VNINDEX INDEX: A VIEW FROM QUANTITATIVE ANALYSIS

* Associate Professor. Ph.D. Hoang Thanh Tung
University of Labor and Social Affairs
Le Ha Minh
Nguyen Sieu High School, Hanoi

Corresponding author. *Hoang Thanh Tung
Email: hoangthanhtung15(at)gmail.com

A B S T R A C T

The financial strategy towards 2030 in Decision no. 368/QD-TTg enacted on 21/3/2022 by the Vietnam Prime Minister had set developmental goals for the stock market to become a channel to promote mid-and-long term capital raising for the economy, to continue changing the structure to be more appropriate for the monetary, the capital, the stock, and the bonds market. In the past two years, the stock market in Vietnam has manifested impressive growth. A prime example is the active growth of private investors. However, many challenges and loopholes still exist in the stock market. The stock market is a special market as the fluctuation of the VN-index index is affected by many factors including the expectations of the investor. When the market shows trends of increases in points then investors expect the next session to grow as well, leading to a rise in sales even for stocks with inflating costs, thus the VNindex will increase and vice versa. The structure of the econometric is utilized to assess the impacts of the VN-index of the previous month on the index of the following month on the Vietnamese stock market in the period from January 2019 to May 2022. The conclusion of the quantitative analysis shows that if the VN-index of the previous month increases by 1% then the VNindex of the following month will increase by 0.965% or vice versa. From the results of the analysis, the research team has proposed a few discussion points intending to stabilize the stock market in the upcoming time and develop the market according to the financial strategy towards 2030 in Decision no. 368/QD-TTg by the Vietnam Prime Minister.

K E Y W O R D S

VNindex index, stock market, quantitative analysis.

1. Setting the problem research

VNIndex is the index of the listed and traded stock on the Ho Chi Minh City Stock Exchange. VNIndex shows the fluctuating trends of the listed and traded stocks on Ho Chi Minh City Stock Exchange. This index compares the capitalization currently available on the market with the initial cost of capitalization on the basis day. Which, the basis day is the first day that HSX was active, 28/7/2000, and VN-Index had the initial value of 100 points.

The VNIndex index is calculated following the market-weighted method, based on the level of fluctuation that a stock experiences. The index is also calculated and changed during the time of the trade, therefore, based on the VNIndex, investors can analyze and determine the trends of the market. Furthermore, the VNIndex also shows the investors' mentality: When the economy is growing steadily, traders will have faith in future development, thus, they will actively trade alongside the rising VNIndex. On the contrary, if the economy shows signs of regressing or a crisis, investors will have a negative mindset and become less enthusiastic about trading. During that period, the cost of stocks will decrease, dragging the VNIndex along with it.

The financial strategy towards 2030 in Decision no. 368/QD-TTg that was enacted on 21/3/2022 by the Prime Minister had set developmental goals for the stock market to become the main channel to promote mid-and-long term capital raising for the economy, to continue changing the structure to be more appropriate for the monetary, the capital, the stock, and the bonds market. By the end of 2025, the government strives to achieve some of the goals set in the financial strategy as well as the plan to develop the banking industry, detailed as follows: Scale the capitalization of the stock market to reach 100% GDP, the debt of the bonds market to be at minimum 47% GDP, in which the debt of enterprise bonds to reach the minimum of 20% GDP.

In the past 2 years, the stock market in Vietnam has manifested impressive development. A particular example is the active growth of private investors. Noticeably, the number of people opening accounts to start investing in stocks has accounted for 5% of the population, which is 3 years faster than the goal set by the government. However, many challenges and loopholes still exist in the stock market, allowing some individuals to exploit for profit. This created a demand for national governing bodies to establish effective solutions for management to aid the market's sustainable development.

In the article's boundary, the author has collected data of the VNIndex index from January 2019 to May 2022, the data is collected following the dates of transaction and is then calculated as a monthly average index. The author has analyzed the fluctuating index during 4 periods and through estimations made using the log-log model, the author has assessed the changes of the VNIndex through time. Specifically, the author observes the dependency of this month's VNIndex on the index of the previous month, to evaluate the trends of the index as well as to observe the important role of stabilizing the index since the current VNindex index depends on the index in the past. The article aims to provide the fluctuation of the index and a different perspective on the fluctuation of the index through time, based on the result made by quantitative analysis.

2. Research data and methods
2.1. Research data

The research team collects VNindex data on https://www.stockbiz.vn/IndicesStats.aspx for the period from January 2019 to May 2022. Statistics are calculated by trading day, then averaged to determine the VNIndex values every month, the results are observations that are included in the model to conduct linear regression steps to examine the effect of the previous month's VNIndex on the previous month. The total number of observations of data in a given time included in the analytical model is 41 observations.

