Full length Research paper

Impacts of External Financing on The Risk Level of Viet Nam Water Industry During The Global Crisis 2007-2009

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This paper estimates the impacts of external financing on market risk for the listed firms in the Viet nam water industry, esp. after the financial crisis 2007-2009. First, by using quantitative and analytical methods to estimate asset and equity beta of total 10 listed companies in Viet Nam water industry with a proper traditional model, we found out that the beta values, in general, for many institutions are acceptable. Second, 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 (0,606) when leverage increases to 30% and vice versa. Third, by changing leverage in 3 scenarios, we recognized the dispersion of risk level decreases (measured by equity beta var) if the leverage increases to 30%.
Finally, this paper provides some outcomes that could provide companies and government more evidence in establishing their policies in governance.

INTRODUCTION

Financial system development has positively related to the economic growth, throughout many recent years, and Viet Nam water industry is considered as one of active economic sectors.

We select the period 2007-2009 for this study as it is the economic crisis time and choose water industry as it is one of the most the vital industries. We note that GDP of Viet nam increases during the period 2006-2010, but decreases in 2009 (see exhibit 4), also the interest rate (basic and borrowing rates) and inflation reached the highest level in 2008 (see exhibit 1, 2 and 3), also the VNI index reduced strongly during 2009 (see exhibit 6).

This paper is organized as follow. The research issues will be covered in section 1. Literature review and conceptual theories areintroduced in the next section2. Then, methodology and data are described in section 3. Session 4 presents empirical results and findings.

Lastly, section 5 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 water companies in Viet Nam stock exchange as following:
Issue 1: Whether the risk level of water firms under the different changing scenarios of leverage increase or decrease so much.
Issue 2: Whether the dispersed distribution of beta values become large in the different changing scenarios of leverage estimated in the water industry.
Beside, we also propose some hypotheses for the above issues:
Hypothesis 1: because using leverage may strongly affect business returns, changing leverage scenarios could strongly affect firm risk.
Hypothesis 2: as external financing is vital for the business development, there will be large disperse in beta or risk values estimated.

LITERATURE REVIEW

Goldsmith (1969), Mc Kinnon (1973) and Shaw (1973) pointed a large and active theoretical and empirical

literature has related financial development to the economic growth process.

Black (1976) proposes the leverage effect to explain the negative correlation between equity returns and return volatilities. Diamond and Dybvig (1983) said banks can also help reduce liquidity risk and therefore enable long-term investment.

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. Next, 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, as Luis E. Peirero (2010) pointed, the task of estimating cost of equity in emerging markets is more difficult because of problems such as collecting data in short periods.

Next, 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. 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. Finally, Chen et all (2013) supports 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.

Finally, financial leverage can be considered as one among many factors that affect business risk of water 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. Financial institutions not only help businesses to reduce agency problems but also enable them to enhance liquidity capacity and long-term capital. And financial innovation also reduces the cost of diversification. So, finance and growth has interrelated.

In a specific industry such as water 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.

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.

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. And FL is a factor that causes financial crises in many economies and firms. Using leverage too much indicates the firm met financial distress.

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). FL has become a positive factor linking finance and growth in many companies. Beside, leverage choice could also become a determinant of firms' capital structure and financial risk.

METHODOLOGY AND DATA

In order to calculate systemic risk results and leverage impacts, in this study, we use the live data during the crisis period 2007-2009 from the stock exchange market in Viet Nam (HOSE and HNX and UPCOM). In detailed, we collect stock price data, risk free rate and VNI index data during this period.

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 water firms in VN stock exchange and curent tax rate is 25%.

Analytical method is used to describe the calculated data and number in the context of the crisis. Philosophical method means the study done based on the observation of several factors fluctuating including leverage changes, competitor size changes.

Leverage scenario analysis is used to support for analysis part. The reason of changing levergage to 30% and 20% is that they can represent for financing decision in a company.

