EVALUATING IMPACTS OF A SIX FACTOR MODEL ON NLG (NAM LONG) STOCK PRICE – A CASE IN REAL ESTATE INDUSTRY IN VIETNAM

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ABSTRACT

Realizing the vision of 2020 becoming the Top 3 developers of urban areas, in the past half of 2019, Nam Long has announced urban development strategies, market expansion and business plans 2019. Variation of stock price in commercial banks in developing countries such as Vietnam 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, Nam Long group (NLG) in Vietnam in the period of 2014-2019, both positive and negative sides. The results of quantitative research, in a six factor model, show that the increase in GDP growth and CPI and lending rate has a significant effect on decreasing NLG stock price with the highest impact coefficient, the second is decreasing the exchange rate. This research finding and recommended policy also can be used as reference in policy for commercial bank system in many developing countries.

KEYWORDS: Bank Stock Price; GDP Growth; Inflationary; Risk Free Rate; Market Interest Rate

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INTRODUCTION

Currently, the total clean land fund NLG owns 650 ha in Ho Chi Minh City, Long An, Dong Nai and Can Tho; Hai Phong; ranked second in Vietnam market in terms of land fund for urban and housing development.

Specifically, an increase of more than 200ha of clean land fund in Waterfront Urban Area (170 ha in Long Hung, Dong Nai), Nam Long Dai Phuoc (45 ha in Nhon Trach, Dong Nai) and Nam Long Hai Phong (21 ha in Thuy Nguyen and Hai Phong). This is considered a remarkable growth rate of NLG's land fund when reaching the rate of 50% of the development land fund of 15 years ago in a short time.

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 6 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 Nam Long group (NLG) stock price moves in the same trend with VN Index and GDP growth, although it fluctuates in a smaller range.

Figure 1

This study will calculate and figure out the impacts of six (6) macro economic factors such as inflation, GDP growth, market interest rate, risk free rate, VNIndex, S&P500 and exchange rate on NLG stock price.

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: NLG stock price, interest rate, exchange rate, inflation, VNIndex, S&P 500 and GDP growth?
- Issue 2: What are the impacts of above 6 macro economic factors on Nam Long group 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 NLG stock price declines.
- Hypothesis 2: An increase in inflation can increase pressure in NLG 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.

Within the scope of this paper, we measure impacts of both internal and external macro factors on NLG stock price 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 2014-2019.

METHODOLOGY AND DATA

This research paper establishes correlation among macro economic factors by using an econometric model to analyze impacts of 6 macro economic factors in Vietnam such as: GDP growth, inflation, interest rate, exchange rate,... on NLG 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. NLG stock price is a function with 6 variables as follows:

$$Y \text{ (NLG Stock Price)} = f(x_1, x_2, x_3, x_4, x_5, x_6) = ax_1 + bx_2 + cx_3 + dx_4 + ex_5 + fx_6 + k$$

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: NLG Stock Price (Y) vs. GDP Growth in Vietnam (G).

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

Chart 2: NLG Stock Price (Y) vs. Inflation (CPI).

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

Chart 3: Y vs. VNIndex.

We see that, NLG 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: %

	NLG Stock Price	GDP Growth	Inflation (CPI)	VN Index	Lending Rate	Risk Free Rate	USD/VND Rate
Mean	24.56	0.06416	0.02588	758.875	0.09856	0.050485	22611.7
Median	24.3	0.0648	0.0264	720.67	0.1	0.05435	22757.5
Maximum	30.1	0.0708	0.0474	984.24	0.1115	0.06535	23350
Minimum	17.6	0.0552	0.0063	545.63	0.0886	0.0297	21405
Standard dev.	4.378	0.005549	0.013884	176.4835	0.007636	0.014066	610.2313

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 7 macro variables, E view 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 NLG Stock Price)

Correlation Matrix								
	Y	G	CPI	VNINDEX	R	RF	EX RATE	SP500
Y	1.000000	0.454846	0.021430	0.905516	-0.305413	-0.460969	0.812425	0.892154
G	0.454846	1.000000	-0.050535	0.653067	-0.390583	-0.474076	0.564582	0.634468
CPI	0.021430	-0.050535	1.000000	0.146050	-0.220576	-0.158705	0.082310	0.183559
VNINDEX	0.905516	0.653067	0.146050	1.000000	-0.440372	-0.634696	0.777514	0.983824
R	-0.305413	-0.390583	-0.220576	-0.440372	1.000000	0.302601	-0.154750	-0.374293
RF	-0.460969	-0.474076	-0.158705	-0.634696	0.302601	1.000000	-0.521420	-0.677534
EX RATE	0.812425	0.564582	0.082310	0.777514	-0.154750	-0.521420	1.000000	0.755250
SP500	0.892154	0.634468	0.183559	0.983824	-0.374293	-0.677534	0.755250	1.000000

The above table 2 shows us that correlation among 7 macro variables. An increase in exchange rate and decrease in lending rate might lead to an increase in NLG stock price. It also indicates that correlation between NLG stock price (Y) in Viet Nam and VNIndex in Viet Nam and S&P 500 in the US (0.9 and 0.89) is higher than that between Y and lending rate (-0.3) or between Y and CPI (0.02).

