The Relationship Between External Debt, Economic Growth, Unemployment and National Expenditure in Viet Nam: A Vector Autoregressive Model Approach

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Abstract

The article examines the relationship between external debt, economic growth, unemployment and national expenditure in Viet Nam between 1987 and 2016. We found that the influence of a variable on other variables varies in the short run. We found that there are directional relationships between GDP and external debt and GDP and national expenditure. We also found that there are directional relationships between unemployment and external debt, GDP, and national expenditure. Results addressed directional relationships between national expenditure and external debt and GDP. There are two co-integrations among variables. In order to sustain macroeconomic stability in Viet Nam, fiscal policy should be re-examined to meet large development needs and monetary policy should be tightened to reduce credit growth. Specifically, external debt should be effectively managed by the government because an increase in external debt leads to a decrease in GDP and a growth of unemployment. Moreover, GDP should be facilitated to reduce unemployment in the economy. Lastly, unemployment needs to be controlled because it generates a boom of national expenditure and vice versa.

Keywords: external debt, economic growth, unemployment, expenditure, Viet Nam

1. Introduction

With the average growth by 6.5 percent over the period 2000–2016, Viet Nam's economy has been known as the most dynamic in East Asia. This is a result of an expansion in exports in addition to stable macroeconomics (IMF, 2018). However, this country must face economic obstacles such as macroeconomic and financial vulnerabilities and the increase of asset prices and ignite inflationary effects due to rapid monetary expansion (World Bank, 2016). Further, thin financial buffers generate an inflexibility of macroeconomic policy frameworks in managing possible shocks (IMF, 2018).

Since 2005, foreign debt of Viet Nam increased rapidly and in early 2016, foreign debt level accounted for 45.2 percent of gross domestic product (GDP) of this country. Most of the debt of Viet Nam is public debt and by 2015, public debt accounted for 58.3 percent of GDP of this country (IMF, 2016). The Vietnamese government is facing budget deficit because of increasing expenditures which accounting for more than two third of the government's annual spending (Hiep, 2016). In the last a decade, external debt of Viet Nam tended to increase continuously (Dao and Oanh, 2017).

What is the relationship between external debt, economic growth, unemployment and national expenditure in Viet Nam? How do these variables correlated in the short run and long run? This article aims to examine the causal relationship between external debt, economic growth, unemployment and national expenditure in Viet Nam for the last three decades (1987–2016). This period is chosen for the study because it presents important events for the development of socio-economics of Viet Nam. For example, in 1986, this country has implemented the renovation by eradicating a planned central economy and transforming into a market-oriented economy. After that, the integration of Vietnam into the international community has been enhanced by participating in the Association of Southeast Asian Nations (ASEAN) in 1995 and the World Trade Organization (WTO) in 2006. Another important contribution of the study to practice is it recommends policies to foster economic growth, control external debt and unemployment to achieve a sustainable development of Viet Nam.

The rest of this paper is organized as follows. Section 2 presents the literature review. Research methods are discussed in section 3. In section 4, we present results and discussion. Finally, conclusion and policy implications are summarized in section 5.

2. Literature Review

2.1 Theory of Endogenous Economic Growth

The theory of economic growth has been appeared in the 80-90s., which presents the influence of imperfect competition and the role of possible changes in the profit rate. As identified by the American economists Paul Romer (1955-till now) and Robert Lucas (1937-till now), the most important of the endogenous character is technological innovations.

Unlike the neoclassical theory, the theory of endogenous growth rejects the assumption in diminishing marginal productivity of capital. Instead, it focuses on the effect of external impacts on the profitability of investments and stresses the importance of positive externalities. Determinants defined in the theory of endogenous growth include the quality of human capital, which depends on investment in human development; creation of the necessary conditions and prerequisites for the protection of intellectual property rights in the imperfect competition; support of the State for the development of science and technology; and the role of government in creating a favorable investment climate and attracting new technologies.

Endogenous growth theory interprets the differences in growth rates of different countries, the effectiveness of various policies performed by the State, and the impact of the international integration and trade on economic growth (Sharipov, 2015).

