Selecting Various Industrial Competitors Affect The Risk Level of Viet Nam Natural Gas and Oil Industry

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Abstract
Using a one factor model, this paperwork estimates the impacts of the size of firms' competitors in the natural gas and oil industry on the market risk level, measured by equity and asset beta, of 15 listed companies in this category. This study identified that the risk dispersion level in this sample study could be minimized in case the competitor size kept as current approximate size (measured by equity beta var of 0,129). Beside, the empirical research findings show us that asset beta min value decreases from 0,107 to 0,034 when the size of competitor doubles. Last but not least, most of beta values are acceptable except a few exceptional cases. Ultimately, this paper illustrates calculated results that might give proper recommendations to relevant governments and institutions in re-evaluating their policies during and after the financial crisis 2007-2011.

Keywords: Risk Management, Competitive Firm Size, Market Risk, Asset And Equity Beta, Natural Gas And Oil Industry
JEL Classification : G00, G3, G30

1. Introduction

Together with financial system development and the economic growth, throughout many recent years, Viet Nam natural gas and oil industry is considered as one of active economic sectors, which has some positive effects for the economy. Additionally, financial risk and reactions has become an issue after the global crisis 2007-2009 which has some certain impacts on the whole Viet nam economy, and specifically, the Viet Nam natural gas and oil industry. Hence, this research paper analyzes market risk under a one factor model of these listed firms during this period. This paper is organized as follow. The research issues and literature review will be covered in next sessions 2 and 3, for a short summary. Then, methodology and conceptual theories are introduced in session 4 and 5. Session 6 describes the data in empirical analysis. Session 7 presents empirical results and findings. Next, session 8 covers the analytical results. Then, session 9 presents risk analysis and session 10 covers discussion. Session 11 will conclude with some policy suggestions. This paper also supports readers with references, exhibits and relevant web sources.

2. Research Issues

For the estimating of impacts of a one factor model: the size of competitor on beta for listed natural gas and oil industry companies in Viet Nam stock exchange, research issues will be mentioned as following:

Issue 1: Whether the risk level of natural gas and oil industry firms under the different changing scenarios of the size of competitor increase or decrease so much.
Issue 2: Whether the disperse distribution of beta values become large in the different changing scenarios of the size of competitor in the natural gas and oil industry.

3. Literature review

Sharpe, Treynor, Lintner (1965) and Mossin (1966), based on diversification and modern portfolio theories of Markowitz, Sharpe and Miller, built CAPM model to estimate appropriate expected rate of return on an underlying asset which shows the sensitivity of asset return on non-diversifiable risk, beta. Moreover, Cohen (1985) and Handa (1989) identified that, for stocks riskier /less risky than the market index, estimates of betas increase/decrease as the return interval increases. And Kothari, Shanken, and Sloan (1995) show that beta significantly explains the cross-sectional variation in average returns. 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.

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Next, Kim et all (2002) noted that the nature of competitive interaction in an industry is important in assessing the effect of corporate product strategies on shareholder value. Pagano and Mao (2007) stated that An intermediated market can therefore remain viable in the face of competition from a possibly faster, non-intermediated market as long as the specialist can generate revenue for the above services that covers his/her costs associated with asymmetric information, order processing, and inventory management. Daly and Hanh Phan (2013) investigated the competitive structure of the banking industries in five emerging asian countries including Viet Nam and showed that the global financial crisis affected dramatically the competition of banking system in emerging Asian countries.

Last but not least, Ana and John (2013) Binomial Leverage – Volatility theorem provides a precise link between leverage and volatility.

4. Conceptual theories

The impact of competition or the size of competitor on the economy and business

In a specific industry such as natural gas and oil industry, there are many firms offering the similar products and services and this helps customers select a variety of qualified goods that meet their demand. Competitors could affect price and customer service policies; hence, affect revenues and profits of a typical company. The competition could drive down profits that firms can earn. Sources of competition include, but not limit to, training. Increasing training can help competition raising productivity.

Two or more diefferent firms offer various products or services to the same group of customer and the same need. This is called indirect competition.

5. Methodology

In this research, analytical research method is used, philosophical method is used and specially, scenario analysis method is used. Analytical data is from the situation of listed natural gas and oil industry firms in VN stock exchange and applied current tax rate is 25%.

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

6. General Data Analysis

The research sample has total 10 listed firms in the natural gas and oil industry market with the live data from the stock exchange.

