A Four Variable Model on the Risk Level of VietNam Hardware Industry During and After the Global Crisis

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Abstract
Over recent years, hardware industry in Viet Nam 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 hardware market in Viet Nam has many efforts to recover and grow from the crisis 2008. This study analyzes the impacts of 4 factors: time point, competitor size, tax rate policy and leverage on market risk for the listed firms in the hardware industry as it becomes necessary.
First, by using quantitative and analytical methods to estimate asset and equity beta of total 22 listed companies in Viet Nam hardware 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 the largest dispersion in equity beta value (0,2), if leverage up to 30% and doubling size competitors for the period of the whole fiscal year 2011.
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 competitor size doubling, tax rate up to 28% and financial leverage down to 20% (measured by asset beta var of 0,075) at the time point t0 or end of the fiscal year 2010.
Finally, this paper provides some outcomes that could provide companies and government more evidence in establishing their policies in governance.

Keyword
Risk Management, Asset Beta, Financial Crisis, Corporate Tax, Leverage, Competitive Firm Size
JEL classification numbers: G010, G390

I. Introduction

Financial leverage has certain effects on the risk level of listed companies on stock exchange. Flifel (2012) stated today, the assumption of efficient capital markets is very controversial, especially in these times of crisis, and is challenged by research showing that the pricing was distorted by detection of long memory. Gabrijelcic et all (2013) find a significant negative effect of leverage on firm performance. And firms that had some foreign debt financing performed better than their counterparts.
Measuring beta is a popular method used in many models such as the famous CAPM model. The Viet Nam hardware industry is selected for the research because until now there is no research published with the same scope and because Viet Nam hardware industry is considered as one of developing economic sectors in the local market, which has some positive effects for the economy. The purpose of this study, therefore, to find out how much market risk for this industry in changing contexts of financial leverage.
We mention some issues on the estimating of impacts of external financing on beta for listed tourism industry companies in Viet Nam stock exchange as following:

- **Issue 1:** Whether the risk level of hardware industry 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 hardware industry.

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 , then, empirical analysis, discussion and conclusion. This paper also supports readers with references, exhibits and relevant web sources.

I. Theoretical Background

A. Conceptual Theories

1. The impact of financial leverage on the economy

Financial development and economic growth are positively interrelated. The interaction between these two (2) fields can be considered as a circle, in which good financial development causes economic growth and vice versa. A sound and effective financial system has positive effect on the development and growth of the economy. Financial institutions and markets can enable corporations to solve liquidity needs and enhance long-term investments. 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.
In a specific industry such as hardware 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.

B. Methodology

For calculating systemic risk results and leverage impacts, in this study, we use the live data during the crisis period 2009-2011 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 hardware industry firms in VN stock exchange and curent tax rate is 25%. Generally speaking, quantitative method is mainly used in this study whith a note that risk measure asset beta is mainly derive from equity beta and financial leverage.
Finally, we use the results to suggest policy for both these enterprises, relevant organizations and government.

C. Previous Studies

Fama, Eugene F., and French, Kenneth R., (2004) also indicated in the three factor model that "value" and "size" are significant components which can affect stock returns. They also mentioned that a stock's return not only depends on a market beta, but also on market capitalization beta. The market beta is used in the three factor model, developed by Fama and French, which is the successor to the CAPM model by Sharpe, Treynor and Lintner.
Dimitrov (2006) documented a significantly negative association between changes in financial leverage and contemporaneous

risk-adjusted stock returns. Aydemir et all (2006) identified in an economy with more realistic variation in interest rates and the price of risk, there is significant variation in stock return volatility at the market and firm level. In such an economy, financial leverage has little effect on the dynamics of stock return volatility at the market level. Financial leverage contributes more to the dynamics of stock return volatility for a small firm. Then, Maia (2010) stated the main determinants of firms' capital structures are related to firms' sensitivities to these systematic sources of risk and they affect asymmetrically low and high leverage firms. And temporary shocks are relatively more important for low leverage firms, and that financial distress risk seems to be captured by the sensitivity of firms' cash flow innovations to market discount rate news.

Umar (2011) found that firms which maintain good governance structures have leverage ratios that are higher (forty-seven percent) than those of firms with poor governance mechanisms per unit of profit. Chen et all (2013) supported regulators' suspicions that over-reliance on short-term funding and insufficient collateral compounded the effects of dangerously high leverage and resulted in undercapitalization and excessive risk exposure for Lehman Brothers. The model reinforces the importance of the relationship between capital structure and risk management. Then, Alcock et all (2013) found evidence that leverage cannot be viewed as a long-term strategy to enhance performance, but in the short term, managers do seem to add significantly to fund excess returns by effectively timing leverage choices to the expected future market environment. And Gunaratha (2013) revealed that in different industries in Sri Lanka, the degree of financial leverage has a significant positive correlation with financial risk.

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

III. Empirical Analysis

A. General Data Analysis

The research sample has total 22 listed firms in the hardware industry market with the live data from the stock exchange.

Equity beta values of these firms are estimated with the using of financial leverage to calculate asset beta values of them. Then, 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 time point t0 : 0,43, 0,44 and 0,45, which increases little more if competitor size is smaller and at time point t1: 0,44, 0,39, 0,43 which are sensitive and decrease more if competitor size dobles. Hence, in 2 different fiscal years, the risk is changed in different dimensions with the competitor selecting strategy. Leverage degree changes definitely has certain effects on risk values.

B. Empirical Research Findings and Discussion

First, we select two (2) points of time, with different capital structure values, to estimate fluctuations of beta values:

+ at time point t0 : at the end of the fiscal year 2010 or the beginning of year 2011

+ at time point t1 : for the whole year 2011

We pay attention to competitor and leverage may vary dependent on time point.

In the below section, data used are from total 22 listed hardware industry companies on VN stock exchange (HOSE and HNX mainly). In the scenario 1, current tax rate is kept as 25% then changed from 20% to 28%. 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 (3) Scenarios (Made by Author)

	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
+Time point t_0			
+Time point t_1			
Leverage up 30%			
+Time point t_0			
+Time point t_1			
Leverage down 20%			
+Time point t_0			
+Time point t_1			
	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, double and smaller and beta values estimated at two time points (t0 and t1).

In this case, all beta values of 22 listed firms on VN hardware industry market as following:

Table 2 – Market risk of listed companies on VN hardware industry market under a 4 factors model (case 1) (source: VN 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	CMT (FL current t zero)	0,665	0,665	0,665	0,373	0,373	0,373
	CMT (FL current t1)	0,665	0,665	0,665	0,326	0,326	0,326
	CMT (Fl up t zero)	0,665	0,665	0,665	0,285	0,285	0,285
	CMT (Fl up t1)	0,665	0,665	0,665	0,224	0,224	0,224
	CMT (Fl down t zero)	0,665	0,665	0,665	0,432	0,432	0,432
	CMT (Fl down t1)	0,665	0,665	0,665	0,394	0,394	0,394
2	SVT (t zero)	0,589	0,536	1,046	0,465	0,423	0,826
	SVT (t1)	0,860	0,212	0,860	0,651	0,161	0,651
	SVT (FL up t zero)	0,589	0,536	1,046	0,428	0,389	0,760
	SVT (FL up t1)	0,792	-0,059	0,792	0,543	-0,040	0,543
	SVT (FL down t zero)	0,589	0,536	1,046	0,490	0,446	0,870
	SVT (FL down t1)	0,903	0,392	0,903	0,728	0,316	0,728
3	VIE (t zero)	0,191	0,498	0,267	0,045	0,118	0,063
	VIE (t1)	0,283	0,263	0,131	0,054	0,050	0,025
	VIE (Fl up t zero)	0,191	0,498	0,267	0,002	0,004	0,002
	VIE (Fl up t1)	-0,085	-0,079	-0,022	0,004	0,004	0,001
	VIE (Fl down t zero)	0,191	0,498	0,267	0,075	0,194	0,104
	VIE (Fl down t1)	0,498	0,463	0,292	0,176	0,163	0,103
4	HPT (t zero)	0,429	0,409	0,429	0,102	0,098	0,102
	HPT (t1)	0,238	0,113	0,238	0,063	0,030	0,063
	HPT (Fl up t zero)	0,429	0,409	0,429	0,005	0,004	0,005
	HPT (Fl up t1)	0,041	0,019	0,041	0,002	0,001	0,002
	HPT (FL down t zero)	0,429	0,409	0,429	0,168	0,160	0,168
	HPT (FL down t1)	0,356	0,169	0,356	0,146	0,069	0,146
5	NIS (t zero)	0,124	0,768	0,411	0,054	0,334	0,179
	NIS (t1)	0,347	0,487	0,347	0,165	0,231	0,165
	NIS (FL up t zero)	0,124	0,768	0,411	0,033	0,204	0,109
	NIS (FL up t1)	0,243	0,341	0,243	0,077	0,108	0,077
	NIS (FL down t zero)	0,124	0,768	0,411	0,068	0,421	0,225
	NIS (FL down t1)	0,411	0,577	0,411	0,238	0,335	0,238
6	TST (t zero)	0,739	0,739	0,739	0,200	0,200	0,200
	TST (t1)	0,739	0,739	0,739	0,236	0,236	0,236
	TST (FL up t zero)	0,739	0,739	0,739	0,038	0,038	0,038
	TST (FL up t1)	0,739	0,739	0,739	0,085	0,085	0,085
	TST (FL down t zero)	0,739	0,739	0,739	0,308	0,308	0,308
	TST (FL down t1)	0,739	0,739	0,739	0,337	0,337	0,337
7	ST8 (t zero)	0,891	0,891	0,891	0,639	0,639	0,639
	ST8 (t1)	0,891	0,891	0,891	0,682	0,682	0,682
	ST8 (Fl up t zero)	0,891	0,891	0,891	0,563	0,563	0,563
	ST8 (Fl up t1)	0,891	0,891	0,891	0,619	0,619	0,619
	ST8 (Fl down t zero)	0,891	0,891	0,891	0,689	0,689	0,689
	ST8 (Fl down t1)	0,891	0,891	0,891	0,724	0,724	0,724
8	TAG (t zero)	0,632	0,632	0,632	0,449	0,449	0,449
	TAG (t1)	0,632	0,632	0,632	0,411	0,411	0,411
	TAG (FL up t zero)	0,632	0,632	0,632	0,394	0,394	0,394
	TAG (FL up t1)	0,632	0,632	0,632	0,345	0,345	0,345
	TAG (FL down t zero)	0,632	0,632	0,632	0,486	0,486	0,486
	TAG (FL down t1)	0,632	0,632	0,632	0,455	0,455	0,455
9	POT (t zero)	1,046	1,046	1,046	0,606	0,606	0,606

	POT (t1)	1,046	1,046	1,046	0,533	0,533	0,533
	POT (Fl up t zero)	1,046	1,046	1,046	0,475	0,475	0,475
	POT (Fl up t1)	1,046	1,046	1,046	0,379	0,379	0,379
	POT (Fl down t zero)	1,046	1,046	1,046	0,694	0,694	0,694
	POT (Fl down t1)	1,046	1,046	1,046	0,636	0,636	0,636
10	CKV (t zero)	0,604	0,604	0,604	0,197	0,197	0,197
	CKV (t1)	0,604	0,604	0,604	0,221	0,221	0,221
	CKV (Fl up t zero)	0,604	0,604	0,604	0,076	0,076	0,076
	CKV (Fl up t1)	0,604	0,604	0,604	0,106	0,106	0,106
	CKV (FL down t zero)	0,604	0,604	0,604	0,279	0,279	0,279
	CKV (FL down t1)	0,604	0,604	0,604	0,297	0,297	0,297
11	ONE (t zero)	0,695	0,522	0,724	0,232	0,174	0,241
	ONE (t1)	0,551	0,294	0,551	0,217	0,116	0,217
	ONE (FL up t zero)	0,695	0,522	0,724	0,092	0,069	0,096
	ONE (FL up t1)	0,314	0,167	0,314	0,067	0,036	0,067
	ONE (FL down t zero)	0,695	0,522	0,724	0,324	0,244	0,338
	ONE (FL down t1)	0,695	0,371	0,695	0,358	0,191	0,358
12	PMT (t zero)	1,191	1,234	1,234	1,008	1,044	1,044
	PMT (t1)	1,234	1,191	1,191	1,056	1,019	1,019
	PMT (FL up t zero)	1,191	1,234	1,234	0,953	0,987	0,987
	PMT (FL up t1)	1,191	1,191	1,191	0,967	0,967	0,967
	PMT (FL down t zero)	1,234	1,234	1,234	1,082	1,082	1,082
	PMT (FL down t1)	1,191	1,191	1,191	1,054	1,054	1,054
13	SMT (t zero)	0,100	0,403	0,831	0,068	0,274	0,564
	SMT (t1)	0,934	0,369	0,826	0,654	0,258	0,578
	SMT (Fl up t zero)	0,100	0,403	0,831	0,058	0,235	0,484
	SMT (Fl up t1)	0,805	0,230	0,738	0,492	0,141	0,450
	SMT (Fl down t zero)	0,100	0,403	0,831	0,074	0,300	0,618
	SMT (Fl down t1)	0,963	0,467	0,882	0,732	0,355	0,671
14	UNI (t zero)	1,186	1,186	1,186	0,771	0,771	0,771
	UNI (t1)	1,186	1,186	1,186	0,732	0,732	0,732
	UNI (FL up t zero)	1,186	1,186	1,186	0,647	0,647	0,647
	UNI (FL up t1)	1,186	1,186	1,186	0,596	0,596	0,596
	UNI (FL down t zero)	1,186	1,186	1,186	0,854	0,854	0,854
	UNI (FL down t1)	1,186	1,186	1,186	0,823	0,823	0,823
15	TLC (t zero)	1,066	1,066	1,066	0,770	0,770	0,770
	TLC (t1)	1,066	1,066	1,066	0,770	0,770	0,770
	TLC (Fl up t zero)	1,066	1,066	1,066	0,682	0,682	0,682
	TLC (Fl up t1)	1,066	1,066	1,066	0,681	0,681	0,681
	TLC (Fl down t zero)	1,066	1,066	1,066	0,829	0,829	0,829
	TLC (Fl down t1)	1,066	1,066	1,066	0,829	0,829	0,829
16	KST (t zero)	0,455	0,764	0,191	0,258	0,434	0,109
	KST (t1)	0,679	0,168	0,405	0,386	0,095	0,230
	KST (Fl up t zero)	0,455	0,764	0,191	0,199	0,334	0,084
	KST (Fl up t1)	0,544	-0,040	0,324	0,239	-0,018	0,142
	KST (FL down t zero)	0,455	0,764	0,191	0,298	0,500	0,125
	KST (FL down t1)	0,764	0,332	0,455	0,500	0,217	0,298
17	VAT (t zero)	1,168	1,028	1,028	0,646	0,569	0,569
	VAT (t1)	1,028	1,168	1,168	0,485	0,551	0,551
	VAT (FL up t zero)	1,168	1,028	1,028	0,490	0,431	0,431
	VAT (FL up t1)	1,168	1,168	1,168	0,366	0,366	0,366
	VAT (FL down t zero)	1,028	1,028	1,028	0,661	0,661	0,661
	VAT (FL down t1)	1,168	1,168	1,168	0,675	0,675	0,675

