Measuring Equity and Asset Beta– Evidence in Viet Nam Three Insurance and Financial Service Industries After Crisis 2007-2009 and Low Inflation Period 2015-2017

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Abstract

Vietnam financial service industries are growing and contributing much to the economic development and has been affected by inflation. High and increasing inflation might reduce values of insurance and banking contracts. This paper measures the volatility of market risk in Viet Nam banking, insurance and stock investment industry after this period (2015-2017). The main reason is the necessary role of the financial system in Vietnam in the economic development and growth in recent years always go with risk potential and risk control policies. This research paper aims to figure out how much increase or decrease in the market risk of Vietnam banking, insurance and stock investment firms during the post-low inflation environment 2015-2017, compared to what happened in the financial crisis 2007-2009.First, by using quantitative combined with comparative data analysis method, we find out the risk level measured by equity beta mean in the banking industry has increased whereas the risk fluctuation also increased. Second, stock investment industry has the level of market risk as well as the risk fluctuation decreasing. Third, different from the 2 above industries, insurance industry experienced the level of market risk increasing while the risk volatility decreasing. Then, one of its major findings is the comparison between risk level of stock investment industry during the financial crisis 2007-2009 compared to those in the post-low inflation time 2015-2017. During the financial crisis 2007-09, stock industry has the highest beta value whereas during the post-low inflation time, banking industry maintained the highest value. Finally, this paper provides some ideas that could provide companies and government more evidence in establishing their policies in governance. This is the complex task but the research results shows us warning that the market risk need to be controlled better during the post-low inflation period 2015-2017. And our conclusion part will recommends some policies and plans to deal with it.

Keywords: Risk management; Asset beta; Financial crisis; Banking industry; Insurance industry; Stock investment industry; Macro policy.

JEL Classification Numbers: G010; G390; C83.

1. Introduction

Throughout many recent years (2006 until now), Viet Nam banking, insurance and stock market are evaluated as one of active markets, which has certain positive effect for the economy and become one of vital players in the financial system of the nation.

These companies have been affected by inflation (see more in the below conceptual theories part). Generally speaking, central banks aim to maintain inflation around 2% to 3%. Increases in inflation significantly beyond this range can lead to possible hyperinflation, a devastating scenario in which inflation rises rapidly out of control, and therefore harm the insurance industry. Looking at exhibit 1, we can see the Vietnam economy has controlled inflation well.

This study will calculate and figure out whether the market risk level during the post-low inflation time (2015-17) has increased or decreased, compared to those statistics in the financial crisis time (2007-2009).

The paper is organized as follows: after the introduction it is the research issues, literature review, conceptual theories and methodology. Next, section 3 will cover main research findings/results. Section 4 gives us some risk analysis, then section 5 presents discussion and conclusion and policy suggestion will be in the section 6.

2. Body of Manuscript
2.1. Research Issues

The scope of this study are:

Issue 1: Whether the risk level of banking, insurance and stock investment firms under the different changing scenarios in post-low inflation period 2015-2017 increase or decrease so much, compared to in financial crisis 2007-2009?

Issue 2: Because Viet Nam is an emerging and immature financial market and the stock market still in the starting stage, whether the dispersed distribution of beta values become large in the different changing periods in the three (3) industries.

2.1.1. Hypotheses for Testing

Because stock market and financial market in Vietnam is still young, the market risk level of financial service companies can be high.

2.2. Literature Review

Next, Martin and Sweder (2012) pointed out that incentives embedded in the capital structure of banks contribute to systemic fragility, and so support the Basel III proposals towards less leverage and higher loss absorption capacity of capital. Najeb (2013) suggested a positive relationship between efficient stock markets and economic growth, both in short run and long run and there is evidence of an indirect transmission mechanism through the effect of stock market development on investment.

Yener et al. (2014), found evidence that unusually low interest rates over an extended period of time contributed to an increase in banks' risk.

Emilios (2015), mentioned that bank leverage ratios are primarily seen as a microprudential measure that intends to increase bank resilience. Yet in today's environment of excessive liquidity due to very low interest rates and quantitative easing, bank leverage ratios should also be viewed as a key part of the macroprudential framework. As such, it explains the role of the leverage cycle in causing financial instability and sheds light on the impact of leverage restraints on good bank governance and allocative efficiency.

Atousa and Shima (2015), found out the econometric results indicate that life insurance sector growth contributes positively to economic growth. Then, Gunarathna (2016) revealed that financial leverage positively correlate with financial risk. However, firm size negatively affects the financial risk.

Aykut (2016), suggested two main findings: (i) Credit risk and Foreign exchange rate have a positive and significant effect, but interest rate has insignificant effect on banking sector profitability, (ii) credit and market risk have a positive and significant effect on conditional bank stock return volatility.

Last but not least, Riet (2017) mentioned that after the euro area crisis had subsided, the Governing Council of the ECB still faced a series of complex and evolving monetary policy challenges. As market volatility abated, but deflationary pressures emerged, the main task as from June 2014 became to design a sufficiently strong monetary stimulus that could reach market segments that were deprived of credit at reasonable costs and to counter the risk of a too prolonged period of low inflation. Hami (2017), showed that inflation has a negatively significant effect on financial depth and also positively significant effect on the ratio of total deposits in banking system to nominal GDP in Iran during the observation period.

Finally, Chizoba et al. (2018), revealed that inflation rate had a positive but insignificant effect on insurance penetration of the Nigerian insurance industry. The implication is that the macroeconomic variable (inflation) increase the level of insurance penetration in Nigerian insurance industry but it increase was not significant. And Miguel et al. (2018) found a consistently negative and nonlinear effect of price increases on financial variables; in particular, it is statistically significant in the full sample of countries, significant in developing countries, and insignificant in developed countries.

2.3. Conceptual Theories

Positive sides of low inflation: Low (not negative) inflation reduces the potential of economic recession by enabling the labor market to adjust more quickly in a downturn, and reduces the risk that a liquidity trap prevents monetary policy from stabilizing the economy. This is explaining why many economists nowadays prefer a low and stable rate of inflation. It will help investment, encourage exports and prevent boom economy. The central bank can use monetary policies, for instance, increasing interest rates to reduce lending, control money supply or the Ministry of finance and the government can use tight fiscal policy (high tax) to achieve low inflation.

Negative side of low inflation: it leads to low aggregate demand and economic growth, recession potential and high unemployment. Production becomes less vibrant. Low inflation makes real wages higher. Workers can thus reduce the supply of labor and increase rest time. On the other hand, low product prices reduce production motivation. The central bank might consider using monetary policy to stimulate the economic growth during low-inflation environment. It means that an expansionary monetary policy can be used to increase the volume of bank loans to stimulate the economy.

