ENHANCING RISK MANAGEMENT CULTURE FOR SUSTAINABLE GROWTH OF ASIA COMMERCIAL BANK - ACB IN VIETNAM UNDER MIXED EFFECTS OF MACRO FACTORS

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Abstract. For sustainable growth, 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 policies and build risk management culture in banking system. What we need to adjust in trade balance, risk free rate and other policies? This is one of reasons for us to conduct this study.This paper measures the Beta CAPM in famous model under impacts of both macro internal and external variables during low inflation time 2015-2020 in the country. The evidence is the fundamental role of risk management in commercial bank has been increasing with new perspectives in management, corporate governance and risk management models. We will estimate effects in risk measurement of one of big listed Vietnam commercial bank, Asia commercial bank (ACB) during the low inflation period 2015-2020 with semiannual data. Through using analysis, synthesis statistics methods, and dialectical materialism method, combined with econometric model with 9 macro variables, we figure out that CPI has a positive correlation with Beta CAPM of ACB, while Risk free rate (Rf) and lending rate have negative correlation with Beta CAPM of the bank. It implies that increase in inflation, together with decrease in Rf and lending rate will increase market risk.Then, one of its major findings is the suggestion of macro and risk management policies for bank and relevant government agencies. Our recommendation can be used for reference and expand researches in many other emerging markets.

Keywords: market risk management; risk culture; beta CAPM; low inflation; banking industry; Vietnam, policy

1. Introduction

Nowadays, under 4.0 industry and Basel impacts, Vietnam banks pay attention more to risk management, especially perspectives in governance, management and risk models. This is the 1st reason we conduct this research paper. Corporate culture can be defined as the set of values and standards of beliefs, behaviors, perception and thinking methods that are recognized by everyone in the company, thinking and acting as a habit. Corporate culture is like a person's personality and spiritual life, influencing its lifestyle and behavior. Building a company culture determines the success, failure and long-term survival of each business. Hence, we can see risk management culture will include perception and thinking methods relating to risk and risk management within the firm.

This study will calculate and figure out not only inflation but other macro factors, both internal and external indicators affecting the market risk level during the low inflation time (2015-2020). Asia Commercial Bank (ACB) is one of big listed joint stock commercial bank in Vietnam, which achieved significant growth in past years. Having endured heavy losses in 2012, the bank returned to positive growth on the first stage of the 2014-2018 development roadmap, with particularly impressive figures in terms of total assets and profits. before tax reported at the end of 2014. Phase two (2015-2016) focuses on building the bank's capacity when core values and competencies are maintained and strengthened, in addition, product and service packages are tailored to each segment. customers, more specifically to improve their competitiveness and better serve the target audience. During this period, ACB's technology platform was also developed by gradually transforming the core system as well as by deploying many IT applications into use. Organizational and operational restructuring is also being implemented. The final phase, which starts in 2017 and will be completed in 2018, focuses on positioning ACB once again as one of the top banks in Vietnam, especially through key metrics. including: customer satisfaction, sustainable financial results, risk management, performance and business ethics.

Our research purpose:
We aim to provide recommendations, via an econometric model, for macro and risk management policies and for building risk management culture at Vietnam commercial banks in order to prevent and control risks better in a changing world with compounding impacts from Covid 19 and trade war. Our suggestion smight be references fro other emerging markets.
We will structure the paper with introduction, research issues, literature review, conceptual theories and methodology. Next is research findings/results. Then we present discussion and conclusion and policy suggestion.

2. Previous studies

2.1. Research questions

We will explore key matters as follow:
Question 1: What are impacts of internal and external macro variables s on market risk measurement of Asia commercial bank (ACB)?
Question 2: What are risk management culture building plans for ACB to reduce potential risks?
There are hypotheses will be checked:Hypothesis 1: Beta CAPM of listed bank (ACB) will increase if inflation increase and it will decrease if GDP growth increases.
Hypothesis 2: If exchange rate decreases (VND appreciation), beta CAPM will decrease.