18	VTC (t zero)	0,635	0,635	0,635	0,457	0,457	0,457
	VTC (t1)	0,635	0,635	0,635	0,431	0,431	0,431
	VTC (FL up t zero)	0,635	0,635	0,635	0,404	0,404	0,404
	VTC (FL up t1)	0,635	0,635	0,635	0,369	0,369	0,369
	VTC (FL down t zero)	0,635	0,635	0,635	0,493	0,493	0,493
	VTC (FL down t1)	0,635	0,635	0,635	0,471	0,471	0,471
19	ELC (t zero)	0,794	0,794	0,493	0,382	0,382	0,237
	ELC (t1)	0,200	0,542	0,200	0,100	0,271	0,100
	ELC (Fl up t zero)	0,794	0,794	0,493	0,259	0,259	0,161
	ELC (Fl up t1)	0,147	0,397	0,147	0,051	0,139	0,051
	ELC (Fl down t zero)	0,794	0,794	0,493	0,465	0,465	0,289
	ELC (Fl down t1)	0,234	0,633	0,234	0,140	0,380	0,140
20	SAM (t zero)	1,191	1,191	1,191	1,113	1,113	1,113
	SAM (t1)	1,191	1,191	1,191	1,069	1,069	1,069
	SAM (Fl up t zero)	1,191	1,191	1,191	1,090	1,090	1,090
	SAM (Fl up t1)	1,191	1,191	1,191	1,033	1,033	1,033
	SAM (FL down t zero)	1,191	1,191	1,191	1,129	1,129	1,129
	SAM (FL down t1)	1,191	1,191	1,191	1,094	1,094	1,094
21	LTC (t zero)	1,102	1,102	1,102	0,314	0,314	0,314
	LTC (t1)	1,102	1,102	1,102	0,329	0,329	0,329
	LTC (FL up t zero)	1,102	1,102	1,102	0,078	0,078	0,078
	LTC (FL up t1)	1,102	1,102	1,102	0,097	0,097	0,097
	LTC (FL down t zero)	1,102	1,102	1,102	0,472	0,472	0,472
	LTC (FL down t1)	1,102	1,102	1,102	0,483	0,483	0,483
22	ITD (t zero)	0,351	0,351	0,351	0,136	0,136	0,136
	ITD (t1)	0,351	0,351	0,351	0,132	0,132	0,132
	ITD (FL up t zero)	0,351	0,351	0,351	0,072	0,072	0,072
	ITD (FL up t1)	0,351	0,351	0,351	0,066	0,066	0,066
	ITD (FL down t zero)	0,351	0,351	0,351	0,179	0,179	0,179
	ITD (FL down t1)	0,351	0,351	0,351	0,175	0,175	0,175

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 and beta values estimated at two time points (t0 and t1)

All beta values of total 22 listed firms on VN hardware industry market as below:

Table 3: Market risks of listed hardware industry firms under a 4 factors model (case 2) (source: VN 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	CMT (FL current t zero)	0,665	0,665	0,665	0,373	0,373	0,373
	CMT (FL current t1)	0,665	0,665	0,665	0,326	0,326	0,326
	CMT (Fl up t zero)	0,665	0,665	0,665	0,285	0,285	0,285
	CMT (Fl up t1)	0,665	0,665	0,665	0,224	0,224	0,224
	CMT (Fl down t zero)	0,665	0,665	0,665	0,432	0,432	0,432
	CMT (Fl down t1)	0,665	0,665	0,665	0,394	0,394	0,394
2	SVT (t zero)	0,603	0,539	1,052	0,476	0,426	0,831
	SVT (t1)	0,866	0,220	0,866	0,656	0,167	0,656
	SVT (FL up t zero)	0,603	0,539	1,052	0,438	0,392	0,764
	SVT (FL up t1)	0,801	-0,062	0,801	0,548	-0,042	0,548
	SVT (FL down t zero)	0,603	0,539	1,052	0,501	0,448	0,875
	SVT (FL down t1)	0,909	0,404	0,909	0,732	0,326	0,732
3	VIE (t zero)	0,198	0,510	0,273	0,047	0,121	0,065

	VIE (t1)	0,292	0,271	0,139	0,056	0,052	0,026
	VIE (Fl up t zero)	0,198	0,510	0,273	0,002	0,004	0,002
	VIE (Fl up t1)	-0,089	-0,082	-0,024	0,005	0,004	0,001
	VIE (Fl down t zero)	0,198	0,510	0,273	0,077	0,199	0,106
	VIE (Fl down t1)	0,510	0,474	0,304	0,180	0,167	0,107
4	HPT (t zero)	0,438	0,438	0,438	0,105	0,005	0,171
	HPT (t1)	0,245	0,116	0,245	0,064	0,031	0,064
	HPT (Fl up t zero)	0,418	0,418	0,418	0,100	0,004	0,163
	HPT (Fl up t1)	0,042	0,020	0,042	0,002	0,001	0,002
	HPT (FL down t zero)	0,438	0,438	0,438	0,105	0,005	0,171
	HPT (FL down t1)	0,363	0,172	0,363	0,149	0,071	0,149
5	NIS (t zero)	0,130	0,779	0,417	0,057	0,339	0,181
	NIS (t1)	0,353	0,496	0,353	0,168	0,235	0,168
	NIS (FL up t zero)	0,130	0,779	0,417	0,035	0,207	0,111
	NIS (FL up t1)	0,249	0,349	0,249	0,079	0,111	0,079
	NIS (FL down t zero)	0,130	0,779	0,417	0,071	0,427	0,229
	NIS (FL down t1)	0,417	0,585	0,417	0,242	0,339	0,242
6	TST (t zero)	0,739	0,739	0,739	0,200	0,200	0,200
	TST (t1)	0,739	0,739	0,739	0,236	0,236	0,236
	TST (FL up t zero)	0,739	0,739	0,739	0,038	0,038	0,038
	TST (FL up t1)	0,739	0,739	0,739	0,085	0,085	0,085
	TST (FL down t zero)	0,739	0,739	0,739	0,308	0,308	0,308
	TST (FL down t1)	0,739	0,739	0,739	0,337	0,337	0,337
7	ST8 (t zero)	0,891	0,891	0,891	0,639	0,639	0,639
	ST8 (t1)	0,891	0,891	0,891	0,682	0,682	0,682
	ST8 (Fl up t zero)	0,891	0,891	0,891	0,563	0,563	0,563
	ST8 (Fl up t1)	0,891	0,891	0,891	0,619	0,619	0,619
	ST8 (Fl down t zero)	0,891	0,891	0,891	0,689	0,689	0,689
	ST8 (Fl down t1)	0,891	0,891	0,891	0,724	0,724	0,724
8	TAG (t zero)	0,632	0,632	0,632	0,449	0,449	0,449
	TAG (t1)	0,632	0,632	0,632	0,411	0,411	0,411
	TAG (FL up t zero)	0,632	0,632	0,632	0,394	0,394	0,394
	TAG (FL up t1)	0,632	0,632	0,632	0,345	0,345	0,345
	TAG (FL down t zero)	0,632	0,632	0,632	0,486	0,486	0,486
	TAG (FL down t1)	0,632	0,632	0,632	0,455	0,455	0,455
9	POT (t zero)	1,046	1,046	1,046	0,606	0,606	0,606
	POT (t1)	1,046	1,046	1,046	0,533	0,533	0,533
	POT (Fl up t zero)	1,046	1,046	1,046	0,475	0,475	0,475
	POT (Fl up t1)	1,046	1,046	1,046	0,379	0,379	0,379
	POT (Fl down t zero)	1,046	1,046	1,046	0,694	0,694	0,694
	POT (Fl down t1)	1,046	1,046	1,046	0,636	0,636	0,636
10	CKV (t zero)	0,604	0,604	0,604	0,197	0,197	0,197
	CKV (t1)	0,604	0,604	0,604	0,221	0,221	0,221
	CKV (Fl up t zero)	0,604	0,604	0,604	0,076	0,076	0,076
	CKV (Fl up t1)	0,604	0,604	0,604	0,106	0,106	0,106
	CKV (FL down t zero)	0,604	0,604	0,604	0,279	0,279	0,279
	CKV (FL down t1)	0,604	0,604	0,604	0,297	0,297	0,297
11	ONE (t zero)	0,707	0,531	0,736	0,236	0,177	0,245
	ONE (t1)	0,563	0,300	0,563	0,222	0,118	0,222
	ONE (FL up t zero)	0,707	0,531	0,736	0,094	0,071	0,098
	ONE (FL up t1)	0,323	0,172	0,323	0,069	0,037	0,069
	ONE (FL down t zero)	0,707	0,531	0,736	0,330	0,248	0,343
	ONE (FL down t1)	0,707	0,377	0,707	0,364	0,194	0,364