There are various ways to classify risks. For instance, business risk can be categorized into: market risk, credit risk and operational risk. In banking operation, market risk includes interest rate risk, liquidity risk and foreign exchange rate risk.

On the other hand, risks can be classified into two types: systematic risk (such as market risk) and unsystematic risk. Systematic risk, known as market risk or volatility or undiversifiable risk, affects to the overall market. It cannot be avoided totally by diversification, but only by using asset allocation strategy. If you want to know the market risk, you can estimate beta (this study suggests 2 beta calculations: equity beta and asset beta, under debt leverage impact). Another example of systematic risk is interest rate risk which affects the whole market and the entire stocks.

Beta equals to 0: means the stock price uncorrelated to the market. Beta negative (less than 0): means the stock price go opposite to the market index. Beta equals to 1: means the portfolio moves in the same direction with the market and sensitive to market risk. Beta higher than (>) 1: means there are more volatility, the portfolio moves in the same direction with the market and very sensitive to market risk . Beta between 0 and 1: i.e less volatility and stock price moves in the same direction with market index. Beta is a popular measure of market risk which cannot be

eliminated by diversification due to its nature, but it can be insurable. Investors can only reduce a portfolio's exposure to systematic risk by sacrificing expected returns.

On the contrary, unsystematic risk, know as diversifiable risk or nonsystematic risk or residual risk, is specific risk in each industry or firm or security. For instance, risk coming from competitors in the market and market share will affect our business and profit. This kind of risk might be reduced via diversification strategy. So it is also called controllable risk. Unsystematic risk normally happens due to internal factors (ex. Employees, industry regulation change, manipulation in financial statements…) which are associated with that business only and affect a single stock or segment.

Financial and credit risk in the bank system can increase when the financial market becomes more active and bigger, esp. with more international linkage influence. Hence, central banks, commercial banks, organizations and the government need to organize data to analyze and control these risks, including market risk.

For the insurance industry, high inflation may harm the insurance companies and cause higher losses and increase the operational costs. In case of low inflation, interest rates may fall and hence, it is not a benefit for insurers' investment portfolio. Hence, risk assessment and control mechanisms are necessary for insurers to reduce these losses.

2.4. Methodology

We use the data from the stock exchange market in Viet Nam (HOSE and HNX) during the financial crisis 2007-2009 period and the post – low inflation time 2015-2017 to estimate systemic risk results. We perform both fundamental data analysis and financial techniques to calculate equity and asset beta values.

In this study, analytical research method and specially, comparative analysis method is used, combined with quantitative data analysis. Analytical data is from the situation of listed insurance, banking, stock firms in VN stock exchange.

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

3. Main Results

3.1. General Data Analysis

We get some analytical results form the research sample with 26 listed banking and financial service firms in the stock market with the live date from the stock exchange. There are 2 firms who withdraw from listing; hence, we have 24 listed companies in 2015-2017.

In the below section, data used are from total 9 banks, 10 listed stock investment industry companies and 7 insurance firms on VN stock exchange (HOSE and HNX mainly). Different scenarios are created by comparing the calculation risk data between 2 periods: the post – low inflation environment 2015-2017 and the financial crisis 2007-2009.

Market risk (beta) under the impact of tax rate, includes: 1) equity beta; and 2) asset beta. We model our data analysis as in the below figure:

Figure-1. Analyzing market risk under two (2) scenarios: post – low inflation period 2015-2017 compared to the financial crisis 2007-2009

	Risk level (equity beta)	Risk level (asset beta)	Other measures	Gap
Post – low inflation period	Scenario …	Scenario …	Scenario …	Analysis
Financial crisis time				

In a banking and financial service sample with 24 firms, equity beta mean is estimated at a value of 0.822 and that of asset beta is about 0,246 which are good numbers, relating to market risk during the crisis. Besides, that sample variance of equity beta is 0,186 and that of asset beta is 0,05 is acceptable, even though the range of max and min value of beta is little large.

Value of equity beta varies in a range from 1.676 (max) to -0,169 (min) and that of asset beta varies in a range from 0.835 (max) to -0,069 (min). This shows us a few companies still has larger risk exposure than most of the others. Looking at table 2, we note that there are 6 financial service firms in the banking, insurance and stock investment sample have beta values higher (>) than 1.

Then, Asset beta max value is 0.835 and min value is -0,069 which show us that though beta of debt is assumed to be zero (0), the company's financial leverage contributes to a decrease in the market risk level. Asset beta's mean value at 0,246 and sample variance at 0,05, together are good risk numbers for companies in the industry.

Lastly, we can see the small difference between equity and asset beta variance values is just 0.136 and that b.t equity and asset beta mean is about 0,576; so, there is not big effect from financial leverage on the gap between company's beta values and industry mean value, although it indicates again that financial leverage can enable banking and financial service firms to reduce market risk.

Table-1. Estimating beta results for Three (3) Viet Nam Listed Banking and Financial Service Groups (post-low inflation period 2015-2017) *(source: Viet Nam stock exchange data)*

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	1.676	0.835	0.841
MIN	-0.169	-0.069	-0.100
MEAN	0.822	0.246	0.576
VAR	0.186	0.050	0.136

Note: Sample size: 24

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	59.0%	3%
0<beta<1	17	57.7%	55%
Beta > 1	6	86.9%	19%
total	24		77%

3.2. Empirical Research Findings and Discussion

A. Banking industry during the post – low inflation environment:

Table-3. The Volatility of Market Risk (beta) of Banking Industry in the post- low inflation period 2015-2017

Order No.	Company stock code	2015-2017 (post - low inflation)		Note
		Equity beta	Asset beta (assume debt beta = 0)	
1	ACB	0.954	0.061	assume debt beta = 0; debt ratio as in F.S 2015
2	CTG	1.676	0.120	
3	BID	1.346	0.065	
4	MBB	0.639	0.066	
5	NVB	0.676	0.045	
6	SHB	0.636	0.035	
7	STB	1.165	0.090	
8	EIB	0.824	0.087	
9	VCB	1.393	0.093	

Table-4. The Statistics of Volatility of Market Risk (beta) of Banking Industry in the post- low inflation period 2015-2017

Statistic results	2015-2017 (post - low inflation)	
	Equity beta	Asset beta (assume debt beta = 0)
MAX	1.676	0.120
MIN	0.636	0.035
MEAN	1.034	0.073
VAR	0.1435	0.0007

Note: Sample size : 9 (we just take a sample of 9 banking firms to make comparison in the below table)

