Evaluating and Comparing Beta CAPM in 2 Listed Vietnam Banks for Banking Sustainable Development During Period 2011-2020

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Abstract

Authors selected 2 big listed banks Vietcombank and Sacombank in order to calculate market risk and make comparison, in Vietnam financial market.

There are both strengths and weaknesses in risk management processes in commercial banks in emerging markets such as Vietnam. Huy, D.T.N (2015) has done a research to state that risk management and corporate governance standards nee to be enhance in corporations.

Study results tell us that CPI has negative effect and higher impact on beta of both banks (table 3), while Rf has high impact and positive effect on beta of the banks, we suggest relevant governmental agencies need to control CPI (not decrease much) and rates of T-bill (not increase much) in order to reduce market risk.

Finally, we make recommendations on risk management.

Key-words: Risk Management Policies, Sustainability,Vietnam Banks, Beta CAPM.
JEL: M21, G30, G32, G38.

1. Introduction

First, we recognize the relation between risk management and banking sustainability has been rising in recent years.

Until now, There are various approaches in sustainability.

As Uddin and Ahmmed (2018) specified that that in case of Islamic banks, green banking will contribute to sustainability through activities of cost and energy savings, as well as preservation of natural resources.

Ziolo et al (2021) stated that the link between sustainable finance and SDGs which means Sustainable development goals- and authors make sure that social and environmental sustainability are reflected.

Under quantitative and econometric model, beta CAPM of the 2 selected banks VCB and STB calculated and compared under macro effects, both internal and external.

2. Literature Review

First, Arasu et al (2014) found the riles of internet in banking, change of service and their linkage and stated the revolutionized role of internet.

Moreover, Gupta (2019) specified that with support of IS or information system organized, we can help better process of cash management and risk management in many bank functions (HR and finance as well).

And last but not least, Aracil et al (2021) found out there are certain perspectives stating that banks have vital roles and can engage in strategies of sustainability.

Then, We summarize previous studies as follows:

Table 1 – Summary of Previous Studies

Authors	Year	Contents, results
Karim	2011	Stated that in order to achieve decision making, in our firms we need Management Information Systems (MIS) to facilitate it.
Giebe et al	2019	There is a good tool considered as Big data and analytics which can help banks in offering products/services
Feitosa et al	2019	We can change in client relation and employee skills, as well as structure of organization though Disruptive technologies.
Huy, D.T.N	2015	Stated that we can apply risk management standards parallel with other corporate governance standards in companies
Gonzalez et al	2018	mentioned in a MIDAS frame which show that mixed and conditional beta, from that we can calculate beta determinants from macro context..

3. Methodology

Method and Data

This study explores 2 real case studies in banking industry in Vietnam : Vietcombank and Sacombank, from a risk management approach.

OLS regression sill has advantage in quantitative so we use it to run for data from reliable sources such as bank system and statistics Bureau.

We Recognize From Below Figures that:

- We experience standard dev get highest values in case of exchange rate and SP500 (figure 1).
- We experience Correlation b.t SP500 and beta higher than that between beta and exchange rate (figure 2).
- Highest values of standard deviation belong to: VNIndex (figure 3).
- Correlation between IM and beta higher than that between beta and GDP growth (figure 4).

Figure 1 - STB and External Descriptive

	BETA_STB	EX_RATE	SP500	TRADEBA...
Mean	0.811000	22394.20	2245.493	-75.16000
Median	0.845000	22700.00	2138.720	-125.0000
Maximum	2.650000	23230.00	3703.060	498.0000
Minimum	-0.180000	20618.00	1292.280	-1162.000
Std. Dev.	0.600736	837.4044	685.2655	402.1636
Skewness	1.124974	-0.853154	0.363508	-0.667135
Kurtosis	5.686445	2.379814	2.307065	3.848882
Jarque-Bera	10.23271	2.746765	0.840594	2.084063
Probability	0.005998	0.253249	0.656852	0.352737
Sum	16.22000	447884.0	44909.86	-1503.200
Sum Sq. Dev.	6.856780	13323677	8922186.	3072975.