2.2. Research Methods

The research team uses a linear log-log model to examine the relationship between the previous month's VN-index and that of the next month.
The model has the form:

$$LVNindex = C1 + C2 \times LVNindex(-1)$$

In there:

LVNindex is the log of VNindex by month

LVNindex (-1) is the log of the previous month's VN-index

The steps are as follows:

Step 1: Use Eviews 10 software to run the model with obtained secondary data.

Step 2: Check the statistical significance of the regression coefficients with the explanatory variables and the statistical significance of the regression model at the significance level = 5%.

A regression coefficient is said to be statistically significant if:

- Prob <= 5%
- Prob(F-statistic) <= 5%

Step 3: Check the explainability of the model through the coefficients R-squared and Adjusted R-squared

A model is said to be explanatory (fits) if:

- R-squared > 0.6
- Adjusted R-squared > 0.6

Step 4: Check the model for defects with = 5%

A model is considered good (can be used for analysis), then besides the regression coefficients of the model are statistically significant, the coefficients R-squared, Adjusted R-squared > 0.6 must also be satisfied. have autocorrelation defects; variance of error changes.

In the study, the authors used tools on Eviews 10 to check for these defects. Specifically:

- Use the Breush-Godfrey test to check for autocorrelation defects. The model does not have autocorrelation defects at some level p if Prob (F-statistics) and Prob (Obs *R-squared) >= 5%
- Use Breusch-Pagan-Godfrey to test for variable variance. The model does not have variable variance if Prob (F-statistic) and Prob (Obs *Chi-squared) > = 5%

When the above conditions are satisfied, the model results will be estimated and analyzed.

3. VNindex and the perspective from quantitative analysis
3.1 Movement of VNindex in the period from January 2019 to May 2022

Figure 1. VN-index in the period from January 2019 to May 2022

Source: Compiled from https://www.stockbiz.vn/IndicesStats.aspx
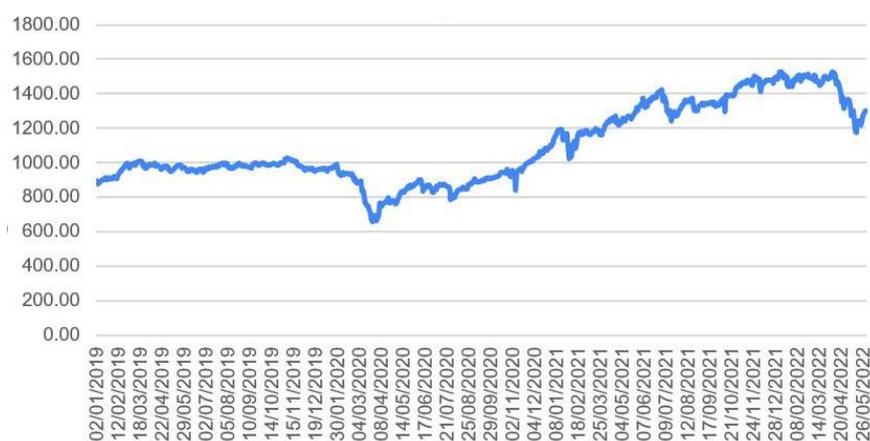
In this research, the authors divide the VNindex from January 2019 to May 2022 into 4 phases, specifically:

Phase 1: From 01 January 2019 to 31 December 2019

In 2019, there were both negative and positive impacts on the world's financial market in general and on the stock market in particular, such as the escalating US-China trade war, Brexit, political instability in some countries, and reversal in monetary policies of some major countries in the world. In terms of Vietnam's stock market in 2019, many factors positively affected the market and supported the development of the market, such as ensuring the macro balance, stabilizing fiscal policy, easing monetary policies, and increasing GDP in the second quarter by 7.31%, and keeping the inflation low. Although there were many fluctuations in the world's stock market, there was a slight recovery in Vietnam's stock market, and on June 30, VNindex reached 949.94 points. At the end of the year, despite the decreasing trend in the VN-index, VNindex peaked at 1024.91 points on 6 November. Vietnam's stock market in 2019 had complications but it still had a slight recovery in general.

Phase 2: From 01 January 2020 to 31 December 2020

At the beginning of 2020, because of the effects of the Covid-19 pandemic, the stock markets in most countries were affected, and Vietnam was not an exception. The epidemic has caused many businesses to close, disrupted the supply chains, and affected numerous industries. Just after 3 months, the VN-index was reduced to 659.21 points on 24 March, which was the lowest point in 3 years. However, thanks to the tight control of the epidemic and the implementation of the expansionary monetary and fiscal policies of the Government and the State Bank of Vietnam, Vietnam's stock market quickly recovered. In addition, interest rates were also at a record low so the money flowed strongly into the stock market. Specifically, the number of new investment accounts created in November was 41.203, which was the highest number of new accounts opened by month in the history of Vietnam's stock market. In general, Vietnam's stock market in 2020 experienced many fluctuations but still grew significantly.