Table-5. The Comparison of Volatility of Market Risk (beta) of Banking Industry in the post- low inflation period 2015-2017 and the financial crisis 2007-2009

Order No.	Company stock code	2007-2009 (financial crisis)		2015-2017(post - low inflation)		Note
		Equity beta	Asset beta (assume debt beta = 0)	Equity beta	Asset beta (assume debt beta = 0)	
1	ACB	0.85	0.083	0.954	0.061	assume debt beta = 0; debt ratio as in F.S 2015 and 2008
2	CTG	0.415	0.024	1.676	0.120	
3	BID			1.346	0.065	
4	MBB	0.081	0.009	0.639	0.066	
5	NVB	0.021	0.003	0.676	0.045	
6	SHB	1.011	0.113	0.636	0.035	
7	STB	0.826	0.089	1.165	0.090	
8	EIB	0.629	0.145	0.824	0.087	
9	VCB	0.473	0.03	1.393	0.093	

Table-6. The Difference between Volatility of Market Risk (beta) of Banking Industry in the post- low inflation period 2015-2017 and the financial crisis 2007-2009

| Order No. | Company stock code | GAP (+/-) 2015-17 compared to 2007-09 | | Note |
		Equity beta	Asset beta (assume debt beta = 0)	
1	ACB	0.104	-0.022	values (2015-17) minus (-) 2007-09
2	CTG	1.261	0.096	
3	BID	1.346	0.065	
4	MBB	0.558	0.057	
5	NVB	0.655	0.042	
6	SHB	-0.375	-0.078	
7	STB	0.339	0.001	
8	EIB	0.195	-0.058	
9	VCB	0.920	0.063	

Table-7. Statistics of Volatility of Market Risk (beta) of Banking Industry in the post- low inflation period 2015-2017 compared to those in the financial crisis 2007-2009

| Statistic results | 2007-2009 (crisis) | | 2015-2017 (post - low inflation) | | GAP (+/-) 2015-17 compared to 2007-09 | |
	Equity beta	Asset beta (assume debt beta = 0)	Equity beta	Asset beta (assume debt beta = 0)	Equity beta	Asset beta (assume debt beta = 0)
MAX	1.011	0.145	1.676	0.120	0.665	-0.025
MIN	0.021	0.003	0.636	0.035	0.615	0.032
MEAN	0.538	0.062	1.034	0.073	0.496	0.011
VAR	0.1297	0.0028	0.143	0.001	0.014	-0.002

Note: Sample size: 9

Chart-1. Statistics of Market risk (beta) in VN banking industry in the post – low inflation period 2015-2017 compared to the financial crisis 2007-2009
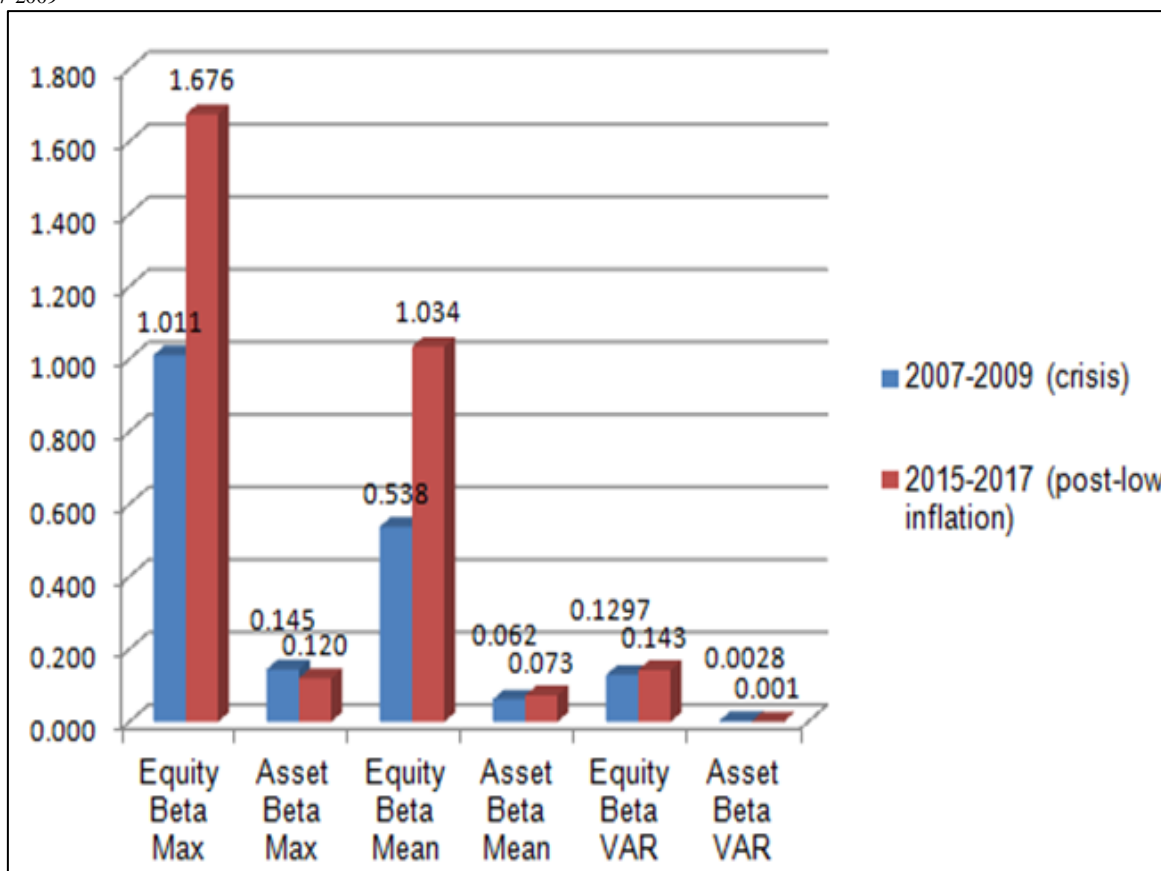
We summarize the data as the analysis follows:

For the banking industry, different from stock and insurance industry, the market risk level has been increasing during the post-low inflation environment (2015-17) as shown by equity beta mean in the above chart, whereas the risk fluctuation has been increasing (equity and asset beta var).

