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The Risk Level of Vietnam Software Industry Under Impacts of a Three Variable Model During and After the Global Crisis

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Summary

Over recent years, software industry in Vietnam has reached a lot of achievements. Under the volatility of stock price, and changes in macro factors such as inflation and interest rates, the well-established software market in Vietnam has many efforts to recover and grow from the crisis 2008. This study analyzes the impacts of 3 factors: competitor size, tax rate policy and leverage on market risk for the listed firms in the software industry as it becomes necessary. First, by using quantitative and analytical methods to estimate asset and equity beta of total 9 listed companies in Vietnam wholesale and retail industry with a proper traditional model, we found out that the beta values, in general, for many companies are acceptable. Second, under 3 different scenarios of changing tax rates (20%, 25% and 28%), we recognized that there is not large disperse in equity beta values, although the risk dispersion increases to 0,216 if tax rate down to 20% and leverage up 30%. Third, by changing tax rates in 3 scenarios (25%, 20% and 28%), this study identified that the risk dispersion level in this sample study could be minimized in case the financial leverage down 20% and tax rate up 28% or maintaining 25% (measured by equity beta var of 0,214). Finally, this paper provides some outcomes that could provide companies and government more evidence in establishing their policies in governance.

Keywords

risk management, asset beta, financial crisis, corporate tax, leverage, competitive firm size

1. Introduction

Throughout many recent years, Vietnam software market is evaluated as one of active markets, which has certain positive effect for the economy. There are many components which affect the risk level of these firms including, but not limit to, external factors and internal factors. The scope of this paperwork covers the influence of 3 factors on the market risk of these listed companies, including: tax rates, financial leverage or external financing, and the competitive firm size.

The organization of paper contents is as following. As our previous series of paper, the research issues and literature review will be covered in next sessions 2.1 and 2.2, for a short summary. Then, methodology and conceptual theories are introduced in session 2.3 and 2.4. Session 3.1 describes the data in empirical analysis. Session 3.2 presents empirical results and findings. Then, session 4 will conclude with some policy suggestions. This paper also supports readers with references, exhibits and relevant web sources.

2. Preliminary Notes

2.1. Research Issues

Among the research areas of the paperwork are:

RQ Issue 1: Whether the risk level of software firms under the different changing scenarios of tax rates increase or decrease so much?

RQ Issue 2: Because Vietnam is an emerging and immature financial market and the stock market still in the starting stage, whether the dispersed distribution of beta values become large in the different changing scenarios of leverage estimated in the software industry.

RQ Issue 3: Whether the risk level of software firms under the different changing scenarios of competitive firm size increase or decrease so much?

2.2. Literature review

John (1999) mentions a two-rate tax system where land is taxed at a higher rate than structures in his research on two-rate property tax effects on land development.

Smith (2004) mentions in Chicago, properties located in a designated TIF (tax increment financing) district will exhibit higher rates of appreciation after the area is designated a qualifying TIF district when compared to those properties selling outside TIF districts, and when compared to properties that sell within TIF district boundaries prior to designation.

Anderson (2009) recognized that the user cost tax elasticities are relatively small while the expected house price inflation elasticity is substantially larger and therefore plays a greater role in affecting housing market demand. Aregger, Brown & Rossi (2013) found that transaction taxes have no impact on house price growth. And their findings suggest that capital gain taxes on real estate are not suitable measures to prevent excessive house price growth.

Then, Sung, et. al. (2013) also indicated that business property values are more responsive to changes in tax rates as compared to residential property.

Reinhart & Rogoff (2009) pointed the history of finance is full of boom-and-bust cycles, bank failures, and systemic bank and currency crises. Adrian & Shin (2010) stated a company can also proactively vary its financial leverage based on variations on market conditions. Clifford, Andrea & Lasse (2012) stated that safer assets must offer higher risk-adjusted returns than riskier assets and that consuming the high risk-adjusted returns of safer assets require leverage, creating an opportunity for investors to apply leverage. Gulser, Chiu & IIhan (2012) also mentioned using financial leverage increases the total risk of the firm by increasing the volatility of a corporation's net income and return on equity.

