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Measurement of Successful Leadership via a Nine Factor Model on Bank Profit – A Case of Vingroup in Real Estate Industry in Vietnam

Dinh Tran Ngoc Huy and Nguyen Dac Anh Chuong

Abstract--- *Vingroup (VIC) has been gaining achievements with Vinfast (cars), VinSmart, Vinpearl, Vinhomes has made very positive contributions to the overall achievements of the real estate sector and industries, deserving of its position as one of the leading group, contributing to economy. Movement of net profit under impacts of cost, stock price and many other factors will reflect the business health of Vingroup and real estate industry. Good business management requires us to consider the impacts of multi macro and micro factors on VIC net profit, 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 NINE (9) macroeconomic factors such as: stock price, VNIndex, risk free rate, lending rate, inflation, GPD growth, S&P500, exchange rate, etc. on net profit of a leading real estate firm, Vingroup (VIC) in Vietnam in the period of 2010-2019, both positive and negative sides. The results of quantitative research, in an eight factor model, show that the increase in inflation, and lending rate and reducing risk free rate has a significant effect on reducing VIC net profit with the highest impact coefficient, the second is decreasing cost. Lst but not least, we recognize that VIC net profit respond much more to yield of government bond, compared to Vinamilk (a milk leading firm in F&B industry). This research finding and recommended policy also can be used as reference in policy for real estate system in many developing countries*.

Keywords--- *VIC Net Profit, Stock Price, GDP Growth, Inflationary, Risk Free Rate. Market Interest Rate.*

JEL: *M21, N1.*

I. INTRODUCTION

Vingroup (VIC) in Vietnam has maintained a higher growth rate than the industry average on all indicators of scale, quality, efficiency, and labor productivity. It currently pushes cooperation with partners in Germany (Vinfast), European and Japan (VinSmart), expands market and control risk. Since 2020, Vingroup continues to develop 3 areas: technology-industry, real estate- tourism, community services.

In the field of Trade and Services, Vingroup continues to reform processes to give customers the best experience. Brands such as Vinhomes (residential real estate), Vincom Retail (retail real estate), Vinpearl (tourism - resorts), Vinfast and Vincommerce (retail) are recognized as the most valuable brands in Vietnam; Vinmec, VinSchool, VinUni ... are also making continuous efforts to make their mark in the health and education sector. Most recently,

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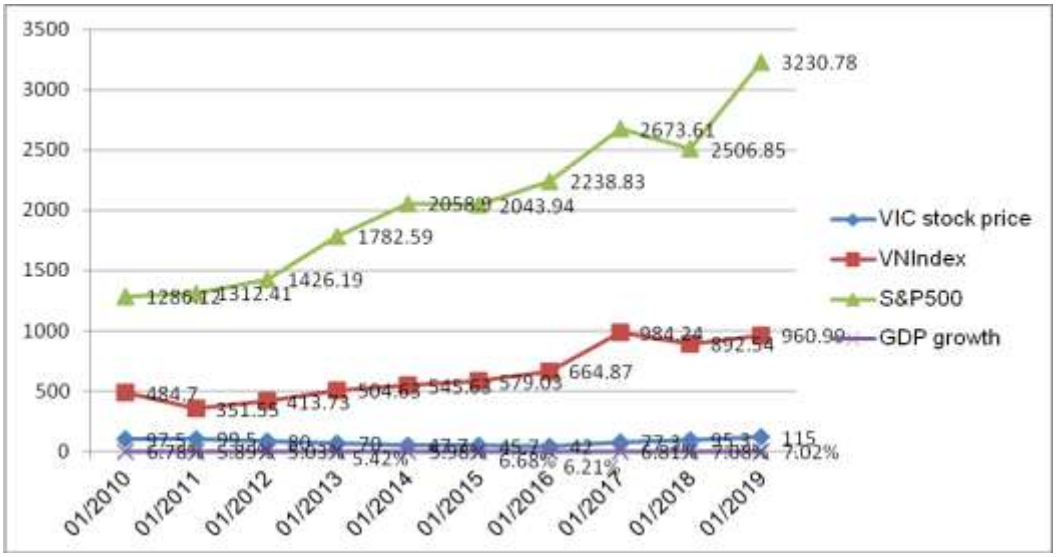
Vingroup announced the opening of the Vinpearl Air High-tech Manpower Training School, showing its efforts to expand the ecosystem of products and services.

Real estate 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 nine (9) internal and external macro economic factors on Vingroup performance, esp. VIC net profit. 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 Vingroup (VIC) stock price moves in the same trend with VN Index and GDP growth, although it fluctuates in a smaller range.



This is just background information as above chart shown.

Later, This study will calculate and figure out the impacts of nine (9) micro and macro-economic factors such as inflation, GDP growth, market interest rate, risk free rate, VNIndex, S&P500 and exchange rate on VIC net profit.

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.

II. Body of Manuscript

2.1 Research Issues

The scope of this study will cover:

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

Issue 2: What are the impacts of above 8 macro-economic factors on VIC net profit?

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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 VIC net profit declines.

Hypothesis 2: An increase in inflation can increase pressure in VIC net profit.

2.2 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 whereas 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 firm performance field, however, they just stop at analyzing internal macroeconomic factors on stock price.

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Within the scope of this paper, we measure impacts of both internal and external macro factors on VIC net profit and suggest policies for bank system, Vietnam government, Ministry of Finance, State Bank and relevant government bodies. We also analyze data throughout time series from 2010-2019.

III. METHODOLOGY AND DATA

This research paper establishes correlation among micro and macro-economic factors by using an econometric model to analyze impacts of nice (9) macro-economic factors in Vietnam such as: GDP growth, inflation, interest rate, exchange rate,… on VIC net profit.