A. Stock Investment Industry during the post – low inflation environment:

Table-8. The Volatility of Market Risk (beta) of Stock Investment industry in the post- low inflation environment 2015-2017

Order No.	Company stock code	2015-2017 (post - low inflation)		Note
		Equity beta	Asset beta (assume debt beta = 0)	
1	AGR	0.911	0.835	assume debt beta = 0; debt ratio as in F.S 2015
2	APG	0.333	0.294	
3	APS	0.821	0.621	
4	AVS			
5	BSI	0.602	0.219	
6	BVS	0.590	0.406	
7	CLS			
8	CTS	0.781	0.586	
9	SHS	1.104	0.338	
10	VNR	-0.169	-0.069	

Table-9. The Statistics of Volatility of Market Risk (beta) of stock Investment industry in the post- low inflation environment 2015-2017

	2015-2017 (post - low inflation)	
Statistic results	Equity beta	Asset beta (assume debt beta = 0)
MAX	1.104	0.835
MIN	-0.169	-0.069
MEAN	0.622	0.404
VAR	0.1559	0.0772

Note: Sample size: 8 (We just take a sample of 8 firms to make comparison)

Table-10. The Comparison of Volatility of Market Risk (beta) of Stock investment Industry in the post- low inflation environment 2015-2017 and the financial crisis 2007-2009

Order No.	Company stock code	2007-2009 (financial crisis)		2015-2017 (post - low inflation)	
		Equity beta	Asset beta (assume debt beta = 0)	Equity beta	Asset beta (assume debt beta = 0)
1	AGR	1	0.313	0.911	0.835
2	APG	0.648	0.63	0.333	0.294
3	APS	0.895	0.382	0.821	0.621
4	AVS	0.546	0.425	0.000	0.000
5	BSI	1	0.873	0.602	0.219
6	BVS	2	2	0.590	0.406
7	CLS	0.662	0.331	0.000	0.000
8	CTS	0.812	0.546	0.781	0.586
9	SHS			1.104	0.338
10	VNR	0.922	0.525	-0.169	-0.069

Table-11. The Difference between Volatility of Market Risk (beta) of Stock investment Industry in the post- low inflation environment 2015-2017 and the financial crisis 2007-2009

Order No.	Company stock code	GAP (+/-) 2015-17 compared to 2007-09		Note
		Equity beta	Asset beta (assume debt beta = 0)	
1	AGR	-0.459	0.522	values (2015-17) minus (-) 2007-09
2	APG	-0.315	-0.336	
3	APS	-0.074	0.239	
4	AVS	-0.546	-0.425	
5	BSI	-0.523	-0.654	
6	BVS	-1.569	-1.186	
7	CLS	-0.662	-0.331	
8	CTS	-0.031	0.040	
9	SHS	1.104	0.338	
10	VNR	-1.091	-0.594	

Table-12. Statistics of Volatility of Market Risk (beta) of Stock investment Industry in the post- low inflation environment 2015-2017 compared to those in the financial crisis 2007-2009

Statistic results	2007-2009 (crisis)		2015-2017 (post - low inflation)		GAP (+/-) 2015-17 compared to 2007-09	
	Equity beta	Asset beta (assume debt beta = 0)	Equity beta	Asset beta (assume debt beta = 0)	Equity beta	Asset beta (assume debt beta = 0)
MAX	2.159	1.592	1.104	0.835	-1.055	-0.757
MIN	0.546	0.313	-0.169	-0.069	-0.715	-0.382
MEAN	1.015	0.624	0.622	0.404	-0.394	-0.220
VAR	0.2488	0.1620	0.156	0.077	-0.093	-0.085

Note: Sample size: 7

Chart-2. Statistics of Market risk (beta) in VN stock investment industry in the post – low inflation period 2015-2017 compared to the financial crisis 2007-2009
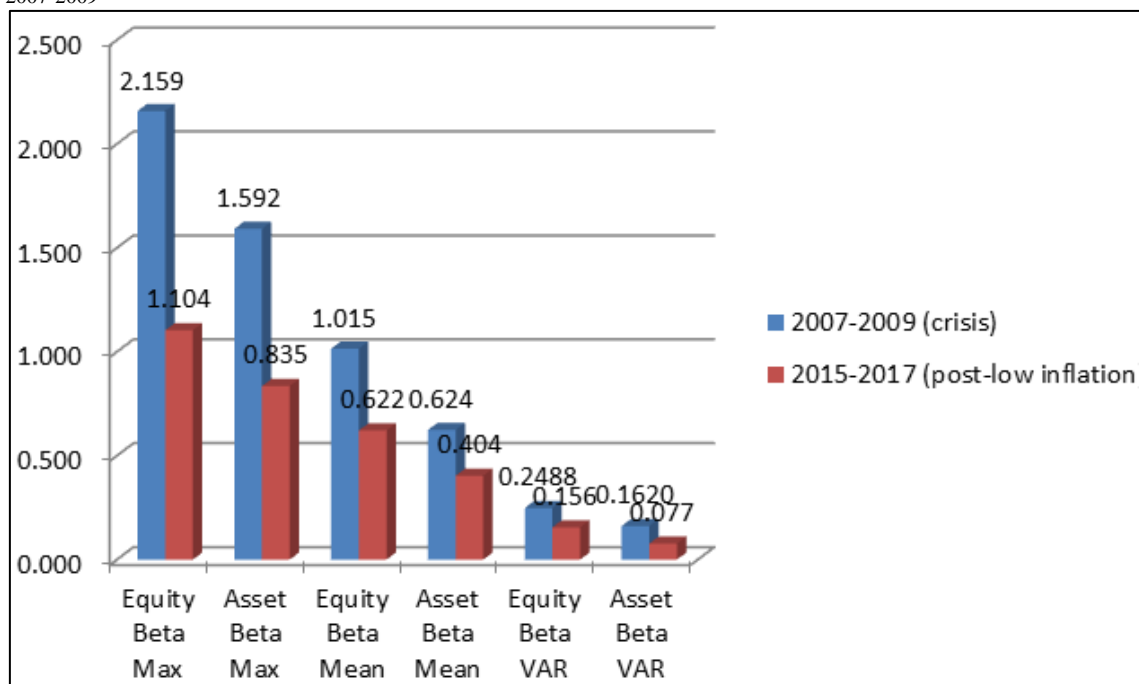
We summarize the data as the analysis follows:

For the stock industry, the market risk level has been reduced during the post-low inflation environment (2015-17) as shown in the above chart, as well as the risk fluctuation also reduced (equity and asset beta var).