Asset beta is estimated based on the formula of unlevered beta. Equity beta orunlevered beta is calculated based on the below formula:

Table 1 – Market risk of listed companies on VN water market

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage
1	BTW	2,272	1,951	PJS as comparable	11,3%
2	BWA	0,413	0,381	LKW as comparable	6,1%
3	CLW	0,452	0,293	NBW as comparable	28,0%
4	GDW	1,723	1,210	BTW as comparable	23,8%
5	LKW	0,438	0,376	NTW as comparable	11,4%
6	NBW	0,634	0,435	SFC as comparable	25,2%
7	NNT	0,105	0,017	PCG as comparable	67,2%
8	NTW	0,493	0,386	HFC as comparable	17,3%
9	PJS	2,552	2,176	VMG as comparable	11,8%
10	TDW	0,046	0,017	NNT as comparable	50,7%
				Average	25,28%

7.2. Scenario 2: financial leverage increases up to 30%

Table 2 – Market risks of listed water firms (case 2)

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage (30% up)
1	BTW	2,094	1,710	PJS as comparable	18,4%
2	BWA	0,363	0,327	LKW as comparable	9,9%
3	CLW	0,345	0,188	NBW as comparable	45,5%
4	GDW	1,421	0,870	BTW as comparable	38,7%
5	LKW	0,393	0,320	NTW as comparable	18,6%
6	NBW	0,561	0,331	SFC as comparable	40,9%
7	NNT	-0,065	0,006	PCG as comparable	109,1%
8	NTW	0,460	0,331	HFC as comparable	28,1%
9	PJS	2,448	1,979	VMG as comparable	19,2%
10	TDW	-0,014	-0,003	NNT as comparable	82,3%
				Average	41,09%

7.3. Scenario 3: leverage decreases down to 20%

$$\text{Beta } (\beta) = \frac{\text{Covariance (Market Index, Stock Price)}}{\text{Variance of Market Index}}$$

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

RESULTS

The research sample has total 10 listed firms in the water 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 2009 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 0,724, 0,606 and 0,818 which are negatively correlated with the leverage. Also in 3 scenarios, we find out equity beta mean values (0,913, 0,801 and 0,991) are also negatively correlated with the leverage. Leverage degree changes definitely has certain effects on asset and equity beta values.

Empirical Research Findings

In the below section, data used are from total 10 listed water companies on VN stock exchange (HOSE and HNX mainly).

In the scenario 1, current financial leverage degree is kept as in the 2009 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.
7.1 Scenario 1: current financial leverage (FL) as in financial reports 2009.

Table 3 – Market risk of listed water firms (case 3)

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage (20% down)
1	BTW	2,392	2,121	PJS as comparable	11,3%
2	BWA	0,447	0,420	LKW as comparable	6,1%
3	CLW	0,527	0,379	NBW as comparable	28,0%
4	GDW	1,937	1,475	BTW as comparable	23,8%
5	LKW	0,469	0,415	NTW as comparable	11,4%
6	NBW	0,681	0,509	SFC as comparable	25,2%
7	NNT	0,204	0,067	PCG as comparable	67,2%
8	NTW	0,514	0,425	HFC as comparable	17,3%
9	PJS	2,621	2,311	VMG as comparable	11,8%
10	TDW	0,115	0,057	NNT as comparable	50,7%
				Average	25,28%

Table 4 - Statistical results (FL in case 1)

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	2,552	2,176	0,3763
MIN	0,046	0,017	0,0289
MEAN	0,913	0,724	0,1886
VAR	0,8376	0,6080	0,2297
Note: Sample size : 10			

Table 5 – Statistical results (FL in case 2)

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	2,448	1,979	0,4692
MIN	-0,065	-0,003	-0,0624
MEAN	0,801	0,606	0,1947
VAR	0,7694	0,4877	0,2818
Note: Sample size : 10			

Table 6- Statistical results (FL in case 3)

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	2,621	2,311	0,3091
MIN	0,115	0,057	0,0583
MEAN	0,991	0,818	0,1726
VAR	0,8897	0,6964	0,1933
Note: Sample size : 10			