Hypothesis 3: With the above reasons in Covid 19 and US-China commerce war and low inflation, Beta CAPM of ACB will impose a high risk value or (>) 1.

2.2. Literature review

First, in 3 factor model, Fama and French (2004) mentioned stock return is affected by value and size. Then, Anderson et al. (2005) pointed that beta value on stock exchange will change according to macro indicators such as industrial manufacturing growth index and effects of macro factors large enough to be meaningful. Hojat (2015) said since the outset of the industrial revolution, the equity market has played an instrumental role in the progress of economic production. Singh et al (2010) revealed that exchange rate and GDP seem to affect returns of all portfolios, while inflation rate, exchange rate, and money supply were having negative relationship with returns for portfolios of big and medium companies. Tahmidi et al (2011) said net lending and net borrowing had significant negative effect on market risk premium in Canada, whereas in Germany and Sweden the relationship was not significant.

Next, Ohdner and Zachrison (2016) has presented research results showing that with Beta as risk measurement, investors will demand higher return when holding higher beta stocks, on the announcement date of monetary policies. Adhikari (2015) said based on cross-sectional approach it is revealed that size and profitability are positively associated with the systemic risk, while the dividend payment is negatively related to the risk. The results thus indicate that financial factors have significant predictive power for the systemic risk of a stock investment in Nepal.

Then, Ahmad and Ramzan (2016) stated the macroeconomic factors have important concerns with stocks traded in the stock market and these factors make investors to choose the stock because investors are interested to know about the factors affecting the working of stock to manage their portfolios. Gay (2016) found no significant relationship was found between respective exchange rate and oil price on the stock market index prices of either BRIC country, this may be due to the influence other domestic and international macroeconomic factors on stock market returns. Nawaz et al. (2017) said the consequences of 29 cement industries showed that there is a huge relationship between industry size, operating efficiency, and profitability with 181 systematic risk and results similar to past studies while liquidity and financial leverage have not a significant relationship with beta (systematic risk). Puspitaningtyas (2017) said the financial information is measured in four accounting variables, i.e. financial leverage, liquidity, profitability, and firm size.

Moreover, Curran and Velic (2018) took advantage of global data on stock prices and highly value CAPM model compared to previous models. They show that in the countries with higher level of openness of financial markets, fluctuation in exchange rate and bigger size of economy receive higher systematic covariance. Also there is negative correlation between world reserves and systematic risk. Kola et al (2018) used factors affecting bank profitability such as bank internal factors, industry, and macroeconomic (external) factors. Klimontowiz (2019) provided direction for banks' decision makers concerning innovativeness' factors that should be taken into account in the process of building competitive advantage and sustainable market performance. Sadeghzadeh (2018) found increases of on current ratio, on the ratio of equity capital ratio to tangible assets, on the ratio of own capital to assets, on accounts receivables turnover rate, net profits, on the ratio of equity, the marketing values of companies, on the ratio of book value increased share earnings in a short term and increases of on the ratio of debt to tangible assets and asset turnover decreased share earnings in a short term significantly. Siregar and D. (2019) showed that there is difference of systematic factors influence to stock return in three observation period. Increased market risk and economic growth, increase stock returns. Tahir et al. (2020) found higher availability of private credit in the host country results in lower dividend repatriation. Huy et al. (2020) show that the increase in GDP growth and lending rate and risk free rate has a significant effect on increasing VCB stock price with the highest impact coefficient, the second is decreasing the exchange rate, finally is a slight decrease in S&P500.

Kozaric & Dzelihodzi (2020) confirm the significance of macroeconomic for non-performing loans control and financial stability maintenance. Kruscovic (2020) pointed countries with inflation targeting have a lower grate of economic growth. Masood et al. (2020) said there is significant influence of terrorism activities on financial stock market of five selected countries. Nain et al 92020) found uncertainty influences the effectiveness of monetary policy shock. Rakshit et al (2020) reveal that in India, a higher degree of bank competition is positively as sociated with the prevalence of non-performing loans. Okpamen et al. (2020) said firms needed to encourage adequate interlocking members who have diverse professional training, high social net worth and experience (experience hypothesis) to positively influence effective management and financial performance of listed firms in Nigeria. Pena (2020) mentioned the interferences among some financial, economic and monetary variables are checked as an indicator of economic performance in the long run and for the monetary policy applied between the Great Moderation (GM) of 1987-2001 and the Global Financial Crisis of 2007-2009. Rakotonirainy et al. (2020) stated the horizon of capital prediction shows that banking sector reacts most to a GDP shock.

