Bureau Statistic)*</small>
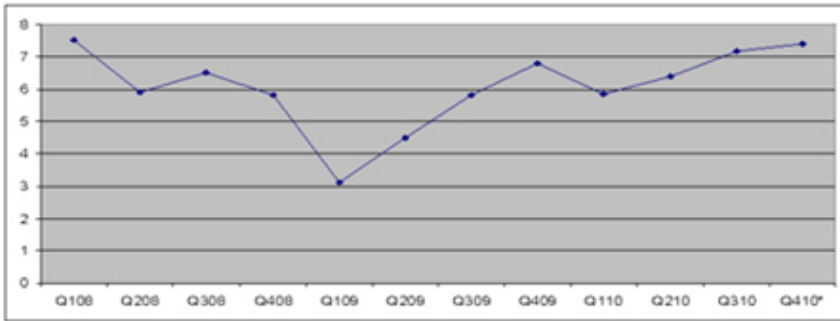
***Exhibit 5**. Increase/decrease risk level of listed medicine and medical equipment firms under changing scenarios of leverage: in 2011 F.S reports, 30% up, 20% down in the period 2007-2011*

Order No.	Company stock code	FL keep as in F.S report		FL 30% up		FL 20% down	
		Equity beta	Asset beta	Increase/ Decrease (equity beta)	Increase/ Decrease (asset beta)	Increase/ Decrease (equity beta)	Increase/ Decrease (asset beta)
1	AMV	0,248	0,232	-0,128	-0,119	0,084	0,078
2	APC	0,617	0,535	-0,014	-0,012	0,009	0,008
3	DBM	0,268	0,089	-0,135	-0,045	0,085	0,028
4	DBT	0,661	0,180	0,000	0,000	0,000	0,000
5	DCL	0,838	0,393	0,000	0,000	0,000	0,000
6	DDN	-1,575	-0,286	0,000	0,000	0,000	0,000
7	DHG	0,618	0,262	0,000	0,000	0,000	0,000
8	DHT	0,491	0,175	0,000	0,000	0,000	0,000
9	DNM	0,254	0,129	-0,145	-0,074	0,086	0,044
10	JVC	0,039	0,003	-0,063	-0,005	0,085	0,006
			Average	-0,048	-0,025	0,035	0,016

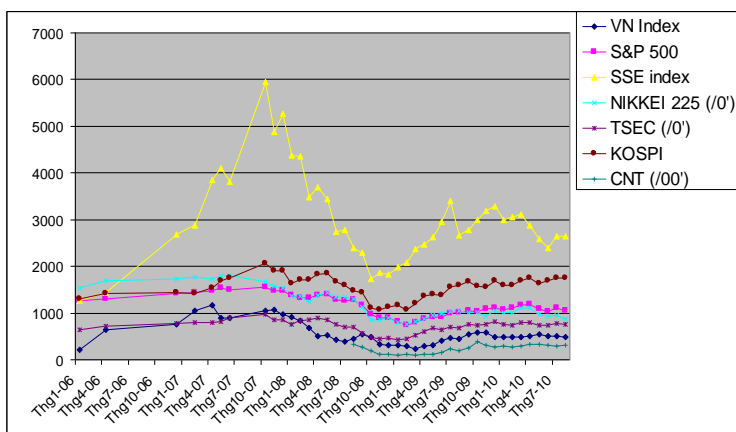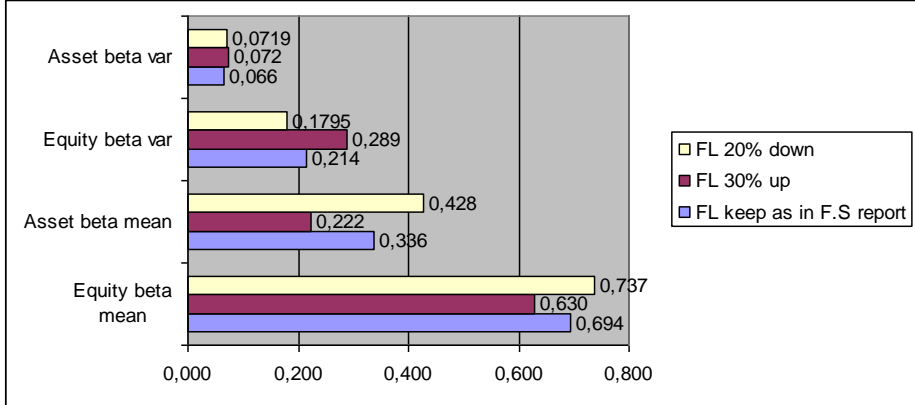***Exhibit 6.** VNI Index and other stock market index during crisis 2006-2010*

Exhibit 7. *Comparing statistical results of three (3) scenarios of changing FL of 121 listed firms in the consumer good industry*

Asset beta var	0,0719 / 0,072 / 0,066	
Equity beta var	0,1795 / 0,289 / 0,214	
Asset beta mean	0,428 / 0,222 / 0,336	
Equity beta mean	0,737 / 0,630 / 0,694	

Legend: □ FL 20% down ■ FL 30% up ■ FL keep as in F.S report

X-axis: 0,000 0,200 0,400 0,600 0,800