The below table 3 shows us that covariance matrix among 7 macro economic variables. NLG 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 NLG stock price.

Table 3: Covariance Matrix for 7 Macro Economic Variables

Covariance Matrix								
	Y	G	CPI	VNINDEX	R	RF	EX_RATE	SP500
Y	17.24640	0.009943	0.001172	629.6085	-0.009188	-0.025546	1953.208	1036.648
G	0.009943	2.77E-05	-3.50E-06	0.575578	-1.49E-05	-3.33E-05	1.720538	0.934488
CPI	0.001172	-3.50E-06	0.000173	0.322068	-2.10E-05	-2.79E-05	0.627614	0.676458
VNINDEX	629.6085	0.575578	0.322068	28031.78	-0.534085	-1.418033	75361.46	46087.69
R	-0.009188	-1.49E-05	-2.10E-05	-0.534085	5.25E-05	2.93E-05	-0.648952	-0.758612
RF	-0.025546	-3.33E-05	-2.79E-05	-1.418033	2.93E-05	0.000178	-4.028085	-2.529699
EX_RATE	1953.208	1.720538	0.627614	75361.46	-0.648952	-4.028085	335144.0	122334.5
SP500	1036.648	0.934488	0.676458	46087.69	-0.758612	-2.529699	122334.5	78286.05

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

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

Note: C: constant

Using E view gives us the below results:

Dependent Variable: Y
Method: Least Squares
Date: 02/16/20 Time: 13:02
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	358.8328	248.3996	1.444578	0.1866
C	1.537289	15.99087	0.096135	0.9258
R-squared	0.206885	Mean dependent var	24.56000	
Adjusted R-squared	0.107745	S.D. dependent var	4.377518	
S.E. of regression	4.134970	Akaike info criterion	5.853694	
Sum squared resid	136.7838	Schwarz criterion	5.914211	
Log likelihood	-27.26847	F-statistic	2.086807	
Durbin-Watson stat	0.957393	Prob(F-statistic)	0.186577	

Hence, $Y = 358 * g + 1.5$, $R^2 = 0.2$, $SER = 4.1$

Within the range of 10 observations (2014-2019) as described in the above scatter chart 1, coefficient 358, when GDP growth increases, NLG stock price will increase.

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

Running Eview gives us below results:

Dependent Variable: Y
 Method: Least Squares
 Date: 02/16/20 Time: 13:02
 Sample: 1 10
 Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	360.6081	265.5584	1.357924	0.2166
CPI	14.04042	106.1353	0.132288	0.8985
C	1.060018	17.45065	0.060744	0.9533
R-squared	0.208863	Mean dependent var		24.56000
Adjusted R-squared	-0.017177	S.D. dependent var		4.377518
S.E. of regression	4.414954	Akaike info criterion		6.051197
Sum squared resid	136.4427	Schwarz criterion		6.141972
Log likelihood	-27.25598	F-statistic		0.924011
Durbin-Watson stat	1.025329	Prob(F-statistic)		0.440435

Therefore, $Y = 360 * g + 14 * CPI + 1.06$, $R^2 = 0.2$, $SER = 4.4$

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

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: 02/16/20 Time: 13:03
 Sample: 1 10
 Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	313.5005	311.3848	1.006794	0.3529
CPI	2.777887	117.4583	0.023650	0.9819
R	-84.99686	231.7015	-0.366838	0.7263
C	12.75121	36.92147	0.345360	0.7416
R-squared	0.226217	Mean dependent var		24.56000
Adjusted R-squared	-0.160674	S.D. dependent var		4.377518
S.E. of regression	4.716101	Akaike info criterion		6.229016
Sum squared resid	133.4497	Schwarz criterion		6.350050
Log likelihood	-27.14508	F-statistic		0.584705
Durbin-Watson stat	1.073890	Prob(F-statistic)		0.646735

Hence, $Y = 313 * G + 2.7 * CPI - 84 * R + 12.7$, $R^2 = 0.2$, $SER = 4.7$

The above regression equation shows us that NLG stock price (Y) has a positive correlation with GDP growth (G) and inflation (I) but negative correlation with lending rate (R). And the coefficient (with GDP) is the highest, the 2nd

highest is with lending rate. Lending interest rate increases together with GDP growth decreases will lead to a decrease in NLG stock price.

