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Tax Rates Effects on the Risk Level of Listed Viet Nam Natural Gas and Oil Firms During Global Economic Crisis 2007-2009

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ABSTRACT

The emerging stock market in Viet Nam has been developed since 2006 and affected by the financial crisis 2007-2009. This study analyzes the impacts of tax policy on market risk for the listed firms in the natural gas and oil industry as it becomes necessary. First, by using quantitative and analytical methods to estimate asset and equity beta of total 15 listed companies in Viet Nam natural gas and oil 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 tax rates (20%, 25% and 28%), we recognized that there is not large disperse in equity beta values, estimated at 0,516, 0,512 and 0,492.Third, by changing tax rates in 3 scenarios (20%, 25% and 28%), we recognized both equity and asset beta mean values have negative relationship with the increasing levels of tax rate. Finally, this paper provides some outcomes that could provide companies and government more evidence in establishing their policies in governance.

Keywords: Beta, Capital Structure, Economic Crisis, Risk, Tax Rate, Gas Industry.

1. INTRODUCTION

Together with the development of the whole economy and the growth of FDI, 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. In the situation of lending rates increase much in the year 2008 (see exhibit 1 & 2) and a high inflation level (see exhibit 3) and GDP growth slightly decreasing in 2008-2009 (see exhibit 4), tax rate can be used as an effective tool to encourage or discourage the flow of investment into gas and oil companies. This paper will analyze the impact of tax rate on the risk level of listed firms in gas and oil industry in Viet Nam, in the context of Vietnam stock price index moves in the same direction as other global stock price indexes (see exhibit 6).

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, conceptual theories and methodology 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 analysis of risk. Lastly, session 10 will conclude with some policy suggestions. This paper also supports readers with references, exhibits and relevant web sources.

Table 1 Interest rates in banking industry during crisis

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

Source: Viet Nam Commercial Banks.

Table 2 Basic interest rate changes in Viet Nam

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%	

Source: State Bank of Viet Nam and Viet Nam Economy.

Table 3 Inflation, GDP growth and macroeconomics factors

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	

Source: Viet Nam Commercial Banks and Economic Statistical Bureau.

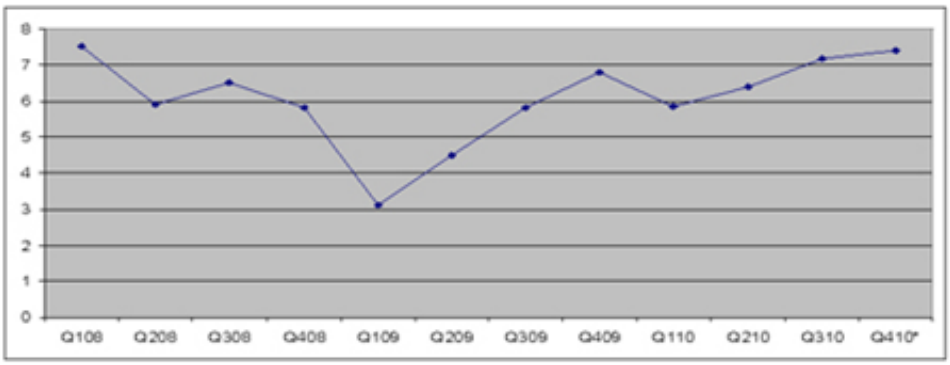

Figure 1. GDP growth Việt Nam 2006-2010.

Source: Bureau Statistic.

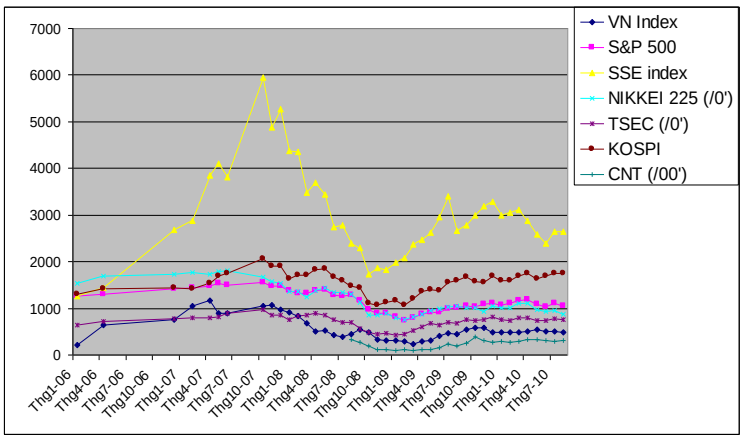

Figure 2. Increase/decrease Risk Level of Listed Gas and Oil Firms Under Changing Scenarios of Tax Rates: 25%, 28%, 20% Period 2007 – 2009.

