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The Discussion of Influence Factors to Stock Market after Vietnam Joined WTO

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Abstract The stock market is an important part of the economy of each country, the increase or decrease in the share prices indicates the boom or recession of economy cycle. This study examined these factors such as Inflation (I), Interest Rate (IR), Foreign Direct Investment (FDI), Exchange Rate (ER) and Oil Prices (OP) impact to Stock Market after Vietnam joined the World Trade Organization (WTO). Simultaneously, this paper seeks to contribute further understanding about the impact of each factor affect to Vietnam stock market. The results, from analysis monthly data from 2007/2 to 2013/12, show that some factors have the positive effect to the securities market and some others have the negative effect. Using the ADF Unit Root test reveals that these variables used in this study are stationary. Analyzing of Co-integration test presents evidence about the long-run relationship between Vietnam stock index (VNI) and other variables. This study uses VECM to forecast the near future of VNI and VAR test to find the relationship between VNI and the factors.

Keywords Influence Factors, Vietnam Stock Market, the World Trade Organization (WTO)

1. Introduction

In the past decade, participating into the regional and international economic integration is a top priority of Vietnam government. Vietnam has set up trade relations with 165 countries, signed bilateral trade agreements with 72 countries, and the most important is with the United States in 2001. Vietnam became no.150 member of WTO (World Trade Organization in short) in January 2007. WTO membership brought opportunities for Vietnam to continued rapid economic development and sustained poverty reduction. New opportunities and challenges created by international economic integration have had significant effect to the economy. The stock market is often considered as the primary indicator of a country's economic strength and development (Mahipal Singh, 2011). Nowadays, with development of technology, stock transaction becomes more easy and popular so that nearly anybody can own stocks (Investopedia Staff et al. 2009). Vietnam is an emerging country and its stock market has grown rapidly. Vietnamese stock market consists of two stock exchanges, namely the Ho Chi Minh City Securities Trading Centre (HSTC) and the Hanoi Securities Trading Centre (HaSTC). The state securities commission is responsible for monitoring the stock exchanges. This study uses the Ho Chi Minh Stock Exchange and known as Vn-index (VNI). The aim of this study is to contribute towards the study of the influence factors to Stock Market after Vietnam Joined WTO. All over the world, many analysts have researched for impact of some factors affect to the stock market. And in this paper, we will research five factors affect to Vietnam stock market which is Inflation (I), Interest Rate (IR), FDI, Exchange Rate (ER) and Oil Price (OP).

This study uses data from 2/2007 to 12/2013. The objectives of this research include: (1) To investigate which variables influence stock market in Vietnam, especially after joining the WTO. (2) To explain more about the extent of each factor affect to Vietnam stock market. (3) To find out the lead-lag relationship between VNI and the factors, beside that we use impulse response function to observe how the VNI react if there was a shock on the factors.

2. Literature Review

2.1. The Relationship between Inflation and Stock Market

In study by Rene and Taufiq (2014) showed that a positive relationship between the inflation rate and stock prices. In contrary, Fama (1981) suggest that a negative relationship between stock prices and inflation. Moreover, Modigliani and Cohn (1979) show that inflation erodes the long-run real value of stocks. Boyd, Levine, & Smith (1996 and 2001)

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empirically documents that the relationship between long run inflation rate and economy financial system performance.

2.2. The Relationship between Interest Rate and Stock Market

Tejvan Pettinger (2008) showed that higher interest rates tend to slow down the economic growth and are often seen as bad news for the stock market. Higher interest rates tend to slow down economic growth. The finding of Campell and Ammer (1991) suggests that what economic forces create the persistent changes in expected excess stock returns.

2.3. The Relationship between FDI and Stock Market

In study by Acheampong and Wiafe (2013) show that a positive relationship between efficient stock market and FDI. Chun-Pin, Chin-Wen and Alfred (2013) find that FDI does not worsen the domestic stock market during a period of financial crisis. However, Haussmann and Fernandez-Arias (2000) emphasized that FDI tends to be larger in countries that are riskier, financially underdeveloped and institutionally weak. In contrary, Syed Ali Raza and Syed Tehseen Jawaid (2012) find that FDI has a significant negative impact on the stock market capitalization in the short run.

2.4. The Relationship between Exchange Rate and Stock Market

Base on the result of Ma and Kao (1990) found the relationship between exchange rate and stock market area also different which is positive for the import-dominant country and negative for the export-dominant country. In stydy by Jorion (1990) show that the volatility of exchange rate market on the stock market sometimes is very little or even showing no power. The study of Vincent and Paul (1999) has shown that an increase in exchange rate volatility is accompanied by a decline in the stock markets. Ying Wu (2001) argues that the relations between the exchange rate and stock prices are negative.

2.5. The Relationship between Oil Price and Stock Market

Bjornland (2009) analyzes the effects of oil price shocks on Norwegian stock market. Her results show that higher oil prices would be expected to lead to higher levels of economic activity. According to Bjornland (2009) and Jimenez-Rodriguez and Sanchez (2005), an oil price increase is expected to have a positive effect in an oil-exporting country, as the country's income will increase. Another study shows that the oil price is not impacted the price creation process of equities in Indian stock markets by Seyed (2012). Kilian and Park (2008), they documented that the responses of U.S. real stock returns to oil price shocks differ substantially, depending on the underlying causes of the oil price increase, can cause the decrease in the stock price.

3. Methodology

3.1. Data Description

Based on the research objectives in the introduction above, we collected monthly data on the following variables: Inflation (I), Foreign Direct Investment (FDI), Interest Rate (IR), Exchange Rate (ER), Oil Price (OP) and Vn-Index (VNI). The data are collected from 2007/2 to 2014/12. All the data are converted into USD using US/VNI exchange rate cited from website of the State Bank of Vietnam.