Next, Spinassou (2013) showed that the impact of Basel III on the regulator's welfare depends on the regulator's strength, and the implementation of an identical leverage ratio across countries would decrease the welfare of regulators with strong powers. Next, Tasca et all (2013) identified a safe regime, in which excessive leverage does not result in an increase of systemic risk, and a risky regime, in which excessive leverage cannot be mitigated leading to an increased systemic risk. And Gunaratha (2013) revealed that in different industries in Sri Lanka, the degree of financial leverage has a significant positive correlation with financial risk.

Beside, Raith (2001) found out the intensity of product market competition increases, principals unambiguously provide stronger incentives to their agents to reduce costs, and hence agents work harder.

At the same time, more intense competition also leads to a higher volatility of both firm-level profits and managers' compensation. Next, Kim et all (2002) noted that the nature of competitive interaction in an industry is important in assessing the effect of corporate product strategies on shareholder value. Giroud & Mueller (2007) conducted event studies around the dates of the first newspaper reports about the BC laws. They found that while firms in non-competitive industries experience a significant stock price decline, firms in competitive industries experience a small and insignificant price impact. Gropp et all (2007) constructed the market shares of insured competitor banks for any given bank, and analyze the impact of this variable on banks' margins and risk-taking behavior, using a large sample of banks from OECD countries. Their results suggest that government guarantees to some banks strongly increase the risk-taking of the competitor banks not protected by such guarantees. Matsa (2011) figured out in the supermarket industry, The risk that customers will switch stores appears to provide competitors with a strong incentive to invest in product quality. Daly & Hanh Phan (2013) investigated the competitive structure of the banking industries in five emerging asian countries including Vietnam and showed that the global financial crisis affected dramatically the competition of banking system in emerging Asian countries. Last but not least, Utar & Luis (2013) mentioned competition from China has negative and significant impact on employment and plant growth, both through the intensive and the extensive margin, in the most unskilled labor intensive sectors of those threatened by competition from China, leading to sectoral reallocation.

2.3. Conceptual theories

The impact of competition or the size of competitor, leverage and tax rates on the economy and business.

The central bank and government or Ministry of Finance could use two tools: fiscal and monetary policies to perform macro economic goals. Tax rate is one of fiscal policies, either expansion or contraction, can affect quickly the aggregate demand and good market and industry growth.

Beside, 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. On the other hand, using financial leverage and changing capital structure offers firms better economic conditions. Firms can vary the capital structure with leverage and change the structure of fixed costs and variable costs. Although leverage can help a firm to increase return, the firm will prefer to increase debt up to a point to be not so nervous about risk because of too much debt financing. During the firm life, leverage can contribute to its performance and growth.

Furthermore, Porter's theory shows us the basic unit of analysis for understanding competition is the industry. And Porter stated that the industry is the arena in which the competitive advantage is won or lost. Beside, competition can help to raise the value of a company by eliminating or reducing monopoly. Sources of competition include, but not limit to, training. Increasing training can help competition raising productivity. For a nation, the more competitive advantages its industries own, the more success the nation achieves.

2.4. Methodology

We use the data from the stock exchange market in Vietnam (HOSE and HNX) during the 2007-2011 period to estimate systemic risk results.

In this study, analytical research method and specially, tax rate scenario analysis method is used. Analytical data is from the situation of listed software firms in Vietnam stock exchange and current tax rate is 25%.

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

3. Main Results

3.1. General Data Analysis

The research sample has 6 listed firms in the software market with the live date 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 tax rate from 25% to 28% and 20% to see the sensitivity of beta values. In 3 cases (rate = 20%, 25%, and 28%), with current debt financing, asset beta mean is estimated at 0,44. Also in 3 scenarios, we find out var of asset beta estimated at 0,134 (the same). Tax rate changes almost have no effect on asset beta var under financial leverage.

