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Weighted Beta CAPM Based On Bank Market Value And Meanings of Financial Data Transparency- Case of 7 Big Listed Commercial Banks In Vietnam

DINH TRAN NGOC HUY[1]*, VU THI KIM ANH, PHD[2], NGUYEN NGOC THACH, PHD[3], LE DINH HAC, PHD[4], TRAN TUAN ANH, PHD[5], HOANG THANH HANH, PHD[6]

[1]MBA, PhD candidate (Banking University HCMC, Ho Chi Minh city Viet Nam, MBA, Graduate School of International Management, International University of Japan, Niigata, Japan
[2]Trade Union University, Hanoi Vietnam
[3]Banking University HCMC, Ho Chi Minh city Vietnam
[4]Banking University HCMC, Ho Chi Minh city Vietnam
[5]Thai Nguyen University of Economics and Business Administration (TUEBA), Vietnam
[6]Academy of Finance Vietnam
*Corresponding Author
Email ID: dtnhuy2010@gmail.com, Kimanhvt@dhcd.edu.vn, thachnn@buh.edu.vn, hacld@buh.edu.vn, tuananhtueba@gmail.com, hoangthanhhanh@hvtc.edu.vn

Abstract: Estimating Beta CAPM is a basis for evaluating market risk in the banking sector in Vietnam economy, esp. During pre-low (L) inflation time 2011-2015 and post-L inflation period 2015-2020. The more the economy growing, the more important the role of risk management in commercial bank. Also, the more transparent of financial data, the better the capital flows in the banking and financial market.

This research paper aims to figure out in 7 big listed banks in Vietnam including Vietcombank (VCB), Vietinbank (CTG), Asia Commercial Bank (ACB), Sacombank (STB), Navibank (NVB) now become National Citizen Bank, Eximbank (EIB) and Saigon Hanoi Bank (SHB), how much and what is the Weighted Beta CAPM formula based on firm or bank market value during the period 2011-2020 with semiannual data.

The result will be a measurement which help us to calculate macro effects on market risk in banking industry. Research findings show us that during post-low inflation time, weighted beta CAPM tends to increase higher, so bank system need to prepare to manage risk better.

Last but not least, Our recommendation can be used for reference in many other developing markets.

JEL classification numbers: M21, M1, G12, G30

Keywords: market risk management, weighted beta CAPM, market value, low inflation, banking industry, Vietnam, policy

INTRODUCTION

Nowadays, under 4.0 industry and Basel impacts, Vietnam banks pay attention more to risk management, esp. New perspectives in governance , management and risk models. This is the 1st reason we conduct this research paper.

Second, macro policy makers will need to look at risk management in banking industry and impacts of macro factors on market risk in order to adjust macro policies. What we need to adjust in trade balance, exchange rate, lending rate and risk free rate policies? This is the 2nd reason for us to conduct this study.

Generally speaking, central banks aim to maintain inflation around 2% to 3% to control risk and price.This study will calculate and figure out not only inflation but other macro factors, both internal and external, such as GDP growth, risk free rate, lending rate, SP500, trade balance and exchange rate, etc. affecting the market risk level during the low inflation time (2015-2020).

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 discussion and conclusion and policy suggestion will be in the section 5.

BODY OF MANUSCRIPT

Research Issues

The scope of this study are:
Issue 1: What are volatility of Beta CAPM in 7 big listed banks in Vietnam?
Issue 2: Evaluating weighted Beta CAPM of group of 7 banks based on market value

LITERATURE REVIEW

During the financial crisis 2007-2009 in Viet Nam and global financial markets, high inflation causing high lending rates have created risks for many industries such as medicine and the whole economy. Mohamad et all (2014) showed that financial risk is vital through using both return on asset and return on equity in the performance equation. This result also implied that we cannot avoid the inverse relation of financial risk and performance; therefore, bank system would be better to make a trade-off between risk and performance.
Wang et all (2014) presented results showing that firms with long-term institutional investors receive significantly positive abnormal returns around the offering announcement.
Then, Gunarathna (2016) revealed that whereas firm size negatively impacts on the financial risk, financial leverage and financial risk has positive relationship.
Hami (2017) showed that financial depth has been affected negatively by inflation in Iran during the observation period.
The below table will summarize previous studies relating to risk management under macro impacts topic:

Table 1: Summarize previous studies

Domestic researches	Authors name	Results, contents
1.Systemic risk and the problem of determining Beta coefficient in Vietnam	Vương Đức Hoàng Quân (2012)	In the first stage, in general, the information from the Vietnam stock market is not sufficient in quantity and quality to estimate the beta coefficient according to the traditional method, which is regression analysis of stock returns volatility compared to indices. VN-Index to value the listed companies and stocks.
2.Fama-French 3-Factor Model: The empirical evidence from the Ho Chi Minh City Stock Exchange	Trương Đông Lộc and Dương Thị Hoàng Trang (2014)	The research results show that earnings of stocks are positively correlated with market risk, firm size and the book value to market value (BE / ME) ratio. In other words, the Fama - French 3-factor model is suitable in explaining the change in profits of stocks listed on HOSE.
3.The econometric model for stock prices in the period 2008-2011 - Case of stock prices ACB, VNIndex, risk free rate and S& P500	Đinh Trần Ngọc Huy (2015)	Analyze the impact of VNIndex and internal and external macro variables on the stock price of ACB.
4.The theory of average return of K.Marx and model of capital asset pricing	Nguyễn Thị Hường (2017)	The limitation of Vietnam's stock market is the lack of beta in stock analysis. However, as the market portfolio matures, beta will keep pace with the development of the market.
5. Book chapter by Dinh Tran Ngoc Huy (2021, Springer Verlag book chapter) "Impacts of Internal and External Macro Factors on Firm Stock Price in An Econometric Model – A Case In Viet Nam Real Estate Industry"	Đinh Trần Ngọc Huy (2021)	Presenting a regression model analyzing the impact of internal macro variables (inflation in Vietnam, lending rate, risk-free rate) and external (US inflation, exchange rate, S&P 500) on stock prices Vingroup is as follows: Stock price_VIC = -245.13 * Inflation_CPI + Lendingrate - 815.06*Rf_rate USD_VND_rate+0.07*SP500 - 372.08*Inflation_US, R2 = 0.84, SER = 19.7
6. Systemic risks in banking business - periods of crisis	Nguyễn Thanh Bé, Bùi Quang Hưng (2019)	Presented in Vietnam, the risk management system at commercial banks has been paid attention to a certain extent in the past few years, but due to its structural and technical limitations, this system has not can meet the complex requirements of a modern commercial bank operating in the current risky environment.
7. Factors affecting the return rate of listed stocks from the Fama French 5-factor model	Trịnh Minh Quang et al (2019)	Referring to factors of market change will strongly affect the share prices of large companies
International researches	Authors name	Results

The Impact of Macroeconomic and Financial Variables on Market Risk: Evidence from International Equity Returns	Patro et al (2002)	They found that a number of variables including imports, exports, inflation, market capitalization, dividend yield, and a book-to-book price ratio significantly influence a person's world market risk at national level.
2. Do economic factors influence stock returns? A firm and industry level analysis	Butt et al (2010)	The results revealed that market returns are primarily changes in stock returns, but macroeconomic variables and industry-related variables add explanatory power in describing volatility. stock returns.
3.Macroeconomic factors and micro-level bank risk	Claudia et al (2010)	The risk of about a third of US banks increases in response to monetary easing.
4.Impact of Macroeconomic Factors on Banking Index in Pakistan	Saeed và Akhter (2012)	In Karachi stock market, Regression results show that exchange rate and short-term interest rate have a significant impact on the Banking index. Macroeconomic variables such as money supply, exchange rate, industrial production and Short-term interest rate and exchange rate have a negative effect on banking index while oil price has a positive effect on the bank index. Banking index.
5.Impact of Macroeconomic Indicators on Stock Market Performance: The Case of The Istanbul Stock Exchange	Arnes (2014)	Their analysis has shown that for investors interested in Turkey, first of all, be careful not to assume that relationships that existed in the past will continue into the future. We also find that depending on the sector, the effects of changes in macroeconomic variables will also differ. For policymakers and lawmakers, however, our findings indicate that keeping interest rates low has been a good policy for the past 20 years.
6.Bank Leverage Ratios and Financial Stability: A Micro- and Macroprudential Perspective	Emilios (2015)	The leverage cycle can cause financial instability and the impact of limited leverage on bank governance performance.
7. Effect Of Macroeconomic Variables On Stock Market Returns For Four Emerging Economies: Brazil, Russia, India, And China	Gay (2016)	According to the hypothesis, the relationship between the exchange rate and the security's price should be in the same direction.
8. The Impact of Macroeconomic Factors on the German Stock Market: Evidence for the Crisis, Pre- and Post-Crisis Periods	Celebi and Honig (2019)	In Germany, the aggregate index (OECD), the Economic Research Institute's Export Expectations index, the climate index, exports, CPI, as well as the 3-year German government bond yield has a delayed effect on stock returns
9. Impacts of macro variables on Starbucks Corp.	Kumaresan (2019)	Indicates that compared to internal corporate factors, macroeconomic factors (exchange rate) have a greater effect on firm performance.