3.2 Methodology

3.2.1. Unit Root Test

This study uses the Unit Root Test to examine the time series properties of the concerned variables. In this study, the DF and ADF unit root test of Dickey and Fuller (1981) have been adopted to examine the data is stationary or non-stationary.

$$\Delta Y_t = a_0 + \gamma Y_{t-1} + a_2 t + \varepsilon_t \quad (1)$$

Where Δ is the first difference operator, a_0 is a drift term or an intercept, $a_2 t$ is the time trend, and ε_t is a white-noise error. In this study, we will test for unit root with variables: VNI, Inflation (I), Interest Rate (IR), FDI, Exchange Rate (ER) and Oil Price (OP).

Test hypothesis for above equations is

$$\begin{cases} H_0 : \gamma_0 = 0 (non - stationary) \\ H_1 : \gamma_0 < 0 \end{cases}$$

3.2.2. Co-integration Test

Co-integration is a property possessed by some non-stationary time series data. In this concept, two variables are co-integrated when a linear combination of the two is stationary, even though each variable is non-stationary:

$$C = Y - \beta X \quad (2)$$

Where the parameter β is the co-integrating parameter that links the two time series together.

In co-integration test, the null hypothesis is non-co-integration. Only two are used here both based on the using an OLS regression in the following form:

$$Y = a + bY + \mu \quad (3)$$

Where b is the estimator for the equilibrium parameter, a is the intercept, and μ is the disturbance term.

The first of the two tests of co-integration is based on the Co-integration Regression Durbin-Watson (CRDW) statistic.

The second test of co-integration is based on testing the stationary of the error terms from equation (3).

$$\Delta \mu_t = a_0 + a_1 \mu_{t-1} + a_2 t + \sum_{i=1}^{k} \gamma_i \Delta \mu_{t-i} + \varepsilon_t \quad (4)$$

where a and γ are the estimated parameters and ε is the error term. The number of lags (k) chosen in equation (4) should be sufficient to ensure that the error term ε is white noise. The choice of k is based on the modified Lagrange Multiplier (LM) statistic. The test for co-integration involves the significance of the estimated a_1 coefficient.

3.2.3. Vector Error Correction Model (VECM)

A Vector Error Correction Model (VECM) can lead to a better understanding of the nature of any non-stationary among the difference component series and an also improve longer term forecasting over an unconstrained model. Consider the following two-variable VECM with non-stationary time series:

$$\Delta Y_t = a_1 + b_1 \Delta Z_{t-1} + \alpha_1 (Y_{t-1} - \beta Z_{t-1}) + e_{1t} \quad (5)$$

$$\Delta Z_t = a_2 + b_2 \Delta Z_{t-1} + c_2 \Delta Y_{t-1} + \alpha_2 (Y_{t-1} - \beta Z_{t-1}) + e_{2t} \quad (6)$$

Where all term involves Δ (first differences) are stationary. This two-variable error correction model (VECM) is a bivariate VAR in the differences augmented by the error term $\alpha_1(Y_{t-1} - \beta Z_{t-1})$ and $\alpha_2(Y_{t-1} - \beta Z_{t-1})$ from the co-integrating relation. In general, the k^{th} order VECM can be represented by the following system:

$$\Delta X_t = \mu + \tau_1 \Delta X_{t-1} + \tau_2 \Delta X_{t-1} + ... + \tau_{k-1} \Delta X_{t-k-1} + \Pi X_{t-k} + e_t \quad (7)$$

Where: X_t is a vector of *p I(1)* variables, μ is a *p x 1* vector of intercepts, τ_1, τ_2, Π, are *p x p* matrices of parameters, e_t is a vector of uncorrelated structural shocks, Δ is a difference operator, *I(1)* is integrated of order 1.

We design VECM for VNI and influenced factors as the following equations:

$$\begin{aligned}\Delta VNI_t = {} & \alpha_0 + \sum_{i=1}^{k} \theta_{1i} \Delta VNI_{t-1} + \sum_{i=1}^{k} \theta_{2i} \Delta I_{t-1} + \sum_{i=1}^{k} \theta_{3i} \Delta IR_{t-1} + \sum_{i=1}^{k} \theta_{4i} \Delta FDI_{t-1} \\ & + \sum_{i=1}^{k} \theta_{5i} \Delta ER_{t-1} + \sum_{i=1}^{k} \theta_{6i} \Delta OP_{t-1} + \lambda (VNI_{t-1} - \beta_1 I_{t-1} - \beta_2 IR_{t-1} \\ & - \beta_3 FDI_{t-1} - \beta_4 ER_{t-1} - \beta_5 OP_{t-1} - \beta_0 - \delta_t) + D_t + e_t \end{aligned} \quad (8)$$

Where: ($VNI_{t-1} - \beta_1 I_{t-1} - \beta_2 IR_{t-1} - \beta_3 FDI_{t-1} - \beta_4 ER_{t-1} - \beta_5 OP_{t-1} - \beta_0 - \delta_t$) is the error correction term, λ is the coefficients of the error correction term which capture the adjustments towards long run equilibrium; e_t: white nose error; α_0, β: intercepts, $\theta_{1i}, \theta_{2i}, \theta_{3i}, \theta_{4i}, \theta_{5i}, \theta_{6i}$: coefficient of ΔVNI_{t-1}, ΔI_{t-1}, ΔIR_{t-1}, ΔFDI_{t-1}, ΔER_{t-1}, ΔOP_{t-1}, respectively, which describe the short run relationship; δ_t is the trend in co-integration equation, D is a dummy variable financial crisis.

3.2.4. VAR Model

In a simple form, a Vector Auto Regression (VAR) model is composed of a system of regression where asset of dependent variables are expressed as linear functions of their own and each other's lagged values, and possibly other independent variables. Consider the following two-variable, one-period lag VAR model:

$$Y_t = a_1 + b_1 Y_{t-1} + c_1 Z_{t-1} + e_{1t} \quad (9)$$

$$Z_t = a_2 + b_2 Z_{t-1} + c_2 Y_{t-1} + e_{2t} \quad (10)$$

In common terms, an unrestricted p^{th} order Gaussian VAR model can be represented as:

$$Y_t = \mu + \Phi_1 Y_{t-1} + \Phi_2 Y_{t-2} + ... + \Phi_k Y_{t-p} + e_t \quad (11)$$

Where: Y_t: a vector of variables, μ: vector of intercepts, $\phi_1, \phi_2 ... \phi_k$: *p ×p:* matrices of parameters with all eigenvalues of ϕ having module less than one so that the VAR is stationary, e_t: a vector of uncorrelated structural shocks.