The below table 1 will summarize previous studies relating to risk management under macro impacts topic:

Table 1. Summarizing 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.
1. Fama-French 3-Factor Model: The empirical evidence from HCM city	Trương Đông Lộc & 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.
2. The econometric model for stock prices in the period 2008-2011 - Case of stock prices ACB, VNIndex, Rf	Đinh Trần Ngọc Huy (2015)	Analyze the impact of VNIndex and internal and external macro variables on the stock price of ACB.
3. The theory of average return of K. Marx and model of capital asset pricing	Nguyễn Thị Hương (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. 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.
6. 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 (summary)	**Authors name**	**Results**
Macro effects on market risk	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. Industrial analysis on stock return	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. Responses from US bank risks	Claudia et al. (2010)	The risk of about a third of US banks increases in response to monetary easing.
4.Macro effects on Pakistan banks	Saeed & Akhter (2016)	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.The case of Istanbul 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 and financial stability	Emilios (2015)	The leverage cycle can cause financial instability and the impact of limited leverage on bank governance performance.
7. Macro effects on 4 countries	Gay (2016)	According to the hypothesis, the relationship between the exchange rate and the security's price should be in the same direction.
8. Liquidity risk and cost inefficiency	Tvaronavičienė et al. (2018)	Liquidity risk and cost inefficiency analysis in leading banks of UK and Germany shows that both, internall and external factors affect banks' performace; external factors in some cases appear to be of crucial importance, and therefore have to be investigated further.
9. Case of German market	Celebi & 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
10. Macro variables effects on Starbucks.	Kumaresan (2019)	Indicates that compared to internal corporate factors, macroeconomic factors (exchange rate) have a greater effect on firm performance.
11. Macroeconomic, Institutional and Bank-Specific Determinants of Non-Performing Loans	Bayar (2019)	Results of the dynamic panel regression analysis showed that economic growth, inflation, economic freedom (institutional development), return on assets and equity, regulatory capital to risk-weighted assets, and noninterest income to total income affected nonperforming loans negatively, while unemployment, public debt, credit growth, lagged values of nonperforming loans, cost to income ratio and financial crises affected nonperforming loans positively
12. Volatility Spillovers between Interest Rates and Equity Markets	Donzwa et al. (2019)	The volatility spillover from interest rates to stock markets are more prominent for the full-sample, as well as the sub-samples covering the pre- and during-Zero Low Bound periods.
13. Liquidity stress test for Indonesian banks	Taruna et al. (2020)	For Indonesian banks, establish significant transmission channels from macroeconomic and idiosyncratic (bank idiosyncratic risks) factors to liquidity runs. By using the macroeconomic scenario transmission, we find the liquidity stress test to be more consistent with the

		solvency stress test.
14. Financial stability	Vucinic (2020)	Stresses out an importance of international cooperation of regulators in order to preserve financial stability in the recent world of technological changes and innovations.
15. Financial Literacy - Indonesia	Tkacova et al. (2018)	Results show that all financial attitudes, behaviour and literacy variables positively affect financial literacy and wellbeing.
16. Macro Stress Testing Credit Risk	Raikotonirainy et al. (2020)	Madagascar banking sector is quite resilient and remains sufficiently capitalized under all macroeconomic scenarios designed with a solvency ratio higher than the minimum regulatory CAR ratio.
17. Capital Flow and Bank Risk Taking Behavior	Rumondor & Bary (2020)	Capital inflows, in the form of portfolio investment, is significant in raising risk-taking behavior. Large banks are less aggressive in their risk-taking behavior vis-à-vis smaller banks.
18. Monetary Base Controllability after an Exit from Quantitative Easing	Tanaka (2020)	If the bank needs to absorb a substantial amount of excess reserves when exiting, the monetary base may become uncontrollable.
19. PBC Financial Strength and Policy	Sun (2020)	Alternative financial strength indicator plays different role in helping the People's Bank of China achieve its alternative policy objectives.
20. Financial vulnerability in Malaysia	Kuek (2020)	Reveal that financial vulnerability shock catalysed significant negative effects on economic activity.