2.2 Empirical Review

The relationship between external debt, economic growth, unemployment and national expenditure is considered by scholars in recent years. Atique and Malik (2012) investigated the influence of debt on economic growth of Pakistan from 1980 to 2010. Results indicated that external debt negatively affects economic growth and the effect of external debt on economic growth is stronger than that of domestic debt. Likewise, a study by Chamalwa and Bakari (2016) assessed the relationship between economic growth, money supply and credit to private sector in Nigeria over the period 1981-2012. Results showed that three variables are non-stationary at levels, but became stationary after first differencing once and there is a long-run relationship among three variables. Similarly, Ijirshar et al. (2016) examined the correlation between external debt and economic growth in Nigeria from 1981 to 2014. Results addressed that all the variables were not stationary at level but achieved stationary after first difference at 5 percent level of significance. In addition, external debt stock had a positive impact on economic growth, while external debt service negatively affects the annual growth rate of Nigerian GDP both in the long run and the short run.

Moreover, Shkolnyk and Koilo (2018) investigated the relationship between external debt and economic growth in emerging economies over the period 2006-2016. Results found that there is a negative relationship between external debt and economic growth for emerging economies. Results also demonstrated that the strategy in public debt management of Ukraine is effective. Likewise, a research by Mweni et al. (2016) assessed the effect of external debt on inflation rate in Kenya from 1972 to 2012. Results indicated that there is a negative correlation between external debt and inflation in this country.

There are some studies on the relationship between external debt, economic growth, unemployment and national expenditure in Viet Nam in recent years. Dao and Oanh (2017) examined the relationship between external debt and economic growth in Viet Nam for the period 2000-2012. Results found that the relationship between external debt and economic growth in this country is non-linear relationship with the threshold level of 28 percent. The study also recommended that effects of external debt on economic growth increase if the government continues to borrow and exceed this threshold. Likewise, Hiep (2016) investigated the relationship between budget deficit and economic growth in Viet Nam over the period 2003-2014. He concluded that public debt of this country continues to rise if the government increasingly relies on borrowing to fuel economic growth and to finance its budget deficit. Political and administrative reforms should be implemented to manage a rapid growth of recurrent expenditure. Lastly, Van and Sudhipongpracha (2015) evaluated the relationship between budget deficit and economic growth in Viet Nam between 1989 and 2011. Results showed that government deficits had no direct effects on the country's economic productivity. Foreign direct investment positively affects economic growth, while interest rates have a negative impact on economic growth in the same period.

3. Methodology

3.1 Data and Sources

A panel dataset for the relationship between external debt, economic growth, unemployment and national expenditure in Viet Nam is gathered from the database released by the World Bank. A panel dataset is collected for the last three decades (1987-2016). Thus, a total of 30 observations is entered for data analysis. The panel data is used for this research because of the following advantages: (1) it benefits in terms of obtaining a large sample, giving more degree of freedom, more information, and less multi-collinearity among variables; and (2) it may overcome constraints related to control individual or time heterogeneity faced by the cross-sectional data (Hsiao, 2014).

3.2 The Vector Autoregressive (VAR) Model

The VAR model is used to examine the causality between external debt, GDP, unemployment and national expenditure in Viet Nam for the last three decades (1987-2016). The VAR model is chosen for this study because it interpret the endogenous variables solely by their own history, apart from deterministic regressors and therefore this method incorporates non-statistical a priori information (Pfaff, 2008). In addition, the VAR model is a popular method in economics and other sciences since it is a simple and flexible model for multivariate time series data (Suharsono *et al.*, 2017).

The specification of a VAR model can be defined as follows (Pfaff, 2008):

$$Y_t = A_1 Y_{t-1} + \cdots + A_p Y_{t-p} + \mathcal{E}_t \tag{1}$$

Where: Y_t denotes a set of K endogenous variables (external debt, GDP, unemployment rate, and national expenditure); A_i represents (K x K) coefficient matrices for i = 1,…, p; and $\mathcal{E}_t$ is a K-dimensional process with $E(\mathcal{E}_t) = 0$.

An important characteristic of the VAR model is stability and therefore it generates stationary time series with time invariant means, variances and covariance structure, given sufficient starting values. The stability of an empirical VAR model can be analyzed by considering the companion form and computing the eigenvalues of the coefficient matrix. A VAR model may be specified as follows (Pfaff, 2008):

$$\mathcal{E}_t = A\mathcal{E}_{t-1} + V_t \tag{2}$$

Where: $\mathcal{E}_t$ denotes the dimension of the stacked vector; A is the dimension of the matrix (K_p x K_p); and V_t represents (KP x 1).