We design the VAR model for the factors as well as the stock price as follow:

$$VNI_t = a_1 + \sum_{i=1}^{k} b_{1i} VNI_{t-1} + \sum_{i=1}^{k} c_{1i} I_{t-1} + \sum_{i=1}^{k} d_{1i} IR_{t-1} + \sum_{i=1}^{k} e_{1i} FDI_{t-1} + \sum_{i=1}^{k} f_{1i} ER_{t-1} + \sum_{i=1}^{k} g_{1i} OP_{t-1} + \varepsilon_t \quad (12)$$

$$I_t = a_2 + \sum_{i=1}^{k} b_{2i} VNI_{t-1} + \sum_{i=1}^{k} c_{2i} I_{t-1} + \sum_{i=1}^{k} d_{2i} IR_{t-1} + \sum_{i=1}^{k} e_{2i} FDI_{t-1} + \sum_{i=1}^{k} f_{2i} ER_{t-1} + \sum_{i=1}^{k} g_{2i} OP_{t-1} + \varepsilon_t \quad (13)$$

$$IR_t = a_3 + \sum_{i=1}^{k} b_{3i} VNI_{t-1} + \sum_{i=1}^{k} c_{3i} I_{t-1} + \sum_{i=1}^{k} d_{3i} IR_{t-1} + \sum_{i=1}^{k} e_{3i} FDI_{t-1} + \sum_{i=1}^{k} f_{3i} ER_{t-1} + \sum_{i=1}^{k} g_{3i} OP_{t-1} + \varepsilon_t \quad (14)$$

$$FDI_t = a_4 + \sum_{i=1}^{k} b_{4i} VNI_{t-1} + \sum_{i=1}^{k} c_{4i} I_{t-1} + \sum_{i=1}^{k} d_{4i} IR_{t-1} + \sum_{i=1}^{k} e_{4i} FDI_{t-1} + \sum_{i=1}^{k} f_{4i} ER_{t-1} + \sum_{i=1}^{k} g_{4i} OP_{t-1} + \varepsilon_t \quad (15)$$

$$ER_t = a_5 + \sum_{i=1}^{k} b_{5i} VNI_{t-1} + \sum_{i=1}^{k} c_{5i} I_{t-1} + \sum_{i=1}^{k} d_{5i} IR_{t-1} + \sum_{i=1}^{k} e_{5i} FDI_{t-1} + \sum_{i=1}^{k} f_{5i} ER_{t-1} + \sum_{i=1}^{k} g_{5i} OP_{t-1} + \varepsilon_t \quad (16)$$

$$OP_t = a_6 + \sum_{i=1}^{k} b_{6i} VNI_{t-1} + \sum_{i=1}^{k} c_{6i} I_{t-1} + \sum_{i=1}^{k} d_{6i} IR_{t-1} + \sum_{i=1}^{k} e_{6i} FDI_{t-1} + \sum_{i=1}^{k} f_{6i} ER_{t-1} + \sum_{i=1}^{k} g_{6i} OP_{t-1} + \varepsilon_t \quad (17)$$

3.2.5. Impulse Response Function

Impulse response analysis is used widely in the empirical literature to uncover the dynamic relationship between the variables within vector auto regressive (VAR) model. Impulse response measures the time profile of the effect of a shock or impulse, on the expected future values of a variable.

4. Results and Discussion

4.1. Analysis of Unit Root Test

In this study, we use the ADF Unit Root Test of Dickey and Fuller (1981) to examine whether the data are stationary series. The results of the ADF Unit Root test for these variables in the level data are reported in Table 1.

Table 1. Results from ADF unit root test

Variables	Level	First Difference
VNI	-1.959	-8.259***
	(0.0483)	(0.0000)
I	-4.632***	-12.877***
	(0.0002)	(0.0001)
IR	-0.849	-8.016***
	(0.3453)	(0.0000)
FDI	-2.068	-14.228***
	(0.0377)	(0.0000)
ER	-1.060	-11.551***
	(0.7287)	(0.0001)
OP	-2.895	-4.920***
	(0.0496)	(0.0001)

Notes: *,**,* denote significance at 1%,5%,10% level respectively.

Our results indicates that all variables which used on this study are non-stationary series at level data (except Inflation (I)) and stationary at the first difference.

4.2. Analysis of Co-integration Test

The Co-integration test is used to determine whether long-term relationships exist among the variables. The results of Johansen Co-integration are displayed in Table 2.

Table 2. Results from Co-integration test

Hypothesized No. of CE(s)	Trace Statistic	Max-Eigen Statistic
None*	147.433***	64.6659***
	(0.0000)	(0.0001)
At most 1*	82.767**	44.8906**
	(0.0033)	(0.0017)
At most 2	37.876	18.2600
	(0.3074)	(0.4736)
At most 3	19.616	13.3368
	(0.4492)	(0.4217)
At most 4	6.2795	4.8034
	(0.6625)	(0.7664)

Note: ***,**,* denote significant at 1%, 5%, 10%, respectively.

Our results show that test statistic was rejection the null-hypothesis of no Co-integration vector under four trace and maximal eigenvalue forms of the test. It is evidence that there exist the long-run relationship between VNI and other variables.

4.3. Analysis of VECM Test

The results of Co-integration test suggest there are long run relationships between stock prices and the factors in Vietnam. There force, in this section, we will employ the VECM model to analyze the short-run relationships.

4.3.1. Selection of Optimal Lag Terms with VAR Model

Before employing the VECM test for analysis, it is necessary to select optimal lag terms. In this research, we take AIC served as the rule for selection of optimal lag terms. Outcomes are shown in the Table 3.