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.

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 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.

METHODOLOGY

We use the data from the stock exchange market in Viet Nam (HOSE and HNX) during the low inflation period 2015-2020 and China-US commerce war to estimate systemic risk results. We perform both fundamental data analysis and financial techniques to calculate beta CAPM 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 bank (CTG) in Vietnam stock exchange. Specifically, stock price data is from live data on HOSE stock exchange during years 2015-2020, which presents the low inflation environment. Then, we use both analytical and summary method to generate analytical results from data calculated.

Analysis of the effects of 9 macro variables on market risk of listed commercial bank, CTG. Weekly data collected from 2015-2020 for Vietinbank stock price to measure Beta and other macro data from reliable sources such as the General Statistics Office and commercial banks. Beta CAPM is a function with 9 macro variables (x1: GDP growth rate (g), x2: Risk-free rate Rf (i), x3: Loan interest rate (r), x4: Exchange rate (ex_rate), x5: S&P 500, x6: VNIndex, x7 : trade balance, x8: industrial production index, x9: CPI). We use OLS regression.

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

MAIN RESULTS

General Data Analysis

First we look at the below chart 1, we find out correlation matrix of internal variables. We see that Increase in industrial manufacturing index will cause Beta CAPM increases while decrease in CPI will make it decreases.

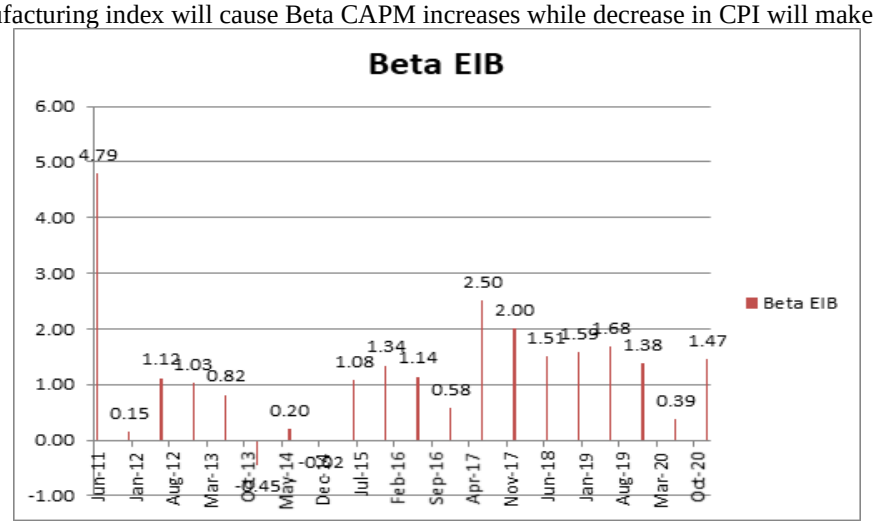

Chart 1: Fluctuations of Beta CAPM Eximbank

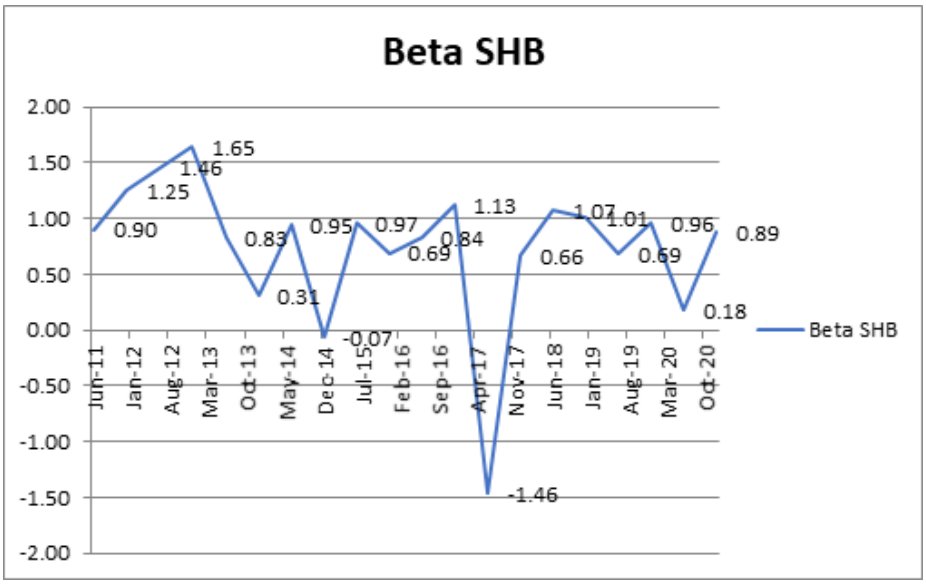

Chart 2: Fluctuations of Beta CAPM Saigon Hanoi Bank

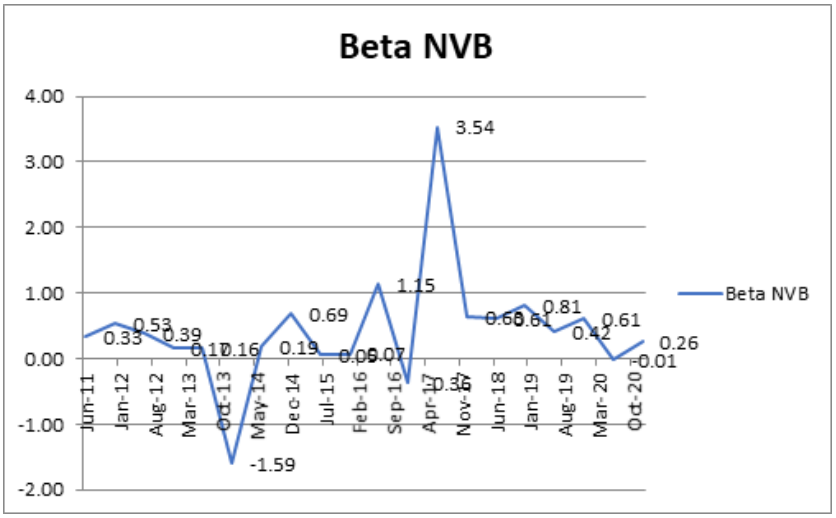

Chart 3: Fluctuations of Beta CAPM Navibank

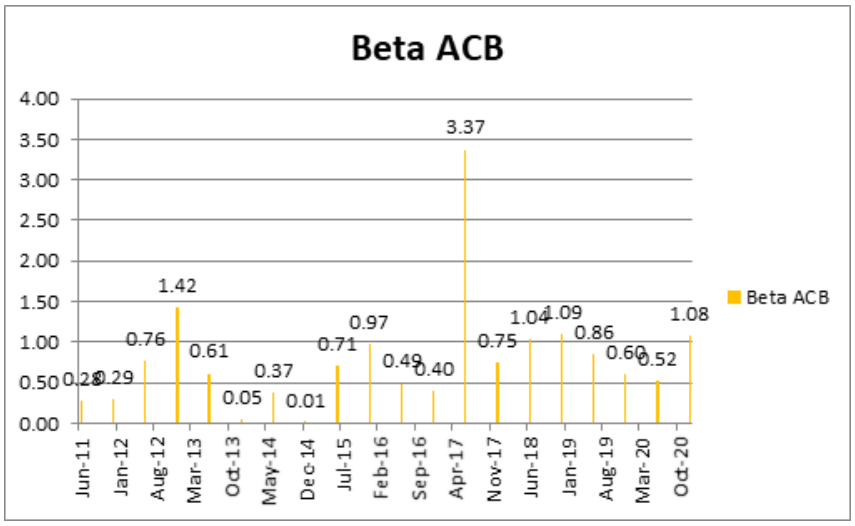

Chart 4: Fluctuations of Beta CAPM Asia Commercial Bank

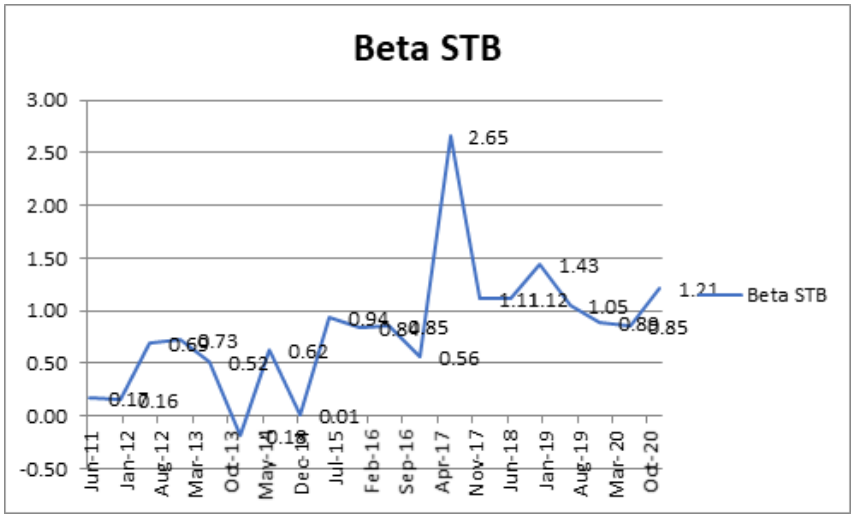

Chart 5: Fluctuations of Beta CAPM Sacombank

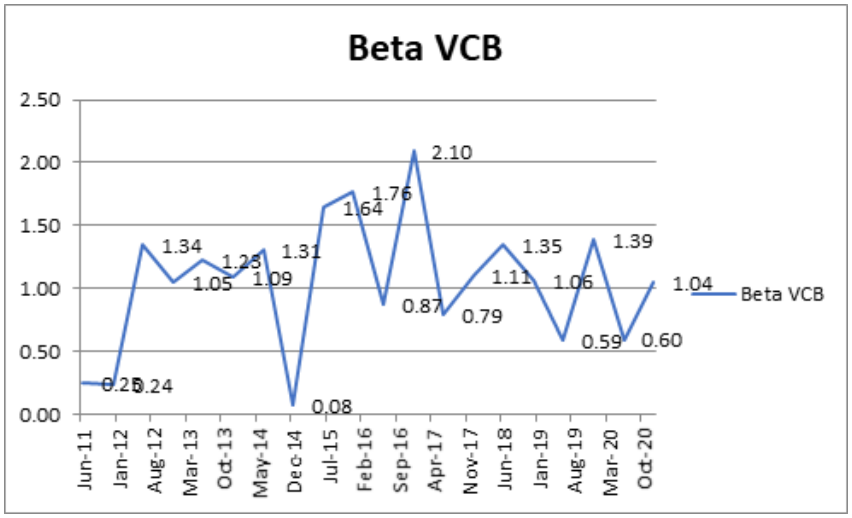

Chart 6: Fluctuations of Beta CAPM Vietcombank

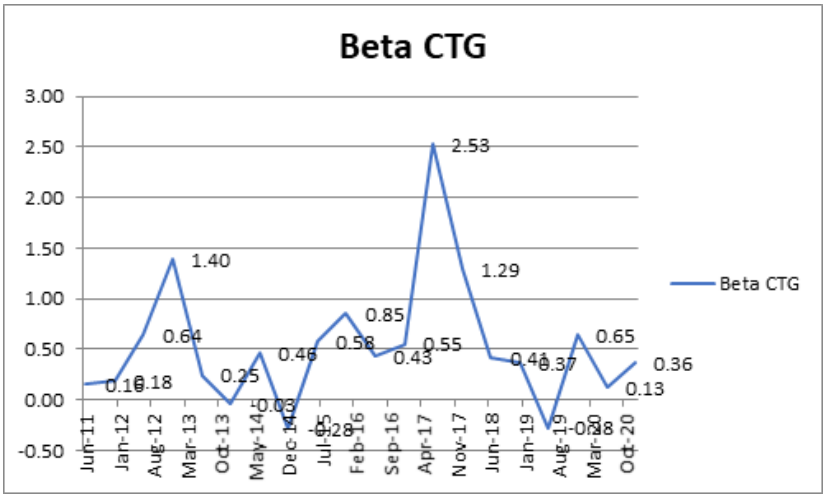

Chart 7: Fluctuations of Beta CAPM Vietinbank

We see from above 7 charts that each bank has different volatility trend of market risk. For instance, Vietinbank has highest beta value in June 2017, VCB has highest value in Oct 2016.

