



## ANAYSIS OF IMPACTS OF A SIX FACTOR MODEL CASE ON EIB STOCK PRICE IN COMMERCIAL BANKING INDUSTRY IN VIETNAM -- AND ROLES OF IT SECURITY AND RISK MANAGEMENT

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### ABSTRACT

During Covid 19 we need to recognize role of risk management including IT security and financial risk management. Risk can reflex in Fluctuation of stock price in commercial banks in developing countries such as Vietnam, which will reflect the business health of bank system and the whole economy. Good business management requires us to consider the impacts of multi macro factors on stock price, and it contributes to promoting business plan and economic policies for economic growth and stabilizing macroeconomic factors. By data collection method through statistics, analysis, synthesis, comparison, quantitative analysis to generate qualitative comments and discussion; using econometric method to perform regression equation and evaluate quantitative results, the article analyzed and evaluated the impacts of six (6) macroeconomic factors on stock price of a joint stock commercial bank, Eximbank (EIB) in Vietnam in the period of 2014-2019, both positive and negative sides. The results of quantitative research, in a seven factor model, show that the increase in Risk free rate has a significant effect on increasing EIB stock price with the highest impact coefficient, the second is decreasing CPI and lending rate. This research finding and recommended policy also can be used as reference in policy for commercial bank system in many developing countries. We also recommend some plans to deal with risk management and IT security in this industry.

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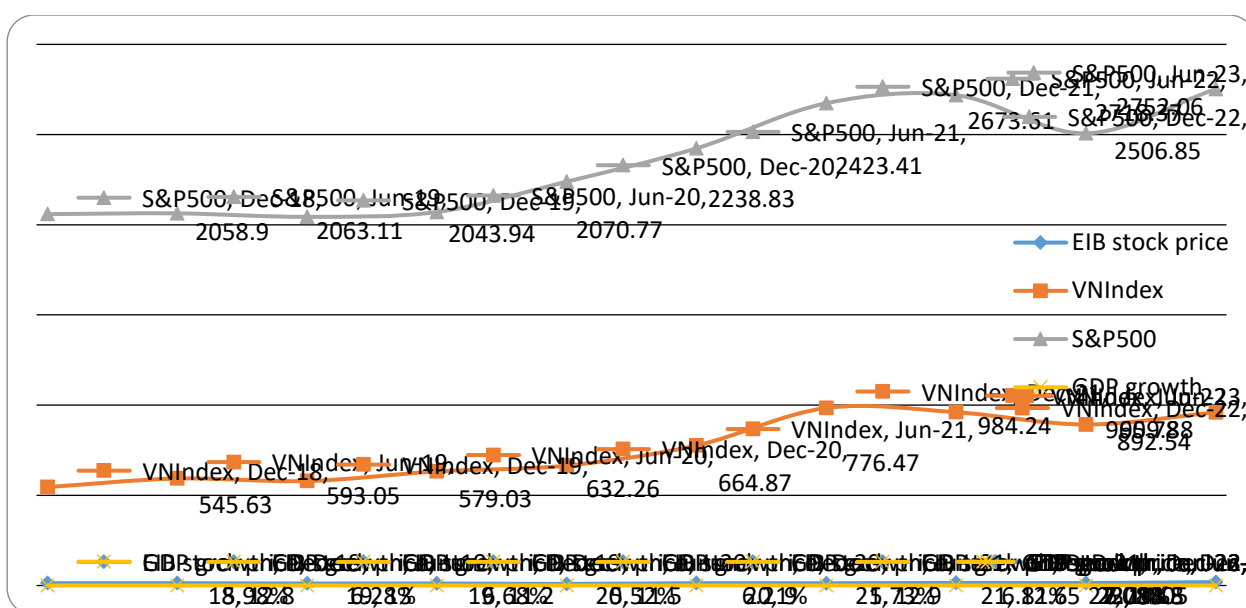
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## INTRODUCTION

Eximbank is considered as one of the professional banks in information disclosure, promoting transparency and high efficiency in operations. The bank is also aware of the role of a business in information disclosure. Especially when Eximbank has its stocks listed on the stock exchange. Therefore, EIB shares are interested and appreciated by investors, because of the Bank's liquidity and sustainable development. In recent years, although the market has had certain difficulties, the operation of the industry has faced difficulties since the global financial crisis occurred and the negative balance has lasted until now, but Eximbank is not only confident to overcome challenges but also gradually asserted itself in the

Vietnam financial market. Commercial bank system in Vietnam in recent years plays a key role in helping the whole economy. In the context that GDP growth in Vietnam has been increasing during 2014-2019 and CPI goes down and up and Vietnam stock market has been growing much, it is necessary to evaluate impacts of seven (7) internal and external macro economic factors on bank performance, esp. bank stock price. From these analytical results, we could suggest bank and government policies to encourage and stabilize the growth of bank system and stock market in developing countries such as Vietnam. Looking at the below chart, we find out that Eximbank (EIB) stock price moves in the same trend with VN Index and GDP growth, although it fluctuates in a smaller range.



This study will calculate and figure out the impacts of seven (7) macro economic factors such as inflation, GDP growth, market interest rate, risk free rate, VN Index, S&P500 and exchange rate on Eximbank stock price (EIB).

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

## Body of manuscript

### Research issues

The scope of this study will cover:

Issue 1: What are the correlation and relationship among many economic factors: EIB stock price, interest rate, exchange rate, inflation, VN Index, S&P 500 and GDP growth?

Issue 2: What are the impacts of above 7 macro economic factors on Eximbank stock price?

Issue 3: Based on above discussion, we recommend some solutions regarding to commercial bank management in incoming period.