Table 4: VNI index and other stock market index during crisis 2006-2010.

		t = 25%		t = 28%		t = 20%	
Order No.	**Company stock code**	**Equity beta**	**Asset beta**	**Increase /Decrease (equity beta)**	**Increase /Decrease (asset beta)**	**Increase /Decrease (equity beta)**	**Increase /Decrease (asset beta)**
1	ASP	0,496	0,119	0,009	0,002	-0,014	-0,003
2	CNG	0,147	0,086	0,007	0,004	-0,010	-0,006
3	GAS	-0,090	-0,049	-0,001	-0,001	0,002	0,001
4	HFC	0,546	0,351	0,006	0,004	-0,010	-0,007
5	HTC	0,546	0,225	0,006	0,003	-0,010	-0,004
6	MTG	0,773	0,387	0,000	0,000	0,000	0,000
7	PCG	0,443	0,278	0,008	0,005	-0,012	-0,008
8	PGC	0,869	0,418	0,000	0,000	0,000	0,000
9	PGD	1,171	0,691	0,000	0,000	0,000	0,000
10	PTH	0,359	0,146	0,009	0,004	-0,015	-0,006
11	SFC	0,853	0,650	0,000	0,000	0,000	0,000
12	TMC	0,777	0,296	0,000	0,000	0,000	0,000
13	VMG	2,883	1,444	0,000	0,000	0,000	0,000
14	PGS	1,013	0,207	-0,103	-0,021	0,000	0,161
15	PVG	1,743	0,465	-0,126	-0,034	0,000	0,256
		Average		-0,012	-0,002	-0,005	0,026

2. RESEARCH ISSUES

We mention some issues on the estimating of impacts of tax rates on beta for listed natural gas and oil companies in Viet Nam stock exchange as following:

Issue 1: Whether the risk level of natural gas and oil firms under the different changing scenarios of tax rates increase or decrease so much.

Issue 2: Whether the disperse distribution of beta values become large in the different changing scenarios of tax rates estimated in the natural gas and oil industry.

Beside, we also propose some hypotheses for the above issues:

Hypothesis 1: because tax may strongly affect business returns, changing tax scenarios could strongly affect firm risk.

Hypothesis 2: as tax policy is vital for the business development, there will be large disperse in beta or risk values estimated.

Hence, the objective of this study is to quantify the impact of tax rate on beta, a measure of risk, of listed gas and oil firms.

3. LITERATURE REVIEW

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

David (2009) stated the U.S can increase the likelihood of using tax rate adjustments to cope with fiscal volatility rather than (more harmful) spending fluctuations. Robert et al (2011) recognized a significant positive relation between changes in intercorporate investment and changes in corporate marginal tax rates on ordinary income.

George and Jot Yau (2012) found that there is a positive relationship between transaction cost and price volatility, suggesting that the imposition of a transaction tax could increase financial market fragility, increasing the likelihood of a financial crisis rather than reducing it. Mark (2012) found in some European countries during the crisis raising tax rates and tax burdens, the trend in which overall revenue levels were broadly stable while marginal rates in corporate and top personal income declined has stopped. Then, Filip (2012) believed low levels of taxation, especially low levels of taxation on the income or wealth of the so-called productive segments of society are beneficial for economic growth.

Therefore, we find out there are no discussion or researches which have been done so far on the impact of tax rate in the gas and oil industry, esp. on beta values of these gas and oil firms.

Hence, tax rate can be considered as one among many factors that affect business risk of natural gas and oil firms.

4. CONCEPTUAL THEORIES

4.1 The Impact of Fiscal Policy on the Economy

Tax policy is one among major fiscal policies. When the government decides to change the tax policy or tax rates, the mobility of capital in the markets will be affected.

In a specific industry such as natural gas and oil industry, on the one hand, using tax policy with a decrease or increase in tax rate could affect tax revenues, profit after tax and financial results and compensation and jobs of the industry. And it also shows the purpose of fiscal policy: following either contractionary or expansionary directions.