Phase 3: From 01 January 2021 to 31 December 2021

Vietnam's stock market in 2021, despite having a significant impact, still witnessed remarkable growth. Thanks to the Covid-19 vaccination plan and the return to "the new normal life" plan, Vietnam's stock market continued to grow in 2021. Nevertheless, the market experienced some fluctuations and adjustments due to the appearance of new strains of Covid-19, Delta, and Omicron. The VN-index has set historic peaks many times and reachedthe highest point at 1500.81 points on November 25. Investors continued to invest in the market, partly due to the crowd sentiment, and in November 2021 the total number of securities accounts in Vietnam reached approximately 4.08 million, which accountsfor nearly 4% of Vietnam's population. However, due to the rapid and strong growth, the stock market had many dangers and risks.

Phase 4: From 01 January 2022 to 31 May 2022.

In the first half of 2022, Vietnam's stock market showed signs of going down. On January 6, 2022, the VN-index reached 1528.57 points, the highest in these 4 phases but then the index dropped dramatically and hit 1171.95 points on May 16. During this phase, the stock market in Vietnam worsened due to inflation and market manipulation. Moreover, Vietnam's stock market was also influenced by the international stock market. However, the current international political-economic situation has many potential risks such as the war between Russia and Ukraine, rising tension between the US and European's embargo policy with Russia, China's lockdown, or tightening monetary and fiscal policies in the world.

3.2 Quantitative analysis results

The econometric model is used to examine the impact of the previous month's VNindex on the next month's VNindex of Vietnam's stock market from January 2019 to May 2022. The results are shown in Table 1:

Table 1. Impact of the last month's VNindex on the next month's VNindex on Vietnam's stock market from 2019 to early 2022

```
Dependent Variable: LVNINDEX
Method: Least Squares
Date: 07/11/22   Time: 22:02
Sample (adjusted): 2019M02 2022M05
Included observations: 40 after adjustments
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LVNINDEX(-1)	0.964954	0.041159	23.44480	0.0000
C	0.253044	0.287406	0.880441	0.3842

R-squared	0.935337	Mean dependent var	6.988457
Adjusted R-squared	0.933635	S.D. dependent var	0.202350
S.E. of regression	0.052128	Akaike info criterion	-3.021510
Sum squared resid	0.103260	Schwarz criterion	-2.937066
Log likelihood	62.43020	Hannan-Quinn criter.	-2.990978
F-statistic	549.6585	Durbin-Watson stat	1.213509
Prob(F-statistic)	0.000000		

Source: Data analysis results of the research team

The results in Table 1 show that all the regressions coefficients are statistically significant because the coefficient Prob (LVNindex (-1) = 0.0000 < 0.05); the regressions model is suitable because the coefficient Prob(F-statistic) = 0.000000 < 0.05

The coefficient of determination of the model R-squared = 0.935337 > 0.6; Adjusted R- squared = 0.933635 > 0.6.

From the results of the data analysis in Table 1, the research team has drawn the following model:

LVNindex = 0.253044 + 0.964954 x LVNindex (-1)

According to the results of quantitative analysis, this month's VN-index is affected by the previous month's VN-index, specifically: coefficient C2 = 0.964954 > 0. This means that while other factors remain unchanged, when the previous month's VN-index increases, the VN-index of the next month tends to increase and when the previous month's VN-index decreases, the VNindex of the next month tends to decrease. When the previous month's VNindex increases by 1%, the following month's VNindex will increase by 0.965% or vice versa. The results of the model show that the previous month's VNindex explains 93.5337% of the change in the next month's VN-index, which is a high percentage indicating that the past VNindex has an important influence on the current VN-index.

Next, the research team examined the defects of this model, specifically:

The results of Table 2 show that the model does not have Heteroskedasticity at a 5% significance level, Prob values > 0.05

Table 2. Verification of Heteroskedasticity