This paper also tests two (2) below hypotheses:

Hypothesis 1: An increase in lending rate will make EIB stock price declines.

Hypothesis 2: An increase in inflation can increase pressure in EIB stock price.

### Literature review

Lina (2012) indicated that both the change of inflation rate and the growth rate of money supply (M2) are positive but insignificant to the banking industry stock return, the exchange rate is positive and significant to banking industry stock return and interest rate is negative and significant to banking industry stock return. Next, Sadia and Noreen (2012) found out exchange rate, and Short term Interest Rate have significant impact on Banking

index. Macroeconomic variables like Money Supply, Exchange Rate, Industrial Production, and Short Term Interest Rate affects the banking index negatively where as Oil prices has a positive impact on Banking index.

Manisha and Shikha (2014) stated that Exchange rate, Inflation, GDP growth rate affect banking index positively whereas Gold prices have negative impact on BSE Bankex but none of them have significant impact on Bankex. Then, Winhua and Meiling (2014) confirmed that macroeconomic do have a substantial influence to the earning power of commercial banks.

Krishna (2015) investigated the nature of the causal relationships between stock prices and the key macro economic variables in BRIC countries. The empirical evidence shows that long-run and short-run relationship exists between macro economic variables and stock prices, but this relationship was not consistent for all of the BRIC countries. And Kulathunga (2015) suggested that all macroeconomic factors influence the stock market development. More precisely, volatile inflation rate and exchange rate together with higher deposit rate have curtailed the stock market development in Sri Lanka. Moreover, positive optimism created by the economic growth and the stock market performance during the previous periods tend to enhance stock market performance. Moreover, Duy (2015) mentioned through the evolution of interest rates and the VNI could see that the relationship between these two variables in the period 2005-2014 is the opposite. This relationship is shown in specific periods of the year the stock market proved quite sensitive to interest rates. When interest rates are low or high but the bearish stock market rally, and vice versa when the high interest rates the stock market decline.

Last but not least, Quy and Loi (2016) found that 3 economic factors (inflation rate, GDP growth rate, and exchange rate) impact significantly on real estate stock prices; but the relationship between 10-year Government bond yield and trading volume, and real estate stock prices was not found. 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. Abrupt variations and unusual movements of macroeconomic variables cause the stock returns to fluctuate due to uncertainty of future gains.

Until now, many researches have been done in this field, however, they just stop at analyzing internal macroeconomic factors on stock price.

Within the scope of this paper, we measure impacts of both internal and external macro factors on Eximbank stock price and suggest policies for bank system, Vietnam government, Ministry of Finance, State Bank and relevant government bodies. We also analyze data through out time series from 2014-2019.

## Methodology and data

This research paper establishes correlation among macro economic factors by using an econometric model to analyze impacts of seven (7) macro economic factors in Vietnam such as: GDP growth, inflation, interest rate, exchange rate,... on Eximbank (EIB) stock price.

In this research, analytical method is used with data from the economy such as inflation in Vietnam and market interest rate, GDP growth rate, exchange rate (USD/VND). Data are included from 2014 - 2019 with semi-annual data (10 observations in total). Data is estimated based on exchange rate and lending interest rates of commercial banks such as: Vietcombank, BIDV, Agribank, Vietinbank... (average calculation). S&P 500 index data is from USA Stock exchange, data source (inflation, GDP) is from Bureau of Statistics. Beside, econometric method is used with the software Eview. It will give us results to suggest policies for businesses and authorities.

We build a regression model with Eview software to measure impacts of factors. Eximbank stock price is a function with 6 variables as follows:

$$Y (\text{EIB stock price}) = f (x_1, x_2, x_3, x_4, x_5, x_6, x_7) = ax_1 + bx_2 + cx_3 + dx_4 + ex_5 + fx_6 + k$$

With:  $x_1$  : GDP growth rate (g),  $x_2$  : inflation,  $x_3$ : VNIndex,  $x_4$ : lending rate,  $x_5$ : risk free rate (Rf),  $x_6$ : USD/VND rate

Beside, this paper also uses analytical and general data analysis method to measure and generate comments on the results, then suggest policies based on these analyses.

## Main results

### General data analysis

First of all, The below chart 1 shows us that Y has a positive correlation with GDP growth:

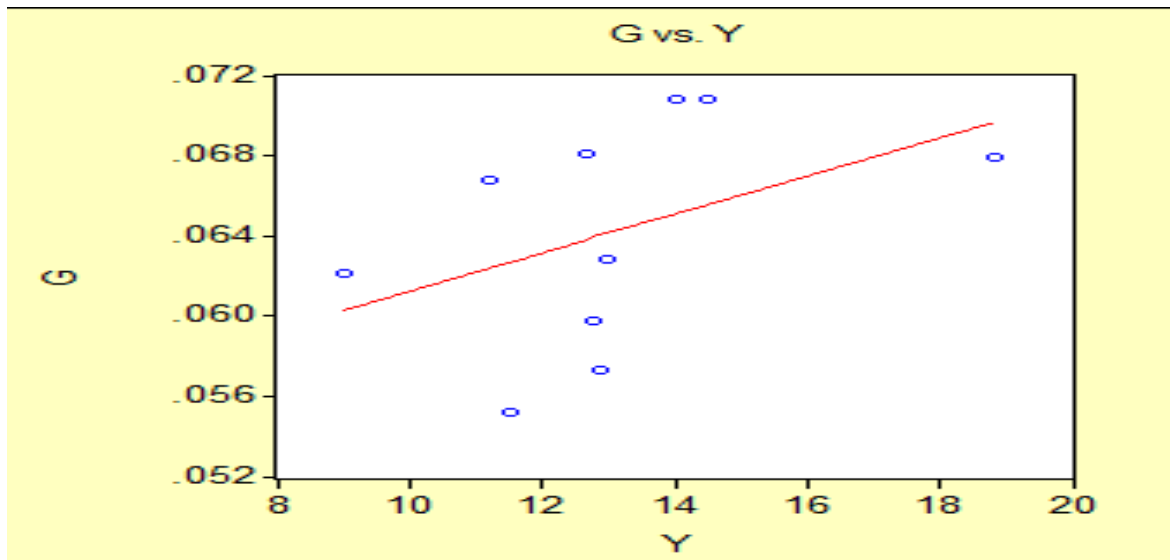


Chart 1 – EIB stock price (Y) vs. GDP growth in Vietnam (G)

Next we find out that, based on the below scatter chart, Y (VCB stock price) has slightly positive correlation with inflation (CPI).