(source: authors calculation and stock exchange)

Figure 2 - STB and External Correlation

Correlation Matrix				
	BETA_STB	EX_RATE	SP500	TRADEBA...
BETA_STB	1.000000	0.309737	0.504187	0.327839
EX_RATE	0.309737	1.000000	0.720764	0.048661
SP500	0.504187	0.720764	1.000000	0.375157
TRADEBA...	0.327839	0.048661	0.375157	1.000000

(source: authors calculation and stock exchange)

Figure 3 – STB and Internal Descriptive

	BETA_STB	CPI	G	IM	R	RF	VNIINDEX
Mean	0.811000	0.049970	0.057150	162.0550	0.112630	0.055213	680.2135
Median	0.845000	0.035350	0.059700	150.4000	0.102500	0.059850	606.6300
Maximum	2.650000	0.181300	0.070800	267.2000	0.190000	0.132000	1067.500
Minimum	-0.180000	0.006300	0.018100	117.4000	0.080000	0.012200	351.5500
Std. Dev.	0.600736	0.045765	0.013917	36.96982	0.030423	0.027599	226.7034
Skewness	1.124974	1.928654	-1.442505	1.394427	1.349477	0.911109	0.267939
Kurtosis	5.686445	5.913603	4.632589	4.628737	4.016835	4.234518	1.664441
Jarque-Bera	10.23271	19.47325	9.157194	8.692074	6.931922	4.037095	1.725736
Probability	0.005998	0.000059	0.010269	0.012958	0.031243	0.132848	0.421950
Sum	16.22000	0.999400	1.143000	3241.100	2.252600	1.104250	13604.27
Sum Sq. Dev.	6.856780	0.039794	0.003680	25968.59	0.017586	0.014472	976494.2

(source: authors calculation and stock exchange)

Figure 4 - STB and Internal Correlation

Correlation Matrix							
	BETA_STB	CPI	G	IM	R	RF	VNIINDEX
BETA_STB	1.000000	-0.422385	0.031546	0.372003	-0.390622	-0.464372	0.581177
CPI	-0.422385	1.000000	0.038007	0.184050	0.547153	0.603133	-0.554246
G	0.031546	0.038007	1.000000	0.244021	-0.040216	0.068575	0.012915
IM	0.372003	0.184050	0.244021	1.000000	0.128743	-0.019349	0.052526
R	-0.390622	0.547153	-0.040216	0.128743	1.000000	0.484905	-0.790059
RF	-0.464372	0.603133	0.068575	-0.019349	0.484905	1.000000	-0.804579
VNIINDEX	0.581177	-0.554246	0.012915	0.052526	-0.790059	-0.804579	1.000000

(source: authors calculation and stock exchange)

Figure 5 - VCB and External Descriptive

	BETA_VCB	EX_RATE	SP500	TRADEBA...
Mean	1.044750	22394.20	2245.493	-75.16000
Median	1.076500	22700.00	2138.720	-125.0000
Maximum	2.099000	23230.00	3703.060	498.0000
Minimum	0.078000	20618.00	1292.280	-1162.000
Std. Dev.	0.518725	837.4044	685.2655	402.1636
Skewness	-0.097695	-0.853154	0.363508	-0.667135
Kurtosis	2.638444	2.379814	2.307065	3.848882
Jarque-Bera	0.140750	2.746765	0.840594	2.084063
Probability	0.932044	0.253249	0.656852	0.352737
Sum	20.89500	447884.0	44909.86	-1503.200
Sum Sq. Dev.	5.112432	13323677	8922186.	3072975.