3.2. Empirical Research Findings and Discussion

In the below section, data used are from total 6 listed software industry companies on Vietnam stock exchange (HOSE and HNX mainly). In the scenario 1, current tax rate is kept as 25% then changed from 20% to 30%. Then, three (3) FL scenarios are changed up to 30% and down to 20%, compared to the current FL degree. In short, the below table 1 shows three scenarios used for analyzing the risk level of these listed firms.

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

Table 1 Analyzing market risk under three scenarios

	Tax rate as current (25%)	Tax rate up to 30%	Tax rate down to 20%
Leverage as current	Competitor size as current, double and slightly smaller	Competitor size as current, double and slightly smaller	Competitor size as current, double and slightly smaller
Leverage up 30%			
Leverage down 20%			
	Scenario 1	Scenario 2	Scenario 3

a. Scenario 1: current tax rate 25% and leverage kept as current, 20% down and 30% up, under the condition that competitor size kept as current. In this case, all beta values of 6 listed firms on Vietnam software industry market as following:

Table 2 Market risk of listed companies on Vietnam wholesale and retail industry market under a 3 factors model (case 1) (source: Vietnam stock exchange 2012)

Order No.	Company stock code	Equity beta			Asset beta		
		Competitor as current	Double	Slightly smaller	Competitor as current	Double	Slightly smaller
1	FPT (FI current)	0,976	0,976	0,976	0,364	0,364	0,364
	FPT (FI up)	0,976	0,976	0,976	0,180	0,180	0,180
	FPT (FI down)	0,976	0,976	0,976	0,486	0,486	0,486
2	CMG	0,949	0,949	0,949	0,348	0,348	0,348
	CMG (FL up)	0,949	0,949	0,949	0,167	0,167	0,167
	CMG (FL down)	0,949	0,949	0,949	0,468	0,468	0,468
3	SRB	1,051	1,051	1,051	1,019	1,019	1,019
	SRB (FI up)	1,051	1,051	1,051	1,009	1,009	1,009
	SRB (FI down)	1,051	1,051	1,051	1,025	1,025	1,025
4	VLA	0,125	0,125	0,125	0,111	0,111	0,111
	VLA (FI up)	0,121	0,121	0,121	0,103	0,103	0,103
	VLA (FL down)	0,128	0,128	0,128	0,116	0,116	0,116
5	HIG	1,112	1,112	1,112	0,740	0,740	0,740
	HIG (FL up)	1,112	1,112	1,112	0,629	0,629	0,629
	HIG (FL down)	1,112	1,112	1,112	0,814	0,814	0,814
6	SRA	0,137	0,137	0,137	0,088	0,088	0,088
	SRA (FL up)	0,137	0,137	0,137	0,073	0,073	0,073
	SRA (FL down)	0,137	0,137	0,137	0,098	0,098	0,098

b. Scenario 2: tax rate increases up to 28% and leverage kept as current, 20% down and 30% up, under the condition that competitor size kept as current. All beta values of total 6 listed firms on Vietnam software industry market as below:

Table 3 Market risks of listed software industry firms under a 3 factors model (case 2) (source: Vietnam stock exchange 2012)

Order No.	Company stock code	Equity beta			Asset beta		
		Competitor as current	Double	Slightly smaller	Competitor as current	Double	Slightly smaller
1	FPT (Fl current)	0,976	0,976	0,976	0,364	0,364	0,364
	FPT (Fl up)	0,976	0,976	0,976	0,180	0,180	0,180
	FPT (Fl down)	0,976	0,976	0,976	0,486	0,486	0,486
2	CMG	0,949	0,949	0,949	0,348	0,348	0,348
	CMG (FL up)	0,949	0,949	0,949	0,167	0,167	0,167
	CMG (FL down)	0,949	0,949	0,949	0,468	0,468	0,468
3	SRB	1,051	1,051	1,051	1,019	1,019	1,019
	SRB (Fl up)	1,051	1,051	1,051	1,009	1,009	1,009
	SRB (Fl down)	1,051	1,051	1,051	1,025	1,025	1,025
4	VLA	0,126	0,126	0,126	0,111	0,111	0,111
	VLA (Fl up)	0,122	0,122	0,122	0,104	0,104	0,104
	VLA (FL down)	0,128	0,128	0,128	0,116	0,116	0,116
5	HIG	1,112	1,112	1,112	0,740	0,740	0,740
	HIG (FL up)	1,112	1,112	1,112	0,629	0,629	0,629
	HIG (FL down)	1,112	1,112	1,112	0,814	0,814	0,814
6	SRA	0,137	0,137	0,137	0,088	0,088	0,088
	SRA (FL up)	0,137	0,137	0,137	0,073	0,073	0,073
	SRA (FL down)	0,137	0,137	0,137	0,098	0,098	0,098