```
Heteroskedasticity Test: Breusch-Pagan-Godfrey
```

F-statistic	0.183836	Prob. F(1,38)	0.6705
Obs*R-squared	0.192580	Prob. Chi-Square(1)	0.6608
Scaled explained SS	0.562888	Prob. Chi-Square(1)	0.4531

Source: Data analysis results of the research team

Results Table 3 show the model without autocorrelation with a significance level of 5%, Prob values > 0.05

Table 3. Autocorrelation defect test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.965913	Prob. F(2,36)	0.0642
Obs*R-squared	5.658543	Prob. Chi-Square(2)	0.0591

Source: Data analysis results of the research team

Thus, the results of the quantitative analysis show the impact of the investors' expectations on the volatility of the VN-index. In the condition that other factors remain unchanged, the impact of investors' expectations on the VNindex according to the model reflects the movement trend of the VN index. The stock market is a special market, the volatility of the VN-index is influenced by many factors, including investors' expectations. When the market is on an uptrend, investors expect the next session will increase, so they increasingly buy the stocks even when the stock prices are going up, thus the VNindex also increases, and in reverse, when the market is in a downtrend, the investors will buy less even when the stock prices decrease, VNindex, therefore, decreases.

4. Discussions and debates:

The VN-index index plays an important role in assisting investors to evaluate and analyze the fluctuations in Vietnam's stock market. Assessing the trends of the index is the first step to aiding investors to decide what position they should participate in the stock market, or what the investing proportions should be. The nature of this index is the calculations based on the fluctuation of the stock, thus, it is inevitable that the index would react precisely according to the changes in the market value.

The financial strategy towards 2030 in Decision no. 368/QD-TTg was enacted on 21/3/2022 by the Prime Minister had set goals to develop a sustainable stock market, that functions safely and effectively, and has a practical structure that balances the monetary, stock, bonds, and derivatives markets.

The Vietnamese stock market is currently still in its developing stages, therefore, is still heavily affected by psychological factors; The conclusion reached through quantitative analysis showed that the VN-index of this month is affected by the index of the previous month, meaning there is a need for positive information that stabilizes investors' mentality, encourages the trust of entities participating in the market, as well as promotes public investors within and out of the country to have faith in our Party, State, Government, and Ministry of Finance as they stabilize the macroeconomic, develop the stock market in a transparent, public, safe, and effective manner.

Furthermore, the State Securities Commission of Vietnam must monitor and evaluate to criticize the content regarding stock and the stock market that can be considered inadequate in the legal frame (including the Laws on Securities and the documents of instructions), especially regulations on information transparency from enterprises, rights and responsibility of involved parties, disciplinary measures for violating laws on the stock market to protect investors, therefore, recovering the trust and ensuring the healthy, transparent, and sustainable growth of the market.

Investors should patiently and unitedly maintain the market, fulfilling their responsibility to the market by not panicking, or overreacting, and not spreading negative information or baseless rumors. All media, including well-known news agents that can dictate the public's opinions, should put thorough consideration when publishing or spreading information, prevent news articles containing unofficial predictions from being published, and have an advisory team that consists of people with high levels of professionalism, job morale, and no selfish intent.

Investors should research carefully the stock ticker they plan to trade with, analyze the technology meticulously before putting in the trading command to buy or sell, and avoid trading with a crowd mentality which makes them vulnerable to being lured by certain groups.

REFERENCES

Asean Securities (2019). *Strategy report.*https://www.aseansc.com.vn/

Minh-Hoang Nguyen (2021). *Will VN-Index continue to rise after hitting the 1,200-point milestone?* Phenikaa University

Nguyen Viet Hung (2022). The situation of the stock market in the context of the Covid-19 pandemic. Industry and trade magazine

N.Bình (2022). VN-index growth in 2022 will be under 10%. https://tuoitre.vn/

Nguyen Thi Mai Huyen, Ngo Sy Nam (2022). The impact of global factors on stock prices on Vietnam's stock market during the Covid-19 pandemic. Banking Magazine

Trung Thanh Nguyen, Thi Linh Do, Van Duy Nguyen (2016). *Impacts of Monetary policy and Information Shock on Stock Market: Case Study in Vietnam*

KB Securities Vietnam (2020). *Market Strategy Report 2020.* https://www.kbsec.com.vn/

KB Securities Vietnam (2021). *Outlook for Vietnam's stock market in 2021.* https://www.kbsec.com.vn/

Thanh Ha (2020). *Looking back at the stock market in 2019: Absence of big waves.*https://m.nhipsongkinhdoanh.vn/

Nguyen Son (2020). *Vietnam's stock market in 2019 and issues in 2020*, https://tapchitaichinh.vn/

Quynh Le (2022). *Which industry stocks are expected to invest in the second half of 2022*, https://thitruongtaichinhtiente.vn/

Thu Huong (2021). *Vietnam's stock market in 2020 and outlook for 2021.* https://consosukien.vn/

Prime Minister (2022). Decision on approving the financial strategy to 2030. No. 368/QD-TTg, Hanoi, March 21, 2022.

VOV.VN (2021). *Stock Market 2021 - A year of sublimation.* https://vov.vn/

Vietnam+ (2022). *Has Vietnam's stock market hit the lowest point?*. https://www.vietnamplus.vn