2.4. Methodology

Values of Beta CAPM are calculated from data of stock price on HOSE and HNX stock market during 2015-2020. This is L-inflation time and China-US commerce war. We use analytical and synthesis methods and dialectical materialism method. Analytical data is from the situation of listed bank (ACB) in Vietnam stock exchange.

Analysis of the effects of 9 macro variables on market risk of listed commercial bank, Asia commercial bank (ACB). Weekly data collected from 2015-2020 for ACB 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.

Reasons why we chose these macro factors:
First, we recognize market risk is systemic risk affected by all market indicators and macro factors.
Second, in global financial market, developing economies receive impacts from big economies such as US, China.
Third, Based on our analysis and results, Macro policies and risk management plans are recommended for both Asia commercial ban (ACB), relevant organizations and government.
Total 9 macro variables are described with sources in the below table 2:

Table 2. Variables description (source: author's synthesis from Bureau statistics, commercial banks, HOSE and HNX stock exchange in Vietnam)

Variable name	Sign	Data source	Reference source
Dependent variable			
Market risk (BetaCAPM)	BetaCAPM	HOSE and HNX	Treynor (1962), Sharpe (1964), Lintner (1965), Mossin (1966)
Independent variables			
GDP growth	g	Bureau statistics	Huy et al. (2021)
VNIndex	VNindex	HOSE and HNX	Huy et al. (2020)
Risk free rate	Rf	German market	Celebi & Honig (2019)
Lending rate	r	Istanbul financial market	Arnes (2014)
Exchange rate	Ex_rate	Pakistan financial market	Saeed & Akhter (2016)
S&P500	SP500	NYSE	Huy et al (2020)
BOT(trade balance)	BOT	Bureau statistics	Author synthesis
IM (Industrial manufacturing index)	IM	Bureau statistics	Author synthesis

In the below table, we see statistics for 9 variables. The table indicated that std.deviation of Exchange rate and trade balance and VNIndex with highest values, while std. deviation of CPI, Rf as lowest values (Figure 1).

	BETACAPM	CPI	G	IM	R	RF	VNINDEX	SP500	EX_RATE	BOT
Mean	0.982799	0.027618	0.060609	167.8909	0.095691	0.042000	800.6455	2576.246	22791.45	-60.45455
Median	0.754649	0.028100	0.067600	147.4000	0.100000	0.037000	825.1000	2506.850	22920.00	-100.0000
Maximum	3.374341	0.047400	0.070800	267.2000	0.110000	0.061800	984.2400	3230.780	23230.00	400.0000
Minimum	0.404721	0.006300	0.018100	127.3000	0.080000	0.019500	579.0300	2043.940	21780.00	-500.0000
Std. Dev.	0.825392	0.012590	0.015273	44.01387	0.010825	0.014450	161.5812	416.1722	443.6015	267.7728
Skewness	2.458229	-0.162938	-2.140463	1.322279	-0.137303	0.114349	-0.254721	0.208963	-1.103011	0.573461
Kurtosis	7.810966	2.045666	6.685526	3.491429	1.756312	1.716206	1.437038	1.681378	3.459091	2.763409
Jarque-Bera	21.68694	0.466101	14.62515	3.316126	0.743494	0.779363	1.238592	0.876987	2.327097	0.628561
Probability	0.000020	0.792114	0.000667	0.190508	0.689529	0.677272	0.538323	0.645007	0.312376	0.730314
Sum	10.81079	0.303800	0.666700	1846.800	1.052600	0.462000	8807.100	28338.71	250706.0	-665.0000
Sum Sq. Dev.	6.812718	0.001585	0.002333	19372.21	0.001172	0.002088	261085.0	1731993.	1967823.	717022.7

Figure 1. Descriptive statistics for 9 macro variables (source: data synthesis from Bureau statistics, commercial banks, HOSE and HNX stock exchange in Vietnam)

3. Findings

3.1. Overall Analysis

First we look at the below figure 2, 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.