Table 1. Description of covariates in the VAR model

Variable definitions	Unit
External debt: the aggregate of debt liabilities to nonresidents to be repaid in foreign currency, goods or services	US$
GDP	US$
Unemployment rate	%
National expenditure: the total expense of a country, including both public and private expenses, excluding export expenses	US$

Source: Author, 2018

Note. US$ means United States Dollar

In this study, the procedure of a VAR model comprises six steps, consisting of (1) performing the unit root test; (2) determining lag length; (3) estimating the VAR model; (4) testing the Granger causality; (5) checking the stability of eigenvalues; and (6) implementing the Johansen test for co-integration. The VAR model is estimated by the Stata MP 14.2 software.

4. Results and Discussion

4.1 Characteristics of External Debt, Economic Growth, Unemployment and National Expenditure in Viet Nam
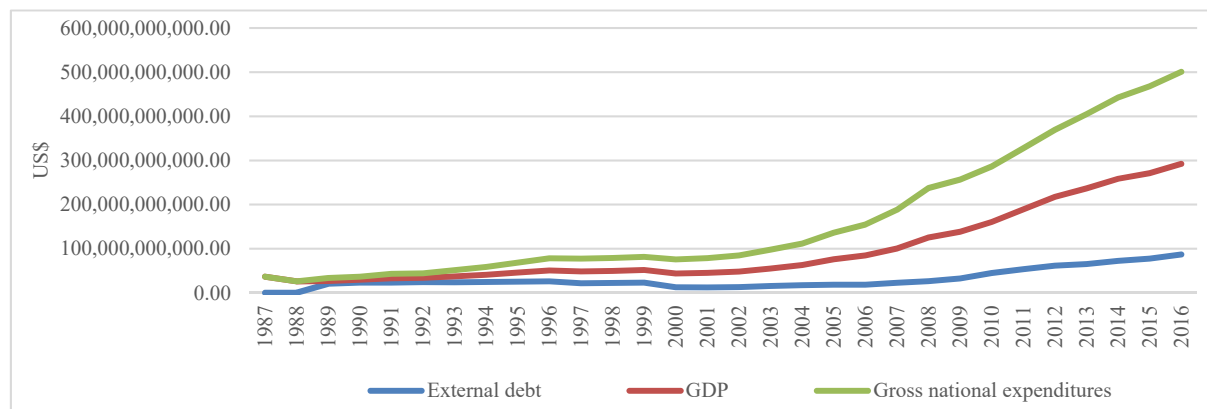

Figure 1. External debt, GDP and national expenditure of Viet Nam (1987-2016)

Source. World Bank, 2018

For the last three decades (1987-2016), GDP and national expenditure of Viet Nam presented a sharp increase, in particular 2004 onward. By 2016, in Viet Nam, national expenditure was higher than GDP by more than US$3.3 billion. The correlation between GDP and national expenditure can be explained by the formula used to compute GDP. Specifically, GDP is calculated by a total of national expenditure and trade balance and consequently, an increase in national expenditure generates a growth of GDP. External debt also significantly increased in the same period. For instance, external debt increased by about US$86.7 billion from more than US$191 million in 1987 to nearly US$87 billion in 2016 (Figure 1).
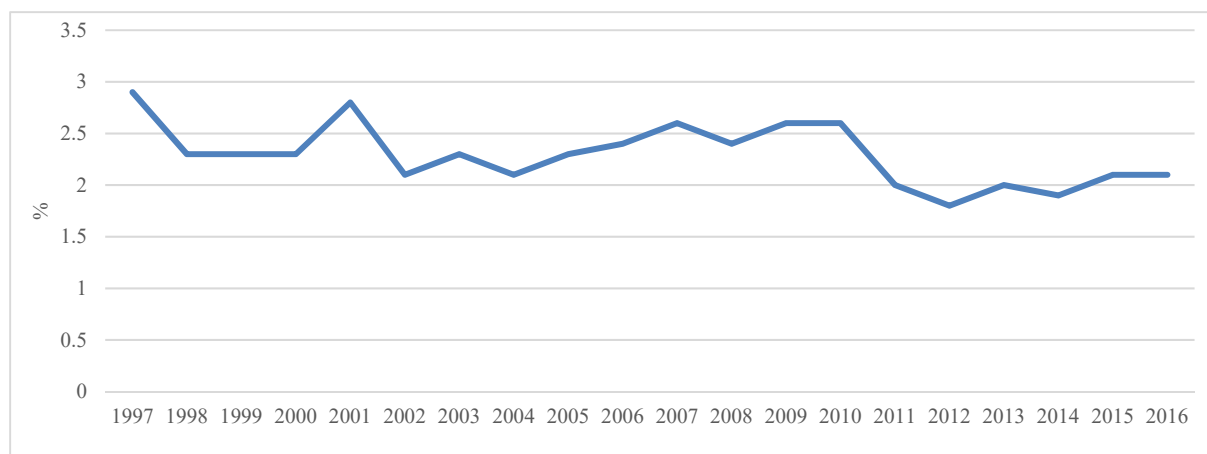
Figure 2. Unemployment rates of Viet Nam (1997–2016)