Table 3. VAR lag order selection criteria

Lag term	AIC
0	81.81975
1	71.19779
2	70.65951*
3	70.74112
4	70.89874
5	71.00246

Note: * indicates lag order selected by criterion
AIC: Akaike information criterion

As above results, the two lag period was selected as optimal lag term for Vietnam market, respectively. Having selected the optimal lag, we take the VNI and other factors as endogenous variables and proceed with VECM analysis system. Empirical results obtain through testing appear in the Table below.

4.3.2. Long Run Relationship

In VECM, the error correction term reveals the long run relationship, which is taken out from the results of Co-integration test. The Table 4 presents the Co-integration coefficients from the Johansen Co-integration test.

Table 4. The Co-integration coefficients from the Johansen Co-integration test

VNI	I	IR	FDI	EX	OP	C
1.000000	-2.53198***	6.8848***	4.36229***	0.36266***	-23.5476***	-6490.48
	[-3.02459]	[2.29832]	[9.12649]	[7.42426]	[-5.23431]	
Normalized ECM						
VNI= 2.53198*I – 6.88483*IR - 4.36229*FDI - 0.362662*EX + 23.54767*OP + 6490.48						

Note: **,**,* denote significance at 1%, 5%, 10%, respectively

Table 5. The short-run relationship stock prices and the factors

	D(VNI)	D(I)	D(IR)	D(FDI)	D(ER)	D(OP)
ECM(-1)	0.030497**	0.000291	4.17E-06***	-3616246***	0.128516*	-0.002825*
	[1.98236]	[1.59547]	[2.38089]	[-6.81907]	[1.93036]	[-1.73381]
D(VNI(-1))	0.134127	-0.000949	-2.48E-06	11959358***	-0.523778	-0.005624
	[1.21804]	[-0.72680]	[-0.19741]	[3.15059]	[-1.09912]	[-0.48226]
D(VNI(-2))	-0.061224	-0.000258	-1.74E-05	4157936.	-0.495217	-0.012648
	[-0.56290]	[-0.19985]	[-1.40574]	[1.10898]	[-1.05209]	[-1.09813]
D(I(-1))	-16.42860*	-0.125774	-0.001583	75574778	-39.24938	0.665169
	[-1.75037]	[-1.13042]	[-1.48061]	[0.23359]	[-0.96630]	[0.66924]
D(I(-2))	7.944925	-0.094713	-0.000906	-3.06E+08	11.90946	0.835036
	[1.02859]	[-1.03437]	[-1.02970]	[-1.15101]	[0.35628]	[1.02088]
D(IR(-1))	696.8335	-10.74756	0.049928	2.60E+10	813.2231	-62.04418
	[0.75981]	[-0.98856]	[0.47781]	[0.82255]	[0.20490]	[-0.63885]
D(IR(-2))	-517.1818	9.178387	0.241683***	-5.68E+10**	-1759.227	-260.3566***
	[-0.62490]	[0.93552]	[2.56300]	[-1.99033]	[-0.49118]	[-2.97067]
D(FDI(-1))	-1.29E-08***	-1.42E-10***	-2.44E-12***	0.464867***	-2.35E-08	9.18E-10*
	[-2.50944]	[-2.33816]	[-4.17009]	[2.63081]	[-1.05975]	[1.69079]
D(FDI(-2))	-7.63E-09**	-4.12E-11	-8.23E-13*	0.100894	-2.26E-08	1.30E-10
	[-1.96763]	[-0.89663]	[-1.86420]	[0.75528]	[-1.34931]	[0.31769]
D(ER(-1))	0.013132	8.76E-05	-7.35E-07	1790753*	-0.24128***	0.000768
	[0.49022]	[0.27586]	[-0.24085]	[1.93932]	[-2.08141]	[0.27060]
D(ER(-2))	0.006550	-0.000284	1.94E-06	-1078761	-0.198814*	-0.004222
	[0.24552]	[-0.89746]	[0.63955]	[-1.17296]	[-1.72193]	[-1.49432]
D(OP(-1))	1.671027	0.048117***	0.000375***	-65005597	9.652429*	0.304758***
	[1.40004]	[3.40076]	[2.75728]	[-1.57996]	[1.86872]	[2.41118]
D(OP(-2))	1.547423	-0.014978	0.000574***	-1.09E+08***	-0.545894	0.064918
	[1.28069]	[-1.04566]	[4.16665]	[-2.62881]	[-0.10440]	[0.50736]
C	-5.861747	-0.006134	-0.000640	67693987	77.50378***	-0.155690
	[-0.99523]	[-0.08786]	[-0.95361]	[0.33341]	[3.04067]	[-0.24962]

Note: 1. Numbers within the square brackets "[ ]"represents t-statistics.
*,**,*** denote significant at 10%,5%,1%, respectively.

Our results show that VNI has long run relationship with Inflation (I), Oil Price (OP). Specifically, the estimated coefficient of Inflation (I) is 2.53198, suggesting that, as Inflation (I) rises by 1%, VNI increases by around 2.53198%. Moreover, VNI is also negatively related to Interest Rate (IR) at 10% and FDI, Exchange Rate (ER) at 1% significant level. It means that, VNI has a decrease if (IR), FDI and (ER) increase.

4.3.3. Short Run Relationship

It can be observed that the coefficient of the error correction term carries the expected positive sign, and it is highly significant at 1% level. The significant of the error correction term support Co-integration, suggesting the existence of the long run steady-state equilibrium between VNI and the factors. In fact, the ECM indicates a feedback of approximately 3% (ECM(-1) = 0.030497) of the previous period's disequilibrium from long run. The empirical results show that, in the short run, VNI is negatively significant affected by FDI one month lag at 1% level and two month lag at 5% level, indicating that either 1% rises in FDI would decrease VNI by 1.29% in the one month lag and 7.63 in the two month lag. The other factors do not have the short run relationship with the VNI. VNI is also negatively significant affected by Inflation (I) one month lag at 1% level.