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 2010 -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. VIC net profit is a function with 9 variables as follows:

Y (VIC net profit) = f (x1, x2, x3, x4, x5, x6, x7, x8, x9) = ax1 + bx2 + cx3+dx4+ ex5 +fx6 + gx7 + hx8 +ix9+k

With: x1: GDP growth rate (g), x2: inflation, x3: VN Index, x4: lending rate, x5: risk free rate (Rf), x6: USD/VND rate; x7: S & P 500; x8: cost; x9: net sale.

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.

IV. MAIN RESULTS

4.1 General Data Analysis

First of all, the below chart 1 shows us that Y has a positive correlation with Cost:

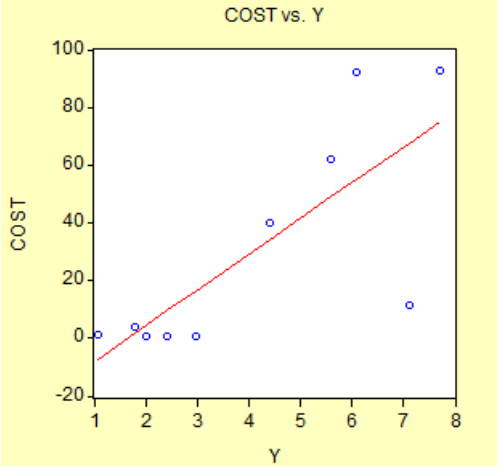

Chart 1: VIC Net Profit (Y) vs. Cost (G)

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Next we find out that, based on the below scatter chart, Y (VIC net profit) has negative correlation with inflation (CPI).

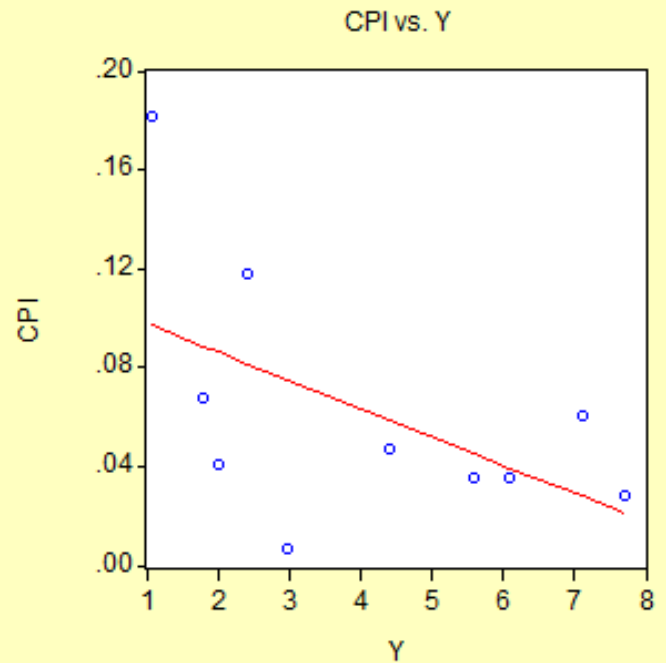

Chart 2: VIC Net Profit (Y) vs. Inflation (CPI)

Looking at the below chart 3, we also recognize that VIC net profit (Y) and VN Index have positive correlation.

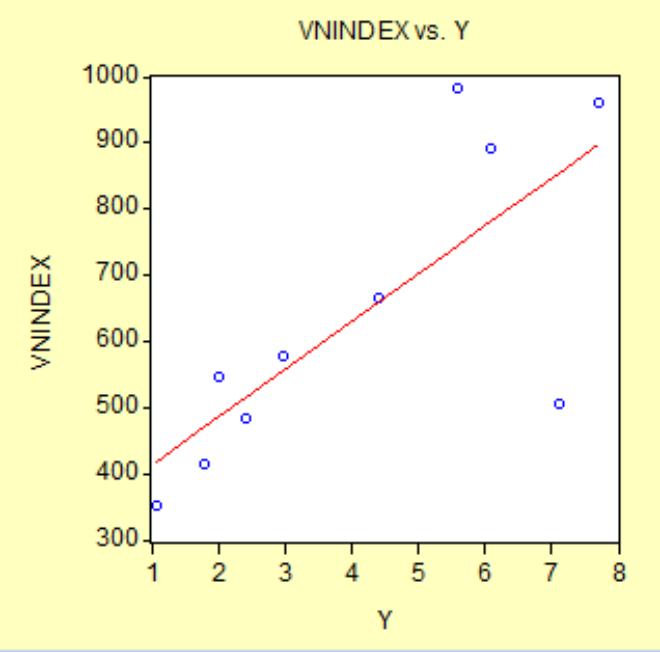

Chart 3: Y vs. VN Index

We see that, VIC net profit (Y) and lending rate have negative correlation:

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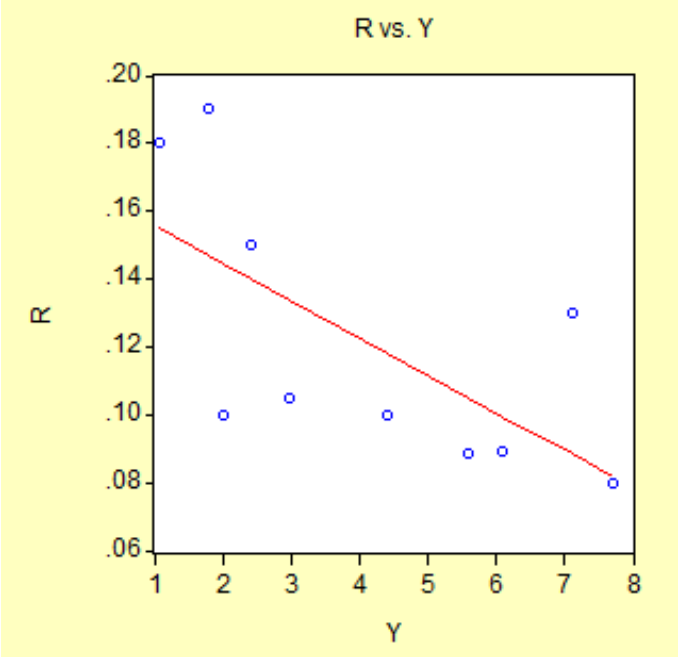