Source. World Bank, 2018

Unemployment of Viet Nam tended to decline over the last two decades (1997-2016). Unemployment rate of this country decreased by nearly one percent from 2.9 percent in 1997 to 2.1 percent in 2016. This result reflects effective impacts of macroeconomic policies implemented by the Vietnamese government in the last two decades, especially in facilitating exports and creating employment in the economy (Figure 2).

Table 2. Characteristics of macroeconomic indicators in Viet Nam

Variable	Mean	SD	Min	Max
External debt	3.05e+10	2.21e+10	1.91e+08	8.70e+10
GDP	6.69e+10	6.25e+10	6.29e+09	2.05e+11
Unemployment rate	1.92	0.81	0	2.9
National expenditure	6.73e+10	6.48e+10	0	2.09e+11

Source: Author's calculation, 2018

Note. SD denotes standard deviation

The average external debt of Viet Nam accounts for US$30.5 billion, while the average GDP and national expenditure are nearly equivalent by US$66.9 billion and US$67.3 billion, respectively. That means external debt accounts for about 45 percent of GDP value. The average unemployment rate of this country reaches more than 1.9 percent (Table 2).

4.2 The Relationship between External Debt, Economic Growth, Unemployment and National Expenditure in Viet Nam

4.2.1 Implementation of the Unit Root Test

The unit root test is carried out to check the stationarity of the time series variables (Adeola and Ikpesu, 2016). In this research, the Augmented Dickey-Fuller (ADF) test is employed to examine the stationarity of external debt, economic growth, unemployment and national expenditure with the hypothesis as follows:

Null hypothesis (H_0): The variables contain a unit root

Alternative hypothesis (H_a): The variables do not contain a unit root

Table 3. The ADF test for the unit root

Variables	Level	1st difference	2nd difference
LnExternal debt	T-statistic: -5.22	T-statistic: -5.81	T-statistic: 0.67
	P-value: 0.00	P-value: 0.00	P-value: 0.98
	Critical values:	Critical values:	Critical values:
	1% level: -3.72	1% level: -3.73	1% level: -3.73
	5% level: -2.98	5% level: -2.99	5% level: -2.99
	10% level: -2.62	10% level: -2.62	10% level: -2.62
LnGDP	T-statistic: -0.02	T-statistic: -0.56	T-statistic: -1.34
	P-value: 0.95	P-value: 0.87	P-value: 0.60
	Critical values:	Critical values:	Critical values:
	1% level: -3.72	1% level: -3.73	1% level: -3.73
	5% level: -2.98	5% level: -2.99	5% level: -2.99
	10% level: -2.62	10% level: -2.62	10% level: -2.62
LnUnemployment rate	T-statistic: -2.68	T-statistic: -2.91	T-statistic: -3.61
	P-value: 0.07	P-value: 0.04	P-value: 0.00
	Critical values:	Critical values:	Critical values:
	1% level: -3.72	1% level: -3.73	1% level: -3.73
	5% level: -2.98	5% level: -2.99	5% level: -2.99
	10% level: -2.62	10% level: -2.62	10% level: -2.62
LnNational expenditure	T-statistic: -4.85	T-statistic: -25.75	T-statistic: -1.38
	P-value: 0.00	P-value: 0.00	P-value: 0.59
	Critical values:	Critical values:	Critical values:
	1% level: -3.72	1% level: -3.73	1% level: -3.73
	5% level: -2.98	5% level: -2.99	5% level: -2.99
	10% level: -2.62	10% level: -2.62	10% level: -2.62

Source. Author's calculation, 2018

Results show that we cannot reject the null hypothesis because P-values of all variables are greater than critical values at 1%, 5%, and 10%, respectively and these imply that variables exhibit a unit root (Table 3).