A. Insurance Industry during the post – low inflation environment:

Table-13. The Volatility of Market Risk (beta) of Insurance Industry in the post- low inflation environment 2015-2017

Order No.	Company stock code	2015-2017 (post - low inflation)		Note
		Equity beta	Asset beta (assume debt beta = 0)	
1	BVH	1.588	0.348	assume debt beta = 0; debt ratio as in F.S 2015
2	PVI	0.827	0.359	
3	ABI	0.353	0.161	
4	BIC	0.679	0.315	
5	BMI	0.924	0.409	
6	PGI	0.139	0.030	
7	PTI	0.935	0.402	

Table-14. The Statistics of Volatility of Market Risk (beta) of Insurance Industry in the post- low inflation environment 2015-2017

Statistic results	2015-2017 (post - low inflation)	
	Equity beta	Asset beta (assume debt beta = 0)
MAX	1.588	0.409
MIN	0.139	0.030
MEAN	0.778	0.289
VAR	0.2171	0.0200

Note: Sample size: 7(we just take a sample of 7 insurance firms to make comparison in the below table)

Table-15. The Comparison of Volatility of Market Risk (beta) of Insurance Industry in the post- low inflation environment 2015-2017 and the financial crisis 2007-2009

Order No.	Company stock code	2007-2009 (financial crisis)		2015-2017 (post - low inflation)		Note
		Equity beta	Asset beta (assume debt beta = 0)	Equity beta	Asset beta (assume debt beta = 0)	
1	BVH	0.966	0.252	1.588	0.348	assume debt beta = 0; debt ratio as in F.S 2015 and 2008
2	PVI	0.937	0.58	0.827	0.359	
3	ABI	0.288	0.104	0.353	0.161	
4	BIC	0.114	0.037	0.679	0.315	
5	BMI	1	0.744	0.924	0.409	
6	PGI	0.15	0.067	0.139	0.030	
7	PTI	0.145	0.063	0.935	0.402	

Table-16. The Difference between Volatility of Market Risk (beta) of Insurance Industry in the post- low inflation environment 2015-2017 and the financial crisis 2007-2009

Order No.	Company stock code	GAP (+/-) 2015-17 compared to 2007-09		Note
		Equity beta	Asset beta (assume debt beta = 0)	
1	BVH	0.622	0.096	values (2015-17) minus (-) 2007-09
2	PVI	-0.110	-0.221	
3	ABI	0.065	0.057	
4	BIC	0.565	0.278	
5	BMI	-0.337	-0.335	
6	PGI	-0.011	-0.037	
7	PTI	0.790	0.339	

Table-17. Statistics of Volatility of Market Risk (beta) of Insurance Industry in the post- low inflation environment 2015-2017 compared to those in the financial crisis 2007-2009

Statistic results	2007-2009 (crisis)		2015-2017 (post - low inflation)		GAP (+/-) 2015-17 compared to 2007-09	
	Equity beta	Asset beta (assume debt beta = 0)	Equity beta	Asset beta (assume debt beta = 0)	Equity beta	Asset beta (assume debt beta = 0)
MAX	1.261	0.744	1.588	0.409	0.327	-0.335
MIN	0.114	0.037	0.139	0.030	0.025	-0.007
MEAN	0.552	0.264	0.778	0.289	0.226	0.025
VAR	0.2352	0.0811	0.217	0.020	-0.018	-0.061

Note: Sample size: 7

Chart-3. Statistics of Market risk (beta) in VN insurance industry in the post – low inflation period 2015-2017 compared to the financial crisis 2007-2009
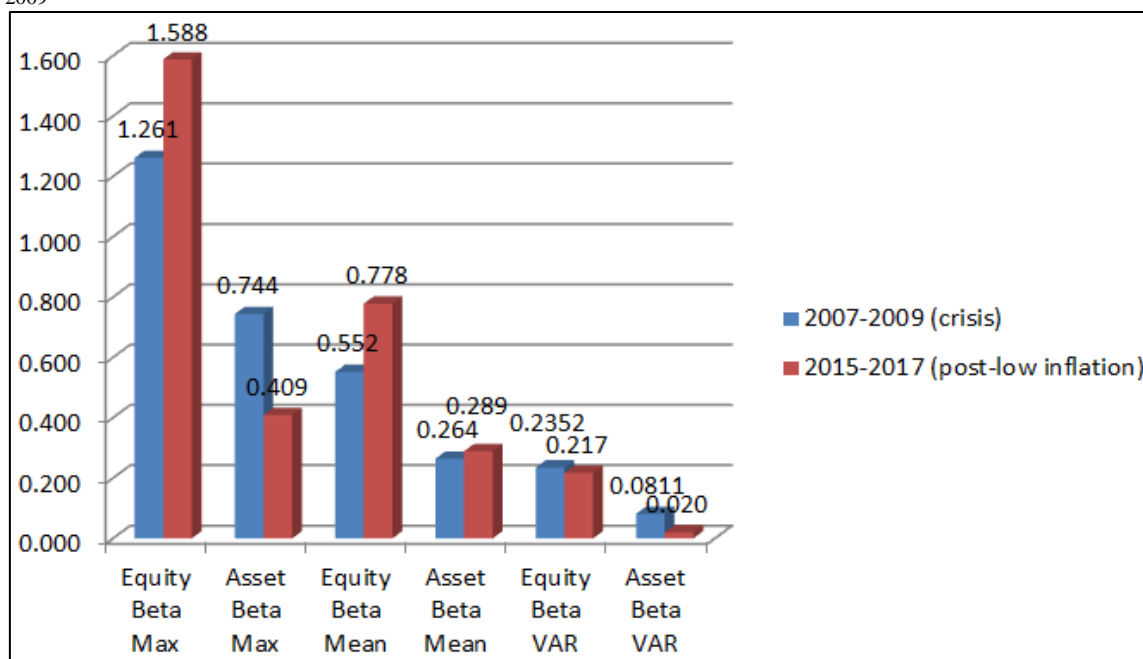
We summarize the data as the analysis follows:

For the insurance industry, different from stock industry, the market risk level has been increasing during the post-low inflation environment (2015-17) as shown by equity beta mean in the above chart, while the risk fluctuation has been reduced (equity and asset beta var).