Chart 4: Y vs. Lending Rate (r)

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

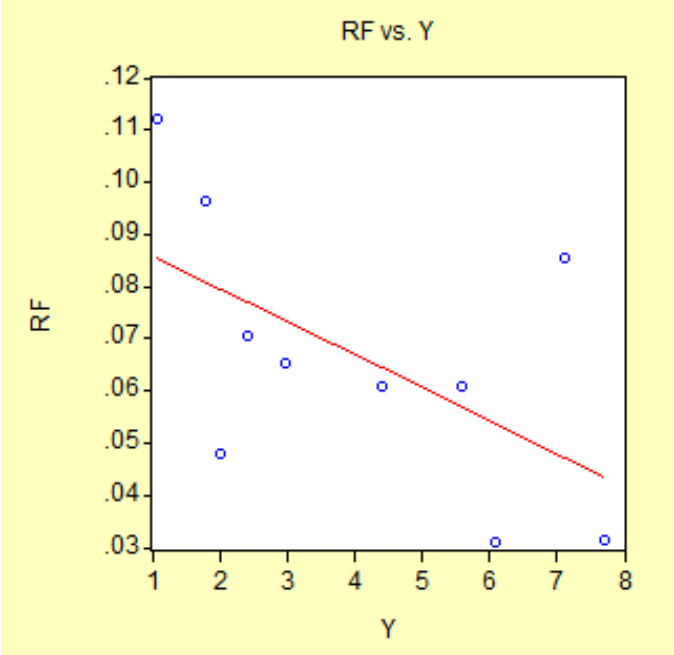

Chart 5: Y vs. Risk free rate (Rf)

The below chart 6 shows us that Y and GDP growth rate have a positive correlation.

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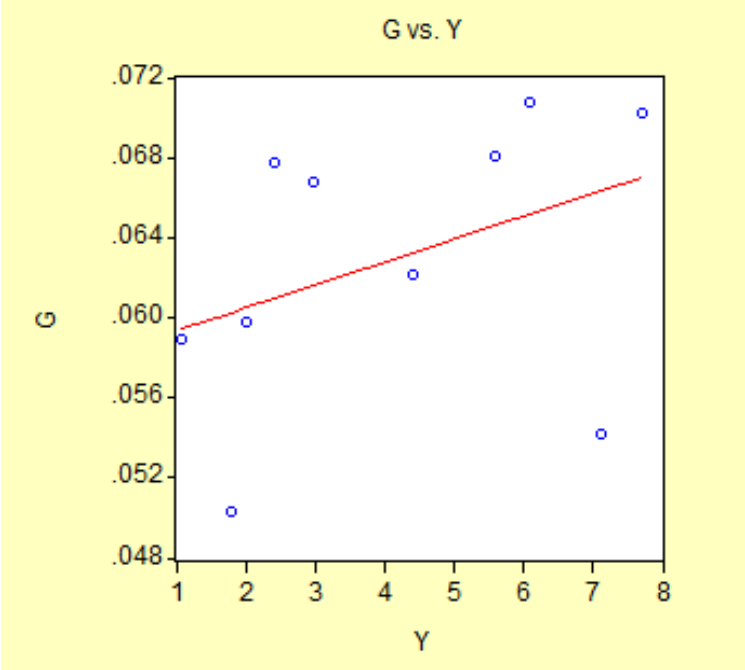

Chart 6: Y vs. GDP growth (g)

The below chart 7 shows us that Y and USD/VND rate have a positive correlation.

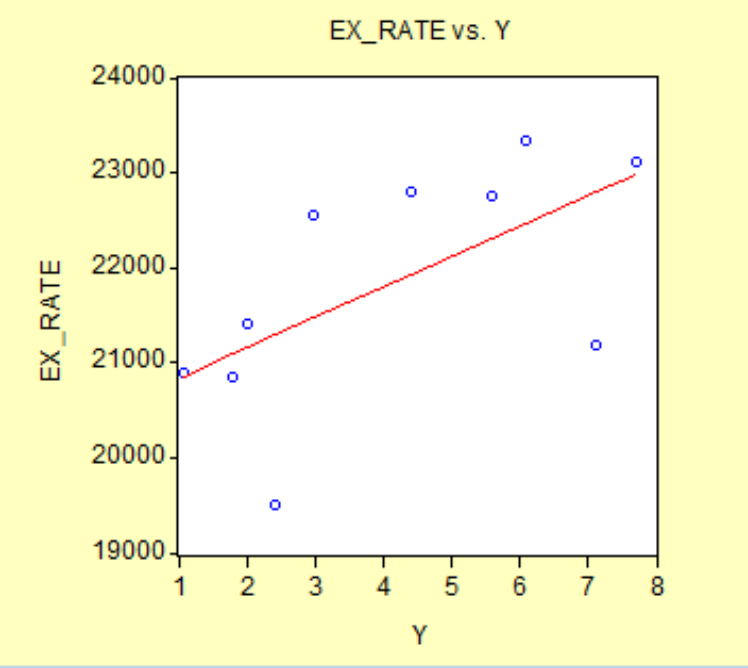

Chart 7: Y vs. Exchange rate (Ex_rate)

The below chart 8 shows us that Y and USD/VND rate have a positive correlation.