(source: authors calculation and stock exchange)

Figure 6 - VCB and External Correlation

Correlation Matrix				
	BETA_VCB	EX_RATE	SP500	TRADEBA...
BETA_VCB	1.000000	0.069274	0.113225	0.117981
EX_RATE	0.069274	1.000000	0.720764	0.048661
SP500	0.113225	0.720764	1.000000	0.375157
TRADEBA...	0.117981	0.048661	0.375157	1.000000

(source: authors calculation and stock exchange)

Figure 7 - VCB and Internal Descriptive

	BETA_VCB	CPI	G	IM	R	RF	VNIINDEX
Mean	1.044750	0.049970	0.057150	162.0550	0.112630	0.055213	680.2135
Median	1.076500	0.035350	0.059700	150.4000	0.102500	0.059850	606.6300
Maximum	2.099000	0.181300	0.070800	267.2000	0.190000	0.132000	1067.500
Minimum	0.078000	0.006300	0.018100	117.4000	0.080000	0.012200	351.5500
Std. Dev.	0.518725	0.045765	0.013917	36.96982	0.030423	0.027599	226.7034
Skewness	-0.097695	1.928654	-1.442505	1.394427	1.349477	0.911109	0.267939
Kurtosis	2.638444	5.913603	4.632589	4.628737	4.016835	4.234518	1.664441
Jarque-Bera	0.140750	19.47325	9.157194	8.692074	6.931922	4.037095	1.725736
Probability	0.932044	0.000059	0.010269	0.012958	0.031243	0.132848	0.421950
Sum	20.89500	0.999400	1.143000	3241.100	2.252600	1.104250	13604.27
Sum Sq. Dev.	5.112432	0.039794	0.003680	25968.59	0.017586	0.014472	976494.2

(source: authors calculation and stock exchange)

Figure 8 - VCB and Internal Correlation

| Correlation Matrix							
	BETA_VCB	CPI	G	IM	R	RF	VNIINDEX
BETA_VCB	1.000000	-0.498026	0.160240	-0.049414	-0.152501	-0.161188	0.132064
CPI	-0.498026	1.000000	0.038007	0.184050	0.547153	0.603133	-0.554246
G	0.160240	0.038007	1.000000	0.244021	-0.040216	0.068575	0.012915
IM	-0.049414	0.184050	0.244021	1.000000	0.128743	-0.019349	0.052526
R	-0.152501	0.547153	-0.040216	0.128743	1.000000	0.484905	-0.790059
RF	-0.161188	0.603133	0.068575	-0.019349	0.484905	1.000000	-0.804579
VNIINDEX	0.132064	-0.554246	0.012915	0.052526	-0.790059	-0.804579	1.000000

(source: authors calculation and stock exchange)

4. Main Results
4.1 Overall Results
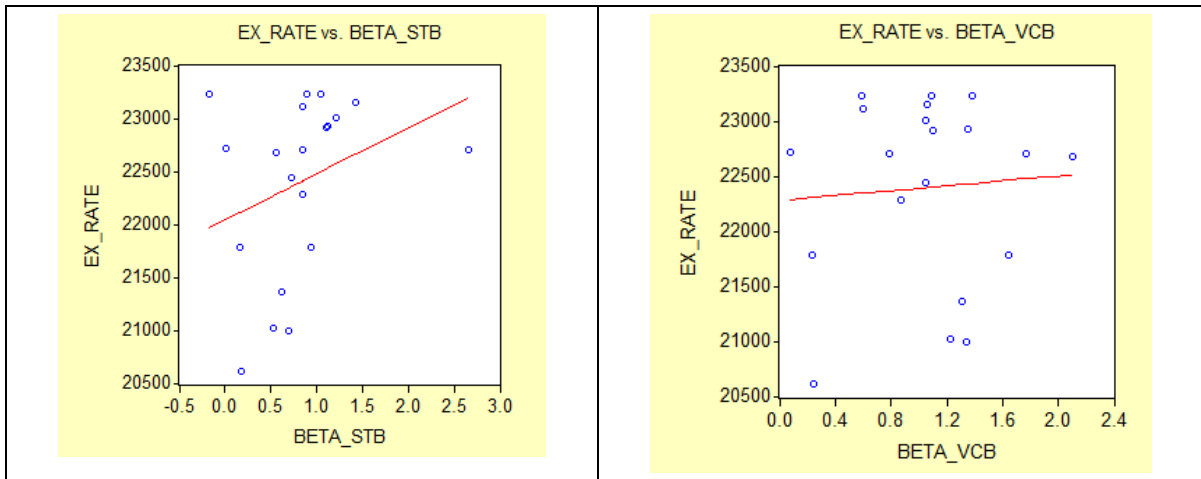
As seeing in below charts, we find that:

- Between CPI and beta: there is negative relation (chart 1).