12	PMT (t zero)	1,191	1,234	1,234	1,008	1,044	1,044
	PMT (t1)	1,191	1,191	1,191	1,019	1,019	1,019
	PMT (FL up t zero)	1,191	1,234	1,234	0,953	0,987	0,987
	PMT (FL up t1)	1,191	1,191	1,191	0,967	0,967	0,967
	PMT (FL down t zero)	1,234	1,234	1,234	1,082	1,082	1,082
	PMT (FL down t1)	1,191	1,191	1,191	1,054	1,054	1,054
13	SMT (t zero)	0,106	0,416	0,838	0,072	0,282	0,569
	SMT (t1)	0,911	0,379	0,834	0,638	0,265	0,584
	SMT (Fl up t zero)	0,106	0,416	0,838	0,062	0,242	0,488
	SMT (Fl up t1)	0,816	0,239	0,747	0,498	0,146	0,456
	SMT (Fl down t zero)	0,106	0,416	0,838	0,079	0,309	0,623
	SMT (Fl down t1)	0,971	0,477	0,889	0,738	0,363	0,676
14	UNI (t zero)	1,186	1,186	1,186	0,771	0,771	0,771
	UNI (t1)	1,186	1,186	1,186	0,732	0,732	0,732
	UNI (FL up t zero)	1,186	1,186	1,186	0,647	0,647	0,647
	UNI (FL up t1)	1,186	1,186	1,186	0,596	0,596	0,596
	UNI (FL down t zero)	1,186	1,186	1,186	0,854	0,854	0,854
	UNI (FL down t1)	1,186	1,186	1,186	0,823	0,823	0,823
15	TLC (t zero)	1,066	1,066	1,066	0,770	0,770	0,770
	TLC (t1)	1,066	1,066	1,066	0,770	0,770	0,770
	TLC (Fl up t zero)	1,066	1,066	1,066	0,682	0,682	0,682
	TLC (Fl up t1)	1,066	1,066	1,066	0,681	0,681	0,681
	TLC (Fl down t zero)	1,066	1,066	1,066	0,829	0,829	0,829
	TLC (Fl down t1)	1,066	1,066	1,066	0,829	0,829	0,829
16	KST (t zero)	0,460	0,773	0,198	0,261	0,439	0,112
	KST (t1)	0,689	0,175	0,411	0,392	0,100	0,233
	KST (Fl up t zero)	0,460	0,773	0,198	0,202	0,338	0,087
	KST (Fl up t1)	0,555	-0,043	0,331	0,244	-0,019	0,145
	KST (FL down t zero)	0,460	0,773	0,198	0,301	0,505	0,130
	KST (FL down t1)	0,773	0,344	0,460	0,506	0,225	0,301
17	VAT (t zero)	1,168	1,028	1,028	0,646	0,569	0,569
	VAT (t1)	1,168	1,168	1,168	0,551	0,551	0,551
	VAT (FL up t zero)	1,168	1,028	1,028	0,490	0,431	0,431
	VAT (FL up t1)	1,168	1,168	1,168	0,366	0,366	0,366
	VAT (FL down t zero)	1,028	1,028	1,028	0,661	0,661	0,661
	VAT (FL down t1)	1,168	1,168	1,168	0,675	0,675	0,675
18	VTC (t zero)	0,635	0,635	0,635	0,457	0,457	0,457
	VTC (t1)	0,635	0,635	0,635	0,431	0,431	0,431
	VTC (FL up t zero)	0,635	0,635	0,635	0,404	0,404	0,404
	VTC (FL up t1)	0,635	0,635	0,635	0,369	0,369	0,369
	VTC (FL down t zero)	0,635	0,635	0,635	0,493	0,493	0,493
	VTC (FL down t1)	0,635	0,635	0,635	0,471	0,471	0,471
19	ELC (t zero)	0,805	0,805	0,500	0,388	0,388	0,241
	ELC (t1)	0,204	0,552	0,204	0,102	0,276	0,102
	ELC (Fl up t zero)	0,805	0,805	0,500	0,262	0,262	0,163
	ELC (Fl up t1)	0,150	0,406	0,150	0,053	0,142	0,053
	ELC (Fl down t zero)	0,805	0,805	0,500	0,471	0,471	0,292
	ELC (Fl down t1)	0,237	0,641	0,237	0,142	0,385	0,142
20	SAM (t zero)	1,191	1,191	1,191	1,113	1,113	1,113
	SAM (t1)	1,191	1,191	1,191	1,069	1,069	1,069
	SAM (Fl up t zero)	1,191	1,191	1,191	1,090	1,090	1,090
	SAM (Fl up t1)	1,191	1,191	1,191	1,033	1,033	1,033
	SAM (FL down t zero)	1,191	1,191	1,191	1,129	1,129	1,129

	SAM (FL down t1)	1,191	1,191	1,191	1,094	1,094	1,094
21	LTC (t zero)	1,102	1,102	1,102	0,314	0,314	0,314
	LTC (t1)	1,102	1,102	1,102	0,329	0,329	0,329
	LTC (FL up t zero)	1,102	1,102	1,102	0,078	0,078	0,078
	LTC (FL up t1)	1,102	1,102	1,102	0,097	0,097	0,097
	LTC (FL down t zero)	1,102	1,102	1,102	0,472	0,472	0,472
	LTC (FL down t1)	1,102	1,102	1,102	0,483	0,483	0,483
22	ITD (t zero)	0,351	0,351	0,351	0,136	0,136	0,136
	ITD (t1)	0,351	0,351	0,351	0,132	0,132	0,132
	ITD (FL up t zero)	0,351	0,351	0,351	0,072	0,072	0,072
	ITD (FL up t1)	0,351	0,351	0,351	0,066	0,066	0,066
	ITD (FL down t zero)	0,351	0,351	0,351	0,179	0,179	0,179
	ITD (FL down t1)	0,351	0,351	0,351	0,175	0,175	0,175

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 and beta values estimated at two time points (t0 and t1)

All beta values of total 22 listed firms on VN hardware industry market as below:

Table 4: Market risks of listed hardware industry firms under a 4 factors model (case 3) (source: VN 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	CMT (FL current t zero)	0,665	0,665	0,665	0,373	0,373	0,373
	CMT (FL current t1)	0,665	0,665	0,665	0,326	0,326	0,326
	CMT (Fl up t zero)	0,665	0,665	0,665	0,285	0,285	0,285
	CMT (Fl up t1)	0,665	0,665	0,665	0,224	0,224	0,224
	CMT (Fl down t zero)	0,665	0,665	0,665	0,432	0,432	0,432
	CMT (Fl down t1)	0,665	0,665	0,665	0,394	0,394	0,394
2	SVT (t zero)	0,568	0,530	1,035	0,448	0,419	0,817
	SVT (t1)	0,849	0,199	0,849	0,643	0,151	0,643
	SVT (FL up t zero)	0,568	0,530	1,035	0,412	0,385	0,752
	SVT (FL up t1)	0,779	-0,054	0,779	0,534	-0,037	0,534
	SVT (FL down t zero)	0,568	0,530	1,035	0,472	0,441	0,861
	SVT (FL down t1)	0,894	0,374	0,894	0,721	0,301	0,721
3	VIE (t zero)	0,181	0,480	0,257	0,043	0,114	0,061
	VIE (t1)	0,269	0,250	0,121	0,051	0,048	0,023
	VIE (Fl up t zero)	0,181	0,480	0,257	0,001	0,004	0,002
	VIE (Fl up t1)	-0,079	-0,074	-0,020	0,004	0,004	0,001
	VIE (Fl down t zero)	0,181	0,480	0,257	0,070	0,187	0,100
	VIE (Fl down t1)	0,480	0,446	0,274	0,169	0,157	0,096
4	HPT (t zero)	0,415	0,396	0,415	0,099	0,095	0,099
	HPT (t1)	0,228	0,108	0,228	0,060	0,028	0,060
	HPT (Fl up t zero)	0,415	0,396	0,415	0,004	0,004	0,004
	HPT (Fl up t1)	0,038	0,018	0,038	0,002	0,001	0,002
	HPT (FL down t zero)	0,415	0,396	0,415	0,162	0,155	0,162
	HPT (FL down t1)	0,344	0,163	0,344	0,141	0,067	0,141
5	NIS (t zero)	0,114	0,751	0,402	0,050	0,327	0,175
	NIS (t1)	0,337	0,473	0,337	0,160	0,224	0,160
	NIS (FL up t zero)	0,114	0,751	0,402	0,030	0,199	0,107
	NIS (FL up t1)	0,233	0,327	0,233	0,074	0,104	0,074
	NIS (FL down t zero)	0,114	0,751	0,402	0,063	0,411	0,220
	NIS (FL down t1)	0,402	0,564	0,402	0,233	0,327	0,233