4.2.2 Determination of the Lag Length

The objective of this step is to specify the optimal lag for the VAR model. If the lag is used too little, then the residual of the regression will not show the white noise process and as the result, the actual error could not be accurately estimated by the model (Suharsono et al., 2017).

Table 4. Selection of the lag length

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	26.10				2.1e-06	-1.70	-1.64	-1.50
1	139.70	227.2	16	0.00	1.2e-09	-9.20	-8.92	-8.24*
2	155.27	31.14	16	0.01	1.4e-09	-9.17	-8.67	-7.43
3	191.55	72.55	16	0.00	3.8e-10	-10.73	-10.01	-8.21
4	216.50	49.90*	16	0.00	3.6e-10*	-11.42*	-10.47*	-8.13

Endogenous: LnExternal debt LnGDP LnUnemployment rate LnNational expenditure
Exogenous: Constant
Number of observations = 26

Source. Author's calculation, 2018

Notes. *denotes lag order selected by the criterion; LL means log likelihood values; LR represents sequential modified LR test statistics; FPE denotes final prediction error; AIC means Akaike information criterion; HQIC represents Hannan-Quinn information criterion; and SBIC means Schwarz's Bayesian information criterion.

As seen in Table 4, results suggest that the optimal lag length in this case is four lags because this value is recommended by FPE, AIC and HQIC indicators, while one lag is only recommended by SBIC. Therefore, four lags (the number of lag is equal to 4) is chosen to run the VAR model in the next step.

4.2.3 Estimation of the VAR Model

We found that external debt positively affects GDP, but it has a negative relationship with GDP in lag 4. This implies that if we have a longer time, an increase of external debt leads to a decrease in GDP of Viet Nam. External debt negatively affects unemployment in lag 1, but it has a positive impact on unemployment in lag 2 and these reflect that if we have a longer time, an increase of external debt generates a rise in unemployment. External debt positively affects national expenditure in lag 1, but it has a negative effect on national expenditure in lag 3 and these suggest that the Vietnamese government has implemented macroeconomic policies to manage its expenditures in recent years (see details in Table A1 of Appendix A).

We also found that GDP has a negative relationship with unemployment and this implies that an increase of GDP generates more jobs for workers in the economy and consequently, unemployment rates tend to decrease. GDP positively affects national expenditure in lag 2, but it has a negative effect on national expenditure in lag 3 and this reflects that if we have a longer time, an increase of GDP leads to a decrease in national expenditure (see details in Table A1 of Appendix A).

In addition, unemployment has positive relationships with GDP and national expenditure. These imply a change in quality of the labour market in Viet Nam in recent years by employing more high-skill labours rather than simple labours. However, the government needs to increase its spending in order to support to unemployment workers and create more jobs in the labour market (see details in Table A1 of Appendix A).

National expenditure negatively affects GDP in lag 2, but it has a positive impact on GDP in lag 4 and this implies that spending of the government facilitates consumption and investment in the domestic market and these lead to an increase of GDP. National expenditure positively affects unemployment (see details in Table A1 of Appendix A).

4.2.4 Testing the Granger Causality

The objective of this step is to evaluate the predictive capacity of a single variable on other variables (Musunuru, 2017). In this study, hypotheses need to be tested as follows:

Testing the relationship between external debt and other variables:

Null hypothesis (H₀): External debt does not cause GDP, unemployment, and national expenditure

Alternative hypothesis (Hₐ): External debt causes GDP, unemployment, and national expenditure

Testing the relationship between GDP and other variables:

Null hypothesis (H₀): GDP does not cause external debt, unemployment, and national expenditure

Alternative hypothesis (Hₐ): GDP causes external debt, unemployment, and national expenditure

Testing the relationship between unemployment and other variables:

Null hypothesis (H₀): Unemployment does not cause external debt, GDP, and national expenditure

Alternative hypothesis (Hₐ): Unemployment causes external debt, GDP, and national expenditure

Testing the relationship between national expenditure and other variables:

Null hypothesis (H₀): National expenditure does not cause external debt, GDP, and unemployment

Alternative hypothesis (Hₐ): National expenditure causes external debt, GDP, and unemployment

