

ESTIMATING BETA OF VIET NAM LISTED PUBLIC UTILITIES, NATURAL GAS AND OIL COMPANY GROUPS DURING AND AFTER THE FINANCIAL CRISIS 2007-2011

DINH TRAN NGOC HUY¹

Received: 14 May 2012

Accepted: 22 April 2013

ABSTRACT: *There comes a need for analyzing riskiness of many industries in Viet Nam stock market during the financial crisis period 2007-2011. Among these industries, the Viet Nam public utilities, natural gas and oil industries, specifically, also has to re-evaluate the risk level.*

First, we found out in the research sample that there are 84% of firms, of total 45 listed firms, with beta values lower than (\leq) 1, meaning with lower risk, and the systemic risk is acceptable.

Second, there are 13% among total 45 listed firms, whose beta values higher than ($>$) 1, meaning having stock returns fluctuating more than the market index.

Third, among three (3) groups, the systemic risk in the electric power industry is the smallest, and asset beta variance in the gas and oil industry is the smallest, shown by estimated values of equity and asset beta mean.

Finally, this paper generates some analytical outcomes that enable companies and government to have more evidence in establishing their policies in investments and in governance.

Key words: *equity beta, financial structure, financial crisis, risk, asset beta, computer and electrical industry*

JEL classification: G010, G100, G390

1. INTRODUCTION

The global crisis 2007-2009 affects the economy of many Asian countries and industries in Viet Nam. Increasing prices and cost of capital influence the business of many industries and Viet nam stock market. In this research, we perform a systemic risk analysis based on asset and equity beta of 45 listed companies in the three (3) groups of public utilities (water and electric power), natural gas and oil firms. The three (3) above industries faced many difficulties in previous years such as how to increase the number of customers, service quality and revenues; now, they have to deal with some problems

¹ MBA, PhD candidate ,Banking University HCMC, Viet Nam - GSIM, International University of Japan, Niigata, Japan, e-mail: dtnhuy2010@gmail.com

from the global crisis. From 2009-2011, the local government and central bank have performed some effective macro policies to help the economy to recover. Then, this paper emphasizes on analyzing un-diversifiable risk in the 3 above industries in one of emerging markets: Vietnam stock market during and after the financial crisis 2007-2011. After the previous published article on estimated beta for listed construction company groups, here, we will estimate and compare asset and equity beta results of listed Viet Nam public utilities, gas and oil companies together to make an analysis on risk evaluation after financial crisis impacts. There is no research, so far, done on the same topic.

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

2. RESEARCH ISSUES

We mention a couple of issues on the estimating of beta for listed public utilities, natural gas and oil companies in Viet Nam stock exchange as following:

Hypothesis/Issue 1: Among the three (3) companies groups, under the financial crisis impact and high inflation, the beta or risk level of listed companies in natural gas and oil industries will relatively higher than those in the rest two (2) industries.

Hypothesis/Issue 2: Because Viet Nam is an emerging and immature financial/technological market and the stock market still in the recovering stage, there will be a large disperse distribution in beta values estimated in the public utilities, natural gas and oil industries.

Hypothesis/Issue 3: With the above reasons, the mean of equity and asset beta values of these listed public utilities, natural gas and oil companies tend to impose a high risk level, i.e., beta should higher than ($>$) 1.

3. LITERATURE REVIEW

William Sharpe., (1963) pointed in a simplified model of portfolio theory that each stock is correlated with each other stock because all are correlated with “the market”, and stock return depends on some factors such as a constant alpha and stock beta. Sheu, Wu and Ku (1998) observed that 3 variables: stock returns and market beta, the sale price and sales volume played a combined role in explaining returns of equity. Next, Copeland, Weston and Shastri (2005) argue that the enterprise entire risk can be reflected as the sum of systematic risk and unsystematic risk. Aswath, Damoradan., (2008) mentioned

several factors which affect beta estimation, including: different time periods generating different beta values, and therefore, different returns. And different return interval such as daily, weekly, monthly can also affect beta estimation. Beside, Pereiro, Luis E., (2010) said in merging markets, measuring betas is more difficult and a complicated job because developed markets have abundant historical data. Then, Mo Chaudhury (2011) investigated the effect of financial crisis 2007/08 on major US stocks and saw beta risk increased considerably for financial stocks. Pablo Fernandez (2013) also stated that industry betas are very unstable.