Correlation Matrix									
	BETACAPM	CPI	G	IM	R	RF	VNINDEX	SP500	EX_RATE	BOT
BETACAPM	1.000000	0.301348	0.040175	0.407736	0.017521	0.071074	0.038443	-0.083222	0.006842	-0.157383
CPI	0.301348	1.000000	0.170563	0.429462	-0.404467	-0.145300	0.410100	0.239791	0.345255	-0.332970
G	0.040175	0.170563	1.000000	0.155701	-0.421321	0.251391	0.236537	-0.176527	-0.008980	-0.118760
IM	0.407736	0.429462	0.155701	1.000000	0.077944	0.117218	0.059045	-0.197708	-0.070142	-0.347985
R	0.017521	-0.404467	-0.421321	0.077944	1.000000	0.664379	-0.914370	-0.747890	-0.770506	-0.454561
RF	0.071074	-0.145300	0.251391	0.117218	0.664379	1.000000	-0.770134	-0.760251	-0.770196	-0.470740
VNINDEX	0.038443	0.410100	0.236537	0.059045	-0.914370	-0.770134	1.000000	0.841551	0.793384	0.563170
SP500	-0.083222	0.239791	-0.176527	-0.197708	-0.747890	-0.760251	0.841551	1.000000	0.775782	0.781213
EX_RATE	0.006842	0.345255	-0.008980	-0.070142	-0.770506	-0.770196	0.793384	0.775782	1.000000	0.502185
BOT	-0.157383	-0.332970	-0.118760	-0.347985	-0.454561	-0.470740	0.563170	0.781213	0.502185	1.000000

Figure 2. Macro external and internal variables correlation matrix

3.2 Empirical Research Findings and Discussion

In the below section, data used are from 2015-2020 with weekly data for stock price of Asian commercial bank (ACB), live data on VN stock exchange. Different scenarios are created by comparing 2 scenarios: macro internal factors impacts and macro external variables effects.

Market risk (beta) under the below model (Figure 3):

Low inflation period 2015-2020	Stock price	Beta CAPM	Other statistic measures	Gap
Internal variables	Scenario	Scenario	Scenario ..	Analysis
External variables				

Figure 3. Calculating market risk under impacts from macro factors in 2 scenarios

Using OLS regression from Eviews, we find out: Balance of trade and SP500 have negative correlation with market risk of ACB while exchange rate has slightly positive correlation with Beta CAPM of ACB (Figure 4).

Dependent Variable: BETACAPM
Method: Least Squares
Date: 01/01/21   Time: 14:40
Sample: 1 11
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BOT	-0.000627	0.001901	-0.329774	0.7512
EX_RATE	0.000235	0.001135	0.206995	0.8419
SP500	-4.43E-05	0.001676	-0.026413	0.9797
C	-4.296450	22.99004	-0.186883	0.8571

R-squared	0.034728	Mean dependent var		0.982799
Adjusted R-squared	-0.378961	S.D. dependent var		0.825392
S.E. of regression	0.969251	Akaike info criterion		3.050701
Sum squared resid	6.576128	Schwarz criterion		3.195390
Log likelihood	-12.77885	F-statistic		0.083946
Durbin-Watson stat	2.625422	Prob(F-statistic)		0.966640

Figure 4. External impacts on Beta CAPM

Looking at the below figure we see internal effects on Beta CAPM of ACB:G and CPI and risk free rate have higher impacts on ACB Beta CAPM, then lending rate rate. If risk free rate increases, market risk will increase (Figure 5).