c. Scenario 3: tax rate decreases down to 20% and leverage kept as current, 20% down and 30% up, under the condition that competitor size kept as current. All beta values of total 6 listed firms on Vietnam software industry market as below:

Table 4 Market risks of listed software industry firms under a 3 factors model (case 3) (source: Vietnam stock exchange 2012)

Order No.	Company stock code	Equity beta			Asset beta		
		Competitor as current	Double	Slightly smaller	Competitor as current	Double	Slightly smaller
1	FPT (Fl current)	0,976	0,976	0,976	0,364	0,364	0,364
	FPT (Fl up)	0,976	0,976	0,976	0,180	0,180	0,180
	FPT (Fl down)	0,976	0,976	0,976	0,486	0,486	0,486
2	CMG	0,949	0,949	0,949	0,348	0,348	0,348
	CMG (FL up)	0,949	0,949	0,949	0,167	0,167	0,167
	CMG (FL down)	0,949	0,949	0,949	0,468	0,468	0,468
3	SRB	1,051	1,051	1,051	1,019	1,019	1,019
	SRB (Fl up)	1,051	1,051	1,051	1,009	1,009	1,009
	SRB (Fl down)	1,051	1,051	1,051	1,025	1,025	1,025
4	VLA	0,124	0,124	0,124	0,110	0,110	0,110
	VLA (Fl up)	0,120	0,120	0,120	0,103	0,103	0,103
	VLA (FL down)	0,127	0,127	0,127	0,115	0,115	0,115
5	HIG	1,112	1,112	1,112	0,740	0,740	0,740
	HIG (FL up)	1,112	1,112	1,112	0,629	0,629	0,629
	HIG (FL down)	1,112	1,112	1,112	0,814	0,814	0,814
6	SRA	0,137	0,137	0,137	0,088	0,088	0,088
	SRA (FL up)	0,137	0,137	0,137	0,073	0,073	0,073
	SRA (FL down)	0,137	0,137	0,137	0,098	0,098	0,098

All three above tables and data show that there are just tiny changes in the values of equity beta and there are bigger fluctuations in the values of asset beta in the three (3) cases.

3.3. Comparing statistical results in 3 scenarios of changing leverage:

Table 5 Statistical results (FL in case 1) (source: Vietnam stock exchange 2012)

		Equity beta			Asset beta			Difference		
	Statistic results	Competitor size as current	Double	Slightly smaller	Competitor size as current	Double	Slightly smaller	Competitor size as current	Double	Slightly smaller
1. FL as cur rent	MAX	1,112	1,112	1,112	1,019	1,019	1,019	0,093	0,093	0,093
	MIN	0,125	0,125	0,125	0,088	0,088	0,088	0,037	0,037	0,037
	MEAN	0,725	0,725	0,725	0,445	0,445	0,445	0,280	0,280	0,280
	VAR	0,2148	0,2148	0,2148	0,1343	0,1343	0,1343	0,081	0,081	0,081
2. FL up 30%	Statistic results	Competitor size as current	Double	Slightly smaller	Competitor size as current	Double	Slightly smaller	Competitor size as current	Double	Slightly smaller
	MAX	1,112	1,112	1,112	1,009	1,009	1,009	0,103	0,103	0,103
	MIN	0,121	0,121	0,121	0,073	0,073	0,073	0,049	0,049	0,049
	MEAN	0,724	0,724	0,724	0,360	0,360	0,360	0,364	0,364	0,364
	VAR	0,2157	0,2157	0,2157	0,1422	0,1422	0,1422	0,074	0,074	0,074
3. FL down 20%	Statistic results	Competitor size as current	Double	Slightly smaller	Competitor size as current	Double	Slightly smaller	Competitor size as current	Double	Slightly smaller
	MAX	1,112	1,112	1,112	1,025	1,025	1,025	0,087	0,087	0,087
	MIN	0,128	0,128	0,128	0,098	0,098	0,098	0,030	0,030	0,030
	MEAN	0,725	0,725	0,725	0,501	0,501	0,501	0,224	0,224	0,224
	VAR	0,2142	0,2142	0,2142	0,1370	0,1370	0,1370	0,077	0,077	0,077