4. CONCEPTUAL THEORIES

Determinants of Equity and Asset Beta

Generally speaking, beta can be estimated for an individual firm by using regression analysis against a stock market index or a return of a portfolio. The slope of the regression line from linear least squares estimation is beta. Beta is also referred to the correlated volatility, or the sensitivity of return of a financial asset against that of market. The fluctuation of stock return is the component determining beta. Other factors affect beta values include, but not limit to, the impact from economic crisis, economic conditions, interest rates and inflation.

Beta is used in CAPM model, which says the expected return on equity is the function of equity beta of the firm. Besides, it is also used in a multiple beta model which says that two financial assets can have the same beta although one can be a better investment. Asset beta can be a function of equity beta and financial leverage. Moreover, beta can also be used in investment strategies that aim to generate returns over the standard market index.

Equity beta is sometimes considered as un-levered beta, which means the firm beta without using debt. Last but not least, beta is non-diversifiable risk which Billio, Getmansky, Lo, and Pelizon (2010) defined as any circumstance that threatens the stability of or public confidence in the financial system. Finally, beta can also be used in portfolio theory and it is a weighted average of the betas of many individual stocks with the weights similar to portfolio holdings.

5. METHODOLOGY

In order to estimate beta results, we use the input data from the live stock exchange market in Viet Nam during the four or five years of financial crisis 2007-2011. We select this period to do this research because Viet Nam stock market has shown the declining trend and this is the time highlighting financial crisis impacts.

Firstly, we use the market stock price of 45 listed companies in the public utilities (water and electric power), natural gas and oil industries in Viet Nam stock exchange market to

calculate the variability in monthly stock price in the same period; secondly, we estimate the equity beta for these 3 listed groups of companies and make a comparative analysis. Thirdly, from the equity beta values of these listed companies, we perform a comparative analysis between equity and asset beta values of these 3 companies groups in Viet Nam. Finally, we use the results to suggest policy for both these enterprises, financial institutions and relevant organizations.

The below table gives us the number of public utilities, natural gas and oil firms used in the research of estimating beta:

Market	Listed Water companies (1)	Listed Electric power companies (2)	Listed Natural Gas and Oil companies (4)	Note (4)
Viet Nam	0	13	9	Estimating by traditional method
	10	7	6	Estimating by comparative method
Total	10	20	15	Total firms in group: 45

(Note: The above data is at the December 12th, 2012, from Viet Nam stock exchange)

6. GENERAL DATA ANALYSIS

This research sample contains 45 companies in categories of industries: water, electric power (public utilities), natural gas and oil companies groups. After the analysis, the mean of equity beta is about 0,609 and that of asset beta is about 0,344 (lower). It shows us the effectiveness of using financial leverage to reduce the entire risk of the 3 industries. And these data, are acceptable values during the crisis and quite lower than those of construction industries in the same period.

Next, the difference of beta mean values (equity and asset) is just 0,2644, which is quite smaller than that of max beta values (about 0,6193).

Beside, the sample variance of asset beta is quite lower (0,0562), while that of equity beta varies higher (0,1524), with a difference of 0,0962. Both data means the high concentration level. This shows us, once again, that the effect of using financial leverage has decreased the systemic risk for the whole industry.

Additionally, max equity beta value is up to 1,617 that is a little bit high, compared to max asset beta value is just 0,998 with lower risk. The below table 2 shows us that a few companies still has larger risk exposure than most of the others.

Then, values of equity beta varies in a range from 1,617 (max) to -0,865 (min) and that of asset beta varies in a safer range from 0,998 (max) to -0,270 (min). There are only 1 listed company with beta lower than (<) 0 showing the stock return moving opposite to the market index (see table 2 below).

Moreover, there is a smaller difference between equity and asset beta variance values which is just 0,0962, compared to the relatively higher gap between max equity and max asset beta values, which is about 0,6193, and the gap b.t mean equity and asset beta values about 0,2644. So, there is not quite big effect from financial leverage on the gap between company's beta variance values.

In summary, there is 84% of listed firms in 3 above industries with acceptable beta values or risk lower than ($<$) 1 and higher than ($>$) 0 whereas there is just 13% of these listed firms having beta higher than ($>$) 1 and having more systemic risks. This number is acceptable. And 84% of firms with acceptable beta values uses little more financial leverage than the 13% (45% compared to 42%).