In this case, all beta values of 10 listed firms on VN water market as following:
If leverage increases up to 30%, all beta values of total 10 listed firms on VN water market as below:
If leverage decreases down to 20%, all beta values of total 10 listed firms on the water market in VN as following:
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:

Based on the above results, we find out: Equity beta mean values in all 3 scenarios are low (< 1) and asset beta mean values are also small (< 0,9) although max equity beta values in some cases might be higher than (>) 1. In the case of reported leverage in 2009, equity beta value fluctuates in an acceptable range from 0,046 (min) up to 2,552 (max) and asset beta fluctuates from

Chart 1 – Comparing statistical results of three (3) scenarios of changing FL (2007-2009)
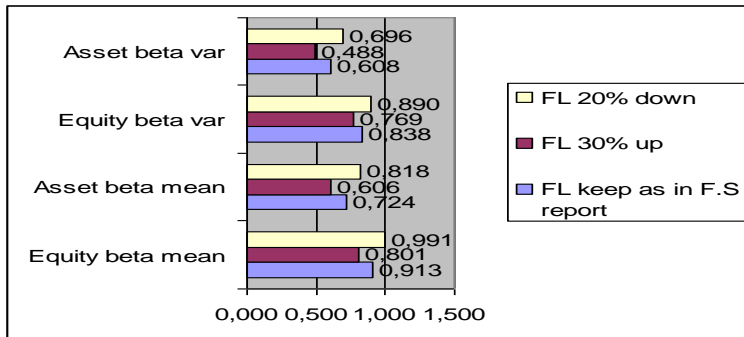

Chart 2 – Comparing statistical results of three (3) scenarios of changing FL (2007-2011)
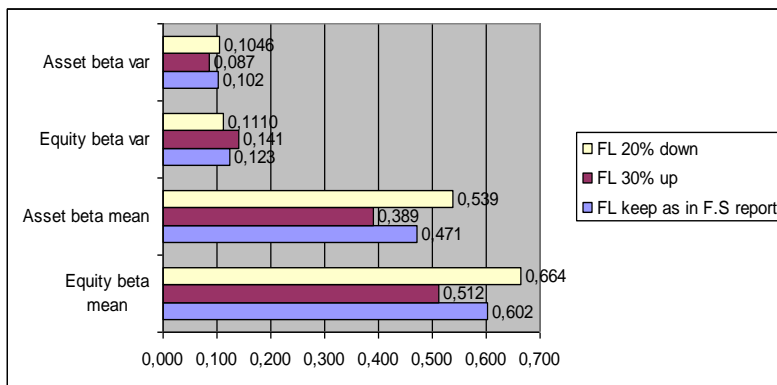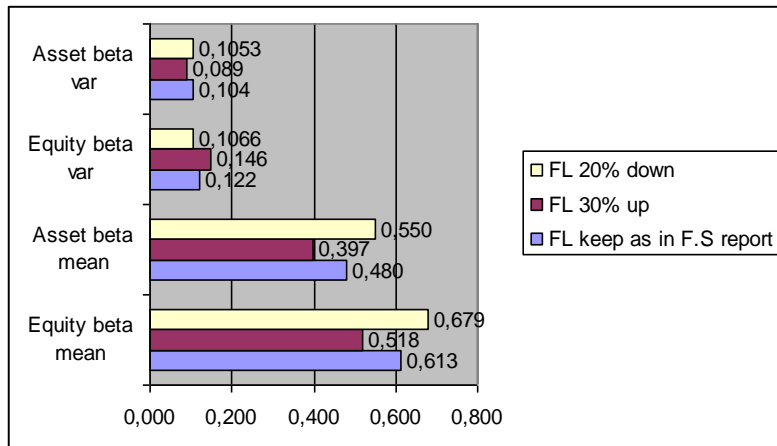

Chart 3 – Comparing statistical results of three (3) scenarios of changing FL (2009-2011)

0,017 (min) up to 2,176 (max). If leverage increases to 30%, equity beta moves in a range from -0,065 (min) up to 2,448 (max unchanged) and asset beta moves from -0,003 (min) up to 1,979 (max).