6	TST (t zero)	0,739	0,739	0,739	0,200	0,200	0,200
	TST (t1)	0,739	0,739	0,739	0,236	0,236	0,236
	TST (FL up t zero)	0,739	0,739	0,739	0,038	0,038	0,038
	TST (FL up t1)	0,739	0,739	0,739	0,085	0,085	0,085
	TST (FL down t zero)	0,739	0,739	0,739	0,308	0,308	0,308
	TST (FL down t1)	0,739	0,739	0,739	0,337	0,337	0,337
7	ST8 (t zero)	0,891	0,891	0,891	0,639	0,639	0,639
	ST8 (t1)	0,891	0,891	0,891	0,682	0,682	0,682
	ST8 (Fl up t zero)	0,891	0,891	0,891	0,563	0,563	0,563
	ST8 (Fl up t1)	0,891	0,891	0,891	0,619	0,619	0,619
	ST8 (Fl down t zero)	0,891	0,891	0,891	0,689	0,689	0,689
	ST8 (Fl down t1)	0,891	0,891	0,891	0,724	0,724	0,724
8	TAG (t zero)	0,632	0,632	0,632	0,449	0,449	0,449
	TAG (t1)	0,632	0,632	0,632	0,411	0,411	0,411
	TAG (FL up t zero)	0,632	0,632	0,632	0,394	0,394	0,394
	TAG (FL up t1)	0,632	0,632	0,632	0,345	0,345	0,345
	TAG (FL down t zero)	0,632	0,632	0,632	0,486	0,486	0,486
	TAG (FL down t1)	0,632	0,632	0,632	0,455	0,455	0,455
9	POT (t zero)	1,046	1,046	1,046	0,606	0,606	0,606
	POT (t1)	1,046	1,046	1,046	0,533	0,533	0,533
	POT (Fl up t zero)	1,046	1,046	1,046	0,475	0,475	0,475
	POT (Fl up t1)	1,046	1,046	1,046	0,379	0,379	0,379
	POT (Fl down t zero)	1,046	1,046	1,046	0,694	0,694	0,694
	POT (Fl down t1)	1,046	1,046	1,046	0,636	0,636	0,636
10	CKV (t zero)	0,604	0,604	0,604	0,197	0,197	0,197
	CKV (t1)	0,604	0,604	0,604	0,221	0,221	0,221
	CKV (Fl up t zero)	0,604	0,604	0,604	0,076	0,076	0,076
	CKV (Fl up t1)	0,604	0,604	0,604	0,106	0,106	0,106
	CKV (FL down t zero)	0,604	0,604	0,604	0,279	0,279	0,279
	CKV (FL down t1)	0,604	0,604	0,604	0,297	0,297	0,297
11	ONE (t zero)	0,677	0,508	0,704	0,225	0,169	0,235
	ONE (t1)	0,532	0,284	0,532	0,210	0,112	0,210
	ONE (FL up t zero)	0,677	0,508	0,704	0,090	0,068	0,094
	ONE (FL up t1)	0,299	0,159	0,299	0,064	0,034	0,064
	ONE (FL down t zero)	0,677	0,508	0,704	0,316	0,237	0,329
	ONE (FL down t1)	0,677	0,361	0,677	0,349	0,186	0,349
12	PMT (t zero)	1,191	1,234	1,234	1,008	1,044	1,044
	PMT (t1)	1,191	1,191	1,191	1,019	1,019	1,019
	PMT (FL up t zero)	1,191	1,234	1,234	0,953	0,987	0,987
	PMT (FL up t1)	1,191	1,191	1,191	0,967	0,967	0,967
	PMT (FL down t zero)	1,234	1,234	1,234	1,082	1,082	1,082
	PMT (FL down t1)	1,191	1,191	1,191	1,054	1,054	1,054
13	SMT (t zero)	0,091	0,383	0,821	0,062	0,260	0,557
	SMT (t1)	0,887	0,352	0,813	0,621	0,247	0,569
	SMT (Fl up t zero)	0,091	0,383	0,821	0,053	0,223	0,478
	SMT (Fl up t1)	0,788	0,217	0,722	0,481	0,132	0,441
	SMT (Fl down t zero)	0,091	0,383	0,821	0,068	0,285	0,610
	SMT (Fl down t1)	0,951	0,450	0,871	0,723	0,342	0,662
14	UNI (t zero)	1,186	1,186	1,186	0,771	0,771	0,771
	UNI (t1)	1,186	1,186	1,186	0,732	0,732	0,732
	UNI (FL up t zero)	1,186	1,186	1,186	0,647	0,647	0,647
	UNI (FL up t1)	1,186	1,186	1,186	0,596	0,596	0,596
	UNI (FL down t zero)	1,186	1,186	1,186	0,854	0,854	0,854