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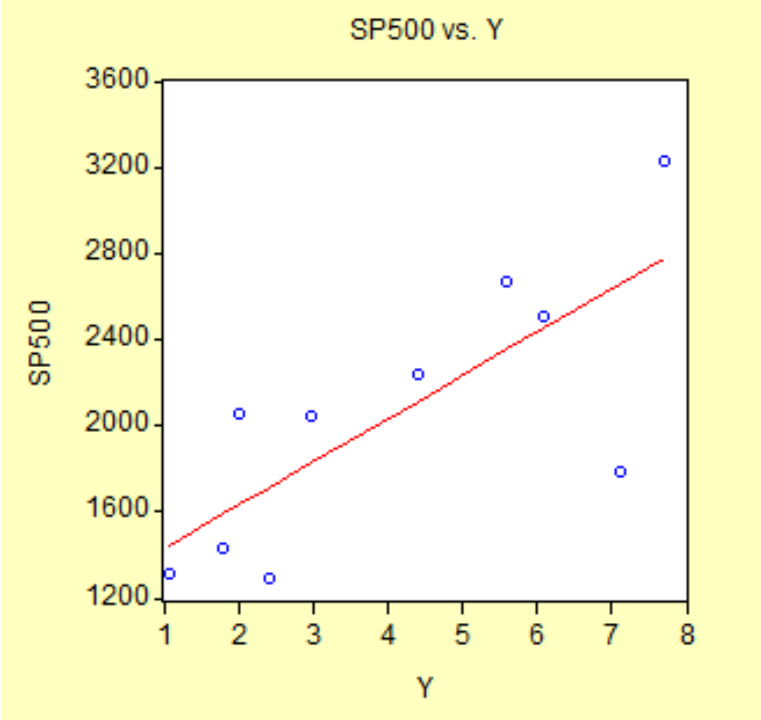

Chart 8: Y vs. S & P500

On the other hand, we could see statistical results with E-view in the below table with 9 variables:

Table 1: Statistics for Macro-economic Factors

Unit: %

	Net sales	*Cost*	*Net profit*	*VIC stock price*	*GDP growth*	*Inflation (CPI)*	*VN Index*	*Lending rate*	*Risk free rate*	*USD/ VND rate*	*S&P 500*
Mean	43.089	30.579	4.119	77	0.06416	0.02588	758.875	0.09856	0.050485	22611.7	2056.022
Median	13.1	7.695	3.685	78.65	0.0648	0.0264	720.67	0.1	0.05435	22757.5	2051.42
Maximum	130	93	7.7	115	0.0708	0.0474	984.24	0.1115	0.06535	23350	3230.78
Minimum	0.62	0.52	1.07	42	0.0552	0.0063	545.63	0.0886	0.0297	21405	1286.12
Standard dev.	52.242	38.520	2.384	25.444	0.005549	0.013884	176.4835	0.007636	0.014066	610.2313	633.811

Looking at the above table, we recognize that standard deviation of exchange rate and D&P500 and net sale 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 9 macro variables, Eview generate the below result in table 2:

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Table 2: Correlation Matrix for Nine (9) Macro-economic Variables (GDP Growth, Inflation in VN, Market Interest Rate, Risk Free Rate, Exchange Rate and VIC Net Profit)

Correlation Matrix											
	Y	SP500	VNINDEX	STOCKPRICE	RF	R	NETSALE	G	EX_RATE	CPI	COST
Y	1.000000	0.756378	0.749808	0.236921	-0.573013	-0.664729	0.779171	0.388725	0.610962	-0.532733	0.768488
SP500	0.756378	1.000000	0.932232	0.099779	-0.816875	-0.880212	0.865862	0.616498	0.869277	-0.701892	0.860151
VNINDEX	0.749808	0.932232	1.000000	0.215098	-0.800688	-0.835661	0.920668	0.729679	0.800218	-0.622082	0.915179
STOCKPRICE	0.236921	0.099779	0.215098	1.000000	-0.023542	0.194896	0.431549	0.282591	-0.119224	0.419862	0.428589
RF	-0.573013	-0.816875	-0.800688	-0.023542	1.000000	0.888975	-0.714651	-0.731404	-0.660120	0.710100	-0.724589
R	-0.664729	-0.880212	-0.835661	0.194896	0.888975	1.000000	-0.670977	-0.698635	-0.785406	0.756683	-0.672997
NETSALE	0.779171	0.865862	0.920668	0.431549	-0.714651	-0.670977	1.000000	0.629169	0.770081	-0.432921	0.998858
G	0.388725	0.616498	0.729679	0.282591	-0.731404	-0.698635	0.629169	1.000000	0.502911	-0.310687	0.636081
EX_RATE	0.610962	0.869277	0.800218	-0.119224	-0.660120	-0.785406	0.770081	0.502911	1.000000	-0.691415	0.777588
CPI	-0.532733	-0.701892	-0.622082	0.419862	0.710100	0.756683	-0.432921	-0.310687	-0.691415	1.000000	-0.433426
COST	0.768488	0.860151	0.915179	0.428589	-0.724589	-0.672997	0.998858	0.636081	0.777588	-0.433426	1.000000

The above table 2 shows us that correlation among 9 micro and macro variables. An increase in exchange rate and decrease in lending rate might lead to an increase in VIC net profit. It also indicates that correlation between VIC net profit (Y) in Viet Nam and VNIndex in Viet Nam and S&P 500 in the US (0.74 and 0.75) is higher than that between Y and lending rate (-0.66) or between Y and CPI (-0.53).