Hence, we note that there is a decrease in equity beta min value if leverage increases. When leverage decreases down to 20%, equity beta value fluctuates in a range from 0,115 to 2,621 (max) and asset beta changes

from 0,057 (min) up to 2,311 (max). So, there is a small increase in equity beta min 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 -0,112 while average asset beta value of these 10 firms decreases little more up to -0,118. Then, when leverage reduces to 20%, average equity

beta value of 10 listed firms goes up to 0,078 and average asset beta value of 10 firms increases more to 0,094.

The below chart 1 shows us : when leverage degree decreases down to 20%, average equity and asset beta values decrease slightly (0,991 and 0,818) compared to those at the initial rate of 25% (0,913 and 0,724). Then, when leverage degree increases up to 30%, average equity beta decreases little more and average asset beta value also decreases more (to 0,801 and 0,606). However, the fluctuation of equity beta value (0,769) in the case of 30% leverage up is lower than (<) the results in the rest 2 leverage cases.

DISCUSSION

Looking at chart 2, it is noted that in case leverage up 30%, during 2007-2009 period, asset and equity beta mean (0,606 and 0,801) of water industry are higher than those in the period 2007-2011 (0,389 and 0,512). Looking at exhibit 7, we can see asset beta mean and equity beta mean are higher than those of consumer good industry (0,222 and 0,630). This relatively shows us that financial leverage does affect asset beta values.

CONCLUSION

In summary, 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 water 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 (including many kinds of loan) for water companies as we could note that in this study when leverage is going to increase up to 30%, the risk level decreases much (as well as the asset beta var), 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. It means that not only the State Bank but also the Ministry of Finance and Regulatory government bodies need to cooperate in providing policies to support the water industry.

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. Management can note the relationship between financing decision and market risk level. Future research implication includes research of the combination of some factors on the risk level such as: leverage and tax rate.

REFERENCES

Carr Peter, Wu Liuren (2007). Leverage Effect, Volatility Feedback, and Self-Exciting Market Disruptions, *SSRN Working Paper*

Chen RR, Chidambaran NK, Imerman MB, Sopranzetti BJ (2013). Liquidity, Leverage, and Lehman: A Structural Analysis of Financial Institutions in Crisis, *Fordham School of Business Research Paper No.2279686*

Chen Zhihong, Huang Yuan, Wei John KC (2013). Executive Pay Disparity and The Cost of Equity Capital, *J. Finan. Quantit. Analy.*

Eugene FF, French KR (2004). The Capital Asset Pricing Model: Theory and Evidence, *J. Econ. Perspect.*

Flifel K (2012). Financial Markets between Efficiency and Persistence : Empirical Evidence on Daily Data, *Asian J. Finan. Acct.*

Tran Ngoc Huy Dinh (2010). A Set of Limited Asian Pacific Corporate Governance Standards After Financial Crisis, Corporate Scandals and Market Manipulation, *SSRN Working Paper Series*

Pereiro LE (2010). The Beta Dilemma in Emerging Markets, *J. Applied Corpo. Finan.*

Umar (2011), Profits, Financial Leverage and Corporate Governance, *SSRN Working Paper.*

OECD Corporate Governance Guidelines, *OECD*, 1999

The Emergency Economic Stabilization Act of 2008 Research

Clarke Thomas (2003). *International Corporate Governance: A Comparative Perspective*, Routledge

Baker RM (2010). *Corporate Governance, Competition and Political Parties: Explaining Corporate Governance Change in Europe*, Oxford University Press, USA