During and after financial crises such as the 2007-2009 crisis, there raises concerns about fiscal policies or public policies of many countries, in both developed and developing markets. The government might choose either lowering the tax rates or cutting the public expenditures while increasing demand stimulating programs to resolve difficulties from the crisis.

5. METHODOLOGY

In this study, we use the live data during the crisis period 2007-2011 from the stock exchange market in Viet Nam (HOSE and HNX) to estimate systemic risk results and tax impacts.

In this research, analytical research method is used, philosophical method is used (which means the method of researching a factor in a changing and developing world) and specially, tax rate scenario analysis method is used. Analytical data is from the situation of listed natural gas and oil firms in VN stock exchange and curent tax rate is 25%.

Equity beta and asset beta are measured, in which asset betas are done with the effect of debt and equity betas are calculated in the normal formula of stock price volatility compared to the market index.

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 15 listed firms in the natural gas and oil 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 tax rate from 25% to 28% and 20% to see the sensitivity of beta values. We found out that in 3 cases (rate = 20%, 25%, and 28%), asset beta mean is estimated at 0,407, 0,381 and 0,379 which decreases if tax rate increases (negatively correlated). Also in 3 scenarios, we find out var of asset beta estimated at 0,132, 0,127 and 0,127 (almost the same) which shows small risk dispersion. Tax rate changes almost has no effect on asset beta var under financial leverage.

7. EMPIRICAL RESEARCH FINDINGS AND DISCUSSION

In the below section, data used are from total 15 listed natural gas and oil companies on VN stock exchange (HOSE and HNX mainly). In the scenario 1, current tax rate is 25% which is used

to calculate market risk (beta). Then, two (2) tax rate scenarios are changed up to 28% and down to 20%, compared to the current corporate tax rate.

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

7.1 Scenario 1: Current Tax Rate is 25%

In the case of tax rate of 25%, all beta values of 15 listed firms on VN natural gas and oil market as following:

Table 5 Market Risk of Listed Companies on VN Natural Gas and Oil Market (t = 25%)

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage
1	ASP	0,496	0,119	PGC as comparable	76,0%
2	CNG	0,147	0,086	ASP as comparable	41,7%
3	GAS	-0,090	-0,049	NT2 as comparable	45,2%
4	HFC	0,546	0,351		35,7%
5	HTC	0,546	0,225	MTG as comparable	58,7%
6	MTG	0,773	0,387		49,9%
7	PCG	0,443	0,278	MTG as comparable	37,1%
8	PGC	0,869	0,418		51,9%
9	PGD	1,171	0,691		41,0%
10	PTH	0,359	0,146	HFC as comparable	59,3%
11	SFC	0,853	0,650		23,8%
12	TMC	0,777	0,296		61,8%
13	VMG	2,883	1,444		49,9%
14	PGS	1,013	0,207		79,5%
15	PVG	1,743	0,465		73,3%

7.2 Scenario 2: Tax Rate Increases Up to 28%

If corporate tax rates increases up to 28%, all beta values of total 15 listed firms on VN natural gas and oil market as below:

Table 6: Market Risks of Listed Natural Gas and Oil Firms (t = 28%)

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage
1	ASP	0,505	0,121	PGC as comparable	76,0%
2	CNG	0,154	0,090	ASP as comparable	41,7%
3	GAS	-0,091	-0,050	NT2 as comparable	45,2%
4	HFC	0,553	0,355		35,7%
5	HTC	0,553	0,228	MTG as comparable	58,7%
6	MTG	0,773	0,387		49,9%

7	PCG	0,450	0,283	MTG as comparable	37,1%
8	PGC	0,869	0,418		51,9%
9	PGD	1,171	0,691		41,0%
10	PTH	0,368	0,150	HFC as comparable	59,3%
11	SFC	0,853	0,650		23,8%
12	TMC	0,777	0,296		61,8%
13	VMG	2,883	1,444		49,9%
14	PGS	0,910	0,186		79,5%
15	PVG	1,617	0,431		73,3%

7.3 Scenario 3: Tax Rate Decreases Down to 20%

If corporate tax rate decreases down to 20%, all beta values of total 15 listed firms on the natural gas and oil market in VN as following:

Table 7 Market Risk of Listed Natural Gas and Oil Firms (t = 20%)