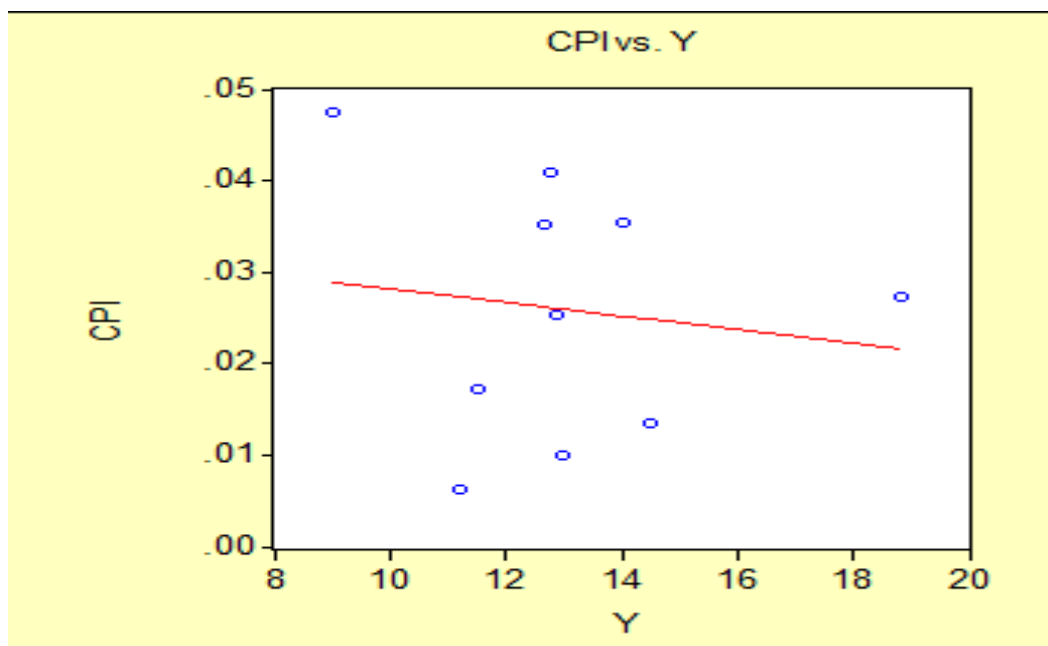


Chart 2 – EIB stock price (Y) vs. Inflation (CPI)

Looking at the below chart 3, we also recognize that BIDV stock price (Y) and VNIndex have positive correlation.

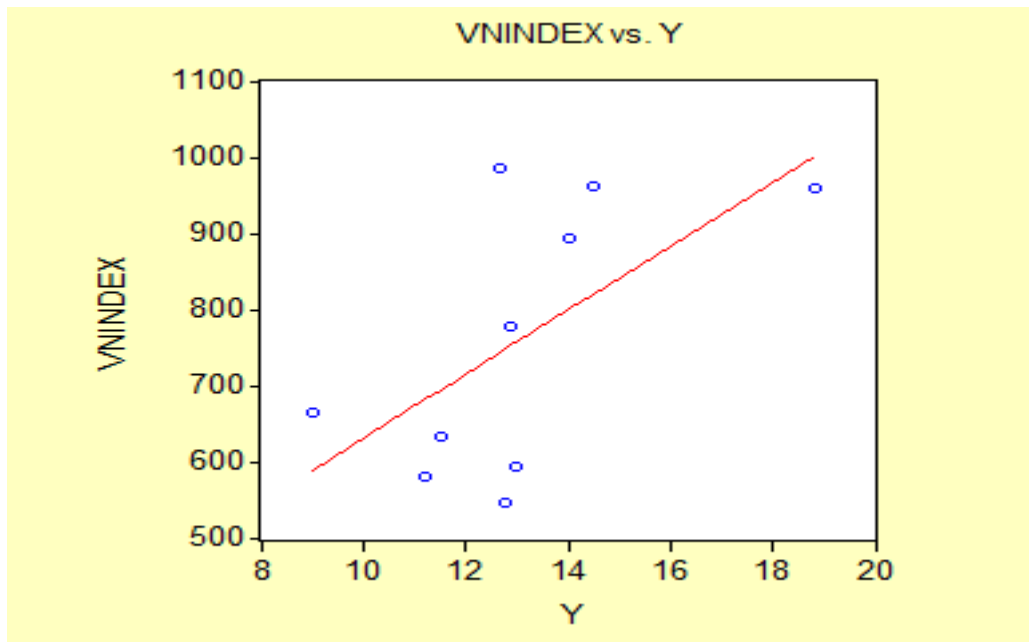


Chart 3 – Y vs. VNIndex

We see that, EIB stock price (Y) and lending rate have negative correlation:

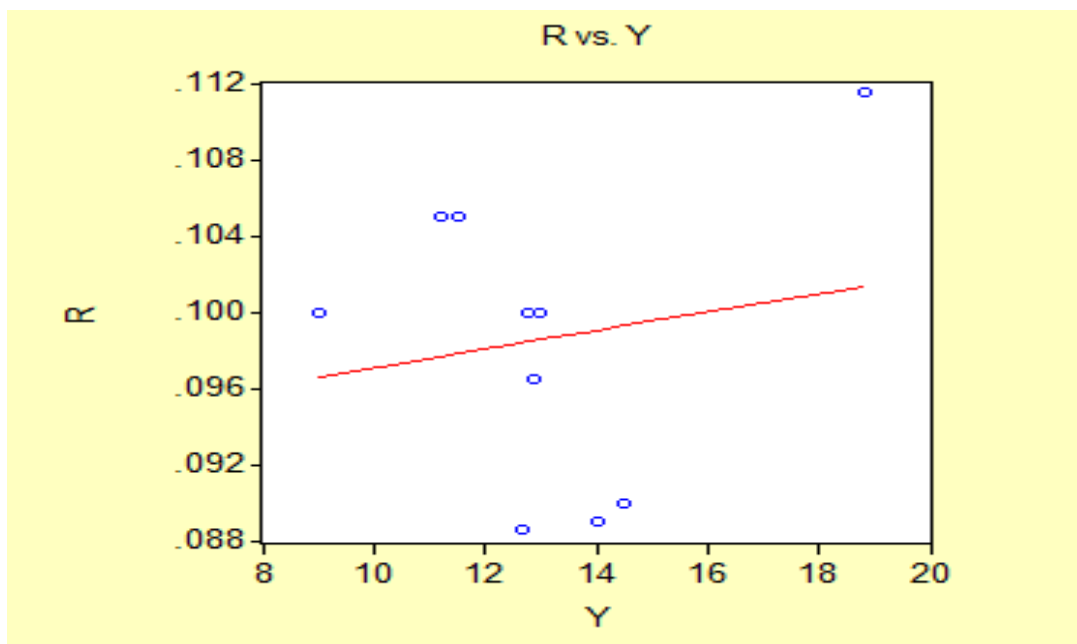


Chart 4 – Y vs. Lending rate (r)

In addition to, the below scatter graph shows us that BIDV stock price (Y) and risk free rate (Rf) also have negative correlation.

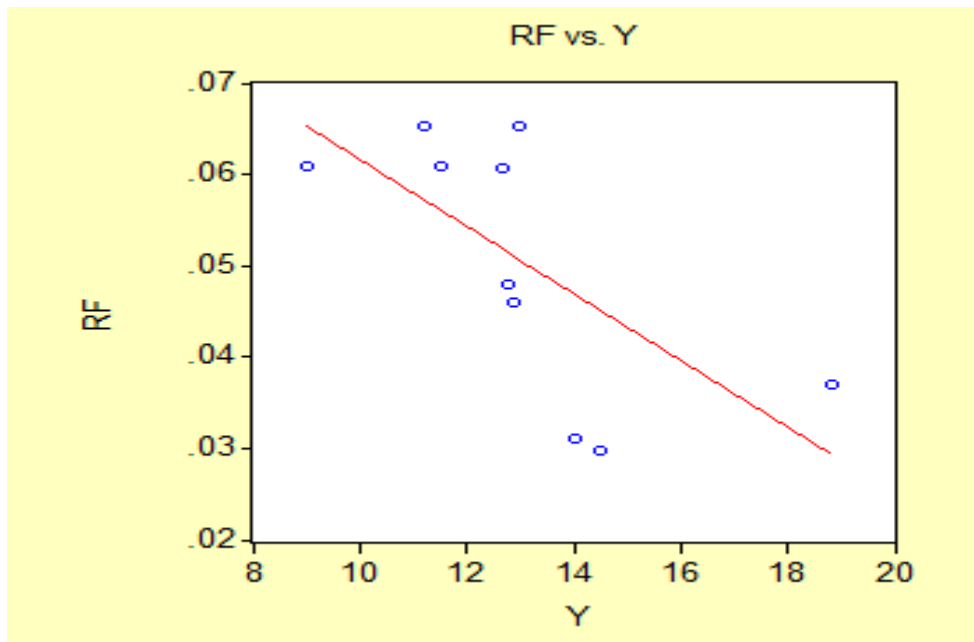


Chart 5 – Y vs. Risk free rate (Rf)

The below chart 6 shows us that Y and USD/VND rate have a positive correlation.

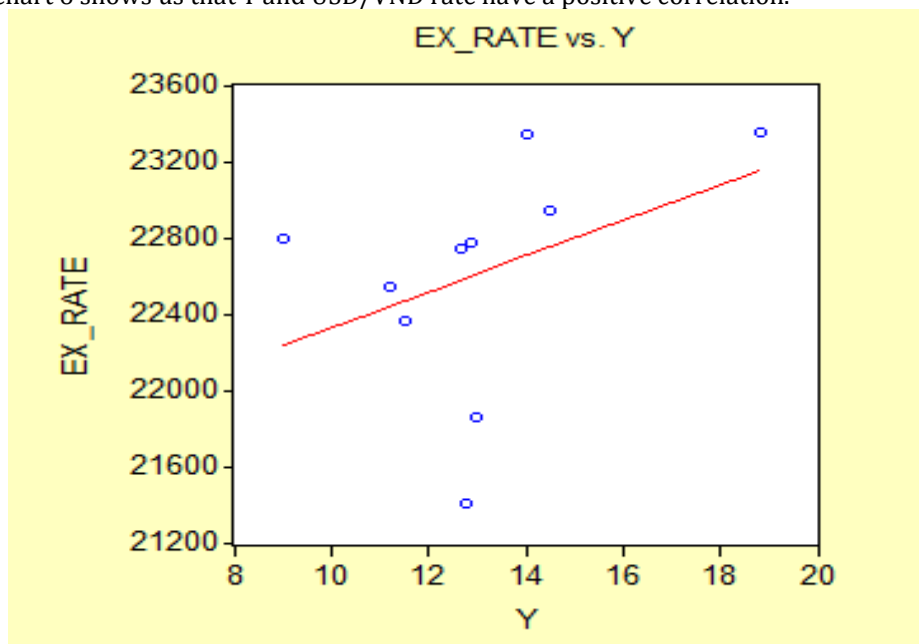


Chart 6 – Y vs. Exchange rate (Ex\_rate)