Table 5. Results of the Granger causality Wald test

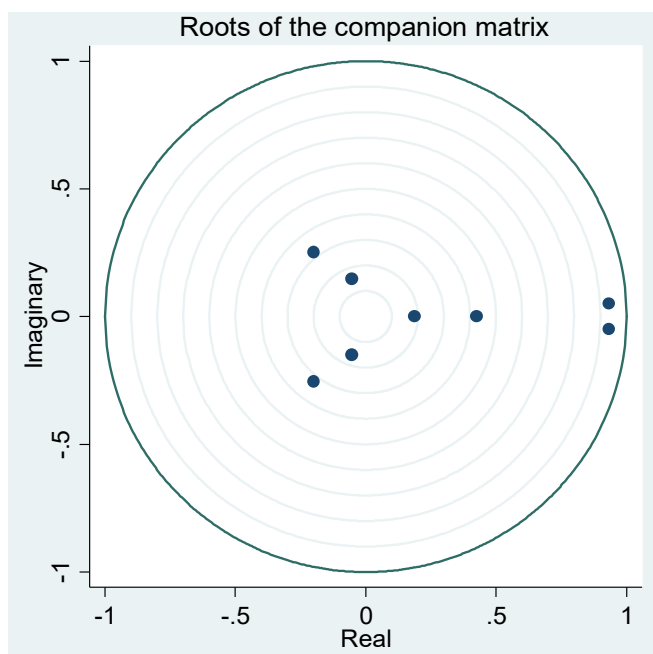| Directional relationship	Probability	Conclusion
External debt ⟶ GDP	$0.91 > 0.05$	Accept H₀: External debt does not cause GDP
Externaldebt ⟶ Unemployment	$0.55 > 0.05$	Accept H₀: External debt does not cause unemployment
External debt ⟶ Expenditure	$0.75 > 0.05$	Accept H₀: External debt does not cause expenditure
GDP ⟶ External debt	$0.01 < 0.05$	Reject H₀: GDP causes external debt
GDP ⟶ Unemployment	$0.21 > 0.05$	Accept H₀: GDP does not cause unemployment
GDP ⟶ Expenditure	$0.02 < 0.05$	Reject H₀: GDP causes expenditure
Unemployment ⟶ External debt	$0.00 < 0.05$	Reject H₀: Unemployment causes external debt
Unemployment ⟶ GDP	$0.01 < 0.05$	Reject H₀: Unemployment causes GDP
Unemployment ⟶ Expenditure	$0.03 < 0.05$	Reject H₀: Unemployment causes expenditure
Expenditure ⟶ External debt	$0.01 < 0.05$	Reject H₀: Expenditure causes external debt
Expenditure ⟶ GDP	$0.02 < 0.05$	Reject H₀: Expenditure causes GDP
Expenditure ⟶ Unemployment	$0.16 > 0.05$	Accept H₀: Expenditure does not cause unemployment

Source. Author's calculation, 2018

Figure 3. Checking eigenvalue stability

Source. Author's calculation, 2018

We found that there are directional relationships between GDP and external debt and GDP and national expenditure. We also found that there are directional relationships between unemployment and external debt, GDP, and national expenditure. Results addressed directional relationships between national expenditure and external debt and GDP.

4.2.5 Examination of Eigenvalue Stability

The goal of this step is to examine stability of the eigenvalues in the VAR model. All the eigenvalues lie inside the unit circle and we can conclude that the VAR model satisfies stability condition (Figure 3).

4.2.6 Performance of the Johansen Co-integration Test

The Johansen co-integration test is performed to examine the long-run relationship among variables. If variables are co-integrated, it suggests that there is a long term relationship among variables (Musunuru, 2017).

The hypothesis to be tested can be identified as follows:

Null hypothesis (H_0): There is no co-integration among variables

Alternative hypothesis (H_a): There is co-integration among variables

In this research, the Johansen co-integration test is carried out by both trace and max statistic tests. Both trace and max tests are all likelihood-ratio-type tests, which operate under different assumptions in the deterministic part of the data generation process. In some situations, the trace tests tend to have more distorted sizes compared to that of the maximum eigenvalue tests (Lutkepohl *et al.*, 2001).