A. Comparison three (3) industries: Banking and Stock Investment and Insurance

Chart-1. Statistics of Market risk (beta) in VN banking industry during the financial crisis 2007-2009 and in the post – low inflation period 2015-2017 compared to those in stock investment industry group
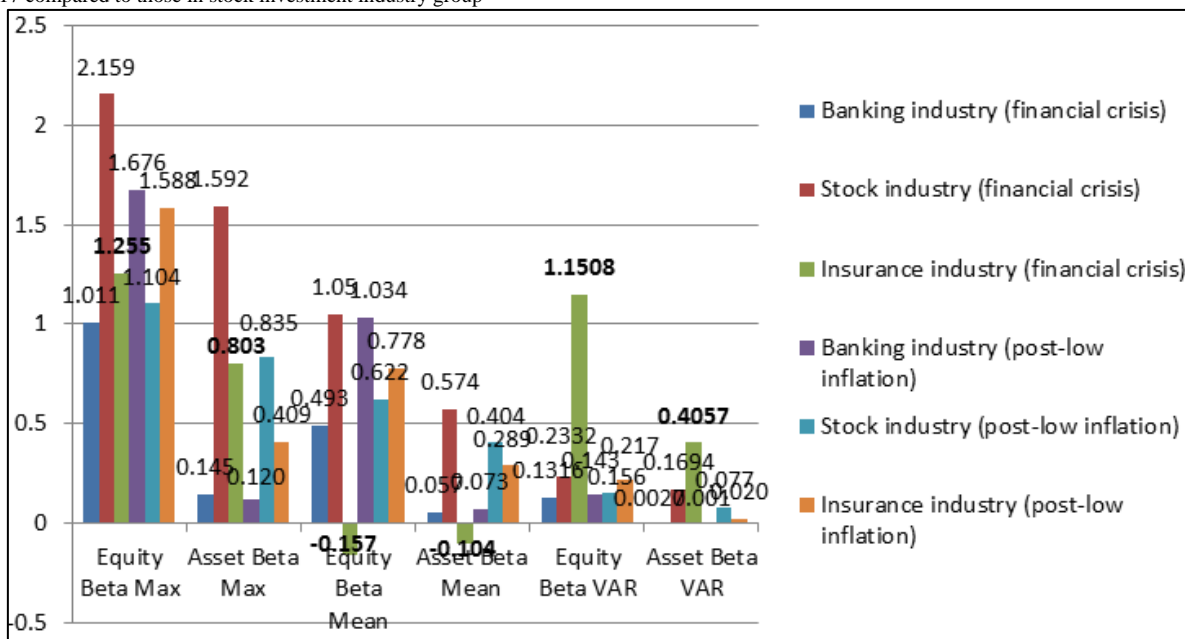
Based on the above calculation result table, we analyze data as follows:

Firstly, Table 6 tells us that there are 4 banking firms (over 9 banks) having beta decreasing while there are 5 banks with beta increasing during post-low inflation environment.

Moreover, table 11 provides evidence for us that there are 6 stock firms (over 10 stock companies) having beta decreasing and there are 4 stock investment firms with beta increasing.

Next, table 16 pointed there are 4 insurance firms (over 7 firms) have beta values increasing and 3 insurance companies with beta decreasing during the post-low inflation time, compared to the financial crisis time.

In addition to, looking at the below chart 3, we can find out:

During the financial crisis 2007-09, stock industry has the highest beta value whereas during the post-low inflation time, banking industry maintained the highest value.

The risk level, measured by equity beta mean, in the stock industry has decreased (down to 0.622) while that of banking industry has increased (up to 1.034) during the pos-low inflation environment (2015-17), compared to financial crisis time (2007-09). The market risk of insurance industry also has increased much (equity beta mean up to 0.778).

In the insurance industry during post – low inflation period, market risk volatility, measured by Equity beta var has decreased much lower than in the financial crisis time.

In banking industry, market risk fluctuation still almost the same in both periods (see equity beta var in the above chart 3).

In stock industry, volatility of market risk also slightly decreased (down to 0.156).

Last but not least, as we see asset beta mean values, in banking industry, under impact of debt leverage, this number slightly increases during 2017-2017.

Finally, looking at exhibit 5, we can see the increase of market risk in financial industry in the post-low inflation time still lower than that of public utilities and energy industries.

4. Risk Analysis

Inflation can affect negatively on market capitalization, but low inflation could be beneficial to economic recovery and might have benefits for financial system as investors can perform more transactions. However, Vietnam inflation rate in 2015 is at a low level, still acceptable, in the context that global economies in many developed countries also reached low rate.

Furthermore, when the Vietnam financial system has been becoming more active and bigger in size, there will be potential risk, esp. in the context of the global impact from international financial markets became bigger.

There are several factors affecting market risk level and fluctuation including, but not limited to: the entire financial market instability of global financial or economic crisis or catastrophic events can cause market risk, or fluctuations and volatility interest rates, foreign exchange rate or stock price.

5. Discussion for Further Researches

We can continue to analyze risk factors behind the risk scene (risk increasing as above analysis) in order to recommend suitable policies and plans to control market risk better. Also, the role of risk management and risk managers need to be developed more.

Specifically, Vietnam stock market has been established and developed since 2005-2006 until now, it has gained a lot of operational experiences with many newly-established stock companies, and some bankruptcies as well. Our analysis stated the risk level of stock company group has been decreasing, but risk management tools always needed to enhance to prevent losses happened as it was in the financial crisis 2007-2009.

Vietnam banks has been established very long time ago from 1945 until 1975, and then after the innovation period 1986; therefore, it received a lot of experience in operation and have been one of leaders in economic system with many leading innovative change in its management and operational structure, in its ways of managing risk and controlling the system, in its ways of supporting each other and stimulating the economy as well as all kinds of businesses to develop. It also follows Basel and international corporate governance standards to keep pace with global development, and keep pace with 4.0 technology revolution in this era. In recent years, economists discuss cross-ownership between banks and try to eliminate this phenomenon, although it can help to reduce risk (as if one bank fails, they can gain profits in the second bank). The drawback is that if both banks fail, the losses will be double. From now, Vietnam banks as well as banks in other countries, not only pay attention to Basel II, III covering operational risk, but also estimating market risk measures and volatility and analyze its root causes.

Vietnam insurance companies can reduce risk by using reinsurance contracts and improve risk management practices, or perform good contract appraisal, or improving customer service to receive, evaluate customer awareness and client feedback to have proper plans to reduce customer complaints.

For all three (3) financial industries: bank, insurance and stock companies, in order to reduce risk, they all need to enhance corporate governance structure, mechanisms and standards. Vietnam banks and financial service firms, as well as in other developing and developed countries, need to adapt to international corporate governance standards which are standardized and recommended by many international organizations such as ADB, OECD, IFC, WB, ECODA, CFA…. In addition to, these financial service firms also pay attention to technology, process and esp., to people or human resources in order to train them about risk management tools and practices to reduce business risk. Establish risk management team will help to manage all market risk, credit risk and operational risk. This risk management team, with management accountability and with experienced supervisory board, will bring together risk management model assessment, technology expertise and regulatory experience. To put in another word, the need of risk management and corporate governance has been increasing since the financial crisis 2007-2009. The roles of risk team and roles of compliance officer, internal control (self-control) and audit committee need to be clarify more in management system. Even in some specific cases, some companies might consider hiring a third-party firm (for example, law firm) to perform risk management activities. Not only banks and financial firms take care of operational risks and technology-driven change and higher competition level, but also they manage financial risks. The fundamental step is to quantify market risk or financial risks with a risk management model which is cost-effective and analyzes or involves risk factors. Therefore, it is necessary to consider and evaluate both benefits and drawback of implementing cost saving risk functions. Another thing to consider is the biases happening and affecting the decision making process in many banks and financial service companies; hence, we need to reduce bias when making decision by using debate techniques to recognize them and then, eliminate biases to achieve a fair and true decision. For better and transparent processes to eliminate financial risks, banks and financial service firms also take care of implementing ISO 9001 standards to build up their operational processes for all functions and departments. Financial risk could be considered as one of core arts of strategic planning.