4.4. Analysis of VAR Test

In this section, we employ the VAR model to analyze the short-term relations of random disturbances on the system variables. The main objective of estimating VAR in this study is to identify any causality relationship among these variables and explain more clearly about their relations.

Table 6. VAR model results

	VNI	I	IR	FDI	EX	OP
VNI(-1)	0.914418***	-0.001310	1.73E-05	2577865	-0.508845	-0.019652
	[8.62662]	[-1.09466]	[1.33760]	[0.65860]	[-1.03907]	[-1.63032]
VNI(-2)	-0.015546	0.002101*	-2.09E-05*	-6833518*	0.342700	0.017899
	[-0.15099]	[1.80714]	[-1.66297]	[-1.79733]	[0.72044]	[1.52873]
I(-1)	-21.00054***	0.561186***	-0.000272	3.27E+08	-26.47465	1.377284
	[-2.47728]	[5.86226]	[-0.26224]	[1.04342]	[-0.67599]	[1.42872]
I(-2)	0.028960	0.020788	0.000927	-5.20E+08*	41.73168	0.438300
	[0.00369]	[0.23451]	[0.96624]	[-1.79420]	[1.15073]	[0.49101]
IR(-1)	1643.248*	1.207217	1.080689***	-3.44E+10	1261.638	-59.73185
	[1.95261]	[0.12703]	[10.5088]	[-1.10685]	[0.32450]	[-0.62416]
IR(-2)	-2097.042***	6.197448	-0.209911***	6.40E+08	-1120.791	27.46824
	[-2.72220]	[0.71242]	[-2.22991]	[0.02249]	[-0.31492]	[0.31356]
FDI(-1)	-4.17E-09	-5.35E-11*	-7.76E-13***	-0.179095*	2.54E-08**	-5.36E-10*
	[-1.49317]	[-1.69488]	[-2.27395]	[-1.73599]	[1.97162]	[-1.68668]
FDI(-2)	1.37E-09	6.00E-11*	1.59E-12***	-0.464238***	4.84E-09	-6.77E-10*
	[0.43341]	[1.67889]	[4.11351]	[-3.97229]	[0.33131]	[-1.88172]
ER(-1)	0.005261	0.000342	7.39E-07	482556.9	0.783797***	-0.000280
	[0.21551]	[1.23893]	[0.24774]	[0.53534]	[6.95001]	[-0.10099]
ER(-2)	-0.008384	-0.000315	-1.65E-06	-2004346***	0.229467***	0.000150
	[-0.34378]	[-1.14309]	[-0.55426]	[-2.22573]	[2.03668]	[0.05421]
OP(-1)	1.859492*	0.044646***	0.000321***	16737850	1.672155	1.36229***
	[1.87620]	[3.98913]	[2.65063]	[0.45735]	[0.36519]	[12.0873]
OP(-2)	-1.686514*	-0.046643***	-0.000218*	87193204***	-5.003023	-0.4453***
	[-1.67433]	[-4.10066]	[-1.77069]	[2.34421]	[-1.07510]	[-3.88828]
C	151.0501	-1.049063	0.017913	2.78E+10***	124.4437	14.08069
	[1.14724]	[-0.70558]	[1.11340]	[5.72392]	[0.20458]	[0.94045]

Note: Numbers within the square brackets "[ ]" represents t-statistics.
*,**,*** denote significant at 10%,5%,1%

Empirical results obtained through testing appear in Table 6. In this study, we exclusively research about the effect of five factors to the Vietnam stock market. The empirical evidence suggests that Inflation (I), Interest rate (IR), Oil price (OP) in one month lag data affect VNI and Interest Rate (IR), Oil price (OP) in two month lag affect VNI. The result also concludes that VNI can be influenced by itself at 1% significant.

However, the other factors, which are FDI and Exchange Rate (ER) do not have any impact on the VNI. Finally, we can conclude that, among the five factors in this study, only Inflation (I), Interest Rate (IR) and Oil price (OP) can affect to Vietnam stock market, FDI and Exchange Rate (ER) do not effect on VNI.

As we mention above, the VAR can exam the causality relationship between factors. Therefore, according to the results in table 8, we can see that VNI also can give impacts on the Inflation (I), Interest rate (IR) and FDI, not for Exchange rate (ER) and Oil Price (OP). To make it simple, we will summary the causality relationship between variables in the table 7.

Referring to these results, investors can rely upon the past behavior of some factors to predict behavior of Vietnam stock market and the past behavior of VNI can predict itself.

Moreover, we use impulse response function to trace out the responsiveness of the dependent variable in the VAR to the shocks to each of the variables. Therefore, for each variable from each equation separately, a unit shock is applied to the error, and the effects upon the VAR system over time are noted.

Table 7. The causality relationship between VNI and the factors

VNI ⟷ Influence Factors	There is a lead-lag relationship between VNI and Inflation, VNI and Interest Rate
VNI ⟶ Influence Factors	VNI lead FDI
VNI ⟵ Influence Factors	Oil price factors lead VNI
VNI ⟷ Influence Factors	There is no lead-lag relationship between VNI and Exchange rate

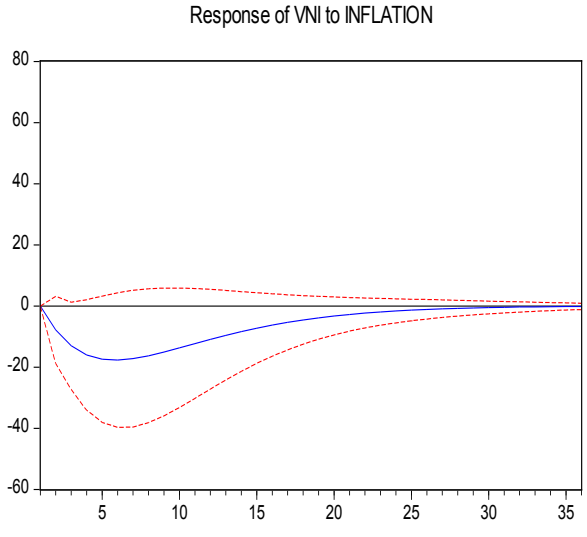
4.5. Impulse Response Function

The impulse response function refers to the level of variables when subjected to the spontaneous interference of one variable in the model. In other words, an impulse response analysis allows us to understand better the dynamic shock and response pattern among variables that results from changes occurring in one variable. The impulse response function also reveals whether these responses are continuous, short or long term, positive or negative. Table 8 show the impulse response function of VNI from other variables.