Firstly, we estimate equity and asset beta values of these firms, as well as the risk dispersion. Secondly, we change the competitor size from aprroxiamte size to doubling size and slightly smaller size to see the sensitivity of beta values. We figure out that in 3 cases, asset beta mean values are estimated at 0,377, 0,323 and 0,371 which are decreasing more if the size of competitors is bigger. Also in 3 scenarios, we find out equity beta mean values (0,826, 0,728 and 0,792) are also decreasing. Various competitors selected definitely have certain effects on asset and equity beta values.

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Table 1 – The number of companies in research sample with different beta values and ratio

	current size		double size		smaller size	
Equity Beta	No. of firms	Ratio	No. of firms	Ratio	No. of firms	Ratio
<0	0	0,0%	0	0,0%	0	0,0%
0<beta<1	11	73,3%	11	73,3%	11	73,3%
Beta > 1	4	26,7%	4	26,7%	4	26,7%
total	15	100,0%	15	100,0%	15	100,0%
	current size		double size		smaller size	
Asset Beta	No. of firms	Ratio	No. of firms	Ratio	No. of firms	Ratio
<0	0	0,0%	0	0,0%	0	0,0%
0<beta<1	15	100,0%	11	73,3%	11	73,3%
Beta > 1	0	0,0%	4	26,7%	4	26,7%
total	15	100,0%	15	100,0%	15	100,0%

7. Empirical Research Findings and Discussion

In the below section, data used are from total 10 listed natural gas and oil industry companies on VN stock exchange (HOSE and HNX mainly). In the three scenarios, current financial leverage degree is kept as in the 2011 financial statements which is used to calculate market risk (beta) whereas competitor size is kept as current, then changed from double size to slightly smaller size. 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 2 – Analyzing market risk under three (3) scenarios (*Made by Author*)

	FL as current
Competitor size as current	Scenario 1
Competitor size slightly smaller	Scenario 2
Competitor size double	Scenario 3

7.1 Scenario 1: current financial leverage and competitor size kept as current
In this case, beta values of 10 listed firms on VN natural gas and oil industry market as:
(refer to exhibit 2)

There are no listed firms with both equity and asset beta values < 0, whereas there are 4 listed firms with equity beta values > 1, or 26% of firms. However there are no listed firms with asset beta > 1.

7.2. Scenario 2: competitor size double

Beta values of total 10 listed firms on VN natural gas and oil industry market as:
(Refer to exhibit 3).

There are no listed firms with both equity and asset beta values < 0, whereas there are 4 listed firms with equity beta value > 1, or 26% of firms.

7.3. Scenario 3: Competitor size slightly smaller

Beta values of total 10 listed firms on the natural gas and oil industry market in VN as:
(Refer to exhibit 4).

There are no listed firms with both equity and asset beta values < 0 and there is 4 listed firms with beta values > 1 (or 26%).

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All three above tables and data show that values of equity and asset beta in the three cases of changing competiotor size have certain fluctuation.

8. **Comparing statistical results in 3 scenarios of changing leverage:**

Table 3 - Statistical results (FL in case 1) *(source: VN stock exchange 2012)*

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			

Table 4 – Statistical results (FL in case 2) *(source: VN stock exchange 2012)*

Statistic results	**Equity beta**	**Asset beta (assume debt beta = 0)**	**Difference**
MAX	1,617	0,662	0,9551
MIN	0,067	0,034	0,0329
MEAN	0,728	0,323	0,4046
VAR	0,2347	0,0512	0,1835
Note: Sample size : 15			

Table 5- Statistical results (FL in case 3) *(source: VN stock exchange 2012)*

Statistic results	**Equity beta**	**Asset beta (assume debt beta = 0)**	**Difference**
MAX	1,617	0,662	0,9551
MIN	0,118	0,028	0,0899
MEAN	0,792	0,371	0,4215
VAR	0,1648	0,0372	0,1277
Note: Sample size : 15			

Based on the calculated results, we find out:

First of all, Equity beta mean values in all 3 scenarios are acceptable (< 0,9) and asset beta mean values are also small (< 0,4). In the case of reported leverage in 2011, equity beta max is 1,617 which is little high in a few exceptional cases. If competitor size doubles, asset beta min decreases from 0,107 to 0,034. Finally, when competitor size is slightly smaller, asset beta min reduces more to the value of 0,028.