On the other hand, we could see statistical results with Eview in the below table with 6 variables:

Table 1 – Statistics for macro economic factors

Unit: %

	EIB stock price	GDP growth	Inflation (CPI)	VN Index	Lending rate	Risk free rate	USD/VND rate
Mean	13.04	0.06416	0.02588	758.875	0.09856	0.050485	22611.7
Median	12.85	0.0648	0.0264	720.67	0.1	0.05435	22757.5
Maximum	18.8	0.0708	0.0474	984.24	0.1115	0.06535	23350
Minimum	9	0.0552	0.0063	545.63	0.0886	0.0297	21405

Standard dev.	2.553	0.005549	0.013884	176.4835	0.007636	0.014066	610.2313
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Looking at the above table, we recognize that standard deviation of exchange rate and VNIndex are the highest values. Whereas standard deviation of GDP growth and lending rate are the lowest values. If we want to see correlation matrix of these 8 macro variables, Eview generate the below result in table 2:

**Table 2 – Correlation matrix for seven (7) macro-economic variables (GDP growth, inflation in VN, market interest rate, Risk free rate, exchange rate and BIDV stock price)**

Correlation Matrix								
	Y	G	CPI	VNINDEX	R	RF	EX_RATE	SP500
Y	1.000000	0.437202	-0.137413	0.606934	0.162851	-0.669679	0.392098	0.649297
G	0.437202	1.000000	-0.050535	0.653067	-0.390583	-0.474076	0.564582	0.634468
CPI	-0.137413	-0.050535	1.000000	0.146050	-0.220576	-0.158705	0.082310	0.183559
VNINDEX	0.606934	0.653067	0.146050	1.000000	-0.440372	-0.634696	0.777514	0.983824
R	0.162851	-0.390583	-0.220576	-0.440372	1.000000	0.302601	-0.154750	-0.374293
RF	-0.669679	-0.474076	-0.158705	-0.634696	0.302601	1.000000	-0.521420	-0.677534
EX_RATE	0.392098	0.564582	0.082310	0.777514	-0.154750	-0.521420	1.000000	0.755250
SP500	0.649297	0.634468	0.183559	0.983824	-0.374293	-0.677534	0.755250	1.000000

The above table 2 shows us that correlation among 8 macro variables. An increase in exchange rate and decrease in lending rate might lead to an increase in VCB stock price. It also indicates that correlation between VCB stock price (Y) in Viet Nam and VNIndex in Viet Nam and S&P 500 in the US (0.928 and 0.923) is higher than that between Y and lending rate (-0.15) or between Y and CPI (0.01).

The below table 3 shows us that covariance matrix among eight (8) macro economic variables. BIDV stock price (Y) has a negative correlation with risk free rate and lending rate but has a positive correlation with exchange rate (EX\_Rate), CPI and GDP growth.

Hence, an increase in GDP may lead to an increase in BIDV stock price.

**Table 3 – Covariance matrix for 7 macro economic variables**

Covariance Matrix								
	Y	G	CPI	VNINDEX	R	RF	EX_RATE	SP500
Y	5.863900	0.005573	-0.004383	246.0710	0.002857	-0.021640	549.6720	439.9250
G	0.005573	2.77E-05	-3.50E-06	0.575578	-1.49E-05	-3.33E-05	1.720538	0.934488
CPI	-0.004383	-3.50E-06	0.000173	0.322068	-2.10E-05	-2.79E-05	0.627614	0.676458
VNINDEX	246.0710	0.575578	0.322068	28031.78	-0.534085	-1.418033	75361.46	46087.69
R	0.002857	-1.49E-05	-2.10E-05	-0.534085	5.25E-05	2.93E-05	-0.648952	-0.758612
RF	-0.021640	-3.33E-05	-2.79E-05	-1.418033	2.93E-05	0.000178	-4.028085	-2.529699
EX_RATE	549.6720	1.720538	0.627614	75361.46	-0.648952	-4.028085	335144.0	122334.5
SP500	439.9250	0.934488	0.676458	46087.69	-0.758612	-2.529699	122334.5	78286.05

## Regression model and main findings

In this section, we will find out the relationship between eight macro economic factors and stock price.

4.2.1 Scenario 1: Regression model with single variable: analyzing impact of GDP growth (G) on EIB stock price (Y)

Note: C: constant

Using Eview gives us the below results:

Dependent Variable: Y				
Method: Least Squares				
Date: 02/01/20 Time: 17:41				
Sample: 1 10				
Included observations: 10				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	201.1194	146.2723	1.374966	0.2064
C	0.136177	9.416364	0.014462	0.9888
R-squared	0.191146	Mean dependent var		13.04000
Adjusted R-squared	0.090039	S.D. dependent var		2.552537
S.E. of regression	2.434913	Akaike info criterion		4.794556
Sum squared resid	47.43041	Schwarz criterion		4.855073
Log likelihood	-21.97278	F-statistic		1.890532
Durbin-Watson stat	1.874021	Prob(F-statistic)		0.206417

Hence,  $Y = 201 * g + 0.13$ ,  $R^2 = 0.19$ ,  $SER = 2.4$

Within the range of 10 observations (2014-2019) as described in the above scatter chart 1, coefficient 201, when GDP growth increases, EIB stock price will increase.