Table 8. The result of Impulse response function

Panel A: Impulse response function between VNI and I

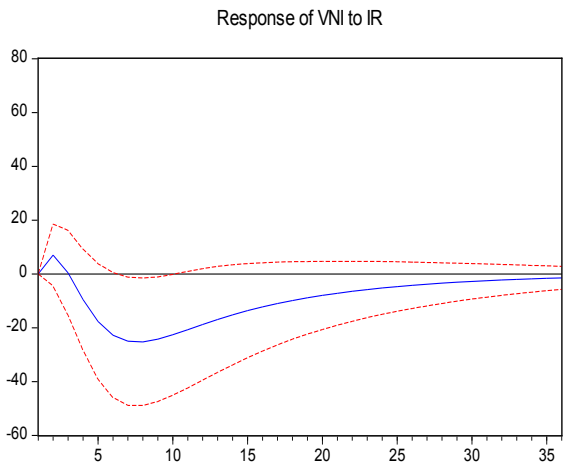
Period (month)	Response of VNI	
	VNI	I
1	51.64312	0.000000
2	54.61212	7.398740
3	49.41963	12.53527
4	43.76583	-15.69418
34	1.065448	-0.176457
35	0.934358	-0.133363
36	0.819470	0.099216



As the graph, we can see that if there is a shock on Inflation, VNI value will be negatively affected and converge back to original level after 30 months.

Panel B: Impulse response function between VNI and IR

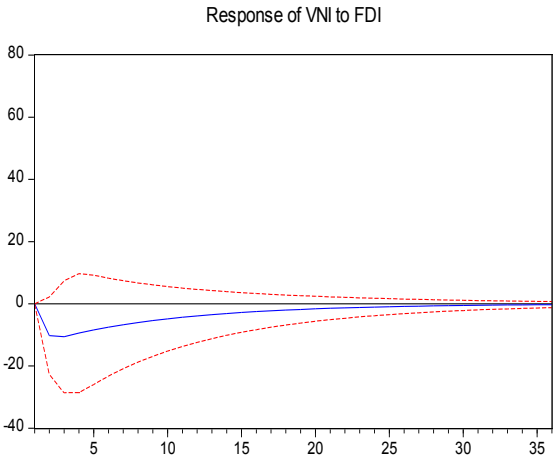
Period (month)	Response of VNI	
	VNI	IR
1	51.64312	0.000000
2	54.61212	6.208573
3	49.41963	1.846368
4	43.76583	-5.196945
⋮	⋮	⋮
34	1.065448	-5.430483
35	0.934358	-4.955054
36	0.819470	-4.518385



As the graph, we can see that if there is a shock on Interest rate (IR), VNI value will be positively affected in the first 3 but after that it becomes negative, then it will be converged back to original level after 36 months.

Panel C: Impulse response function between VNI and FDI

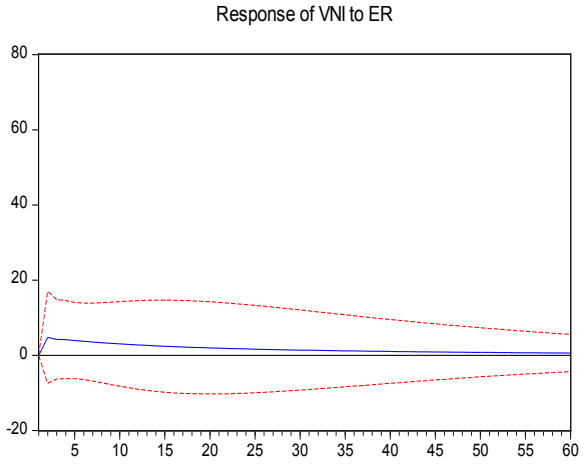
Period (month)	Response of VNI	
	VNI	LFDI
1	51.64312	0.000000
2	54.61212	-10.66092
3	49.41963	-10.94647
4	43.76583	-9.722313
⋮	⋮	⋮
34	1.065448	-0.352156
35	0.934358	-0.315358
36	0.819470	-0.282405



As the graph, if there is a shock on FDI, VNI value will become negative. However, it will be converged back to original level after 30 months.

Panel D: Impulse response function between VNI and ER

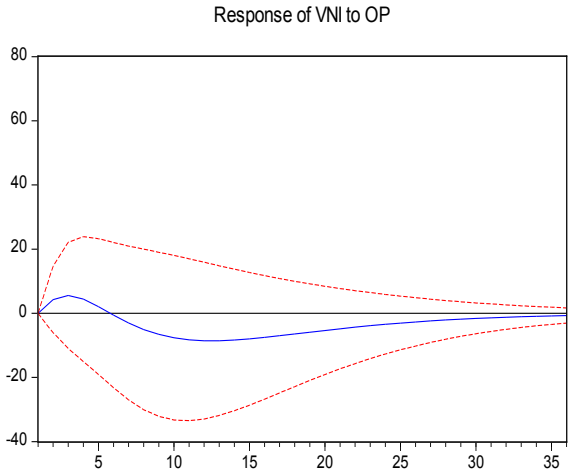
Period (month)	Response of VNI	
	VNI	ER
1	51.64312	0.000000
2	54.61212	4.440578
3	49.41963	4.145582
4	43.76583	4.304960
⋮	⋮	⋮
58	1.065448	1.440273
59	0.934358	1.403570
60	0.819470	1.367751