Table 1: *Estimating beta results for Three (3) Viet Nam Listed Public Utilities, Natural Gas and Oil Companies Groups (as of Dec 2012) (source: Viet Nam stock exchange data)*

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	1,617	0,998	0,6193
MIN	-0,865	-0,270	-0,5946
MEAN	0,609	0,344	0,2644
VAR	0,1524	0,0562	0,0962

Note: Sample size : 45

Table 2: *The number of companies in research sample with different beta values and financial leverage*

Beta	No. of firms	Financial leverage (average)	Ratio
<0	1	68,76%	2%
$0 < \text{beta} < 1$	38	45,07%	84%
Beta > 1	6	42,33%	13%
total	45	31,6%	100%

7. EMPIRICAL RESEARCH FINDINGS AND DISCUSSION

A-Water listed companies group

The market for these companies are still exists and obvious during the crisis period 2007-2011, but has certain difficulties. The market for these firms and other firms and the public has been affected because good prices increase.

There are 10 listed firms in this industry category whose values of equity and asset beta mean are around 0,602 and 0,471, accordingly. (see the below tables 3 and 4)

These data show a low and acceptable systemic risk. In addition to, the asset beta is lower than the beta mean of total 45 firms.

Beside, the variance of equity and asset beta of the sample group equals to **0,1230 (lower than the entire equity beta var) and 0,1015 accordingly (with a gap of 0,0215)** that are higher than the entire sample asset beta var, indicating that the beta values are more dispersed. And the impact from using financial leverage makes these beta values fluctuate a little more from the sample asset beta mean.

Furthermore, we might note that asset beta mean of these 10 listed firms in this water category are the highest among those of firms in the rest two (2) groups, whereas equity beta mean is the 2nd highest. This rejects our 1st hypothesis mentioned above that the beta or risk level of listed companies in natural gas and oil industries will relatively higher than those in the rest two (2) industries. And this is one feature of the water industry during the crisis period. Among three (3) industries, the market risk of water group companies is a bit higher than those of the rest two groups.

Ultimately, the table 3 and 4 give us equity and asset beta mean values lower than (<) 1 which are acceptable numbers and it rejects our 3rd research hypothesis or issue that the mean of equity and asset beta values of these listed companies tend to impose a high risk level or beta should higher than (>) 1.

Table 3: *Estimating beta results for Viet Nam Listed Water Companies (as of Dec 2012)*
(source: Viet Nam stock exchange data)

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage
1	BTW	1,042	0,895	PJS as comparable	14,1%
2	BWA	0,551	0,509	LKW as comparable	7,6%
3	CLW	0,430	0,279	NBW as comparable	35,0%
4	GDW	0,790	0,555	BTW as comparable	29,8%
5	LKW	0,585	0,501	NTW as comparable	14,3%
6	NBW	0,603	0,413	SFC as comparable	31,5%
7	NNT	0,131	0,021	PCG as comparable	84,0%
8	NTW	0,658	0,516	HFC as comparable	21,6%
9	PJS	1,170	0,998	VMG as comparable	14,7%
10	TDW	0,057	0,021	NNT as comparable	63,3%

Table 4: *Statistical results for Vietnam listed Water companies*

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	1,170	0,998	0,1726
MIN	0,057	0,021	0,0361
MEAN	0,602	0,471	0,1310
VAR	0,1230	0,1015	0,0215

Note: Sample size : 10

B- Electric power listed companies group

In a developing economy such as Viet Nam, one of emerging markets with the high growth rate of GDP and economy, the demand comes from all business sectors and from households definitely exists and potential because of the public need though it could be affected the financial crisis.

This is the category with the highest number of listed firms (20 firms). The Table 5 below shows us the equity and asset beta mean of 20 listed electric power companies, with values of 0,449 and 0,256, accordingly. This shows us the risk is low and acceptable in this category. Additionally, the max equity beta and asset beta values are 0,914 and 0,604 which are quite good numbers, indicating acceptable risk in the industry. Next, the difference b.t 2 beta mean values is smaller than (<) that of the entire 45 firms.