- Between exchange rate, G and beta : there are positive relation (chart 2 and 3).

- Between VNIndex and beta: there is also positive relation (chart 6).

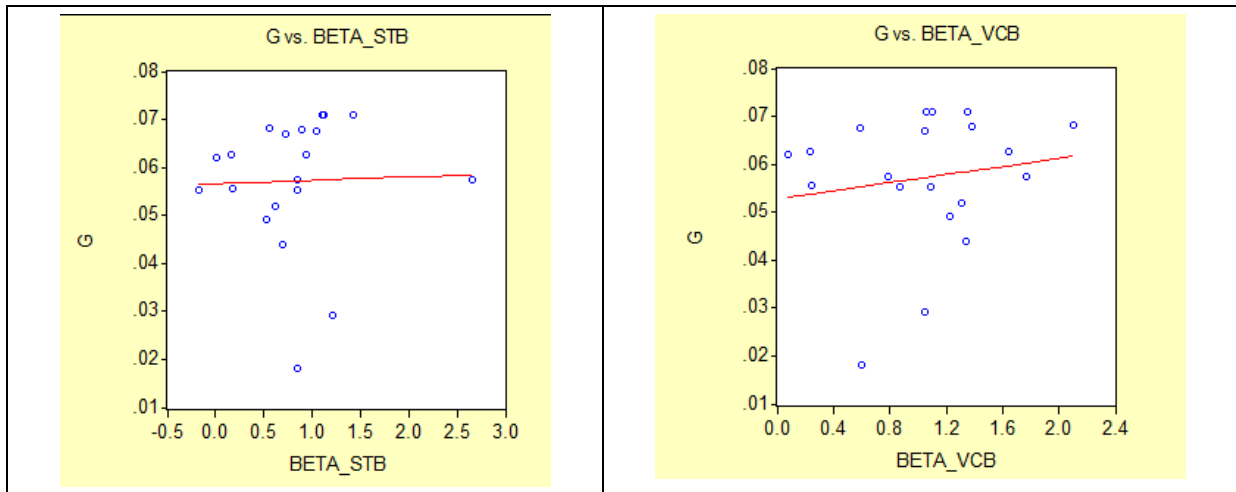Chart 1 - CPI and Beta of 2 Banks
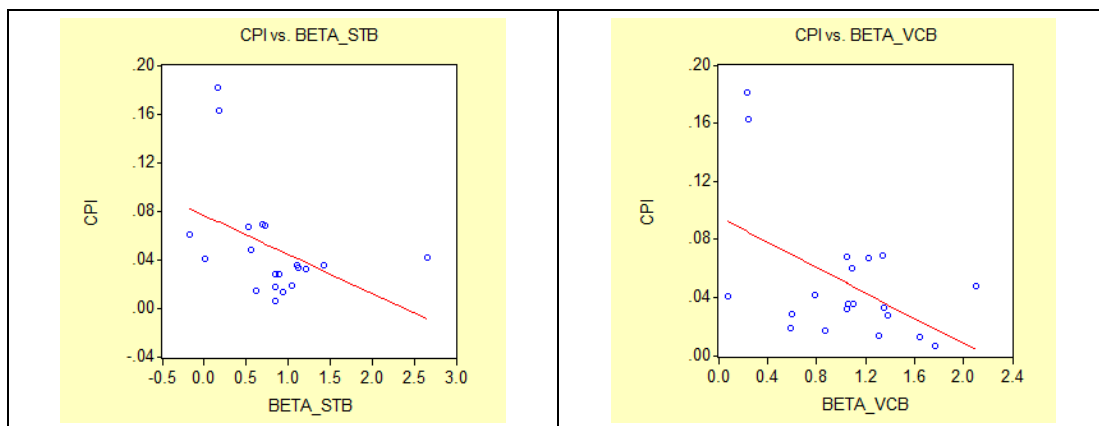
(source: authors calculation and stock exchange)