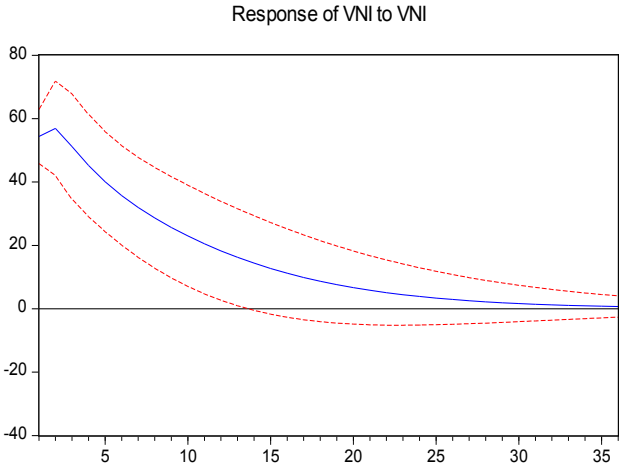
As the graph, if there is a shock on Exchange Rate (ER), the VNI value will become positive for a length of time, however, even after 5 years, it still keep a positive value and seem keep being like this for a long time before it is back to normal.

Panel E: Impulse response function between VNI and OP

Period (month)	Response of VNI	
	VNI	OP
1	51.64312	0.000000
2	54.61212	3.863626
3	49.41963	5.374101
4	43.76583	4.722444
34	1.065448	-0.572875
35	0.934358	-0.501308
36	0.819470	-0.438919



As the graph, if there is a shock on the Oil Price (OP), the VNI value will become positive for the first 6 months, however, it become negative from the 6th months after that. Then, it will be back to normal after 36 months.



Note: -------- : is the 95% confidence interval line.
——— : is the predicted value line

The impulse response of VNI to shock the factors are shown in the Table. For the shock derived by the VNI on itself, the observation of Table shows that the response caused by internal shock are largest, in the second month, 54.61212 units of standard deviation. Next period investors begin to adjust. The VNI start to decrease at that time. It means investors have no response with shocks in VNI after past experiences. It implies that in the short-term, the correct ability of VNI to its own is very strong and always has a positive impact. The effect of shock does not die down, even after 36 months.

The impulse response of VNI to other variables reveals a very fast moment at period one but the market does not aware the influence till period two. From the period two, it's predicted to have a pattern.

5. Conclusions

Recently Vietnamese economy in general and stock market in particular have been noticeably improving in all aspects. The purpose of this study is to contribute towards the study of influence factors to stock market after Vietnam joined WTO. In the Chapter one, this study has mentioned and list out the possible factors which could affect to stock market.

In the VAR test, the results show that the Vietnam stock market is not efficiency, contrary with the conclusion of

Khoa and Jian Zhou (2014) covering the efficiency of the Vietnam stock market. The results suggest that Vietnam stock prices could be affected by Inflation (I), Interest Rate (IR) and Oil price (OP), VNI is also affected simultaneously by the previous period's VNI.

One lag of Inflation rate value negatively affects Vietnam stock market at 1% significant. Meanwhile, one lag of real interest rate positively influence Vietnam stock market at 10% significant but two lag of real interest rate oppositely negative affect Vietnam stock market at 1% significant. Besides that, one lag of Oil price value positively affects Vietnam stock market at 10% significant but in two lag of Oil price, its value negatively affects Vietnam stock market also at 10% significant.

And with the other factor, FDI and Exchange Rate (ER) do not have an impact on the Vietnam stock market.

Besides that, according to the results of VAR model, we can figure out the lead-lag relationship between VNI and the factors. The result shows that there is a lead-lag relationship between VNI and Inflation, VNI and interest rate. Meanwhile, VNI lead FDI, Oil price (OP) lead VNI and there is no lead-lag relationship between VNI and Exchange rate (ER).

With the results of impulse response function between VNI and the factors, this study can suggest that Inflation (I), Interest rate (IR), FDI, Exchange Rate (ER) and Oil Price (OP) have different effect on the VNI. It is clearly that the impulse response of VNI to Inflation (I), FDI has a negative impact but after 36 months, VNI will get back to the normal level. For the impulse response of VNI to Exchange Rate (ER), the response of VNI to it is positive and it takes a very long time for VNI converge back to the normal level even after 5 years. But for the Interest Rate (IR) it has positive affect for the first 3 months, but after the third months, it is turn to a negative effect on VNI and then, it will converge back to the normal level after 36 months. In the same way, Oil Price (OP) also shows a positive effect to the fifth month, but after that, the impact on VNI of OP becomes negative.

Based on the results of VECM suggest that Vietnam stock market has short-run relationship with FDI. The other factors do not show any evidence of the existing of short-run relationship between them. Besides that, we can base on the results of VECM to forecast the future VNI through other factors. Therefore stock investors have gradually become more professional in their investment and they can base on the information about historical value of VNI and other factors to make a prediction about VNI.

6. Suggestion

Future research in the following directions will be encouraged because we take the Vietnam stock index monthly after joining WTO, 2007, then the monthly data period is short. Therefore, it will be interesting to apply data such as daily or weekly data in order to make analysis that is more complete.

In this research depend on the VAR model and VECM model to characterize the behavior of important variables. Therefore, a possible extension of this work would be to employ this economic theory to investigate the relationship between Vietnam stock market and the influenced factors in developing country as Vietnam.

REFERENCES

[1] Amine, Mohamed and Duc (2014), World gold prices and stock returns in China: insight for hedging and diversification strategic. *Journal of economic modeling 44, 272-283*.

[2] Bi-Juan Lee, Chin Wei Yang and Bwo-Nung Huang (2012), Oil price movement and Stock markets revisited: A case of sector stock price indexes in G-7 countries. *Energy Economics* 34, 1284-1300.

[3] Campbell, John Y. (1987). Stock returns and the term structure. *Journal of Financial Economics 18, no. 2: 373-399*.