Compared to the equity/asset beta values in the water industry, those of the hotel industry are a little lower. Even though it does not reflect income or return, it reflects a lower level of systemic risk and maintains the investor confidence of business operation in this industry, and also indicates the good effect from using financial leverage.

Besides, the variance of beta values among these 20 firms is quite small, from 0,1353 to 0,0417, for equity and, especially, asset beta, accordingly.

Among 3 groups, this is the group whose values of asset beta mean are the smallest. Please refer to Exhibit 2 for more information.

Table 5: *Statistical results for Vietnam listed Electric power companies*

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	0,914	0,604	0,3094
MIN	-0,865	-0,270	-0,5946
MEAN	0,449	0,256	0,1927
VAR	0,1353	0,0417	0,0936

Note: Sample size : 20

C- Natural Gas and Oil listed companies group

Among 3 groups, this is the group with the 2nd smallest number of listed firms (sample size = 15) and with the highest equity beta mean of about 0,826 that is higher than the mean of the entire equity beta. We can see that the effect of leverage has influenced these listed firms' risk a bit more than the water industry when we compare the difference between equity/asset beta mean values in these 2 industries.

Different from firms in the other industries, the gap b.t equity and asset beta mean values in this category is the highest (0,4490) which shows more effect from leverage.

Moreover, 15 listed entertainment firms has the lowest asset beta var value, estimated at 0,0310, which implies there is a less dispersion in market risk among firms in this industry category, compared to the others.

While equity and asset beta mean values are acceptable, around 0,826 and 0,377 accordingly, the max value of equity beta is a little high, about 1,617. However, max asset beta is 0,662 is low.

The equity beta value are distributed in a longer range, from 1,617 to 0,183, but in a shorter range for asset beta, compared to those of 2 previous groups. Last but not least, the decrease in asset beta mean value (or the difference of 0,4490), together with the small gap of 0,0980 b.t equity/asset beta var indicate the effectiveness of using financial leverage.

Please refer to Exhibit 3 for more information.

Table 6: *Statistical results for Vietnam listed Natural Gas and Oil companies*

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	1,617	0,662	0,9551
MIN	0,183	0,107	0,0765
MEAN	0,826	0,377	0,4490
VAR	0,1290	0,0310	0,0980

Note: Sample size : 15

Comparison among 3 groups of water, electric power, natural gas and oil companies

We can find out among the 3 groups, equity and asset beta mean values of the electric power group is the lowest (0,45 and 0,26) while equity beta value of the gas and oil group is the highest (0,83) and asset beta of the water group is the highest (0,47). Assuming debt beta is 0, financial leverage has helped many listed firms in these industries lower the un-diversifiable risk, esp., the firms within the electric power, gas and oil industries. (see below chart)

Furthermore, we see the asset beta mean values of all 3 groups have not big difference and lower than ($<$) 0,5. As a result, it also rejects our 3rd hypothesis that the mean values of equity/asset beta of all 3 groups impose higher risks.

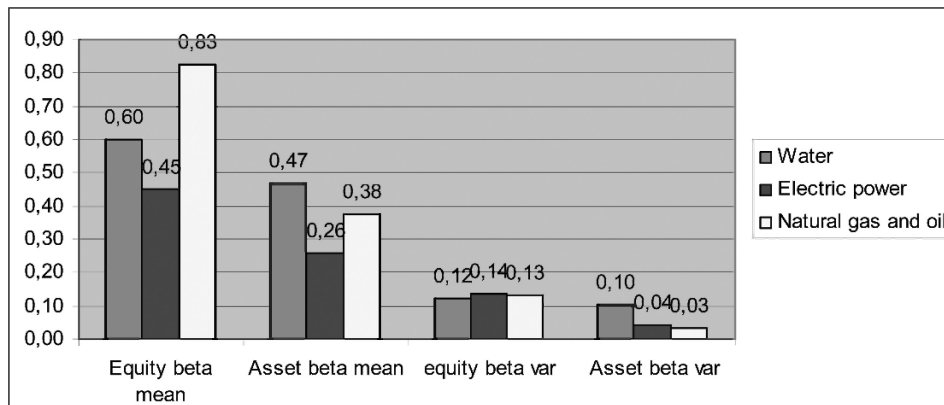
Then, we can recognize from the chart that, the risk in the water industry is higher than that in the two others. So, it rejects our 1st hypothesis.