Next we can use above beta values to be a parameter to estimate macro effects on market risk, for instance:

Dependent Variable: BETA
Method: Least Squares
Date: 01/17/21 Time: 15:45
Sample: 1 12
Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CPI	7.546648	16.67913	0.452460	0.6699
G	3.882276	19.32358	0.200909	0.8487
IM	0.000455	0.004588	0.099109	0.9249
R	-46.97655	50.31045	-0.933733	0.3933
RF	-8.973971	26.35003	-0.340568	0.7473
VNINDEX	-0.004621	0.002702	-1.710528	0.1479
C	9.310512	6.701538	1.389310	0.2234

R-squared	0.542161	Mean dependent var	1.192528
Adjusted R-squared	-0.007246	S.D. dependent var	0.471413
S.E. of regression	0.473118	Akaike info criterion	1.632255
Sum squared resid	1.119205	Schwarz criterion	1.915118
Log likelihood	-2.793533	F-statistic	0.986811
Durbin-Watson stat	2.455563	Prob(F-statistic)	0.516474

Fig.1: Internal impacts on Beta CAPM – Case VCB – period 2015-2020

Empirical Research Findings and Discussion

We can estimate weighted beta CAPM or market risk from the below tables and formula:

Table 2: Weighted Beta CAPM period 2015-2020

	Beta CTG	MV (CTG)	Beta EIB	MV (EIB)	Beta SHB	MV (SHB)	Beta NVB	MV (NVB)	Beta ACB	MV (ACB)	Beta STB	MV (STB)	Beta VCB	MV (VCB)	Weighted Beta CAPM
Jun-15	0.58	49148.94	1.08	23605.11	0.97	7679.60	0.05	2053.92	0.71	18821.75	0.94	20679.46	1.64	119126.41	1.20
Dec-15	0.85	40957.45	1.34	22252.74	0.69	5783.40	0.07	1815.78	0.97	17208.46	0.84	21102.75	1.76	113263.36	1.36
Jun-16	0.43	42446.81	1.14	20531.53	0.84	5783.40	1.15	1666.95	0.49	17208.46	0.85	20381.28	0.87	124722.95	0.78
Dec-16	0.55	33510.64	0.58	18502.97	1.13	5148.29	-0.36	1428.81	0.40	15774.42	0.56	17044.52	2.10	126641.45	1.45
Jun-17	2.53	53989.37	2.50	24896.02	-1.46	8393.95	3.54	2589.73	3.37	25732.02	2.65	25611.88	0.79	138514.09	1.65
Dec-17	1.29	59946.81	2.00	29752.28	0.66	10408.49	0.63	2145.60	0.75	36379.76	1.11	23176.95	1.11	195358.83	1.16
Jun-18	0.41	53989.37	1.51	29813.75	1.07	9865.58	0.61	2264.80	1.04	38607.91	1.12	20832.20	1.35	208670.58	1.17
Dec-18	0.37	52313.83	1.59	23728.06	1.01	8662.46	0.81	2831.00	1.09	36916.09	1.43	21553.66	1.06	192469.92	1.02
Jun-19	-0.28	70000.01	1.68	23973.94	0.69	8181.22	0.42	2384.00	0.86	36043.07	1.05	20471.47	0.59	261475.86	0.55
Dec-19	0.65	62925.54	1.38	25387.79	0.96	7699.97	0.61	3825.80	0.60	37602.90	0.89	18307.08	1.39	335653.41	1.20
Jun-20	0.13	66090.43	0.39	54104883.24	0.18	24574.72	-0.01	3500.20	0.52	39240.60	0.85	20381.28	0.60	308949.49	0.39
Dec-20	0.36	71117.03	1.47	42661.32	0.89	30542.86	0.26	3744.40	1.08	60415.56	1.21	30571.93	1.04	361986.44	0.99

We see in the chart below for Weighted beta CAPM in 2 periods for group of 7 big listed banks:

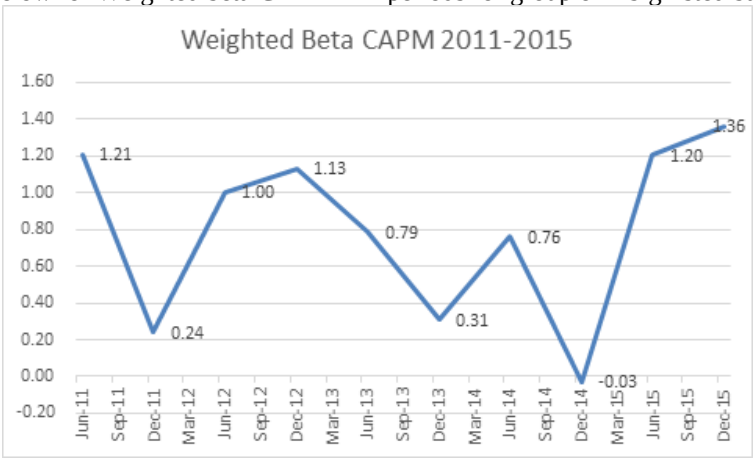

Chart 8: Pre- L inflation time

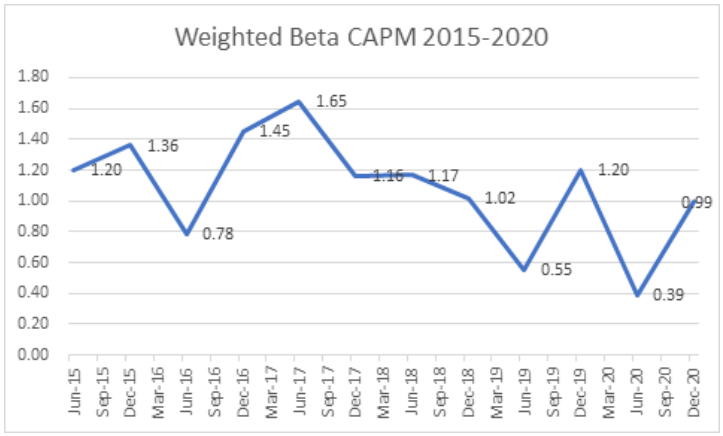

Chart 9: Post - L inflation time

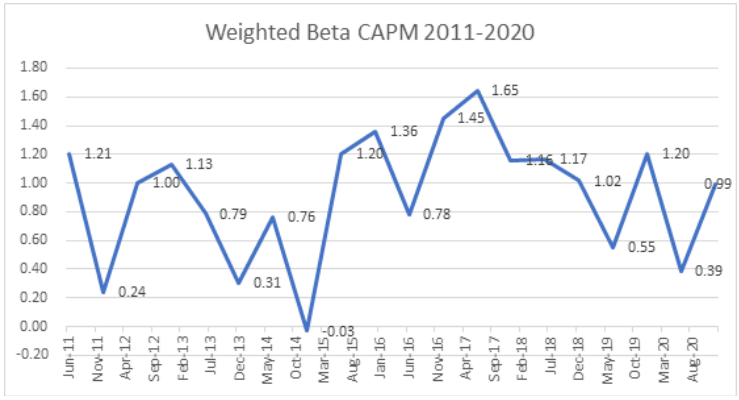

Chart 10: for the whole period 2011-202

DISCUSSION FOR FURTHER RESEARCHES

In pre-L inflation period, We can see market risk for the whole group of 7 big listed banks in Vietnam has reached the highest value of 1.36 in Dec 2015, and lowest value of 0.24 in Dec 2011 and -0.03 in Dec 2014.

In post-L inflation period, We can see market risk for the whole group of 7 big listed banks in Vietnam has reached the highest value of 1.65 in June 2017, and lowest value of 0.39 in June 2020.

In order to enhance risk management culture at 7 big banks in Vietnam, we have to consider some following action plans in below section.

CONCLUSION AND POLICY SUGGESTION

As shown from the above estimation, there are more values of weighted beta CAPM higher than (>) 1. Government, SBV and Ministry of Finance need to increase risk management plans to lower market risk.

This research paper provides evidence that the market risk tends to increase higher in the post-low inflation period (see above harts), hence more risk management plans needed to avoid systematic risk.

Management implications:

For banks and firms:

- Deploying the construction of 4 risk defense lines in listed commercial banks and enterprises: Line 1: the level of transactors, brokers, customer relations specialists, departments need to limit risks when trading Second line: Legal division is responsible for communication, consulting legal procedures Third line: Risk management division / Internal Audit drafted and issued internal governance regulations, risk culture and increased awareness of risk management in enterprises. Line 4: Internal auditor is responsible for periodic inspection of reporting compliance

- Suggestions for some risk management activities at enterprise and bank level are as follows:

Make a risk recognition report; Promulgating the Code of Professional Ethics; Regulations that employees are not allowed to disclose internal information; Strengthen legal communication to raise awareness and compliance; Issue the Internal Control Procedures

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