The below table 3 shows us that covariance matrix among nine (9) micro and macro-economic variables. VIC net profit (Y) has a negative correlation with risk free rate and lending rate but has a positive correlation with exchange rate (EX_Rate), and GDP growth.

Hence, an increase in inflation may have slight negative impact on in VIC net profit.

Table 3: Covariance Matrix for 9 Macro-economic Variables

Covariance Matrix											
	Y	SP500	VNINDEX	STOCKPRICE	RF	R	NETSALE	G	EX_RATE	CPI	COST
Y	5.115949	1028.687	369.7660	12.93530	-0.032375	-0.056369	87.34424	0.005850	1638.757	-0.058656	63.51910
SP500	1028.687	361545.2	122213.5	1448.206	-12.26913	-19.84271	25802.88	2.466311	619836.3	-20.54446	18899.93
VNINDEX	369.7660	122213.5	47536.57	1132.033	-4.360682	-6.830873	9948.444	1.058476	206899.6	-6.602438	7291.619
STOCKPRICE	12.93530	1448.206	1132.033	582.6660	-0.014195	0.176378	516.2723	0.045384	-3412.810	0.493355	378.0550
RF	-0.032375	-12.26913	-4.360682	-0.014195	0.000624	0.000833	-0.884727	-0.000122	-19.55408	0.000863	-0.661413
R	-0.056369	-19.84271	-6.830873	0.176378	0.000833	0.001406	-1.246747	-0.000174	-34.91917	0.001381	-0.922040
NETSALE	87.34424	25802.88	9948.444	516.2723	-0.884727	-1.246747	2456.274	0.207463	45259.76	-1.044456	1809.031
G	0.005850	2.466311	1.058476	0.045384	-0.000122	-0.000174	0.207463	4.43E-05	3.967930	-0.000101	0.154651
EX_RATE	1638.757	619836.3	206899.6	-3412.810	-19.55408	-34.91917	45259.76	3.967930	1406290.	-39.91345	33696.96
CPI	-0.058656	-20.54446	-6.602438	0.493355	0.000863	0.001381	-1.044456	-0.000101	-39.91345	0.002370	-0.771013
COST	63.51910	18899.93	7291.619	378.0550	-0.661413	-0.922040	1809.031	0.154651	33696.96	-0.771013	1335.390

Regression Model and Main Findings

In this section, we will find out the relationship between nine macro-economic factors and VIC net profit.

4.2.1 Scenario 1: Regression model with single variable: analyzing impact of Cost (c.o) on VIC Net profit (Y)

Note: C: constant

Using Eview gives us the below results:

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Dependent Variable: Y
Method: Least Squares
Date: 02/24/20 Time: 13:03
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COST	0.047566	0.014002	3.396992	0.0094
C	2.664481	0.667205	3.993497	0.0040

R-squared	0.590574	Mean dependent var	4.119000
Adjusted R-squared	0.539396	S.D. dependent var	2.384195
S.E. of regression	1.618102	Akaike info criterion	3.977241
Sum squared resid	20.94602	Schwarz criterion	4.037758
Log likelihood	-17.88620	F-statistic	11.53955
Durbin-Watson stat	2.485692	Prob(F-statistic)	0.009402

Hence, Y = 0.04 * COST + 2.6, R^2 = 0.59 SER = 1.6

(0.01) (0.66)

Within the range of 10 observations (2014-2019) as described in the above scatter chart 1, coefficient 0.04, when cost increases, VIC net profit will increase slightly.

4.2.2 Scenario 2 - Regression model with 2 variables: analyzing impact of Inflation (CPI) on VIC net profit (Y):

Running Eview gives us below results:

Dependent Variable: Y
Method: Least Squares
Date: 02/24/20 Time: 13:03
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COST	0.040971	0.015583	2.629197	0.0340
CPI	-11.42243	11.69808	-0.976437	0.3614
C	3.574910	1.147666	3.114938	0.0170

R-squared	0.639655	Mean dependent var	4.119000
Adjusted R-squared	0.536699	S.D. dependent var	2.384195
S.E. of regression	1.622832	Akaike info criterion	4.049548
Sum squared resid	18.43509	Schwarz criterion	4.140323
Log likelihood	-17.24774	F-statistic	6.212903
Durbin-Watson stat	2.809419	Prob(F-statistic)	0.028088

Therefore, Y = 0.04 * COST - 11.4*CPI + 3.57, R^2 = 0.63, SER = 1.62

(0.01) (11.6) (1.14)

Hence, this equation shows us VIC net profit has a positive correlation with cost and negative relationship with inflation in Vietnam. Esp., it is highly positively affected by CPI.

4.2.3. Scenario 3 - Regression model with 3 variables: adding lending rate (r) into the above model

Eviews generates below statistical results:

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Dependent Variable: Y
Method: Least Squares
Date: 02/24/20 Time: 13:04
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COST	0.037860	0.020651	1.833306	0.1165
CPI	-8.274812	17.53854	-0.471807	0.6537
R	-7.138107	27.74579	-0.257268	0.8056
C	4.340306	3.220416	1.347747	0.2264

R-squared	0.643586	Mean dependent var	4.119000
Adjusted R-squared	0.465379	S.D. dependent var	2.384195
S.E. of regression	1.743270	Akaike info criterion	4.238577
Sum squared resid	18.23395	Schwarz criterion	4.359611
Log likelihood	-17.19288	F-statistic	3.611456
Durbin-Watson stat	2.716803	Prob(F-statistic)	0.084685

Hence, Y = 0.03 * COST - 8.2 * CPI - 7.1*R + 4.3, R^2 = 0.64, SER = 1.74

(0.02) (17.5) (27.7)

The above regression equation shows us that VIC net profit (Y) has a positive correlation with Cost and negative relationship with inflation (CPI) and lending rate (R). And the coefficient (with CPI) is the highest, the 2nd highest is with lending rate. Lending interest rate increases together with CPI increases will increase costs of business and lead to a decrease in VIC net profit.