4.2.2 Scenario 2 - Regression model with 2 variables: analyzing impact of GDP growth (G) and Inflation (CPI) on EIB stock price (Y):

Running Eviews gives us below results:

Dependent Variable: Y				
Method: Least Squares				
Date: 02/01/20 Time: 17:42				
Sample: 1 10				
Included observations: 10				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	198.4318	155.2760	1.277930	0.2420
CPI	-21.25597	62.05888	-0.342513	0.7420
C	0.858723	10.20366	0.084158	0.9353
R-squared	0.204478	Mean dependent var		13.04000
Adjusted R-squared	-0.022814	S.D. dependent var		2.552537
S.E. of regression	2.581489	Akaike info criterion		4.977935
Sum squared resid	46.64861	Schwarz criterion		5.068711
Log likelihood	-21.88968	F-statistic		0.899627
Durbin-Watson stat	1.671763	Prob(F-statistic)		0.449038

Therefore,  $Y = 198 * g - 21 * CPI + 0.85$ ,  $R^2 = 0.2$ ,  $SER = 2.5$

Hence, this equation shows us EIB stock price has a positive correlation with GDP growth and negative correlation with inflation in Vietnam. Esp., it is highly positively affected by GDP growth rate.

4.2.3. Scenario 3 - Regression model with 3 variables: adding lending rate (r) into the above model Eviews generates below statistical results :



Dependent Variable: Y				
Method: Least Squares				
Date: 02/01/20 Time: 17:42				
Sample: 1 10				
Included observations: 10				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	270.1979	169.8420	1.590878	0.1627
CPI	-4.098045	64.06653	-0.063965	0.9511
R	129.4886	126.3794	1.024602	0.3451
C	-16.95224	20.13847	-0.841784	0.4322
R-squared	0.322942	Mean dependent var		13.04000
Adjusted R-squared	-0.015587	S.D. dependent var		2.552537
S.E. of regression	2.572354	Akaike info criterion		5.016694
Sum squared resid	39.70202	Schwarz criterion		5.137728
Log likelihood	-21.08347	F-statistic		0.953955
Durbin-Watson stat	2.038328	Prob(F-statistic)		0.472358

Hence,  $Y = 270 * G - 4.09 * CPI + 129 * R - 16$ ,  $R^2 = 0.32$ ,  $SER = 2.5$

The above regression equation shows us that EIB stock price (Y) has a positive correlation with GDP growth (G) and lending rate (R). And the coefficient (with GDP) is the highest, the 2<sup>nd</sup> highest is with lending rate. Lending interest rate increases together with CPI decreases will increase savings of public and lead to an increase in EIB stock price.

4.2.4. Scenario 4 - regression model with 4 macro variables: Eviews presents the below results:

Dependent Variable: Y				
Method: Least Squares				
Date: 02/01/20 Time: 17:43				
Sample: 1 10				
Included observations: 10				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	61.32741	171.9531	0.356652	0.7359
CPI	-23.37171	52.82588	-0.442429	0.6767
R	175.8384	105.0211	1.674315	0.1549
VNINDEX	0.011138	0.005487	2.029726	0.0981
C	-16.07274	16.34039	-0.983620	0.3705
R-squared	0.628797	Mean dependent var		13.04000
Adjusted R-squared	0.331835	S.D. dependent var		2.552537
S.E. of regression	2.086479	Akaike info criterion		4.615685
Sum squared resid	21.76696	Schwarz criterion		4.766978
Log likelihood	-18.07843	F-statistic		2.117431
Durbin-Watson stat	1.255663	Prob(F-statistic)		0.215923

Therefore,  $Y = 61.3 * G - 23.3 * CPI + 175.8 * R + 0.01 * VNINDEX - 16$ ,  $R^2 = 0.62$ ,  $SER = 2.08$

We find out impacts of 4 macro variables, with the new factor: VNINDEX, shown in the above equation, EIB stock price (Y) has negative correlation with inflation, whereas it has positive correlation with GDP growth, lending rate (R), VNINDEX and interest rate (R). When inflation goes down, VNINDEX and interest rate increase, this will increase public savings and investment in stock market, as a result, EIB stock price will increase.

4.2.5. Scenario 5 - regression model with 5 macro variables:

Running Eviews gives us results:

Dependent Variable: Y				
Method: Least Squares				
Date: 02/01/20 Time: 17:43				
Sample: 1 10				
Included observations: 10				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	31.64825	149.1128	0.212244	0.8423
CPI	-31.51432	45.74214	-0.688956	0.5287
R	175.0858	90.41322	1.936506	0.1249
VNINDEX	0.007157	0.005300	1.350381	0.2482
RF	-92.31165	55.70275	-1.657219	0.1728
C	-6.202088	15.27632	-0.405993	0.7055
R-squared	0.779910	Mean dependent var	13.04000	
Adjusted R-squared	0.504797	S.D. dependent var	2.552537	
S.E. of regression	1.796237	Akaike info criterion	4.292975	
Sum squared resid	12.90587	Schwarz criterion	4.474526	
Log likelihood	-15.46487	F-statistic	2.834872	
Durbin-Watson stat	1.451400	Prob(F-statistic)	0.167267	

Hence,  $Y = 31.6 \cdot G - 31.5 \cdot CPI + 175 \cdot R + 0.007 \cdot VNINDEX - 92.3 \cdot Rf - 6.2$ ,  $R^2 = 0.77$ ,  $SER = 1.7$

Here we see impacts of 5 macro factors, with the new variable: risk free rate (Rf), the above equation shows that EIB stock price (Y) has negative correlation with inflation and risk free rate, whereas it has positive correlation with GDP growth, lending rate and VNINDEX. We also recognize that GDP growth and lending rate and Rf have the highest impact on EIB stock price. When risk free rate declines, it will increase investment in stock market, then it will lead to an increase in EIB stock price.