Scenario 4: Regression model with 4 macro variables:

Eviews presents the below results:

Dependent Variable: Y
Method: Least Squares
Date: 02/16/20 Time: 13:03
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	-209.0679	169.6474	-1.232367	0.2726
CPI	-45.44247	52.11754	-0.871923	0.4231
VNINDEX	0.027865	0.005414	5.147144	0.0036
R	30.96470	103.6129	0.298850	0.7771
C	14.95161	16.12129	0.927445	0.3963
R-squared	0.877150	Mean dependent var	24.56000	
Adjusted R-squared	0.778871	S.D. dependent var	4.377518	
S.E. of regression	2.058501	Akaike info criterion	4.588686	
Sum squared resid	21.18714	Schwarz criterion	4.739979	
Log likelihood	-17.94343	F-statistic	8.925042	
Durbin-Watson stat	2.216968	Prob(F-statistic)	0.016889	

Therefore, $Y = -209 \cdot G - 45.4 \cdot CPI + 30.9 \cdot R + 0.02 \cdot VNINDEX + 14.9$, $R^2 = 0.87$, $SER = 2.05$

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

Scenario 5: Regression model with 5 macro variables:

Running Eviews gives us results:

Dependent Variable: Y
Method: Least Squares
Date: 02/16/20 Time: 13:04
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	-194.1253	180.6436	-1.074632	0.3430
CPI	-41.34290	55.41460	-0.746065	0.4971
R	31.34363	109.5317	0.286160	0.7890
VNINDEX	0.029870	0.006420	4.652314	0.0096
RF	46.47627	67.48144	0.688727	0.5289
C	9.982025	18.50660	0.539377	0.6182
R-squared	0.890174	Mean dependent var	24.56000	
Adjusted R-squared	0.752892	S.D. dependent var	4.377518	
S.E. of regression	2.176063	Akaike info criterion	4.676621	
Sum squared resid	18.94100	Schwarz criterion	4.858172	
Log likelihood	-17.38310	F-statistic	6.484263	
Durbin-Watson stat	2.632893	Prob(F-statistic)	0.047096	

Hence, $Y = -194 \cdot G - 41 \cdot \text{CPI} + 31.3 \cdot R + 0.02 \cdot \text{VNINDEX} + 46.4 \cdot R_f + 9.9$, $R^2 = 0.89$, $\text{SER} = 2.1$

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

Scenario 6: Regression model with 6 macro variables:

Running Eviews gives us results:

Dependent Variable: Y
Method: Least Squares
Date: 02/16/20 Time: 13:05
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	-233.0519	172.5190	-1.350877	0.2696
CPI	-44.36689	52.09497	-0.851654	0.4570
R	-17.79483	110.2344	-0.161427	0.8820
VNINDEX	0.023576	0.007883	2.990697	0.0581
RF	50.47280	63.45132	0.795457	0.4845
EX_RATE	0.002378	0.001919	1.239344	0.3033
C	-31.80272	37.93073	-0.838442	0.4633
R-squared	0.927363	Mean dependent var	24.56000	
Adjusted R-squared	0.782090	S.D. dependent var	4.377518	
S.E. of regression	2.043460	Akaike info criterion	4.463193	
Sum squared resid	12.52719	Schwarz criterion	4.675003	
Log likelihood	-15.31597	F-statistic	6.383589	
Durbin-Watson stat	2.836248	Prob(F-statistic)	0.078375	

$Y = -233 \cdot G - 44.3 \cdot \text{CPI} - 17.7 \cdot R + 0.02 \cdot \text{VNINDEX} + 50.4 \cdot R_f + 0.002 \cdot \text{EX_RATE} - 31.8$,

$R^2 = 0.92$, $\text{SER} = 2.04$

Therefore, we see impacts of 6 macro factors, with the new variable: exchange rate USD/VND (EX_RATE), the above equation shows that NLG stock price (Y) has negative correlation with inflation and GDP, lending rate, whereas it has positive correlation with R_f , VNINDEX and exchange rate. We also recognize that GDP growth and R_f , lending rate, then VNIndex have the highest impact on NLG 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 an increase in CPI has a significant impact on decreasing NLG stock price (Y) with the high coefficient of impact, followed by an increase in lending rate and decrease in risk free rate, then a decrease in VNINDEX, a decrease in VNINDEX, as well as a little reduction 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.

Besides, 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 NLG stock price.

CONCLUSIONS AND POLICY SUGGESTION

Based on the above data analysis from our regression model, although low inflation during 2015-2016 is a good signal for NLG 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, risk free rate 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 NLG 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.

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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.