[4] Chu-sheng tai, (2000) Time-varying market, interest rate, and exchange rate risk premia in the US commercial bank stock returns. *Journal of Multinational Financial Management* 10, 397–420.

[5] Chun Tsai (2012), The relationship between stock price index and exchange rate in Asian markets: A quantile regression approach. *Journal of International Financial Markets, Institutions & Money* 22, 609-621.

[6] Chien-Hsiu Lin (2011), The comovement between exchange rates and stock prices in the Asian emerging markets. *International Review of Economics and Finance* 22, 191-172.

[7] Cuong C. Nguyen, M. Ishaq Bhattib (2012), Copula model dependency between oil prices and stockmarkets: Evidence from China and Vietnam. *Journal of International Financial Markets, Institutions & Money* 22, 758-773.

[8] David E. Rapa (2002), The long-run relationship between inflation and real stock prices. *Journal of Macroeconomics* 24, 331–351.

[9] Jing Lu and Robin Chou (2011), Does the weather have impacts on returns and trading activities in order-driven stock markets? Evidence from China. *Journal of Empirical Finance 19, 79-93*.

[10] J. M. Keynes (1964), the general theory of employment, interest and money (Harcourt Brace Jovanovich, London).

[11] John y Campbell anf John Ammer (1991). What move the stock and bond markets? A variance decomposition for Long Term Asset returns. *Journal of Financial, volXLVIII, no.1*

[12] Harasty H and Roulet j (2000), Modeling Stock Market Returns. *Journal of Portfolio Management, 26 (2), 33*

[13] Hiroyuki Aman (2013), An analysis of the impact of media coverage on stock price crashes and jumps: Evidence from Japan. *Journal of Pacific-Basin Finance 24, 22-38*.

[14] Ikram, Mohamed and Frederic (2014), On the effects of world stock market and oil price shocks on food prices: An empirical investigation based on TVP-VAR models with

stochastic volatility. *Journal of Energy Economics 45, 66-98*.

[15] Glauco De Vita and Khine S. Kyaw (2008), Determinants of capital flows to developing countries: a structural VAR analysis, *Journal of Economic Studies, Vol. 35 Iss: 2 pp. 304-322.*

[16] Kuo-Jui Wua, Cheng-Cheng Lub, Haruhiro Jonoc and Irell Perezd (2012), Interrelationship between Philippine Stock Exchange Index and USD exchange rate. *Social and Behavioral Sciences 40, 768 – 782.*

[17] Khoa and Jian Zhou (2014), Market efficiency in emerging stock markets: A case study of the Vietnamese stock market. *Journal of Business and Management Volume 16, Issue 4. Ver. IV.*

[18] Marco and James (2013), Bond vs Stock market's Q: Testing for stability across frequencies and over time. *Journal of Empirical Finance24, 138-150.*

[19] Mohan Nandhaa and Shawkat Hammoudehb (2007), Systematic risk, and oil price and exchange rate sensitivities in Asia-Pacific stock markets. *Research in International Business and Finance* 21, 326–341.

[20] Md. Mahmudul Alam (2009), Relationship between Interest Rate and Stock Price: Empirical Evidence from Developed and Developing Countries. Vol 4, No.3.

[21] Nguyen Ngoc Anh, Nguyen Thang, le Dang Trung, Pham Quang Ngoc, Nguyen Dinh Chuc and Nguyen Duc Nhat (2008). Foreign Direct Investment in Vietnam: Is There any Evidence Of Technological Spillover Effects, Working Paper Series No. 2008/18.

[22] Paresh Kumar Narayan and Seema Narayan (2010), Modeling the Impact of oil prices on Vietnama's stock market. Applied Energy 87, 356-361.

[23] Stijn Claessens, Daniela Klingebiel, and Sergio L. Schmukler, (2001), FDI and Stock Market Development: Complements or Substitutes?

[24] Sangbae Kim and Francis In (2005), The Relationship between Stock Return and Inflation: new evidence from wavelet analysis. *Journal of empirical finance* 12, 435-444.

[25] Spyrou I. S. (2001). Stock returns and inflation evidence from an emerging market. *Applied Economics Letters, 8.*

[26] Syed Ali Raza and Syed Tehseen Jawaid (2012) foreign capital inflows, economic growth and stock market capitalization in Asian countries: an ARDL bound testing approach. Volume 48, p375-385.

[27] Syed Abul Basher, Alfred A.Hang and Perry Sadosky (2012), Oil prices, exchange rate and emerging stock markets. Energy Economics 34, 221-240.

[28] Taufiq Choudhry (2001), Inflation and rates of return on stocks: evidence from high inflation countries. *Journal of International Financial Markets, Institutions and Money* 11, 75–96.

[29] Timothy W. Koch and Andrew Saporoschenko (2001), The effect of market returns, interest rates, and exchange rates on the stock returns of Japanese horizontal keiretsu financial firms. *Journal of Multinational Financial Management* 11, 165–182.

[30] Tsoyu Calvin Lin and Zong-Han Lin (2011), Are stock and real estate markets integrated. An empirical study of six Asian economics. Pacific-Basin Financial Journal 19,571-585.

[31] Rangan, Shawkat, Mampho and Duc (2014), Can economic uncertainty, financial stress and consumer sentiments predict U.S equity premium? *Journal of International Financial Markets, Institutions & Money 33, 367-378*.

[32] Richard Heaney and Sivagowry Sriananthakumar (2012), Time-varying correlation between stock market returns and real estate returns. *Journal of Empirical Finance* 19, 583-894.

[33] Zhou C. (1996). Stock Market Fluctuations and the Term Structure. Board of Governors of the Federal Reserve System

[34] Zordan D J (2005). Stock Prices, Interest Rates, Investment Survival. *Econometrica USA, Illinois.*

[35] Liow, K.H and Huang. Q. (2004), Interested rate risk and time-varying excess returns for property stocks: an asset pricing perspective. Working paper, Department of Real estate, NUS.