4.2.6. Scenario 6 - regression model with 6 macro variables: Running Eviews gives us results:

Dependent Variable: Y				
Method: Least Squares				
Date: 02/01/20 Time: 17:44				
Sample: 1 10				
Included observations: 10				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	72.43399	118.0421	0.613629	0.5829
CPI	-28.34590	35.64476	-0.795233	0.4846
R	226.5711	75.42526	3.003915	0.0575
VNINDEX	0.013751	0.005394	2.549473	0.0840
RF	-96.49904	43.41507	-2.222709	0.1128
EX_RATE	-0.002492	0.001313	-1.897813	0.1540
C	37.57825	25.95321	1.447923	0.2435
R-squared	0.899985	Mean dependent var	13.04000	
Adjusted R-squared	0.699954	S.D. dependent var	2.552537	
S.E. of regression	1.398189	Akaike info criterion	3.704260	
Sum squared resid	5.864801	Schwarz criterion	3.916070	
Log likelihood	-11.52130	F-statistic	4.499232	
Durbin-Watson stat	2.513578	Prob(F-statistic)	0.122366	

$Y = 72.4 \cdot G - 28.3 \cdot CPI + 226.5 \cdot R + 0.01 \cdot VNINDEX - 96.4 \cdot Rf - 0.002 \cdot EX\_RATE + 37.5$ ,

$R^2 = 0.89$ ,  $SER = 1.39$

Therefore, we see impacts of 6 macro factors, with the new variable: exchange rate USD/VND (EX\_RATE), the above equation shows that EIB stock price (Y) has negative correlation with inflation, exchange rate and risk free rate, whereas it has positive correlation with GDP growth, lending rate, VNINDEX. We also

recognize that GDP growth and lending rate, then risk free rate and CPI have the highest impact on EIB stock price, while exchange rate just has a slightly impact on stock price.

4.2.7. Scenario 7 - regression model with 6 macro variables:

Running Eviews gives us results:

Dependent Variable: Y				
Method: Least Squares				
Date: 02/01/20 Time: 17:45				
Sample: 1 10				
Included observations: 10				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	78.49870	136.7318	0.574107	0.6239
CPI	-20.91311	43.69797	-0.478583	0.6794
R	254.4017	103.1033	2.467444	0.1324
VNINDEX	0.025263	0.023700	1.065956	0.3981
RF	-109.1886	56.07841	-1.947071	0.1909
EX_RATE	-0.002753	0.001601	-1.719214	0.2277
SP500	-0.006771	0.013451	-0.503399	0.6647
C	47.99756	36.40241	1.318527	0.3181
R-squared	0.911232	Mean dependent var	13.04000	
Adjusted R-squared	0.600544	S.D. dependent var	2.552537	
S.E. of regression	1.613268	Akaike info criterion	3.784963	
Sum squared resid	5.205265	Schwarz criterion	4.027031	
Log likelihood	-10.92481	F-statistic	2.932950	
Durbin-Watson stat	2.243434	Prob(F-statistic)	0.277727	

$$Y = 78.4 \cdot G - 20.9 \cdot \text{CPI} + 254 \cdot R + 0.02 \cdot \text{VNINDEX} - 109 \cdot R_f - 0.002 \cdot \text{EX\_RATE} - 0.006 \cdot \text{SP500} + 47.9,$$

$$R^2 = 0.91, \text{SER} = 1.61$$

Therefore, we see impacts of 6 macro factors, with the new variable: SP500, the above equation shows that EIB stock price (Y) has negative correlation with inflation and risk free rate, exchange rate, SP500 whereas it has positive correlation with GDP growth, lending rate, VNINDEX. We also recognize that GDP growth and lending rate, then CPI, risk free rate have the highest impact on EIB stock price, while exchange rate just has a slightly impact on stock price.

### Discussion and further researches

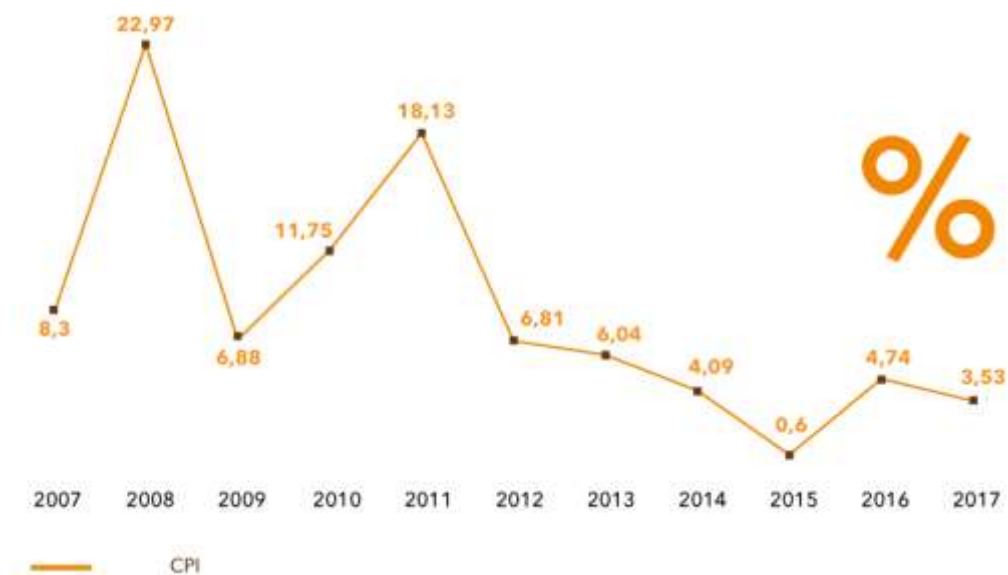
Through the regression equation with above 6 macroeconomic variables, this research paper used updated data from 2014-2019 to analyze the regression equation via Eview in order to show that a decrease in  $R_f$  has a significant impact on increasing EIB stock price (Y) with the highest coefficient of impact, followed by an increase in lending rate and increase in GDP growth, then a decrease in CPI, a reduction in exchange rate and increase in VNINDEX, as well as a little reduction in SP500.