	UNI (FL down t1)	1,186	1,186	1,186	0,823	0,823	0,823
15	TLC (t zero)	1,066	1,066	1,066	0,770	0,770	0,770
	TLC (t1)	1,066	1,066	1,066	0,770	0,770	0,770
	TLC (Fl up t zero)	1,066	1,066	1,066	0,682	0,682	0,682
	TLC (Fl up t1)	1,066	1,066	1,066	0,681	0,681	0,681
	TLC (Fl down t zero)	1,066	1,066	1,066	0,829	0,829	0,829
	TLC (Fl down t1)	1,066	1,066	1,066	0,829	0,829	0,829
16	KST (t zero)	0,447	0,750	0,181	0,254	0,426	0,103
	KST (t1)	0,663	0,156	0,395	0,377	0,088	0,225
	KST (Fl up t zero)	0,447	0,750	0,181	0,196	0,328	0,079
	KST (Fl up t1)	0,527	-0,036	0,314	0,232	-0,016	0,138
	KST (FL down t zero)	0,447	0,750	0,181	0,292	0,490	0,118
	KST (FL down t1)	0,750	0,314	0,447	0,491	0,205	0,293
17	VAT (t zero)	1,168	1,028	1,028	0,646	0,569	0,569
	VAT (t1)	1,168	1,168	1,168	0,551	0,551	0,551
	VAT (FL up t zero)	1,168	1,028	1,028	0,490	0,431	0,431
	VAT (FL up t1)	1,168	1,168	1,168	0,366	0,366	0,366
	VAT (FL down t zero)	1,028	1,028	1,028	0,661	0,661	0,661
	VAT (FL down t1)	1,168	1,168	1,168	0,675	0,675	0,675
18	VTC (t zero)	0,635	0,635	0,635	0,457	0,457	0,457
	VTC (t1)	0,635	0,635	0,635	0,431	0,431	0,431
	VTC (FL up t zero)	0,635	0,635	0,635	0,404	0,404	0,404
	VTC (FL up t1)	0,635	0,635	0,635	0,369	0,369	0,369
	VTC (FL down t zero)	0,635	0,635	0,635	0,493	0,493	0,493
	VTC (FL down t1)	0,635	0,635	0,635	0,471	0,471	0,471
19	ELC (t zero)	0,777	0,777	0,482	0,374	0,374	0,232
	ELC (t1)	0,195	0,527	0,195	0,097	0,264	0,097
	ELC (Fl up t zero)	0,777	0,777	0,482	0,253	0,253	0,157
	ELC (Fl up t1)	0,141	0,382	0,141	0,049	0,134	0,049
	ELC (Fl down t zero)	0,777	0,777	0,482	0,455	0,455	0,282
	ELC (Fl down t1)	0,229	0,619	0,229	0,137	0,371	0,137
20	SAM (t zero)	1,191	1,191	1,191	1,113	1,113	1,113
	SAM (t1)	1,191	1,191	1,191	1,069	1,069	1,069
	SAM (Fl up t zero)	1,191	1,191	1,191	1,090	1,090	1,090
	SAM (Fl up t1)	1,191	1,191	1,191	1,033	1,033	1,033
	SAM (FL down t zero)	1,191	1,191	1,191	1,129	1,129	1,129
	SAM (FL down t1)	1,191	1,191	1,191	1,094	1,094	1,094
21	LTC (t zero)	1,102	1,102	1,102	0,314	0,314	0,314
	LTC (t1)	1,102	1,102	1,102	0,329	0,329	0,329
	LTC (FL up t zero)	1,102	1,102	1,102	0,078	0,078	0,078
	LTC (FL up t1)	1,102	1,102	1,102	0,097	0,097	0,097
	LTC (FL down t zero)	1,102	1,102	1,102	0,472	0,472	0,472
	LTC (FL down t1)	1,102	1,102	1,102	0,483	0,483	0,483
22	ITD (t zero)	0,351	0,351	0,351	0,136	0,136	0,136
	ITD (t1)	0,351	0,351	0,351	0,132	0,132	0,132
	ITD (FL up t zero)	0,351	0,351	0,351	0,072	0,072	0,072
	ITD (FL up t1)	0,351	0,351	0,351	0,066	0,066	0,066
	ITD (FL down t zero)	0,351	0,351	0,351	0,179	0,179	0,179
	ITD (FL down t1)	0,351	0,351	0,351	0,175	0,175	0,175

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.

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

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

t0		Equity beta			Asset beta			Difference		
1. FL as current	Statistic results	Competitor size as current	Double	Slightly smaller	Competitor size as current	Double	Slightly smaller	Competitor size as current	Double	Slightly smaller
	MAX	1,191	1,234	1,234	1,113	1,113	1,113	0,078	0,121	0,121
	MIN	0,124	0,351	0,267	0,045	0,098	0,063	0,079	0,253	0,204
	MEAN	0,742	0,774	0,766	0,431	0,442	0,448	0,311	0,332	0,318
	VAR	0,1081	0,0734	0,0918	0,0938	0,0860	0,0996	0,014	-0,013	-0,008
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	1,191	1,234	1,234	1,090	1,090	1,090	0,101	0,144	0,144
	MIN	0,100	0,351	0,191	0,002	0,004	0,002	0,099	0,347	0,189
	MEAN	0,715	0,779	0,763	0,333	0,354	0,365	0,382	0,425	0,399
	VAR	0,1439	0,0885	0,1183	0,1057	0,0983	0,1144	0,038	-0,010	0,004
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	1,234	1,234	1,234	1,129	1,129	1,129	0,106	0,106	0,106
	MIN	0,100	0,351	0,191	0,068	0,160	0,104	0,032	0,191	0,087
	MEAN	0,716	0,776	0,762	0,479	0,514	0,515	0,236	0,261	0,247
	VAR	0,1221	0,0775	0,1030	0,0946	0,0754	0,0935	0,028	0,002	0,010
Note: Sample size : 22 firms										
t1		Equity beta			Asset beta			Difference		
1. FL as current	Statistic results	Competitor size as current	Double	Slightly smaller	Competitor size as current	Double	Slightly smaller	Competitor size as current	Double	Slightly smaller
	MAX	1,234	1,191	1,191	1,069	1,069	1,069	0,165	0,122	0,122
	MIN	0,200	0,113	0,131	0,054	0,030	0,025	0,147	0,083	0,106
	MEAN	0,748	0,678	0,728	0,441	0,393	0,430	0,307	0,285	0,298
	VAR	0,108	0,139	0,123	0,089	0,090	0,089	0,019	0,049	0,033
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	1,191	1,191	1,191	1,033	1,033	1,033	0,158	0,158	0,158
	MIN	-0,085	-0,079	-0,022	0,002	-0,040	0,001	-0,087	-0,039	-0,024
	MEAN	0,694	0,611	0,684	0,337	0,287	0,330	0,357	0,325	0,353
	VAR	0,157	0,204	0,157	0,092	0,099	0,093	0,065	0,105	0,064
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	1,191	1,191	1,191	1,094	1,094	1,094	0,097	0,097	0,097
	MIN	0,234	0,169	0,234	0,140	0,069	0,103	0,094	0,100	0,131
	MEAN	0,786	0,721	0,759	0,521	0,476	0,506	0,265	0,245	0,253
	VAR	0,093	0,108	0,104	0,081	0,082	0,085	0,011	0,026	0,019
Note: Sample size : 22 firms										

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

t0		Equity beta			Asset beta			Difference		
1. FL as current	Statistic results	Competitor size as current	Double	Slightly smaller	Competitor size as current	Double	Slightly smaller	Competitor size as current	Double	Slightly smaller
	MAX	1,191	1,234	1,234	1,113	1,113	1,113	0,078	0,121	0,121
	MIN	0,130	0,351	0,273	0,047	0,005	0,065	0,083	0,346	0,208
	MEAN	0,745	0,778	0,768	0,432	0,438	0,453	0,313	0,340	0,316
	VAR	0,1068	0,0716	0,0909	0,0935	0,0897	0,0971	0,013	-0,018	-0,006

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	1,191	1,234	1,234	1,090	1,090	1,090	0,101	0,144	0,144
	MIN	0,106	0,351	0,198	0,002	0,004	0,002	0,104	0,347	0,196
	MEAN	0,717	0,783	0,765	0,339	0,355	0,374	0,378	0,428	0,391
	VAR	0,1428	0,0869	0,1177	0,1025	0,0981	0,1094	0,040	-0,011	0,008
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	1,234	1,234	1,234	1,129	1,129	1,129	0,106	0,106	0,106
	MIN	0,106	0,351	0,198	0,071	0,005	0,106	0,035	0,346	0,092
	MEAN	0,719	0,780	0,765	0,478	0,509	0,516	0,241	0,271	0,249
	VAR	0,1206	0,0755	0,1019	0,0961	0,0812	0,0931	0,025	-0,006	0,009
Note: Sample size : 22 firms										
t1		**Equity beta**			**Asset beta**			**Difference**		
1. FL as current	**Statistic results**	**Competitor size as current**	**Double**	**Slightly smaller**	**Competitor size as current**	**Double**	**Slightly smaller**	**Competitor size as current**	**Double**	**Slightly smaller**
	MAX	1,191	1,191	1,191	1,069	1,069	1,069	0,122	0,122	0,122
	MIN	0,204	0,116	0,139	0,056	0,031	0,026	0,148	0,086	0,112
	MEAN	0,754	0,681	0,731	0,443	0,395	0,432	0,311	0,286	0,299
	VAR	0,109	0,137	0,121	0,087	0,090	0,089	0,022	0,047	0,032
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	1,191	1,191	1,191	1,033	1,033	1,033	0,158	0,158	0,158
	MIN	-0,089	-0,082	-0,024	0,002	-0,042	0,001	-0,090	-0,040	-0,025
	MEAN	0,696	0,612	0,686	0,338	0,287	0,331	0,358	0,325	0,355
	VAR	0,156	0,203	0,156	0,092	0,098	0,093	0,064	0,105	0,063
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	1,191	1,191	1,191	1,094	1,094	1,094	0,097	0,097	0,097
	MIN	0,237	0,172	0,237	0,142	0,071	0,107	0,095	0,102	0,130
	MEAN	0,789	0,725	0,762	0,523	0,478	0,507	0,266	0,247	0,254
	VAR	0,092	0,106	0,102	0,081	0,081	0,084	0,011	0,025	0,018
Note: Sample size : 22 firms										