Dependent Variable: BETACAPM
Method: Least Squares
Date: 01/01/21   Time: 14:46
Sample: 1 11
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CPI	10.30767	41.38333	0.249078	0.8156
G	-5.656530	48.56264	-0.116479	0.9129
IM	0.006252	0.011538	0.541862	0.6167
R	-0.847973	129.9411	-0.006526	0.9951
RF	9.063353	65.33558	0.138720	0.8964
VNINDEX	0.000465	0.007505	0.061982	0.9536
C	-0.680716	17.49729	-0.038904	0.9708

R-squared	0.193698	Mean dependent var		0.982799
Adjusted R-squared	-1.015754	S.D. dependent var		0.825392
S.E. of regression	1.171869	Akaike info criterion		3.416203
Sum squared resid	5.493106	Schwarz criterion		3.669409
Log likelihood	-11.78912	F-statistic		0.160154
Durbin-Watson stat	3.057151	Prob(F-statistic)		0.975154

Figure 5. Internal impacts on Beta CAPM (ACB)

Finally, Looking at the below figure we see internal effects on Beta CAPM of ACB:

We recognize that Trade balance, CPI, Industrial manufacturing have positive correlation or impacts on Beta CAPM, whereas other factors such as Risk free rate, GDP growth, Exchange rate and SP500 and lending rate have negative correlation with market risk (Beta of ACB). When GDP growth increases, beta CAPM of ACB will decreases, it is in favor of our 1st hypothesis above. And if CPI increase the market risk will go up, it is in favor of our 1st hypothesis. If exchange rate decreases (VND appreciation), it will makes market risk increase. It is NOT in favor of our 2nd hypothesis (Figure 6).

Dependent Variable: BETACAPM
Method: Least Squares
Date: 01/01/21   Time: 14:46
Sample: 1 11
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CPI	233.9104	277.0017	0.844437	0.5536
G	-120.6929	185.2058	-0.651669	0.6323
IM	0.001964	0.017724	0.110799	0.9297
R	-273.2131	366.3667	-0.745737	0.5921
RF	-72.76848	210.1528	-0.346265	0.7878
VNINDEX	-0.005350	0.023525	-0.227411	0.8576
SP500	-0.015548	0.016631	-0.934891	0.5214
EX_RATE	-0.001797	0.003307	-0.543452	0.6831
BOT	0.017794	0.020113	0.884680	0.5389
C	117.0860	146.9517	0.796765	0.5717

R-squared	0.571877	Mean dependent var		0.982799
Adjusted R-squared	-3.281235	S.D. dependent var		0.825392
S.E. of regression	1.707830	Akaike info criterion		3.328611
Sum squared resid	2.916684	Schwarz criterion		3.690334
Log likelihood	-8.307361	F-statistic		0.148419
Durbin-Watson stat	3.115738	Prob(F-statistic)		0.971058

4. Discussion for further researches

Other macro factors such as (FDI, public debt, etc.) could be added in order to recommend suitable policies and plans to control market risk better.

In order to enhance risk management culture at ACB, a big listed joint stock commercial bank in Vietnam, we have to consider some following action plans:

Forms and activities of monitoring risk

Risk monitoring is the continuous monitoring and control of activities to ensure achieving goals. It is a process of implementing controls, assessing activities continuously, independent evaluating and reporting results and defects that need to be resolve and overcome.

Monitoring risk in business life can be done periodically or randomly and it will help firms to recognize new risks happening in ongoing business activities. Monitoring risk can be performed at the division, branch levels or from

head quarters and under the form of risk report in which we might analyze risk root causes and suggest preventive or corrective actions, functioned as risk responses and may require changes.

In risk report, we could identify new risks and risk trend, or cost trend and price trend, etc.

Normally, there are two methods of risk monitoring as following:

First, it is continuous monitoring (assessment of KPI business management: turnover, cash, financial indicators, operational statistics, comparison of production, inventory, quality, sales, etc.)