4.2.4. Scenario 4 - regression model with 5 macro variables: adding exchange rate and risk free rate (Rf) into the above model:

Eviews presents the below results:

Dependent Variable: Y
Method: Least Squares
Date: 02/24/20 Time: 13:04
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COST	0.085840	0.027556	3.115092	0.0357
CPI	-29.61364	17.30677	-1.711101	0.1622
R	-64.49637	34.28063	-1.881423	0.1331
EX_RATE	-0.001814	0.000960	-1.889386	0.1318
RF	109.3037	52.29699	2.090057	0.1048
C	43.52605	21.39067	2.034815	0.1116

R-squared	0.843285	Mean dependent var	4.119000
Adjusted R-squared	0.647392	S.D. dependent var	2.384195
S.E. of regression	1.415755	Akaike info criterion	3.816912
Sum squared resid	8.017447	Schwarz criterion	3.998463
Log likelihood	-13.08456	F-statistic	4.304816
Durbin-Watson stat	2.458753	Prob(F-statistic)	0.091115

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Therefore, Y = 0.08*COST – 29.6*CPI - 64.4*R - 0.01*EX_RATE + 109* Rf + 43.5, R^2 = 0.84, SER = 1.4

(0.02) (17.3) (34.2) (0.0009) (52.2)

We find out impacts of 5 micro and macro variables, with the new factor: Risk free rate, shown in the above equation, VIC net profit (Y) has negative correlation with exchange rate and inflation, whereas it has positive correlation with cost and risk free rate. When inflation goes down, and interest rate declines, this will increase public investment in stock market, as a result, VIC net profit will increase.

4.2.5. Scenario 5 - regression model with 7 macro variables: adding GDP growth (g) and net sales into the above model:

Running Eviews gives us results:

Dependent Variable: Y
Method: Least Squares
Date: 02/24/20 Time: 13:05
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COST	0.382787	0.511582	0.748241	0.5323
CPI	-31.53843	27.83755	-1.132946	0.3748
R	-91.91808	55.75518	-1.648602	0.2410
EX_RATE	-0.002455	0.001630	-1.505681	0.2711
RF	136.1296	96.59422	1.409294	0.2941
G	-83.64996	147.0771	-0.568749	0.6269
NETSALE	-0.205098	0.354038	-0.579311	0.6209
C	64.21145	37.78045	1.699595	0.2313

R-squared	0.881998	Mean dependent var	4.119000
Adjusted R-squared	0.468989	S.D. dependent var	2.384195
S.E. of regression	1.737375	Akaike info criterion	3.933190
Sum squared resid	6.036944	Schwarz criterion	4.175258
Log likelihood	-11.66595	F-statistic	2.135543
Durbin-Watson stat	2.399690	Prob(F-statistic)	0.355629

Hence, Y = -83.6*G – 31.5*CPI - 91.9*R - 0.2* NETSALE + 136.1* Rf - 0.0028EX_RATE + 64.2, R^2 = 0.88, SER = 1.73

(147) (27.8) (55.7) (0.35) (96.5) (0.001)

Here we see impacts of 7 micro and macro factors, with the new variable: risk free rate (Rf), the above equation shows that VIC net profit (Y) has negative correlation with GDP growth and inflation and lending rate, net sale and exchange rate whereas it has positive correlation with risk free rate . We also recognize that GDP growth and lending rate and risk free rate have the highest impact on VIC net profit. When lending rate declines, it will increase investment in stock as well as financial market, then it will lead to an increase in VIC net profit.

4.2.6. Scenario 6 - regression model with 8 macro variables: adding VIC stock price

Running Eviews gives us results:

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Dependent Variable: Y
Method: Least Squares
Date: 02/24/20 Time: 13:05
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COST	0.348107	0.650728	0.534949	0.6873
CPI	-33.13812	35.35253	-0.937362	0.5206
R	-106.2521	76.11450	-1.395950	0.3957
EX_RATE	-0.001952	0.002294	-0.851157	0.5511
RF	132.7578	122.3537	1.085034	0.4741
G	-130.0699	207.8717	-0.625722	0.6441
NETSALE	-0.201929	0.447816	-0.450918	0.7303
STOCKPRICE	0.037408	0.074770	0.500311	0.7047
C	56.26154	50.35575	1.117281	0.4648

R-squared	0.905622	Mean dependent var	4.119000
Adjusted R-squared	0.150594	S.D. dependent var	2.384195
S.E. of regression	2.197352	Akaike info criterion	3.909798
Sum squared resid	4.828354	Schwarz criterion	4.182124
Log likelihood	-10.54899	F-statistic	1.199455
Durbin-Watson stat	2.852426	Prob(F-statistic)	0.612110

Y = -130*G – 33.1*CPI - 106.2*R + 0.03* STOCKPRICE + 132.7* Rf - 0.001*EX_RATE -0.2*NETSALE + +0.3* COST + 56.2,

R^2 = 0.9, SER =2.1

(207.8) (35.3) (76.1) (0.03) (122.3) (0.002)

Therefore, we see impacts of 8 micro and macro factors, with the new variable: exchange rate USD/VND (EX_RATE), the above equation shows that VIC net profit (Y) has negative correlation with GDP growth, inflation, exchange rate, net sale and lending rate, whereas it has positive correlation with risk free rate, stock price and cost. We also recognize that GDP growth and lending rate, then risk free rate have the highest impact on VIC net profit, while exchange rate just has a slightly impact on net profit.