Last but not least, in number, equity beta var varies from 0,12 (water) to 0,14 (electric) and asset beta var varies from 0,03 (gas and oil) to 0,1 (water) which are not so high under the effectiveness of leverage. This also rejects our 2nd hypothesis.

Then, if we compare beta values of three (3) above industries to those of construction, material and real estate group companies, we see the equity beta mean values in the water and electric power industries are lower, and the asset beta mean value in the gas and oil industry is also quite lower than those in the construction category (see exhibit 5). It indicates the business in the gas and oil industries could be more effective in using financial leverage to control market risk.

Finally, we could compare beta values of the above 3 industries to those of computer and electrical industries (see exhibit 4) and realize that equity beta mean values in the electric power and gas & oil industries are still lower than those in hardware/software/telecom industries, as well as asset beta mean values. The reason might come from the market and the demand under the crisis which might have more impacts on the computer and electrical industries than the electric power, gas and oil industries in this research.

Chart 1: *Statistical results of three (3) groups of 45 listed VN public utilities, natural gas and oil firms during/after the crisis period 2007-2011*



8. RISK ANALYSIS

The general macro economic factors are shown with high rates during the year 2008 (see in exhibit 1). The market for public utilities such as water and electric power is obvious and the economy and crisis has influenced on increasing price pressure during this period because of increasing material price and some losses. Moreover, the ratio of wastes in using fresh water in Viet Nam is still high and a few supporting or sponsoring programs from international organizations such as ADB needed. More electric power companies have been established to join in the electric market.

In addition to, the inflation increasing has certain impacts on selling prices of gasoline and oil. Electric power is an alternative source of energy for gas and oil; so, it affects the business and growth of gas and oil companies. In reality, some foreign companies left this market (Up Gas, BP Gas) because of some difficulties in competition to other firms.

Even though there are many difficulties, these 3 industries can expect the economy recovery from effective macro policies of the local government.

9. CONCLUSION AND POLICY SUGGESTION

Water industry

Whereas beta mean values are fine, this is the industry which has the highest asset beta mean and the 2nd highest equity beta mean values and the highest asset beta var (see chart 1). During the crisis period, this industry has higher market risk and the leverage might have less effect on dispersion of asset beta value of firms in the group, compared to those in the 2 other industries. Fluctuation in the real estate and construction groups also affects companies in this group.

After the crisis period, financial services firms, the government and central banks have some certain efforts to support businesses, corporate tax and investment environment, and stabilize inflation.

Electric power industry

In general, this is the industry which has the lowest values of equity and asset beta mean values, and the highest equity beta var, among 3 groups. The stability of market and the using of financial leverage can be reason to reduce market risk.

Natural gas and oil industry

In our research sample on beta values, this is the industry which has the highest equity beta mean and the lowest asset beta var, compared to those of the other two (2) above industries. Therefore, it shows smaller dispersion of market risk, with leverage, than, esp., water and electric power firms.

In general, our empirical findings state that they are not in favor of our 1st, 2nd and 3rd hypotheses or research issues.

In summary, though Viet Nam is an emerging market with imperfect financial system, the beta values estimated are at acceptable level with 84% companies in the research sample while just some companies' beta values are riskier (about 13% firms only).

Once again, the research indicates the effect of financial leverage, and the higher risk level in the water industry, compared to the 2 other. Moreover, if we compare these data and values to those of construction and real estate firms, and to those of computer and electrical companies in our previous research (see exhibit 4 and 5), we might see that in

this research, the asset or equity beta mean of electric power and gas and oil groups can be much lower while the financial crisis impacts on the entire market. The financial crisis might have less influence on the firms in the above groups.