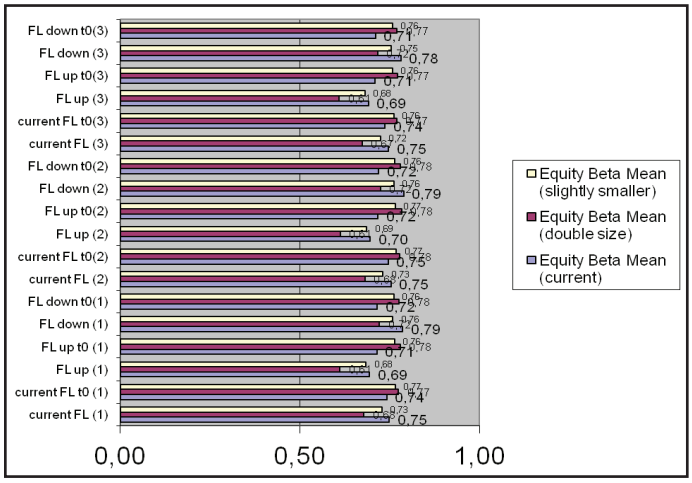
Table 7- Statistical results (FL in case 3) (source: VN stock exchange 2012)

t0		**Equity beta**			**Asset beta**			**Difference**		
1. FL as current	**Statistic results**	**Competitor size as current**	**Double**	**Slightly smaller**	**Competitor size as current**	**Double**	**Slightly smaller**	**Competitor size as current**	**Double**	**Slightly smaller**
	MAX	1,191	1,234	1,234	1,113	1,113	1,113	0,078	0,121	0,121
	MIN	0,114	0,351	0,257	0,043	0,095	0,061	0,072	0,256	0,196
	MEAN	0,737	0,770	0,762	0,429	0,440	0,447	0,309	0,330	0,315
	VAR	0,1104	0,0751	0,0934	0,0944	0,0865	0,0999	0,016	-0,011	-0,006
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	1,191	1,234	1,234	1,090	1,090	1,090	0,101	0,144	0,144
	MIN	0,091	0,351	0,181	0,001	0,004	0,002	0,090	0,347	0,179
	MEAN	0,709	0,773	0,758	0,331	0,352	0,363	0,378	0,421	0,395
	VAR	0,1467	0,0911	0,1205	0,1059	0,0987	0,1144	0,041	-0,008	0,006
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	1,234	1,234	1,234	1,129	1,129	1,129	0,106	0,106	0,106
	MIN	0,091	0,351	0,181	0,063	0,155	0,100	0,029	0,196	0,081
	MEAN	0,711	0,770	0,758	0,477	0,511	0,512	0,234	0,259	0,245
	VAR	0,1245	0,0797	0,1049	0,0956	0,0765	0,0941	0,029	0,003	0,011
Note: Sample size : 22 firms										

t1		Equity beta			Asset beta			Difference		
1. FL as current	Statistic results	Competitor size as current	Double	Slightly smaller	Competitor size as current	Double	Slightly smaller	Competitor size as current	Double	Slightly smaller
	MAX	1,191	1,191	1,191	1,069	1,069	1,069	0,122	0,122	0,122
	MIN	0,195	0,108	0,121	0,051	0,028	0,023	0,144	0,080	0,098
	MEAN	0,747	0,673	0,724	0,439	0,391	0,429	0,308	0,282	0,296
	VAR	0,113	0,142	0,125	0,088	0,091	0,090	0,025	0,051	0,035
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	1,191	1,191	1,191	1,033	1,033	1,033	0,158	0,158	0,158
	MIN	-0,079	-0,074	-0,020	0,002	-0,037	0,001	-0,081	-0,037	-0,021
	MEAN	0,691	0,609	0,681	0,335	0,286	0,329	0,356	0,324	0,352
	VAR	0,158	0,204	0,158	0,092	0,099	0,093	0,066	0,106	0,065
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	1,191	1,191	1,191	1,094	1,094	1,094	0,097	0,097	0,097
	MIN	0,229	0,163	0,229	0,137	0,067	0,096	0,092	0,096	0,132
	MEAN	0,782	0,716	0,755	0,519	0,473	0,504	0,263	0,243	0,251
	VAR	0,094	0,111	0,106	0,082	0,083	0,085	0,012	0,028	0,020

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 competitor size kept as current (approximate size) and Fl kept as current, equity beta value decreases slightly from 1,234 to 0,200 when tax rate is 25%. (at time point t1).
Then, at time point t0, If competitor size kept as current (approximate size) and Fl kept as current, equity beta value changes from 1,191 to 0,124.
The below chart 1 and 2 show us: in scenario 1 (current tax rate), when leverage degree as current, with current approximate size competitors, average equity beta value increases maximum (0,75). However, equity beta var reaches 0,748 (maximum), in case current competitors. Then, in scenario 2 (tax rate up to 28%), when leverage degree decreases down to 20%, with current approximate size competitors, average equity beta value increases maximum (0,789). In addition to, equity beta var reaches 0,106 (maximum), in case double size competitor. Finally, in scenario 3 (tax rate down 20%), equity beta mean reaches 0,609 (minimum) if leverage up 30% and doubling size competitors.
The below chart 3 and 4 show us: in scenario 1 (current tax rate), asset beta mean reaches 0,521 (maximum) if leverage down 20% and current approximate size competitors. And asset beta var reaches 0,099 (maximum) in case 30% leverage up and double size competitors. Then, in scenario 2 (tax rate up to 28%), asset beta mean also reaches 0,523 (maximum) if leverage down 20% and current approximate size competitors. And asset beta var reaches 0,098 (maximum) in case leverage up 30% and doubling size competitors. Finally, in scenario 3 (tax rate down 20%), asset beta mean reaches 0,286 (minimum) in case FL up 30% and doubling size competitors, whereas asset beta var reaches 0,082 (minimum) in case Fl down 20% and competitive firm size kept as current.

Chart 1 – Comparing statistical results of equity beta var and mean in three (3) scenarios of changing FL and tax rate and competitor size (source: VN 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: VN stock exchange 2012)