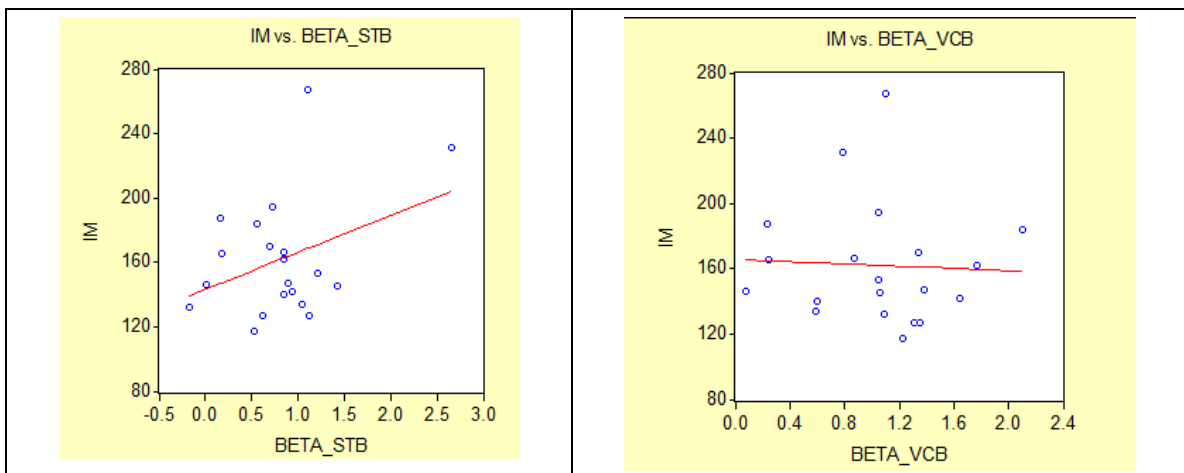Chart 2 - Exchange Rate and Beta of 2 Banks

(source: authors calculation and stock exchange)
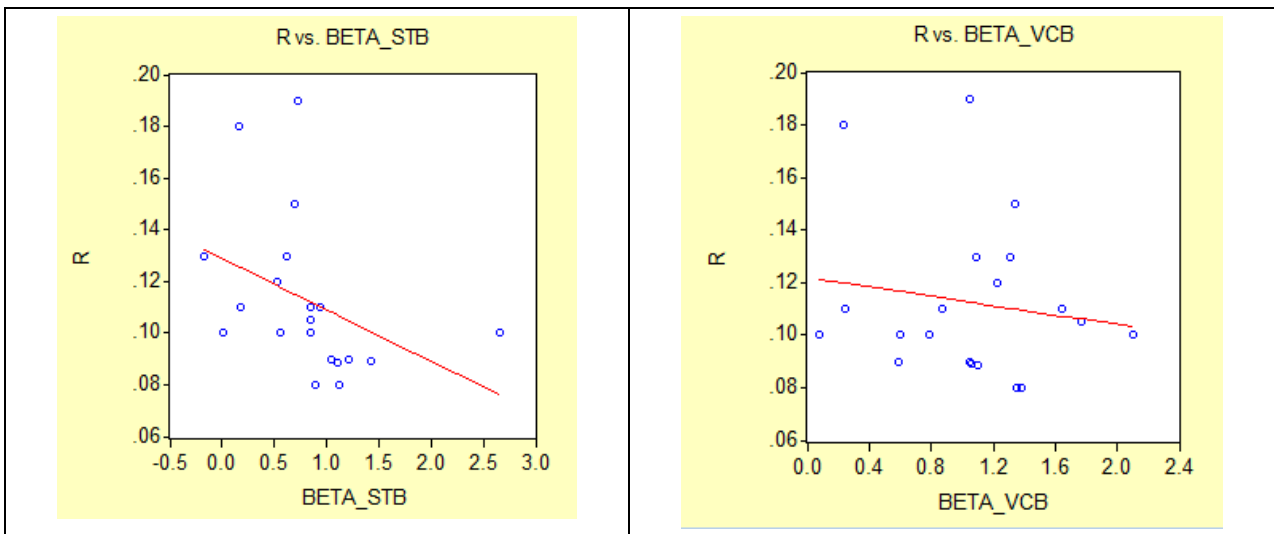
Chart 3 - G and Beta of 2 Banks