Table 6. Results of trace statistic in the Johansen co-integration test

Maximum rank	LL	Eigenvalue	Trace statistic	5% critical value	1% critical value
0	-6.55		319.93	47.21	54.46
1	124.00	0.999	58.82	29.68	35.65
2	146.59	0.800	13.64[*1*5]	15.41	20.04
3	152.75	0.355	1.32	3.76	6.65
4	153.41	0.046			

Source. Author's calculation, 2018

Notes. [*1] and [*5] denote the number of co-integrations (ranks) chosen to accept the null hypothesis at 1% and 5% critical values, respectively

Table 7. Results of max statistic in the Johansen co-integration test

Maximum rank	LL	Eigenvalue	Max statistic	5% critical value	1% critical value
0	-6.55		261.11	27.07	32.24
1	124.00	0.999	45.18	20.97	25.52
2	146.59	0.800	12.31	14.07	18.63
3	152.75	0.355	1.32	3.76	6.65
4	153.41	0.046			

Source. Author's calculation, 2018

As seen in Table 6, we cannot reject the null hypothesis in the rank two (two co-integrations) because trace statistic is less than the 5% and 1% critical values (13.64 < 15.41 and 13.64 < 20.04) and this implies that there are two co-integrations among variables.

4.3 Discussion

The effect of a variable on other variables varies in the short run. We found that external debt positively affects GDP, but it has a negative relationship with GDP in lag 4. External debt negatively affects unemployment in lag 1, but it has a positive impact on unemployment in lag 2. External debt positively affects national expenditure in lag 1, but it has a negative effect on national expenditure in lag 3. We also found that GDP has a negative relationship with unemployment. GDP positively affects national expenditure in lag 2, but it has a negative effect on national expenditure in lag 3. Unemployment has positive relationships with GDP and national expenditure. National expenditure negatively affects GDP in lag 2, but it has a positive impact on GDP in lag 4. In the long run,

we found that there are directional causalities between external debt, GDP, unemployment, and national expenditure and other variables and there are two co-integrations among variables.

We found that there are directional relationships between GDP and external debt and GDP and national expenditure. We also found that there are directional relationships between unemployment and external debt, GDP, and national expenditure. Results addressed directional relationships between national expenditure and external debt and GDP.

Our results are consistent with conclusions of Dao and Oanh (2017) and Hiep (2016) because an increase of external debt generates a decrease in economic growth in Viet Nam. However, Van and Sudhipongpracha (2015) concluded that government deficits have no direct effects on the country's economic productivity of Viet Nam, and foreign direct investment positively affects economic growth, while interest rates have a negative impact on economic growth in the same period. Different outcomes can be interpreted by different models, which are used in two studies. Specifically, our research employs the VAR model to investigate the causal relationship between external debt, economic growth, unemployment and national expenditure in Viet Nam over the period 1987–2016. Van and Sudhipongpracha (2015) assessed impacts of independent variables such as inflation rate, real exchange rate, real interest rate, budget deficit, and gross domestic investment on economic growth in Viet Nam between 1989 and 2011.

5. Conclusion and Policy Implications

This article investigates the relationship between external debt, economic growth, unemployment and national expenditure in Viet Nam between 1987 and 2016. We found that the influence of a variable on other variables varies in the short run. Results addressed that external debt positively affects GDP, but it has a negative relationship with GDP in lag 4. External debt negatively affects unemployment in lag 1, but it has a positive impact on unemployment in lag 2. External debt positively affects national expenditure in lag 1, but it has a negative effect on national expenditure in lag 3. We also found that GDP has a negative relationship with unemployment. GDP positively affects national expenditure in lag 2, but it has a negative effect on national expenditure in lag 3. Unemployment has positive relationships with GDP and national expenditure. National expenditure negatively affects GDP in lag 2, but it has a positive impact on GDP in lag 4. In the long run, we found that there are directional causalities between external debt, GDP, unemployment, and national expenditure and other variables and there are two co-integrations among variables.

We found that there are directional relationships between GDP and external debt and GDP and national expenditure. We also found that there are directional relationships between unemployment and external debt, GDP, and national expenditure. Results addressed directional relationships between national expenditure and external debt and GDP.

In order to achieve the target in a sustainable development for socio-economics in Viet Nam, external debt should be effectively managed by the government because an increase in external debt leads to a decrease in GDP and a growth of unemployment. Moreover, GDP should be facilitated to reduce unemployment in the economy. Lastly, unemployment needs to be controlled because it generates a boom of national expenditure and vice versa.