Note: Sample size : 6 firms

Table 6 Statistical results (FL in case 2)
(source: Vietnam stock exchange 2012)

		Equity beta				Asset beta				Difference			
1. FL as current	Statistic results	VAR	MEAN	MIN	MAX	VAR	MEAN	MIN	MAX	VAR	MEAN	MIN	MAX
	Competitor size as current	0,2147	0,725	0,126	1,112	0,1342	0,445	0,088	1,019	0,080	0,280	0,038	0,093
	Double	0,2147	0,725	0,126	1,112	0,1342	0,445	0,088	1,019	0,080	0,280	0,038	0,093
	Slightly smaller	0,2147	0,725	0,126	1,112	0,1342	0,445	0,088	1,019	0,080	0,280	0,038	0,093
2. FL up 30%	Statistic results	VAR	MEAN	MIN	MAX	VAR	MEAN	MIN	MAX	VAR	MEAN	MIN	MAX
	Competitor size as current	0,2155	0,724	0,122	1,112	0,1421	0,360	0,073	1,009	0,073	0,364	0,049	0,103
	Double	0,2155	0,724	0,122	1,112	0,1421	0,360	0,073	1,009	0,073	0,364	0,049	0,103
	Slightly smaller	0,2155	0,724	0,122	1,112	0,1421	0,360	0,073	1,009	0,073	0,364	0,049	0,103
3. FL down 20%	Statistic results	VAR	MEAN	MIN	MAX	VAR	MEAN	MIN	MAX	VAR	MEAN	MIN	MAX
	Competitor size as current	0,2141	0,725	0,128	1,112	0,1370	0,501	0,098	1,025	0,077	0,224	0,030	0,087
	Double	0,2141	0,725	0,128	1,112	0,1370	0,501	0,098	1,025	0,077	0,224	0,030	0,087
	Slightly smaller	0,2141	0,725	0,128	1,112	0,1370	0,501	0,098	1,025	0,077	0,224	0,030	0,087

Note: Sample size : 6 firms

Table 7 Statistical results (FL in case 3)
(source: Vietnam stock exchange 2012)

		Equity beta				Asset beta				Difference			
1. FL as current	Statistic results	VAR	MEAN	MIN	MAX	VAR	MEAN	MIN	MAX	VAR	MEAN	MIN	MAX
	Competitor size as current	0,2149	0,725	0,124	1,112	0,1344	0,445	0,088	1,019	0,081	0,280	0,037	0,093
	Double	0,2149	0,725	0,124	1,112	0,1344	0,445	0,088	1,019	0,081	0,280	0,037	0,093
	Slightly smaller	0,2149	0,725	0,124	1,112	0,1344	0,445	0,088	1,019	0,081	0,280	0,037	0,093
2. FL up 30%	Statistic results	VAR	MEAN	MIN	MAX	VAR	MEAN	MIN	MAX	VAR	MEAN	MIN	MAX
	Competitor size as current	0,2159	0,724	0,120	1,112	0,1422	0,360	0,073	1,009	0,074	0,364	0,048	0,103
	Double	0,2159	0,724	0,120	1,112	0,1422	0,360	0,073	1,009	0,074	0,364	0,048	0,103
	Slightly smaller	0,2159	0,724	0,120	1,112	0,1422	0,360	0,073	1,009	0,074	0,364	0,048	0,103
3. FL down 20%	Statistic results	VAR	MEAN	MIN	MAX	VAR	MEAN	MIN	MAX	VAR	MEAN	MIN	MAX
	Competitor size as current	0,2143	0,725	0,127	1,112	0,1371	0,501	0,098	1,025	0,077	0,224	0,029	0,087
	Double	0,2143	0,725	0,127	1,112	0,1371	0,501	0,098	1,025	0,077	0,224	0,029	0,087
	Slightly smaller	0,2143	0,725	0,127	1,112	0,1371	0,501	0,098	1,025	0,077	0,224	0,029	0,087