(source: authors calculation and stock exchange)
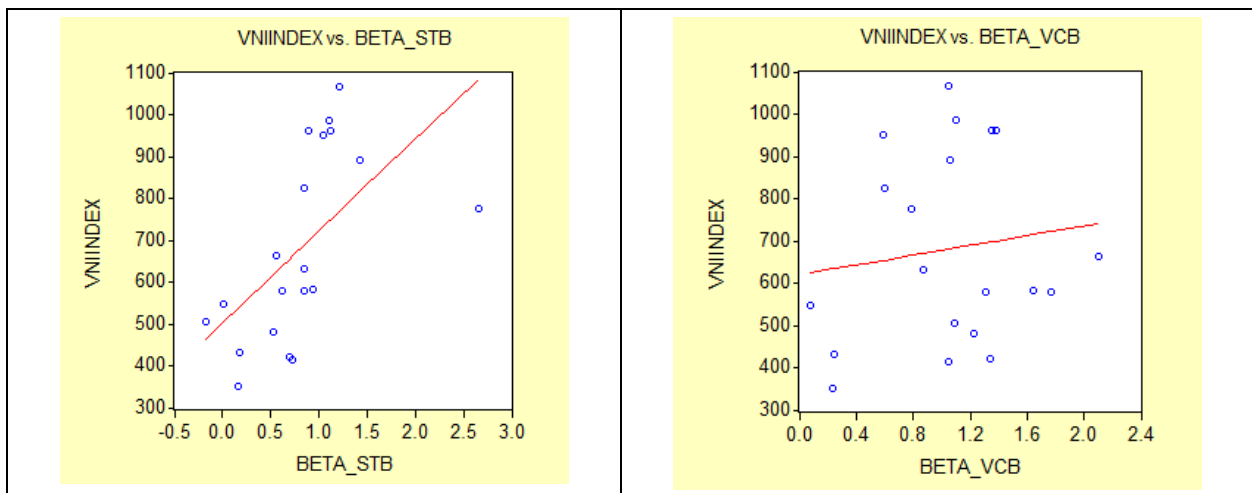
Chart 4 - IM and Beta of 2 Banks

(source: authors calculation and stock exchange)

Chart 5 - R and Beta of 2 Banks

(source: authors calculation and stock exchange)

Chart 6 - VNIndex and Beta of 2 Banks

(source: authors calculation and stock exchange)

4.2 OLS Regression Results

In below section, we have result of OLS for 1 factor and see that:

- Because coefficient calculated of -7.7, R and beta STB has negative correlation (see figure 9).

- Because coefficient calculated of 0.006, IM and beta STB has positive correlation (see figure 10).

- Because coefficient calculated of 0.001, VNIndex and beta STB has positive correlation (see figure 11).

- Because coefficient calculated of -2.9, and -7.2, CPI, Rf and beta STB has negative correlation (see figure 12).

Figure 9 - STB – 1 Factor OLS - R

```
Dependent Variable: BETA_STB
Method: Least Squares
Date: 07/27/21   Time: 15:52
Sample: 1 20
Included observations: 20
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.
R	-7.713267	4.284428	-1.800303	0.0886
C	1.679745	0.498999	3.366231	0.0034
R-squared	0.152586	Mean dependent var		0.811000
Adjusted R-squared	0.105507	S.D. dependent var		0.600736
S.E. of regression	0.568161	Akaike info criterion		1.801817
Sum squared resid	5.810532	Schwarz criterion		1.901390
Log likelihood	-16.01817	F-statistic		3.241090
Durbin-Watson stat	1.964316	Prob(F-statistic)		0.088595

(source: authors calculation and stock exchange)

Figure 10 - STB – 1 Factor OLS - IM