Data are from observations in the past 10 years, it is partly based on the market economic rules, and the

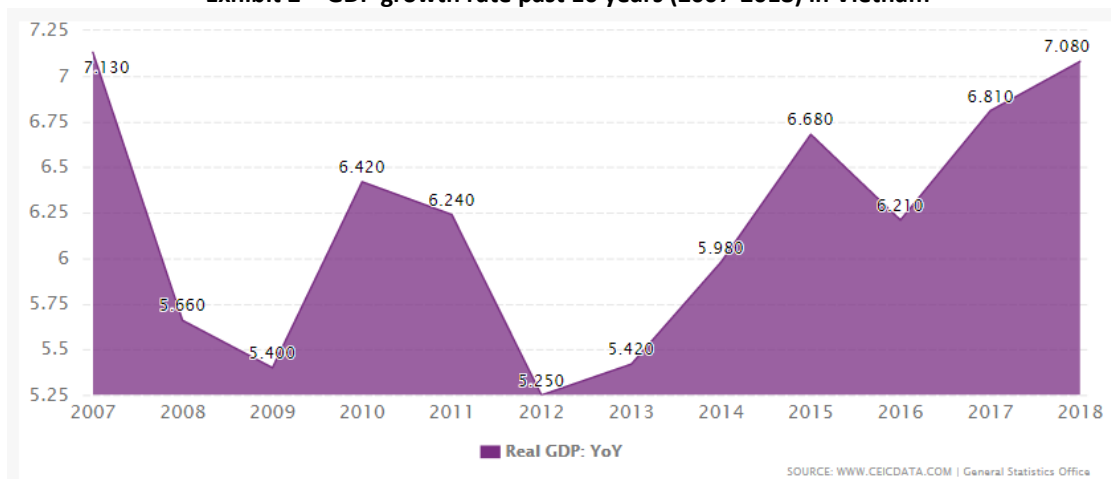
research results are also affected by socio-economic characteristics in Vietnam such as: efficiency of public investment, waste of public investment, enterprise bankruptcy, and investment in areas that increase GDP such as production, electricity, etc. or investing in healthcare, environment and education sectors. We have not yet considered the impact of these factors.

Beside, we can analyze impact of another macro factor, for example, deposit rate when we add this variable into our regression model of stock price. Furthermore, we can add unemployment rate or public debt increase into our econometric model to measure the impact of these extra factors on EIB stock price.

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



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



### Conclusion and policy suggestion

Based on the above data analysis from our regression model, although low inflation during 2015-2016 is a good signal for EIB stock price, we would suggest the government, Ministry of Finance and State Bank of Vietnam consider to control inflation more rationally, i.e not increasing much and suitable with each economic development stage. Governmental bodies and bank system also need to apply macro policies to stimulate economic growth, however not increasing lending rate too much, together with credit, operational and market risk management, corporate governance and controlling bad debt.

Next, it is necessary to coordinate synchronously between the management and administration of commercial bank policies with fiscal policies, monetary policies (used as effective tools to stimulate bank stock price) and other economic

development policies to limit the negative effects of lending rate, CPI and exchange rate, i.e not increasing much. Lending policy of bank system need to be selective and increase interest rates for acceptable high risk high return projects.

Generally speaking, managing EIB stock price depends on many factors, so the government need to use fiscal policy combined with monetary policies and socio-economic policies to reduce unemployment and stimulate economic growth, toward a good stock price management.

Finally, this research paper also helps to direct further future researches, for instance, we could add deposit rate and unemployment rate into our above econometric model to measure impacts of them on commercial bank stock price.

## Roles of IT security and risk management in medicine industry

In this section we suggest IT security and risk management for better performance of Vietnam medicine and pharma companies, because better risk management need go together with IT security and data protection:

Informatics, increasingly plays an important role in many fields including the health sector. Computing applications are increasingly available at hospitals, clinics and health facilities. Therefore, in parallel with the application of information technology, these information systems need to be monitored to detect and manage security risks for information security risks that may affect services and medical activities. Network security attacks that enter the network by exploiting remote access functionality on connected devices and systems or by any other means remain a significant threat to health care activities. Attacks can cause devices or systems to fail, expose or damage the data they hold, all of which can seriously hamper the delivery of patient care and cause patients at risk or intended to meet legitimate business needs such as allowing on-site clinicians access to patient and provider data to troubleshoot an installed system in the facility but besides that, remote access systems can be exploited for illegal purposes.

Therefore, risk management is essential for all organizations in general and health care facilities in particular, although it is not possible to prevent all security incidents and data breaches. The security management program helps an organization build a culture of safety, identify potential risks and manage risk at an acceptable level. This contributes to better individual and community health outcomes by building patient trust and maintaining the integrity of medical records. Therefore, a strong data management program can help health organizations meet privacy and security regulations and successfully resolve complaints; audit restrictions, enforcement activities, and sanctions; reduce liability.

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