Note: Sample size : 6 firms

The above calculated figures generate some following results:

First of all, Equity beta mean values in all 3 scenarios are acceptable (< 0,8) and asset beta mean values are also small (< 0,6). If leverage and competitor size kept as current, equity beta min value increases slightly to 0,126 from 0,125 when tax rate is up to 28%. Finally, when leverage and competitor size kept as current, equity beta min value decreases to 0,124 in case tax rate down 20%.

The below chart 1 and 2 show us: in scenario 1 (current tax rate), if leverage down 20% in all three cases of competitor size, average equity beta value increases maximum (0,725). However, equity beta var reaches 0,216 (maximum), in case leverage up 30%. Then, in scenario 2 (tax rate up to 28%), when leverage degree decreases down to 20%, average equity beta value increases maximum (0,73). Similarly, equity beta var reaches 0,216 (maximum), in case leverage up 30%. Finally, in scenario 3 (tax rate down 20%), equity beta mean reaches 0,72 (minimum) if leverage up 30%.

The below chart 3 and 4 show us: in scenario 1 (current tax rate), asset beta mean reaches 0,50 (maximum) if leverage down 20% in all three cases of competitor size. And asset beta var reaches 0,142 (maximum) in case FL up to 30%. Then, in scenario 2 (tax rate up to 28%), asset beta mean also reaches 0,50 (maximum) if leverage down

20%. Similarly, asset beta var reaches 0,142 (maximum) in case leverage up 30%. Finally, in scenario 3 (tax rate down 20%), asset beta mean reaches 0,36 (minimum) in case FL up 30%, whereas asset beta var reaches 0,134 (minimum) with current leverage.

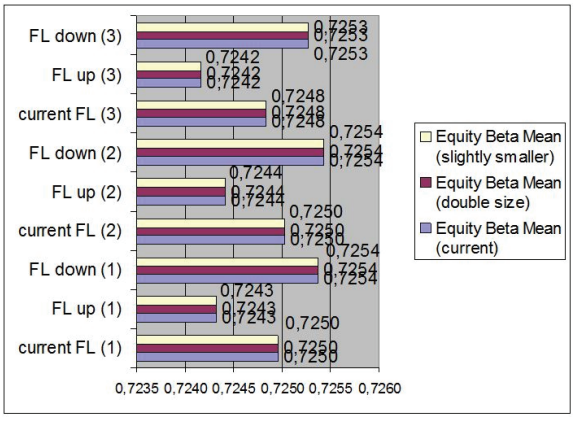

Chart 1 Comparisson of statistical results of equity beta var and mean in three scenarios: changing FL, tax rate and competitor size
(source: Vietnam stock exchange 2012)
Note: (1) current tax rate; (2): tax rate up 28%; (3): tax rate down 20%

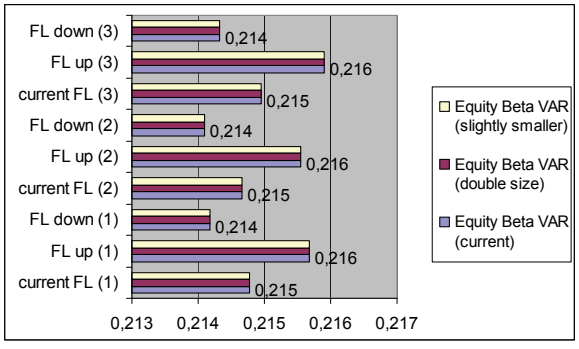

Chart 2 Comparing statistical results of equity beta var and mean in three (3) scenarios of changing FL and tax rate and competitor size
(source: Vietnam stock exchange 2012)