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

REFERENCES

- Ang, A. & Chen, J. (2007). CAPM Over the Long Run: 1926-2001. *Journal of Empirical Finance*, 14 (1), 1-40.
- Baker, K. H., Singleton, C. J. & Veit, T. E. (2011). *Survey Research in Corporate Finance: Bridging The Gap Between Theory and Practice*. Oxford: Oxford University Press
- Bessembinder, H. & Zhang, F. (2013). Firm Characteristics and Long-run Stock Returns After Corporate Events. *Journal of Financial Economics*. In press DOI: 10.1016/j.jbr.2011.03.031.
- Beyhaghi, M. & Hawley, J. P. (2012). Modern Portfolio Theory and Risk Management: Assumptions and Unintended Consequences. *Journal of Sustainable Finance & Investment*, 3 (1), 17-37.
- Eugene, F. F. & French, K. R. (2004). The Capital Asset Pricing Model: Theory and Evidence. *Journal of Economic Perspectives*, 18 (4), 25-46.
- Fan, J. P.H., Wei, J. K.C. & Xu, X. (2011). Corporate Finance and Governance in Emerging Markets: A Selective Review and An Agenda for Future Research. *Journal of Corporate Finance*, 17 (2), 207-214.
- Huy, D. T.N., (2012), Estimating Beta of Viet Nam listed construction companies groups during the crisis. *Journal of Integration and Development*.
- Lettau, M. , Ludvigson, S. & Wachter, J. A. (2008). The Declining Equity Premium: What Role Does Macroeconomic Risk Play. *The Review of Financial Studies*, 21 (4), 1653-1687.
- McMurray, J. & Melnikov, S. (2013). Measuring Market Risk: Approaches and Inherent Assumptions. *Journal of Investing*, 22 (1), 49-56.

Other web sources

1. <http://www.ifc.org/ifcext/mekongpsdf.nsf/Content/PSDP22>
2. <http://www.mofa.gov.vn/vi/>
3. <http://www.hsx.vn/hsx/>

EXHIBIT

Exhibit 1: Interest rates, Inflation, GDP growth and macroeconomics factors
(source: Viet Nam commercial banks and economic statistical bureau)

Year	Basic rates	Lending rates	Deposit rates	Inflation	GDP	USD/VND rate
2012	n/a	12% - 15%	9%	6,81%	5,03%	20.828
2011	9%	18%-22%	13%-14%	18%	5,89%	20.670
2010	8%-9%	19%-20%	13%-14%	11,75% (Estimated at Dec 2010)	6,5% (expected)	19.495
2009	7%	9%-12%	9%-10%	6,88%	5,2%	17.000
2008	8,75%-14%	19%-21%	15%-16,5%	22%	6,23%	17.700
2007	8,25%	12%-15%	9%-11%	12,63%	8,44%	16.132
2006	8,25%			6,6%	8,17%	
2005	7,8%			8,4%		
Note	Approximately (2007: required reserves ratio at SBV is changed from 5% to 10%) (2009: special supporting interest rate is 4%)					

Exhibit 2: Estimating beta results for Viet Nam Listed Electric Power Companies
(as of Dec 2012) (source: Viet Nam stock exchange data)

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage
1	BTP	0,840	0,357		57,5%
2	CHP	0,407	0,168	BTP as comparable	58,7%
3	DNC	-0,865	-0,270		68,8%
4	DRL	0,473	0,388	NLC as comparable	17,9%
5	DTV	0,527	0,499	NLC as comparable	5,4%
6	GHC	0,359	0,117	NBP as comparable	67,3%
7	HJS	0,699	0,200		71,3%
8	KHP	0,615	0,308		50,0%
9	NBP	0,914	0,604		33,9%
10	ND2	0,180	0,043	TBC as comparable	76,2%
11	NLC	0,550	0,510		7,2%
12	NT2	0,639	0,137		78,6%
13	PPC	0,811	0,232		71,3%
14	RHC	0,361	0,200		44,7%
15	SBA	0,177	0,062	SJD as comparable	64,8%
16	SEB	0,427	0,194		54,5%
17	SHP	0,485	0,245	BTP as comparable	49,4%
18	SJD	0,420	0,221		47,4%
19	TBC	0,612	0,568		7,3%
20	TIC	0,351	0,343		2,2%

Exhibit 3: Estimating beta results for Viet Nam Listed Natural Gas and Oil Companies (as of Dec 2012) (source: Viet Nam stock exchange data)

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage
1	ASP	0,619	0,149	PGC as comparable	76,0%
2	CNG	0,183	0,107	ASP as comparable	41,7%
3	GAS	0,416	0,228	NT2 as comparable	45,2%
4	HFC	0,794	0,511		35,7%
5	HTC	0,794	0,328	MTG as comparable	58,7%
6	MTG	1,125	0,564		49,9%
7	PCG	0,644	0,405	MTG as comparable	37,1%
8	PGC	1,084	0,521		51,9%
9	PGD	0,691	0,408		41,0%
10	PTH	0,522	0,213	HFC as comparable	59,3%
11	SFC	0,812	0,618		23,8%
12	TMC	0,856	0,327		61,8%
13	VMG	1,322	0,662		49,9%
14	PGS	0,910	0,186		79,5%
15	PVG	1,617	0,431		73,3%