Other web sources

www.ecgi.org/codes

http://www.itgovernance.co.uk/corpgov_us.aspx

http://corporatelawandgovernance.blogspot.com/2010/07/

http://www.sec.gov/news/speech/2008/spch062708psa-eng.htm

http://www.iadb.org/research/projects_detail.cfm?id=81

http://info.worldbank.org/etools/docs/library/

Exhibits

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
2008	19%-21%	15%-16,5%	at SBV is changed from 5%
2007	12%-15%	9%-11%	to 10%)
			(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		

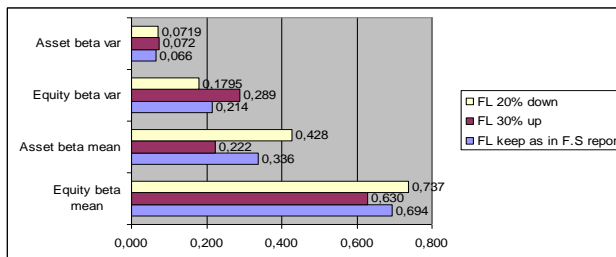**Exhibit 4**: GDP growth Việt Nam 2006-2010 (*source: Bureau Statistic*)
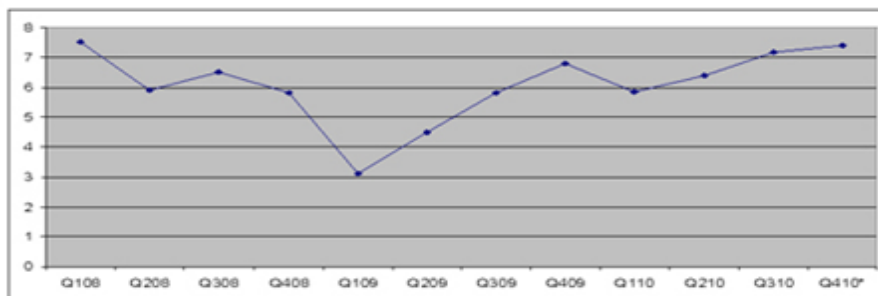
Exhibit 5 – Increase/decrease risk level of listed water firms under changing scenarios of leverage : in 2011 F.S reports, 30% up, 20% down in the period 2007 - 2009

Order No.	Company stock code	FL keep as in F.S report		FL 30% up Increase /Decrease (equity beta)	Increase /Decrease (asset beta)	FL 20% down Increase /Decrease (equity beta)	Increase /Decrease (asset beta)
		Equity beta	Asset beta				
1	BTW	2,272	1,951	-0,177	-0,241	0,120	0,171
2	BWA	0,413	0,381	-0,050	-0,054	0,034	0,039
3	CLW	0,452	0,293	-0,107	-0,106	0,075	0,086
4	GDW	1,723	1,210	-0,303	-0,339	0,214	0,266
5	LKW	0,438	0,376	-0,045	-0,056	0,031	0,040
6	NBW	0,634	0,435	-0,073	-0,103	0,047	0,075
7	NNT	0,105	0,017	-0,170	-0,011	0,099	0,050
8	NTW	0,493	0,386	-0,033	-0,056	0,021	0,039
9	PJS	2,552	2,176	-0,104	-0,197	0,068	0,135
10	TDW	0,046	0,017	-0,060	-0,019	0,069	0,040
			Average	-0,112	-0,118	0,078	0,094

Exhibit 6- VNI Index and other stock market index during crisis 2006-2010
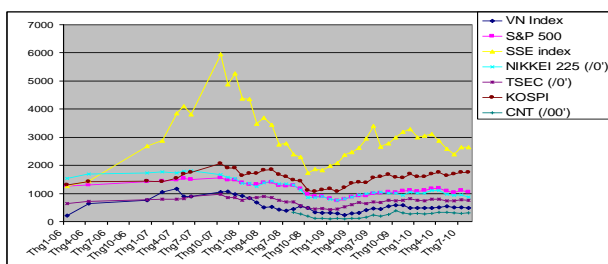
Exhibit 7 – Comparing statistical results of three (3) scenarios of changing FL of 121 listed firms in the consumer good industry