4.2.7. Scenario 7 - regression model with 8 macro variables: adding VNIndex

Running Eviews gives us results:

Dependent Variable: Y
Method: Least Squares
Date: 02/24/20 Time: 13:06
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COST	0.221633	0.052466	4.224296	0.1480
CPI	-55.15575	2.851280	-19.34421	0.0329
R	-141.7153	6.651769	-21.30490	0.0299
EX_RATE	-0.002521	0.000179	-14.07466	0.0452
RF	179.0845	9.635137	18.58660	0.0342
NETSALE	-0.047751	0.037023	-1.289742	0.4199
STOCKPRICE	0.034221	0.005440	6.290887	0.1004
VNINDEX	-0.017664	0.001191	-14.83733	0.0428
C	71.84426	4.173431	17.21467	0.0369

R-squared	0.999406	Mean dependent var	4.119000
Adjusted R-squared	0.994655	S.D. dependent var	2.384195
S.E. of regression	0.174303	Akaike info criterion	-1.158625
Sum squared resid	0.030382	Schwarz criterion	-0.886298
Log likelihood	14.79312	F-statistic	210.3619
Durbin-Watson stat	2.080647	Prob(F-statistic)	0.053276

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Y = 0.22*COST – 55.1*CPI - 141.7*R + 0.03* STOCKPRICE + 179* Rf - 0.002*EX_RATE - 0.01*VNINDEX - 0.04*NETSALE + 71.8,

R^2 = 0.99, SER = 0.17

(0.05) (2.85) (6.65) (0.005) (9.6) (0.0001)

Therefore, we see impacts of 8 micro and macro factors, with the new variable: VNINDEX, the above equation shows that VIC net profit (Y) has negative correlation with Net sale, inflation, lending rate, VNIndex and exchange rate, whereas it has positive correlation with risk free rate, cost and stock price. We also recognize that inflation and lending rate, then risk free rate have the highest impact on VIC net profit, while exchange rate and VNIndex just has a slightly impact on net profit.

4.2.7. Scenario 8 - regression model with 8 macro variables: adding S & P 500

Running Eviews gives us results:

Dependent Variable: Y
Method: Least Squares
Date: 02/24/20 Time: 13:06
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COST	0.457117	0.357249	1.279545	0.4223
CPI	-51.01972	13.70471	-3.722787	0.1671
R	-127.1202	31.58837	-4.024273	0.1551
EX_RATE	-0.003452	0.001073	-3.218137	0.1918
RF	193.4517	54.65412	3.539564	0.1753
NETSALE	-0.208507	0.260515	-0.800365	0.5703
VNINDEX	-0.016227	0.005835	-2.780876	0.2198
SP500	0.001922	0.002459	0.781709	0.5776
C	86.68703	21.59554	4.014118	0.1554

R-squared	0.985043	Mean dependent var	4.119000
Adjusted R-squared	0.865391	S.D. dependent var	2.384195
S.E. of regression	0.874740	Akaike info criterion	2.067636
Sum squared resid	0.765171	Schwarz criterion	2.339962
Log likelihood	-1.338178	F-statistic	8.232530
Durbin-Watson stat	2.629354	Prob(F-statistic)	0.263559

Y = -0.2*NETSALE – 51*CPI - 127.1*R - 0.016* VNINDEX + 193.4* Rf - 0.003*EX_RATE + 0.001*SP500 +0.45*COST + 86.6, R^2 = 0.98, SER = 0.87

(0.26) (13.7) (31.5) (0.006) (54.6) (0.001)

Therefore, we see impacts of 8 macro factors, with the new variable: S&P500, the above equation shows that VIC net profit (Y) has negative correlation with net sale, inflation, lending rate, VNIndex and exchange rate, whereas it has positive correlation with risk free rate, cost and S&P500. We also recognize that inflation and lending

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rate, then risk free rate have the highest impact on VIC net profit, while exchange rate, S&P500 and VNIndex just have a slightly impact on net profit. We saw that when cost increases, net profit will increase.

Looking at the Exhibit, we see Vinamilk (VNM), a leader in Vietnam milk industry, net profit and lending rate has a positive correlation (coeficient 2.3), also VNM net profit has negative correlation with cost. On the contrary, VIC net profit has negative correlation with lending rate and positive correlation with cost. High lending rate will harm its net profit, this happened for real estate industry in crisis 2008. And VIC net profit will increase when it increases investment cost in sound projects, with higher impacts, shown by coefficient of 0.45.

V. DISCUSSION AND FURTHER RESEARCHES

Through the regression equation with above 9 micro and macroeconomic variables, this research paper used updated data from 2010-2019 to analyze the regression equation via Eview in order to show that an increase in lending rate has a significant impact on reducing VIC net profit (Y) with the highest coefficient of impact, followed by an increase in inflation, then a reduction in risk free rate and increase in VNINDEX, a decrease in S&P500, as well as an increase in exchange rate.

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 public debt. Furthermore, we can add unemployment rate or public debt increase into our econometric model to measure the impact of these extra factors on VIC net profit.

Comparing VIC and VNM (Exhibit 3), we find out that correlation between VIC net profit and Risk free rate (Rf) is much higher than that of VNM net profit and Rf (shown by coefficient). This shows that VIC profit is more sensitive and respond much more to fluctuation in yield of government bond.

VI. 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 VIC net profit, 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, risk free rate and exchange rate, i.e not

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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 VIC net profit 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.