Second, monitoring is done through separate evaluation. The below figure 7 will explain more.
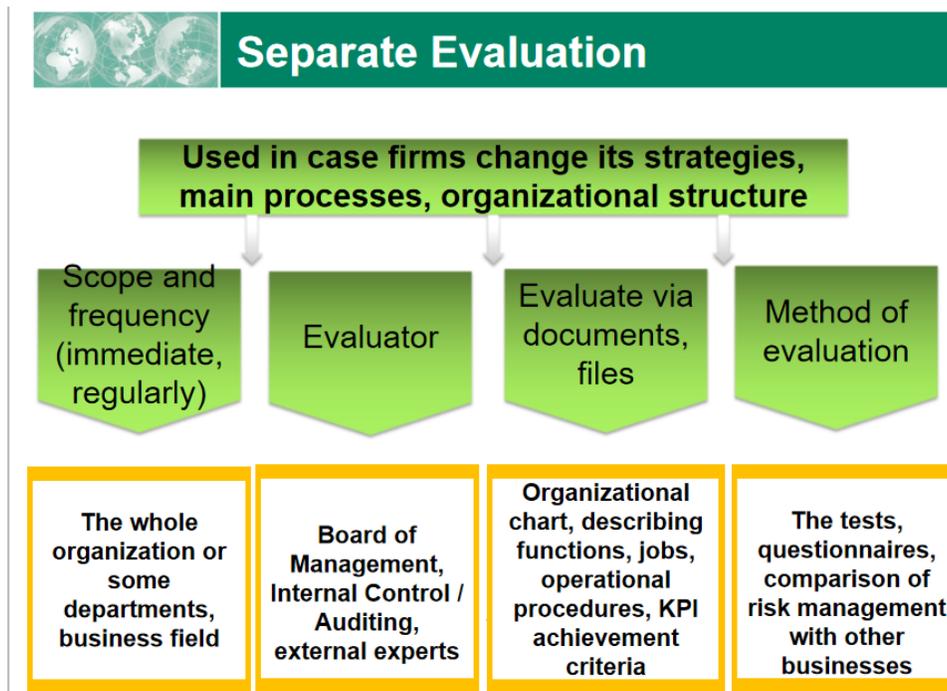
Figure 7. Explanation of Separate Evaluation

5. Conclusion and Policy suggestion

As shown from the above regression model and equation, Goverment and Ministry of Finance need to increase GDP growth and reduce CPI for lower market risk. This research paper provides evidence that the market risk are affected much more by CPI, GDP growth, risk free rate and lending rate. It means that the role of bank system in trying to control credit growth and rates reasonably.

Our model also shows that other macro factors such as VNIndex and exchange rate just have slight impact on Beta CAPM. And macro internal factors have much more effects on market risk of Asia commercial bank (ACB).

Policy implications:

Specifically, for banks and companies listed on Vietnam's stock market, in the context that bank loans tend to reduce since 2018 (see exhibit 1):

- Building a Beta CAPM /market risk measurement model as described above through the stages to monitor risks of key financial services industries including listed banks on Vietnam stock market
- Building a model to analyze the impact of macro variables on Beta CAPM for the financial services sector as described above.
Moreover, 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 the risk volatility and hence, help the bank system as well as the whole economy become more stable in next development stage. 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. The State Bank of Viet Nam continues to increase the effectiveness of capital providing channels for medicine companies as we could note that in this study, debt leverage has certain impacts on reducing risk level.