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage
1	ASP	0,483	0,116	PGC as comparable	76,0%
2	CNG	0,137	0,080	ASP as comparable	41,7%
3	GAS	-0,088	-0,048	NT2 as comparable	45,2%
4	HFC	0,536	0,344		35,7%
5	HTC	0,536	0,221	MTG as comparable	58,7%
6	MTG	0,773	0,387		49,9%
7	PCG	0,430	0,271	MTG as comparable	37,1%
8	PGC	0,869	0,418		51,9%
9	PGD	1,171	0,691		41,0%
10	PTH	0,344	0,140	HFC as comparable	59,3%
11	SFC	0,853	0,650		23,8%
12	TMC	0,777	0,296		61,8%
13	VMG	2,883	1,444		49,9%
14	PGS	1,013	0,368		79,5%
15	PVG	1,743	0,720		73,3%

All three above tables and data show that values of equity and asset beta in the case of increasing tax rate up to 28% or decreasing rate down to 20% have small fluctuation.

8. COMPARING STATISTICAL RESULTS IN THREE (3) SCENARIOS OF CHANGING TAX RATE

Table 8: Statistical results (tax rate = 25%)

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	2,883	1,444	1,4396
MIN	-0,090	-0,049	-0,0406
MEAN	0,835	0,381	0,4543
VAR	0,5117	0,1268	0,3849
Note: Sample size : 15			

Table 9: Statistical results (tax rate = 28%)

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	2,883	1,444	1,4396
MIN	-0,091	-0,050	-0,0412
MEAN	0,823	0,379	0,4443
VAR	0,4920	0,1265	0,3655
Note: Sample size : 15			

Table 10 Statistical Results (tax rate = 20%)

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	2,883	1,444	1,4396
MIN	-0,088	-0,048	-0,0397
MEAN	0,831	0,407	0,4241
VAR	0,5157	0,1324	0,3833
Note: Sample size : 15			

Based on the above results, we find out:

Equity beta mean values in all 3 scenarios are low (< 0,9) and asset beta mean values are also small (< 0,5) although max equity beta values in some cases might be higher than (>) 1. In the case of current tax rate of 25%, equity beta value fluctuates in an acceptable range from -0,09 (min) up to 2,883 (max) and asset beta fluctuates from -0,049 (min) up to 1,444 (max). If corporate tax rate increases to 28%, equity beta moves in an unchanged range and asset beta moves from -0,05 (min) up to 1,444 (max). Hence, we note that there is almost no change in beta values if corporate tax increases. When tax rate decreases down to 20%, equity beta value changes from -0,088 (min) up to 2,883 (max) and asset beta changes from -0,048 (min) up to 1,444 (max). So, there is a small increase in asset beta min when tax rate decreases in scenario 3.

Beside, Exhibit 5 informs us that in the case 28% tax rate, average equity beta value of 15 listed firms decreases to -0,012 while average asset beta value of these 15 firms decrease less slightly up to -0,002. Then, when tax rate reduces to 20%, average equity beta value of 15 listed firms reduces to -0,005 while average asset beta value of 15 firms up to 0,026.

The below chart 1 shows us : when tax rate decreases down to 20%, average equity and asset beta values decrease slightly (0,831 and 0,407) compared to those at the initial rate of 25% (0,835 và 0,381). At the same time, when tax rate increases up to 28%, average equity beta increases slightly whereas average asset beta value remains unchanged (to 0,823 and 0,379).

However, the fluctuation of equity beta value (0,516) in the case of 20% tax rate is higher than (>) the results in the rest 2 tax rate cases.

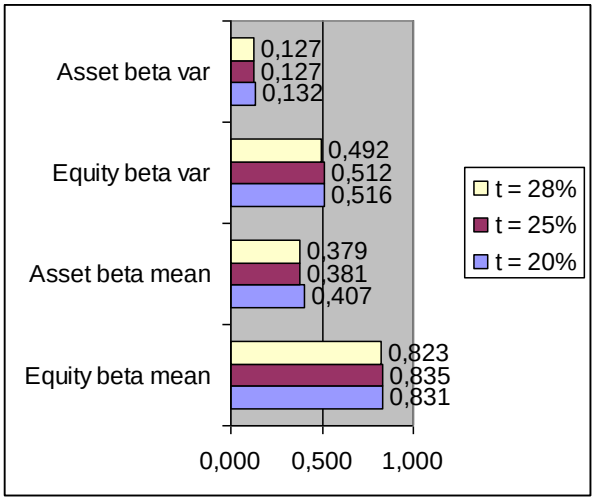

Figure 3. Comparing statistical results of three (3) scenarios of changing tax rate (2007-2009).