The below chart 1 shows us : when competitive firm size decreases slightly, average equity beta value decrease more (0,792) compared to that at the initial selected competitor (0,602). Next, average asset beta decreases little (to 0,371). However, in case the competitor size doubles, the risk level of the selected firms decreases more (0,728). Last but not least, the fluctuation of equity beta value (0,235) in the case of doubling size competitors is higher than (>) the results in the rest 2 cases. And we could note that in the case competitor size slightly smaller, the risk is less dispersed (0,037 compared to 0,051).

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

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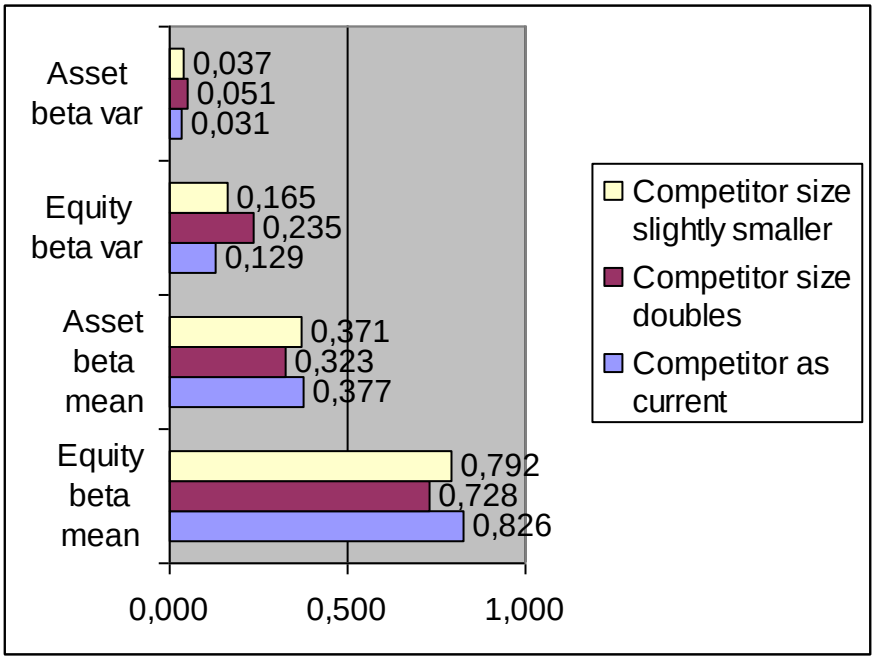
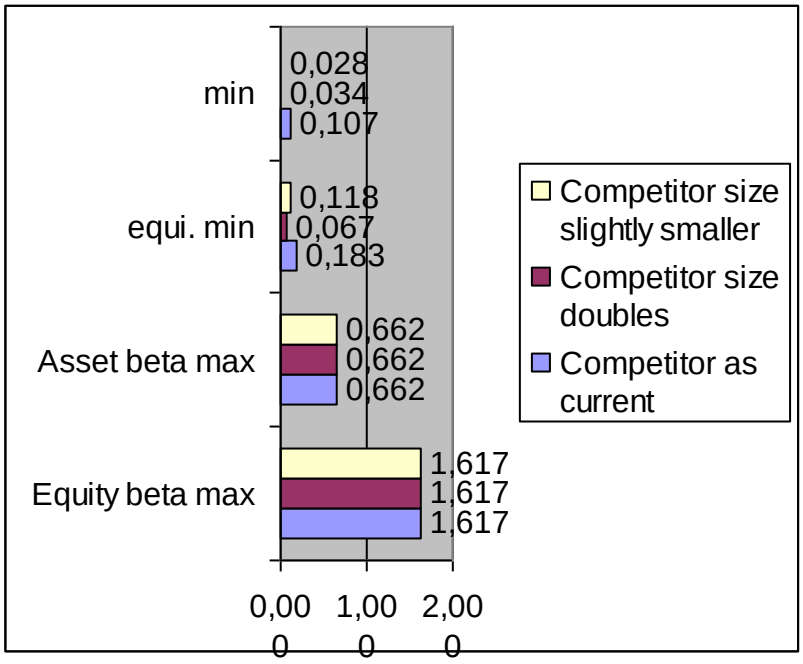


Chart 2 – Comparing statistical results of equity/asset beta max and min in three (3) scenarios of changing competitor size *(source: VN stock exchange 2012)*



9. Risk analysis

Generally speaking, during the financial crisis 2007-2011, esp. the period 2007-2009, the water industry can survive well and maintain the development and profits, although these firms have to face other kinds of risks: materials or water or electric prices increasing. These risks can affect the operating cash flow of these companies.