Risk management culture implications:
- 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
- With the application of macro-variable impact analysis on Beta CAPM, businesses and banks need to develop two risk causation analyzes according to the 5M model as follows (from which proposing solutions to minimize risks): Man-Machine-Method-Material-Money.
Last but not least, we can use DMAIC model combined with Separate evaluation for risk monitoring as shown in the below model (Figure 8):
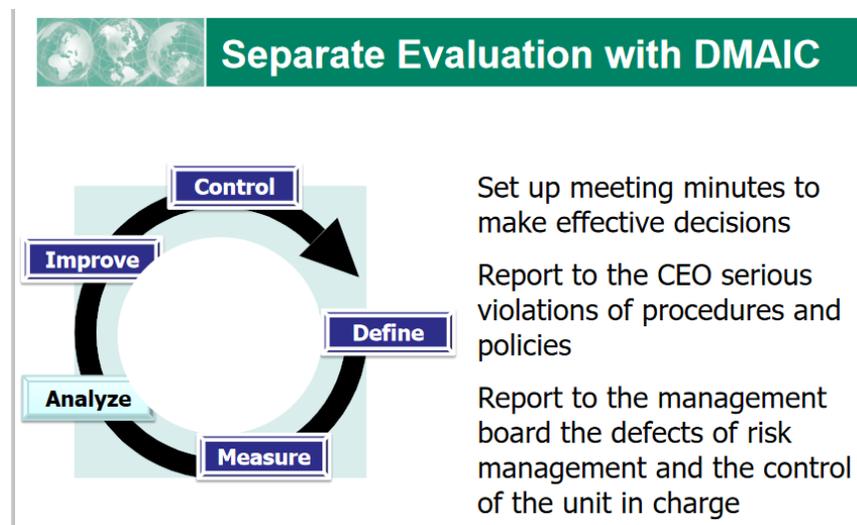

Figure 8. The process of risk monitoring with DMAIC model

Here we refer to the using of Six Sigma DMAIC model to: firstly, define scope of risk monitoring and risk scope; secondly, measure risks and safety of working place and business environment; thirdly, analyze root causes of risk; fourthly, improving and resolving defects after knowing root causes and finally, control or re-evaluation of changes made, whether It is effective or bad.

The role of risk monitoring is presented through risk assessment results sharing, coordination and communication and from that, we could propose proper risk responses and build trust.

Limitation of the research:

Finally, this study opens some new directions for further researches in risk control policies in medicine system as well as in the whole economy. We also can add other factors such as public debt into our model for expanding research. Even we can expand our research model for other Vietnam industries as well as in other emerging markets and all over the world.

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Exhibit

Exhibit 1. Loan/Credit growth rate in the past years (2012-2018) in Vietnam
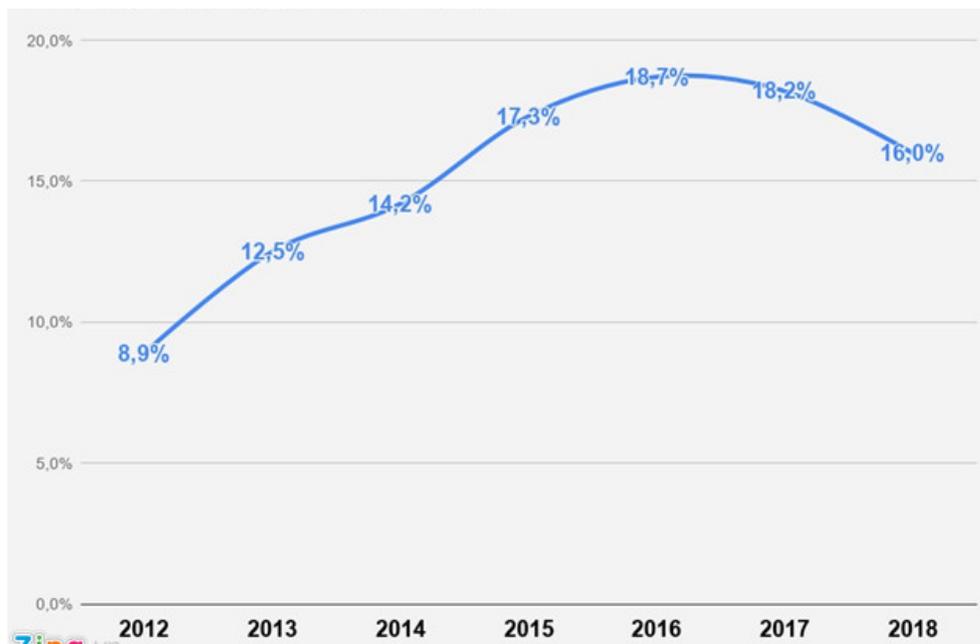
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