```
Dependent Variable: BETA_STB
Method: Least Squares
Date: 07/27/21   Time: 15:52
Sample: 1 20
Included observations: 20
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IM	0.006045	0.003555	1.700301	0.1063
C	-0.168590	0.590198	-0.285650	0.7784
R-squared	0.138386	Mean dependent var		0.811000
Adjusted R-squared	0.090518	S.D. dependent var		0.600736
S.E. of regression	0.572902	Akaike info criterion		1.818435
Sum squared resid	5.907898	Schwarz criterion		1.918008
Log likelihood	-16.18435	F-statistic		2.891023
Durbin-Watson stat	1.830374	Prob(F-statistic)		0.106288

(source: authors calculation and stock exchange)

Figure 11 - STB – 1 Factor OLS - VnIndex

Dependent Variable: BETA_STB
Method: Least Squares
Date: 07/27/21   Time: 15:52
Sample: 1 20
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
VNIINDEX	0.001540	0.000508	3.029979	0.0072
C	-0.236561	0.363516	-0.650757	0.5234

R-squared	0.337767	Mean dependent var		0.811000
Adjusted R-squared	0.300976	S.D. dependent var		0.600736
S.E. of regression	0.502261	Akaike info criterion		1.555245
Sum squared resid	4.540785	Schwarz criterion		1.654818
Log likelihood	-13.55245	F-statistic		9.180771
Durbin-Watson stat	2.226125	Prob(F-statistic)		0.007200

(source: authors calculation and stock exchange)

Figure 12 - STB – 3 Factors OLS - CPI, G and Rf

Dependent Variable: BETA_STB
Method: Least Squares
Date: 07/27/21   Time: 15:53
Sample: 1 20
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CPI	-2.931674	3.559660	-0.823583	0.4223
G	2.716801	9.359109	0.290284	0.7753
RF	-7.269774	5.912357	-1.229590	0.2366
C	1.203613	0.592602	2.031066	0.0592

R-squared	0.251414	Mean dependent var		0.811000
Adjusted R-squared	0.111054	S.D. dependent var		0.600736
S.E. of regression	0.566397	Akaike info criterion		1.877814
Sum squared resid	5.132889	Schwarz criterion		2.076960
Log likelihood	-14.77814	F-statistic		1.791210
Durbin-Watson stat	2.051907	Prob(F-statistic)		0.189374

(source: authors calculation and stock exchange)

Next We Run OLS and Got Results in 2 below Tables

Table 2 - OLS for External Factors

	Coefficient	
	Beta STB	Beta VCB
Exchange rate	-3.03E	1.05E
SP500	0.0004	5.03E
Trade balance	0.0002	0.0001
C	0.56	0.7
SER	0.55	0.55
Akaike info criteria	1.84	1.85

(source: authors calculation and stock exchange)

Table 3 - OLS for Internal Factors

	Coefficient	
	Beta STB	**Beta VCB**
CPI	-4.5	-7.8
G	-2.9	6.5
IM	0.006	0.0002
R	3.8	2.5
Rf	5.1	3.3
VNIndex	0.001	1.21E
C	-1.8	0.5
R-squared	0.51	0.32
SER	0.5	0.51
Akaike info criteria	1.73	1.78

(source: authors calculation and stock exchange)

5. Discussion

During Period 2011-2020

From internal element approach for STB and VCB we see R and RF have positive correlation with beta for both banks, and from external element approach study shows, SP500 and trade balance have positive correlation with beta of 2 banks.

Next,we see that CPI has negative effect and higher impact on beta of both banks (table 3), while Rf has high impact and positive effect on beta of the banks.

6. Conclusion

Therefore we can have implications for policies as below:

As CPI has negative effect and higher impact on beta of both banks (table 3), while Rf has high impact and positive effect on beta of the banks, we suggest relevant agencies need to control CPI (not decrease much) and rates of T-bill (not increase much) in order to reduce market risk.

Build Better Risk Management Information System (RMIS) Implications

Macro risk is a type of political risk that affects all businesses operating in the same country, whether they are domestic or foreign. In this paper, we emphasizes on analysis of macro effects on beta - market risk of banks.

So banks need to evaluate proper scenarios of macro situation on market risk.

Limitation of Research

We can expand our research model for other industries and other markets.

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