Market risk or systematic risk can be insurable or reduce through hedging techniques. The meaning of hedging just similar to insurance, i.e hedge and reduce losses when an unexpected event or bad scenario in future happens. For instance, investors might buy and use options to hedge risk, or reduce risk of a stock or portfolio when the price of the underlying asset declines. Another method to avoid market risk is choosing modern portfolio theory to identify investor risk tolerance and then build an optimal portfolio by using statistical measures to examine the correlation between assets, between risk and returns. Hedging, known as using financial instruments or derivatives such as options and future, helps you to reduce losses, rather than making money and you have to pay premium or cost of hedging (this is the price of hedging). Our discussion on risk factors, risk management framework, and risk management model here might be applied and might be true for several developing countries in which central bank and bank system play a major role and leading role in corporate restructuring, and with the young, newly established and active stock market

For investment strategy, it depends on risk attitude of each investor when they choose a portfolio based on risk level measured by beta values. For instance, risk-adverse investors may prefer stocks with beta less than 1 so that they will reduce losses when the market declines sharply. On the other hand, risk takers might prefer stocks with higher beta which aim for higher profits.

As we can see from Exhibit 1, the risk management plan and scheme need to be put in the context that Vietnam economy has controlled inflation well in many years (4-5%), and achieved good GDP growth rate (see Exhibit 2) annually more than 5%. Also, in the whole picture of the local economy, loan growth rate also slightly decreases and has been controlled at rate of about 16% (see exhibit 3) whereas the lending rate tends to reduce and the gap between deposit rates and borrowing rates also have been shorten since 2017.

6. Conclusion and Policy Suggestion

In general, banking, insurance and stock investment companies system in Vietnam has been contributing significantly to the economic development and GDP growth rate of more than 6-7% in recent years (see Exhibit 2). The above analysis shows us that most of risk measures (equity beta max, mean and var) are decreasing during the post-low inflation period. However, three (3) financial service groups in Vietnam need to continue increase their corporate governance system, structure and mechanisms, as well as their competitive advantage to control risk better. For instance, banking, insurance and stock investment system might consider proper measures and plans to manage bad scenarios in future. Another way is increasing productivity while reducing management or operational costs.

This research paper provides evidence that the market risk potential has increased in 2015-2017 post-low inflation period for banking and insurance industries while decreased in stock industry (although exhibit 5 shows us that the market risk level in these financial service industries atll lower than that of energy and public utilities industries). Whereas the Exhibit 3 also suggests that the credit growth rate increased in 2016 and slightly decreased in later years (2017-2018). It means that the local economy is trying to control credit growth reasonably and logically, however we need to analyze risk factors more carefully to reduce more market risk.

Last but not least, shown by evidence in insurance and banking industries, as it generates the result that the risk level became higher in the post-low inflation period, the government and relevant bodies such as Ministry of Finance and State Bank of Vietnam need to consider proper policies (including a combination of fiscal, monetary, exchange rate and price control policies) aiming to reduce/control the risk better and hence, help the stock market as well as the whole economy become more stable in next development stage.

Finally, this study opens some new directions for further researches in risk control policies in bank system as well as in the whole economy. For instance, how increasing inflation and deflation affects the risk level of stock investment industry and how much inflation is sufficient for financial system and economic development.

Acknowledgements

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Exhibit

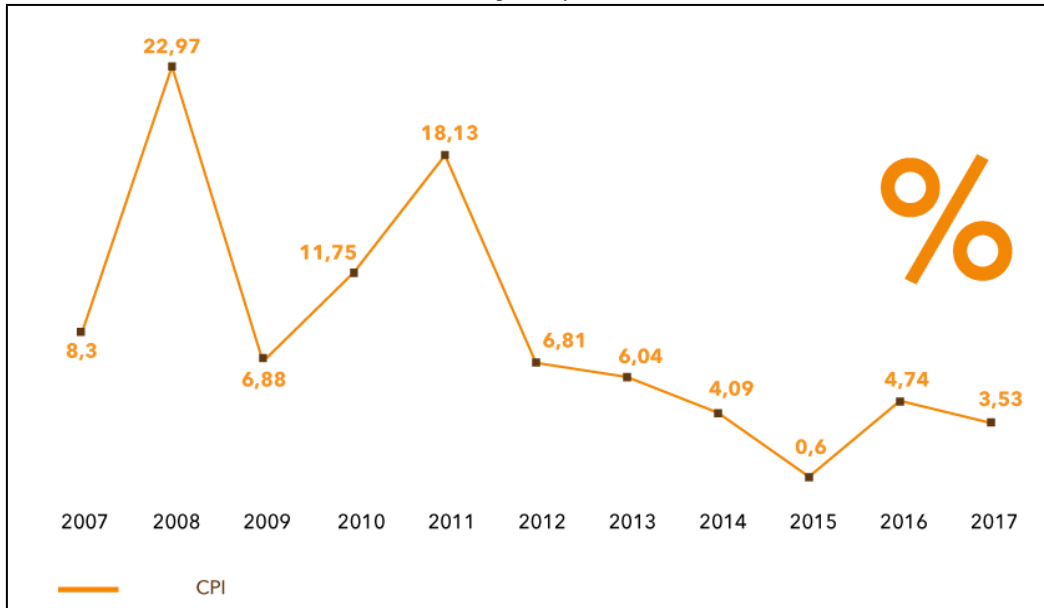**Exhibit-1.** Inflation, CPI over past 10 years (2007-2017) in Vietnam