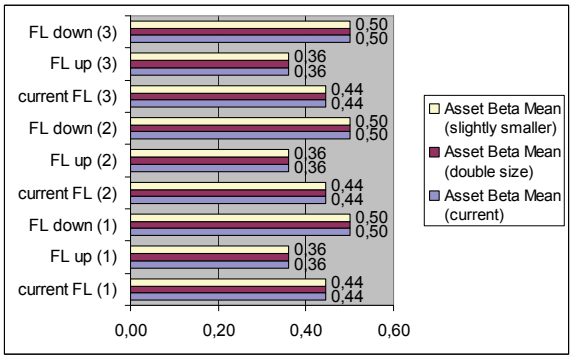

Chart 3 Comparing statistical results of asset beta var and mean in three (3) scenarios of changing FL and tax rate and competitor size
(source: Vietnam stock exchange 2012)
Note: (1) current tax rate; (2): tax rate up 28%; (3): tax rate down 20%

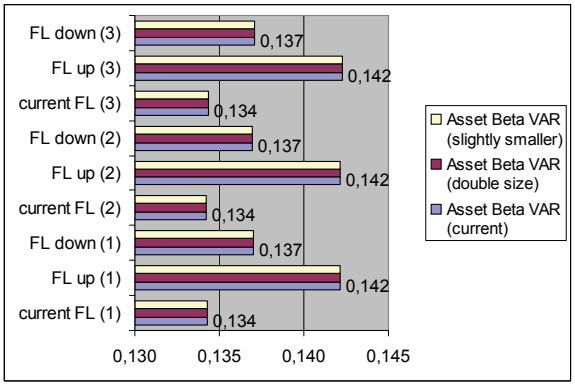

Chart 4 Comparing statistical results of asset beta var and mean in three (3) scenarios of changing FL and tax rate and competitor size
(source: Vietnam stock exchange 2012)

4. Conclusion and Policy suggestion

In summary, the government has to consider the impacts on the movement of market risk in the markets when it changes the macro policies and the legal system and regulation for developing the software market. The Ministry of Finance continues 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 Vietnam continues to increase the effectiveness of capital providing channels for software firms as we might note that in this study when leverage is going to increase up to 30%, the risk level decreases to 0,36 (for all three cases of tax rates and competitor size).

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 Vietnam government and relevant organizations, economists and investors from current market conditions.

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Exhibit

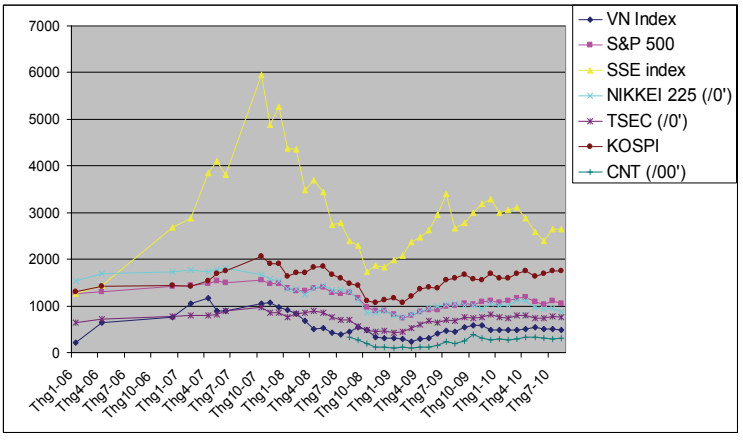

Exhibit 1 Vietnam Index and other stock market index during crisis 2006-2010
(source: global stock exchange 2012)

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