10.Discussion

Table 1 shows us there are 73%, 73% of firms having acceptable beta values (0 < beta < 1) in cases: current or doubling size competitors. If competitor size is smaller, this number is maintained at 73%. Moreover, chart 2 tells us that equity and asset beta min values decrease (0,067 and 0,034) in case doubling size competitors.

Looking at exhibit 5, it is noted that comparing to beta results of electronic and electrical

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industry in the period 2007-2011, asset beta mean of natural gas and oil industry group during 2007-2011 is higher in current situation (0,377). And the risk dispersion in natural gas and oil industry when competitor size is smaller during 2007-2011 (shown by asset beta var of 0,03) is also smaller than that in electronic and electrical industries (0,07).

11. Conclusion and Policy suggestion

In conclusion, the government has to consider the impacts on the mobility of capital in the markets when it changes the macro policies and the legal system and regulation for developing the natural gas and oil 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 natural gas and oil companies as we could note that in this study when competitive firm size doubles, the risk level decreases (equity beta mean value is estimated at: 0,728), and the equity beta var value (0,235) is little higher than that in case competitor size as current (0,129).

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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Exhibit

Exhibit 1 – 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 2 – Market risk of listed companies on VN natural gas and oil industry market under one factor model (case 1) *(source: VN stock exchange 2012)*

Order No.	**Company stock code**	**Equity beta**	**Asset beta (assume debt beta = 0)**	**Note**	**Financial leverage (F.S reports)**
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%
				Average	52,3%

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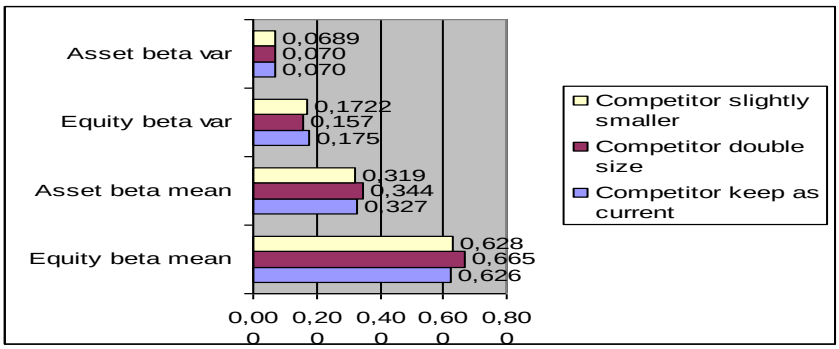
Exhibit 3 - Market risks of listed natural gas and oil industry firms under one factor model (case 2) *(source: VN stock exchange 2012)*

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note
1	ASP	0,395	0,095	PGD as comparable
2	CNG	0,117	0,068	ASP as comparable
3	GAS	0,888	0,486	PVF as comparable
4	HFC	0,083	0,053	
5	HTC	0,083	0,034	CNG as comparable
6	MTG	1,125	0,564	
7	PCG	0,067	0,042	CNG as comparable
8	PGC	1,084	0,521	
9	PGD	0,691	0,408	
10	PTH	0,869	0,354	VMG as comparable
11	SFC	0,812	0,618	
12	TMC	0,856	0,327	CNG as comparable
13	VMG	1,322	0,662	SFC as comparable
14	PGS	0,910	0,186	
15	PVG	1,617	0,431	

Exhibit 4 – Market risk of listed natural gas and oil industry firms under one factor model (case 3) *(source: VN stock exchange 2012)*

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note
1	ASP	0,118	0,028	CNG as comparable
2	CNG	0,207	0,121	HJS as comparable
3	GAS	0,978	0,536	MSN as comparable
4	HFC	0,573	0,369	
5	HTC	0,573	0,237	SFC as comparable
6	MTG	1,125	0,564	
7	PCG	0,644	0,405	MTG as comparable
8	PGC	1,084	0,521	
9	PGD	0,691	0,408	
10	PTH	0,377	0,153	HFC as comparable
11	SFC	0,812	0,618	
12	TMC	0,856	0,327	PCG as comparable
13	VMG	1,322	0,662	PTH as comparable
14	PGS	0,910	0,186	
15	PVG	1,617	0,431	

Exhibit 5 – Comparing statistical results of equity beta var and mean in three (3) scenarios of changing competitor size in 18 listed commercial electric firms 2007-2011 *(source: VN stock exchange 2012)*



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