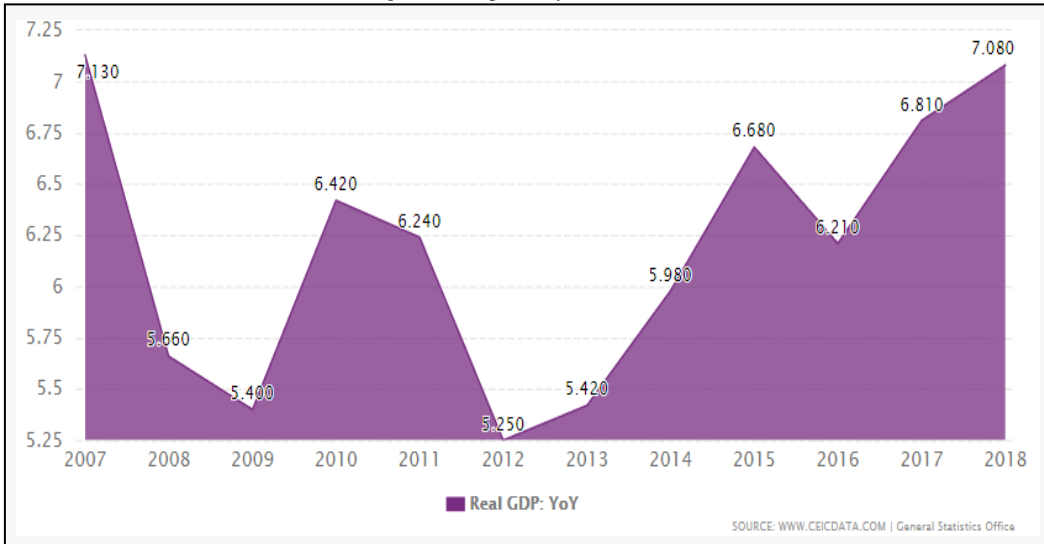**Exhibit-2.** GDP growth rate past 10 years (2007-2018) in Vietnam

Exhibit-3. Loan/Credit growth rate in the past years (2012-2018) in Vietnam
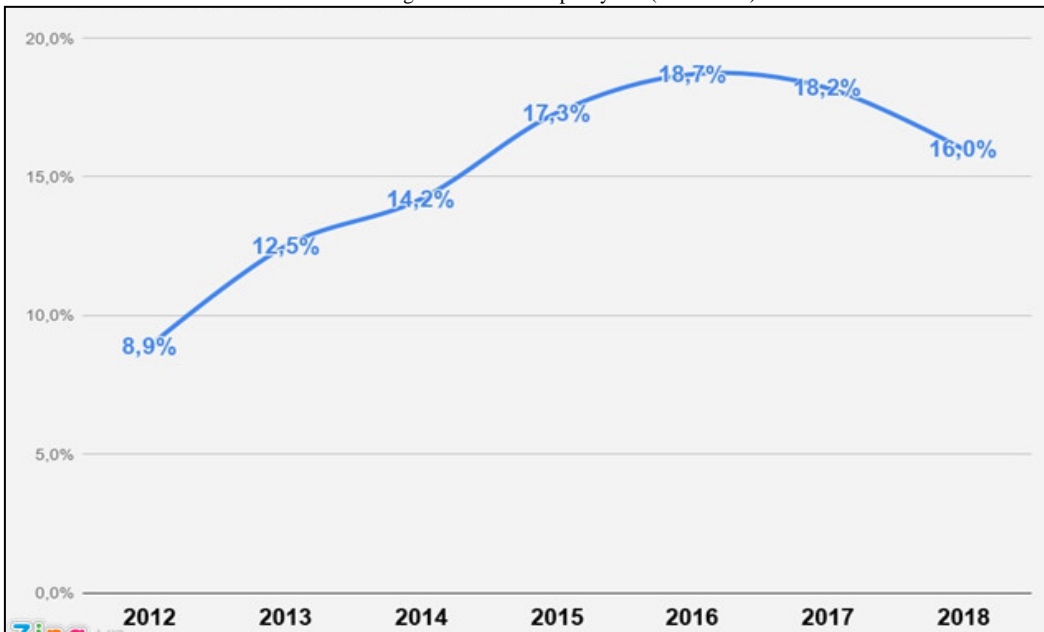
Exhibit-4. Deposit and lending interest rates in the past 12 years (2005-2018) in Vietnam
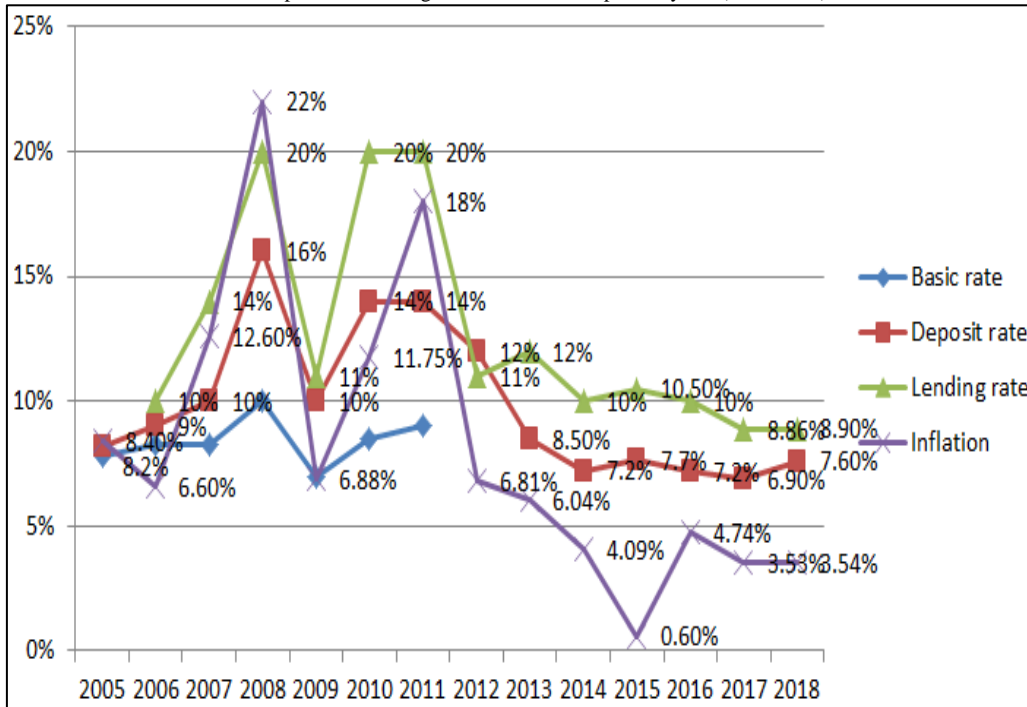

Exhibit-5. Statistics of Market risk (beta) in VietNam public utilities and energy industries during the financial crisis 2007-2009 and in the post – low inflation period 2015-2017