Exhibit 4: Statistical results of four (4) groups of 64 listed VN computer and electrical firms during/after the crisis period 2007-2011

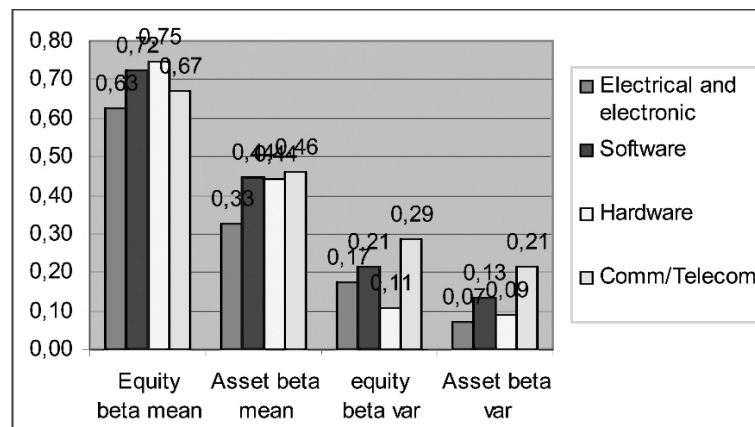


Exhibit 5: Statistical results of three (3) groups of 103 listed construction firms during crisis period

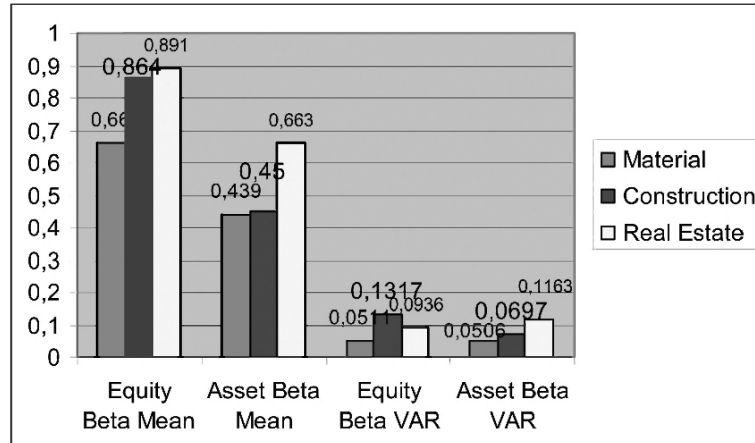


Exhibit 6: Statistical results of three (3) groups of 229 listed VN consumer good, wholesale and retail firms during/after the crisis period 2007-2011

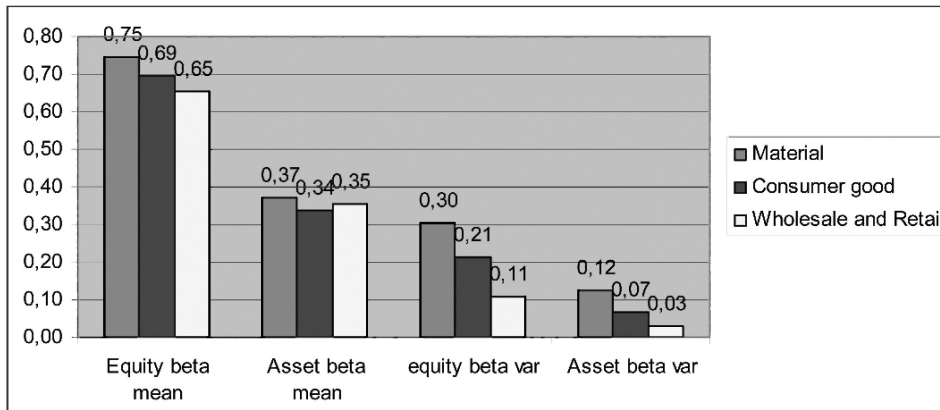


Exhibit 7: Statistical results of three (3) groups of 22 listed VN tourism, hotel and entertainment firms during/after the crisis period 2007-2011