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Appendix A

The VAR Model

Table A1. Estimation of the VAR model

Variables	Coefficient	Standard error	t	P-value
LnExternal debt				
LnExternal debt				
L1	1.08**	0.39	2.74	0.023
L2	0.08	0.41	0.20	0.842
L3	0.00	0.45	0.01	0.995
L4	-0.15	0.32	-0.48	0.645
LnGDP				
L1	-0.08	2.08	-0.04	0.967
L2	2.56	2.71	0.95	0.369
L3	-0.37	0.74	-0.50	0.627
L4	-0.11	0.60	-0.20	0.849

Table A1. (Continued)

LnUnemployment				
L1	0.59	0.72	0.82	0.434
L2	0.69	0.54	1.29	0.230
L3	-0.30	0.37	-0.81	0.437
L4	0.18	0.30	0.60	0.563
LnNational expenditure				
L1	1.05	1.80	0.59	0.573
L2	-2.93	2.54	-1.15	0.279
L3	-0.05	0.06	-0.73	0.484
L4	-0.00	0.06	-0.10	0.921
Constant	-2.54	3.86	-0.66	0.526
LnGDP				
LnExternal debt				
L1	0.39***	0.10	3.86	0.004
L2	-0.02	0.10	-0.20	0.843
L3	-0.15	0.11	-1.34	0.213
L4	-0.16*	0.08	-1.98	0.079
LnGDP				
L1	0.99*	0.53	1.84	0.099
L2	1.74**	0.69	2.50	0.034
L3	-0.26	0.19	-1.40	0.196
L4	0.20	0.15	1.32	0.220
LnUnemployment				
L1	0.38*	0.18	2.06	0.070
L2	0.26*	0.13	1.87	0.094
L3	-0.10	0.09	-1.03	0.328
L4	0.12	0.07	1.55	0.155
LnNational expenditure				
L1	0.40	0.46	0.87	0.408
L2	-2.25***	0.65	-3.43	0.007
L3	-0.01	0.01	-0.88	0.402
L4	0.04**	0.01	2.63	0.028
Constant	2.04*	0.99	2.05	0.070
LnUnemployment				
LnExternal debt				
L1	-0.98***	0.19	-5.14	0.001
L2	0.36*	0.20	1.84	0.099
L3	0.18	0.21	0.83	0.426
L4	0.04	0.15	0.31	0.762
LnGDP				
L1	-2.54**	1.00	-2.52	0.033
L2	-0.78	1.31	-0.60	0.565
L3	-0.04	0.36	-0.13	0.896
L4	-0.39	0.29	-1.37	0.204
LnUnemployment				
L1	-1.02**	0.35	-2.91	0.017
L2	-0.26	0.26	-1.01	0.340
L3	0.19	0.18	1.04	0.326
L4	-0.35**	0.14	-2.35	0.043
LnNational expenditure				
L1	1.72*	0.87	1.97	0.080
L2	2.40*	1.23	1.96	0.082

Table A1. (Continued)

L3	0.00	0.03	0.20	0.844
L4	-0.04	0.03	-1.38	0.202
Constant	3.06	1.86	1.64	0.135
LnNational expenditure				
LnExternal debt				
L1	0.34***	0.10	3.37	0.008
L2	-0.01	0.10	-0.11	0.914
L3	-0.23*	0.11	-1.98	0.079
L4	-0.08	0.08	-1.03	0.329
LnGDP				
L1	0.71	0.53	1.34	0.214
L2	2.29***	0.69	3.29	0.009
L3	-0.47**	0.19	-2.49	0.035
L4	0.12	0.15	0.80	0.444
LnUnemployment				
L1	0.44**	0.18	2.36	0.042
L2	0.29*	0.13	2.14	0.061
L3	-0.06	0.09	-0.62	0.548
L4	0.07	0.07	0.90	0.390
LnNational expenditure				
L1	0.83	0.46	1.80	0.105
L2	-2.61***	0.65	-4.00	0.003
L3	-0.02	0.01	-1.49	0.171
L4	0.02	0.01	1.47	0.175
Constant	2.33**	0.99	2.36	0.043

Source: Author's calculation, 2018

Notes. L1, L2, L3, and L4 mean lag 1, lag 2, lag 3, and lag 4, respectively; ***, ** and * denote statistical significance at 1%, 5% and 10%, respectively

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