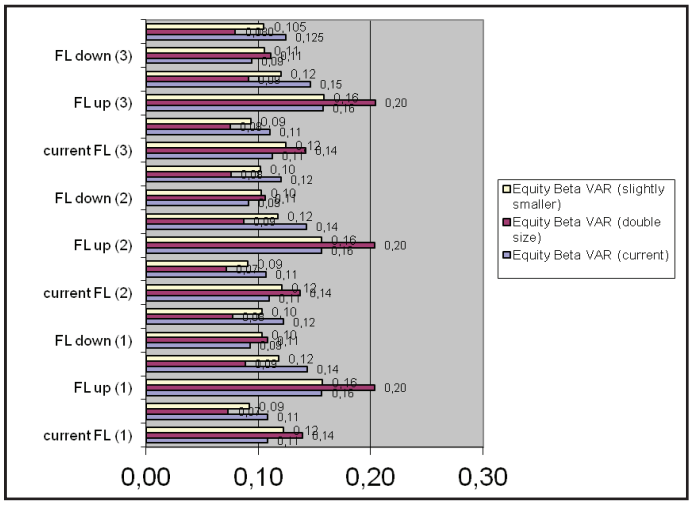
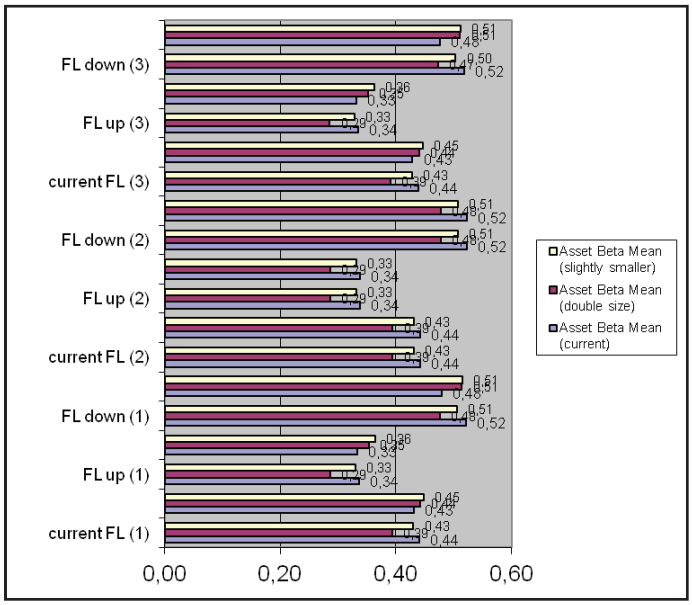
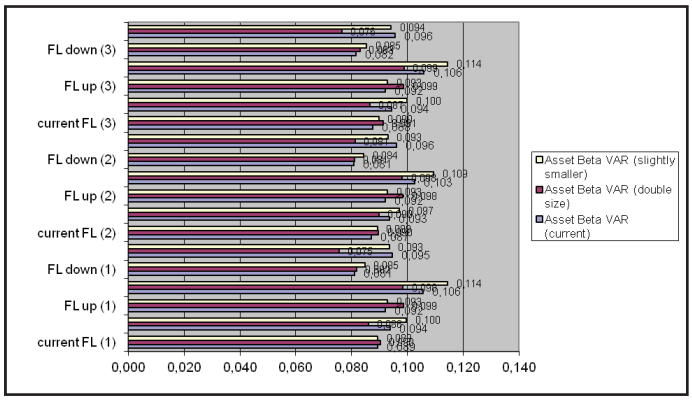


Chart 3 – Comparing statistical results of asset beta var and mean in three (3) scenarios of changing FL and tax rate and competitor size (source: VN stock exchange 2012)



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: VN stock exchange 2012)



(source: Viet Nam stock exchange 2012)

D. Empirical Results

In scenario 1 (tax 25%), asset beta mean reach the highest value of 0,44 at time point t1 with current approximate size competitor and that of 0,45 at time point t0 with slightly smaller competitor whereas asset beta var also reaches maximum value of 0,099 at time point t1 if competitor size doubles and 0,114 at time point t0 with slightly smaller size competitor, compared to the rest 2 cases (see tables 5,6,7).

In scenario 2 (tax up 28%), asset beta mean reach maximum value of 0,52 at time point t1 with current competitor size and of 0,51 at time point t0 with either double or smaller competitor whereas asset beta var reaches maximum value of 0,109 at time point t0 with smaller competitor and of 0,098 at time point t1 with double size competitor, compared to the rest 2 cases.

And finally, in scenario 3 (tax down 20%), asset beta mean reach maximum value of 0,52 at time point t1 with current competitor and of 0,52 at time point t0 with current competitor while asset beta var reaches maximum value of , compared to the rest 2 cases.

E. Discussion

Looking at exhibit 6, it is noted that in case current leverage, comparing to beta results of consumer good industry, asset and equity beta mean (0,44 and 0,75) of hardware industry are higher than those of consumer good industry (0,336 and 0,694). This relatively shows us that financial leverage affects on beta values.

IV. Conclusion

In general, the government has to consider the impacts on the mobility of capital in the markets when it changes the macro policies. Beside, it continues to increase the effectiveness of building the legal system and regulation supporting the plan of developing hardware 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 Viet Nam continues to increase the effectiveness of capital providing channels for hardware companies as we could note that in this study when leverage is going to increase up to 30%, the risk level decreases little less (0,29 from 0,39) whereas the asset beta var increases slightly (0,092 from 0,089), 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.

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Appendix 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 (2007: required reserves ratio at SBV is changed from 5% to 10%) (2009: special supporting interest rate is 4%)
2009	9%-12%	9%-10%	
2008	19%-21%	15%-16,5%	
2007	12%-15%	9%-11%	

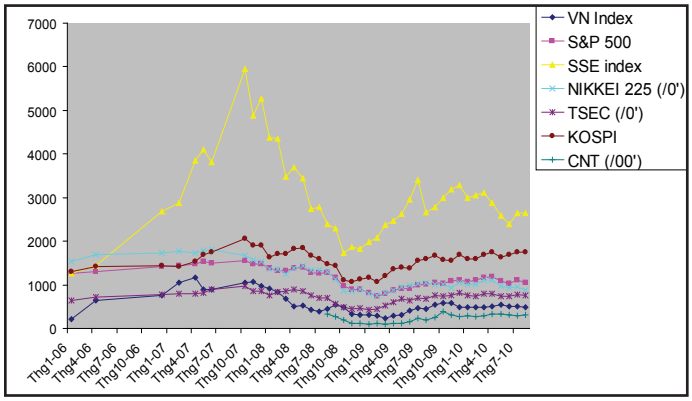
Appendix 2. Basic interest rate changes in Viet Nam
(source: State Bank of Viet Nam and Viet Nam economy)

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%	

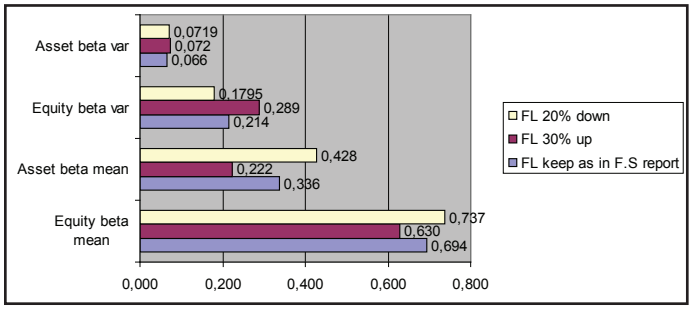
Appendix 3. Inflation, GDP growth and macroeconomics factors
(source: Viet Nam commercial banks and economic statistical bureau)

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		

Appendix 4. VNI Index and other stock market index during crisis 2006-10



Appendix 5. Comparing statistical results of three (3) scenarios of changing FL of 121 listed firms in the consumer good industry



(source: Viet Nam stock exchange 2012)

Appendix 6. How much capital structure changes from time point t0 (2010) to time point t1 (2011)

Order No.	Company stock code	Financial leverage (2011)	Financial leverage (end 2010)	Increase/ Decrease
1	CMT	51,1%	43,9%	7,2%
2	SVT	24,2%	21,0%	3,2%
3	VIE	81,0%	76,3%	4,7%
4	HPT	73,7%	76,1%	-2,4%
5	NIS	52,5%	56,5%	-4,0%
6	TST	68,1%	73,0%	-4,9%
7	ST8	23,5%	28,3%	-4,8%

8	TAG	35,0%	29,0%	6,0%
9	POT	49,0%	42,0%	7,0%
10	CKV	63,5%	67,3%	-3,8%
11	ONE	60,6%	66,7%	-6,1%
12	PMT	14,4%	15,4%	-1,0%
13	SMT	30,0%	32,1%	-2,1%
14	UNI	38,3%	35,0%	3,3%
15	TLC	27,8%	27,7%	0,1%
16	KST	43,1%	43,2%	-0,1%
17	VAT	52,8%	44,6%	8,1%
18	VTC	32,2%	28,0%	4,2%
19	ELC	50,0%	51,8%	-1,8%
20	SAM	10,2%	6,5%	3,7%
21	LTC	70,2%	71,5%	-1,3%
22	ITD	62,5%	61,2%	1,2%
	Average	46,1%	45,3%	0,7%

"*Author note: My sincere thanks are for the editorial office and Lecturers/Doctors at Banking University and International University of Japan. Through the qualitative analysis, please kindly email me if any error found*".