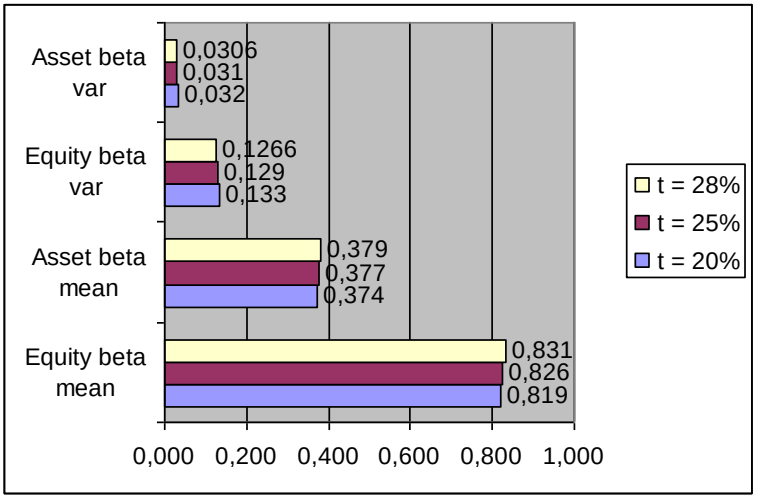

Figure 4. Comparing statistical results of three (3) scenarios of changing tax rate (2007-2011).

9. RISK ANALYSIS

On the one hand, in the case of decreasing tax rate, (20%), the market and companies can receive more benefits such as generating more jobs, output and compensation, but the government budget can have deficit and the government has to cut expenditures. Hence, changes in tax rates can have both positive and negative impacts on the local market.

On the other hand, in the case of increasing tax rate (28%), the government will have budget to finance public expenditures but the income tax burden could reduce both demand and supply, as well as the output, jobs and compensation.

When tax rates increase or decrease in 2 scenarios, there is a small impact on risk measures (equity and asset betas); hence, it is not in favor of the hypothesis 1. Also, there is not much large disperse in beta or risk values estimated, so it is not in favor of the hypothesis 2.

10. CONCLUSION AND POLICY SUGGESTION

In summary, the government has to consider the impacts on the mobility of capital in the markets when it changes the tax policy or tax rates. Beside, it continues to increase the effectiveness of building the legal system and regulation and macro policies supporting the plan of developing the natural gas 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, although we could note that in this study when tax rate is going to increase up to 28%, the risk level decrease, compared to the case it is going to decrease down to 20%. And the risk dispersion during 2007-2009 (asset beta var of 0,127) is higher than that during 2007-2011 (0,031) in case tax 25%.

The State Bank of Viet Nam continues to increase the effectiveness of capital providing channels for both construction and real estate companies. 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.

REFERENCES

Ameer, B., & Jamil, M. (2013). A Test of Fama and French Three Factor Model in Pakistan Equity Market. *Global Journal of Management and Business Research, 13*(7), 24-28.

Baker, K. H., Singleton, C.J., & Veit, T.E. (2011). *Survey research in corporate finance: bridging the gap between theory and practice.* New York, USA: Oxford University Press.

Huy, D. T. N. (2013). Estimating beta of viet nam listed public utilities, natural gas and oil company groups during and after the financial crisis 2007-2011. *Economic and Business Review, 15*(1), 57-71.

Huy, D. T. N. (2013). Beta of Viet Nam listed computer and electrical company groups during and after the financial crisis 2007-2011. *Asian Journal of Finance & Accounting*, *5*(1), 127-139.

Mamun, Md. A.A. (2013). Performance evaluation of prime bank limited in terms of capital adequacy. *Global Journal of Management and Business Research*, *13*(9), 26-29.

Ovat, O.O. (2013). Liquidity constraints and entrepreneurial financing in nigeria: the fate of fresh graduate entrepreneurs. *Global Journal of Management and Business Research*, 13(9), 49-57.

Raj, B., & Sindhu. (2013). Skill level in risk management: Training in credit risk – a comparative study of indian banks and foreign banks. *Global Journal of Management and Business Research*, *13*(7), 56-62.

Rehman, S.S.S.U. (2013). Relationship between financial leverage and financial performance: empirical evidence of listed sugar companies of Pakistan. *Global Journal of Management and Business Research, 13*(8), 45-53.