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Exhibit

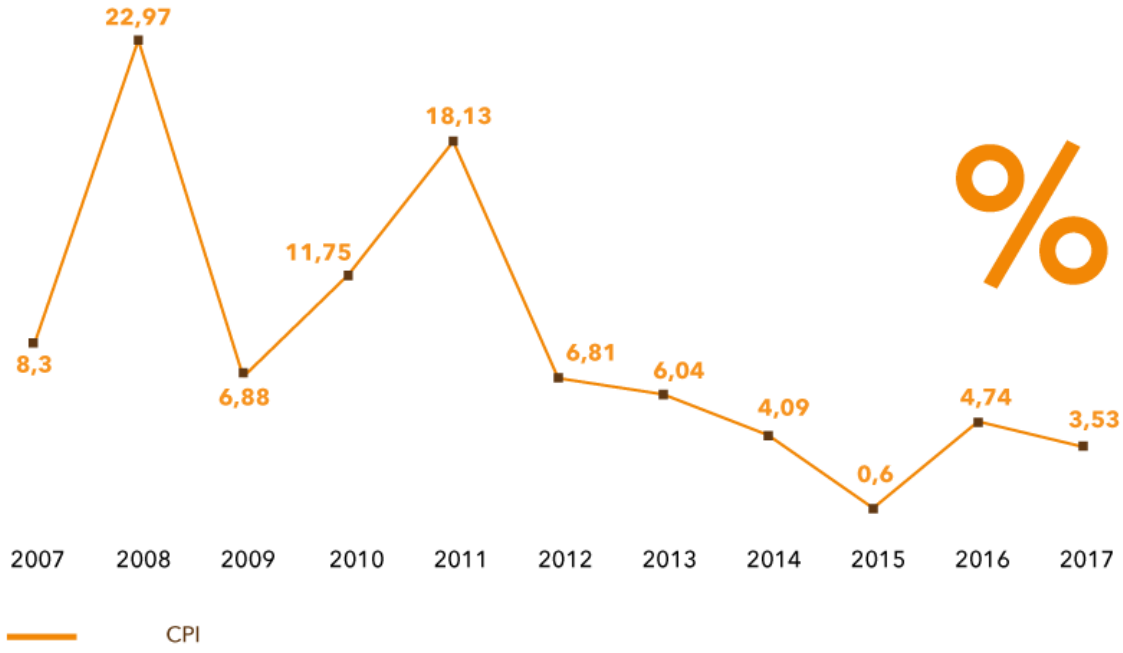

Exhibit 1: Inflation, CPI over Past 10 Years (2007-2017) in Vietnam

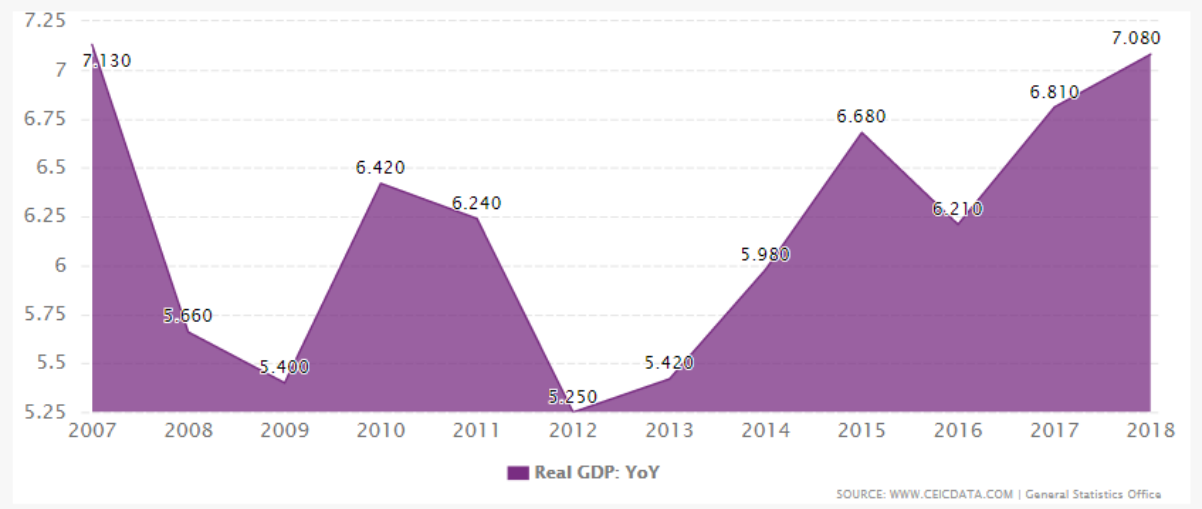

Exhibit 2: GDP Growth Rate Past 10 Years (2007-2018) in Vietnam

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Dependent Variable: Y
Method: Least Squares
Date: 02/24/20 Time: 12:52
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COST	-0.255745	0.158714	-1.611359	0.3536
CPI	-5.462845	5.962077	-0.916265	0.5278
R	2.309325	10.87159	0.212418	0.8668
EX_RATE	-0.000235	0.000961	-0.245079	0.8470
RF	10.92041	13.38041	0.816149	0.5642
NETSALE	0.338820	0.170005	1.993004	0.2961
VNINDEX	-1.24E-05	0.003118	-0.003961	0.9975
SP500	-0.000636	0.001479	-0.430178	0.7414
C	6.072519	18.45935	0.328967	0.7977

R-squared	0.996727	Mean dependent var	7.400000
Adjusted R-squared	0.970541	S.D. dependent var	2.560382
S.E. of regression	0.439454	Akaike info criterion	0.690845
Sum squared resid	0.193119	Schwarz criterion	0.963172
Log likelihood	5.545774	F-statistic	38.06381
Durbin-Watson stat	2.239852	Prob(F-statistic)	0.124742

Exhibit 3: Vinamilk Net Profit Regression Model with Eviews

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