

THE RELATIONSHIP BETWEEN FOREIGN DIRECT INVESTMENT (FDI), EXPORT, AND ECONOMIC GROWTH IN VIETNAM

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Abstract-The relationship between foreign direct investment (FDI) and economic growth (GDP) in recipient economies remains a great debate. While many studies agree that FDI bring up a positive impact on growth, some do not. Therefore, this study aims to analyze the relationship between FDI, export, and economic growth in Vietnam since the beginning of the Renovation in 1986. The period of 1990 to 2018 was chosen to evaluate economic growth. The co-integration method and Granger causality test, based on the Vector Auto Regression (VAR) model, were applied to examine this relation. The empirical results show strong evidence on the existence of a link between FDI, export, and economic growth in Vietnam. In the long-term, FDI also has a positive impact on export growth. However, in the short-term, FDI does not influence Vietnamese exports. Based on these results, the hypothesis, that FDI is an essential factor for the Vietnamese economic growth, is supported.

Keyword- Economic Growth; Exports; FDI; VAR; Vietnam.

I. INTRODUCTION

Over the last decades, the interaction between foreign direct investment (FDI) and economic growth has been debated among policy researchers. Ahmad et al. (2000), Frank S.T. Hsiao et al. (2006) and Nguyen, T.K.N (2017) supported the idea of FDI having a positive impact on economic growth in a recipient economy. Moreover, not only did FDI impact directly the country's financial situation (Trinh, H.N et al. 2015), but also FDI is a source of both knowledge and new technology for the recipient economy through its linkages with local firms (F.H., Liang 2017). Besides, the positive effects of FDI inflow would later spread over the rest of the host economy (Omri et al. 2014; Girma et al. 2015) by, for example: promoting export growth in the host country (Pham, M.A, 2008; Tekin, 2012). This is because it helped local production companies through its linkages with foreign firms, which directly made exportation thrive (Ahmad, Q.M et al. 2000; C. Li et al. 2019). However, some studies do not support the FDI-led growth hypothesis (Leff 1969; Jung, W.S. et al. 1985; T. Vissak, et al. 2005; B. Lin et al. 2018). They showed FDI has a negative effect (e.g., deficit in the investment balance, uneven regional development, fiscal and balance of payments deficits, cultural conflicts, and increased unemployment, reduce the labor cost-price, disclosing national secrets etc.) for the host economy (Ahmad et al. 1991; Mencinger, J. (2003 & 2008); Asma Salman et al. 2009). Thus, these above results give a further cue in understanding the relationship between FDI and economic growth.

In the international trade and development theory suggests export contributes positively to economic growth (Ahmad et al. 2000; Alici et al. 2003; Nguyen, T.K.N 2017; Nguyen, Q.H 2018). Because the promote exports could enhance the efficiency of local production (F.H. Liang 2017), the foreign trade expansion (M.H. Ahmad et al. 2003; Anwar, S. et al. 2011), allow increases in imports of capital and intermediate goods (S. Girma et al. 2015), diffusion of technical knowledge in production (Sultan 2013), etc. Besides, exports helped local firms to access the international market more easily (Ahmad et al. 1991; S. Girma et al., 2015; Liang, 2017). Thus, exports are also a significant determinant of the economic growth of the host country (R.B. Tekin 2012; Seng, S., 2016; Nguyen, Q.H, 2018).

This paper is to analyze the causal relations between FDI, export, and economic growth in Vietnam. The Vector autoregressive (VAR) model, Johansen co-integration test, and Granger causality test will be used to analyze this relation while the variables FDI, export, and GDP and data from 1990 to 2018 will be chosen. This paper is divided into five parts. The first part is about the

introduction. The second part is the literature review. The third part is about the model and data of the study. The results and discussion will be next whereas conclusion and policy implications will be the last.

II. LITERATURE REVIEW

There have been numerous empirical studies, examining the relationship between FDI, export, and economic growth in the host country with different approaches (input data, time, research model, etc.). So far, they have brought about a series of different results. In this part, the author would present such results, related to this study. Frank S.T Hsiao et al. (2006) used panel data during 1986 to 2004 and the VAR model to examine the Granger causal relations between FDI, export, and economic growth in the eight countries. The result was about FDI, which both directly and indirectly impacted on the national economic growth. At the same time, they had also confirmed the existence of bidirectional relation causality between exports and economic growth in the host country. Some studies also supported the above conclusion (e.g., Ahmad, Q.M., et al., 2000; Z.A., Sultan, 2013). R.B Tekin (2012) used the VAR model to examine causality relations amongst FDI, export, and economic growth in the least developed countries (LDCs) from 1970 to 2009. The results revealed the Granger causality from exports to economic growth, from FDI to export, and from FDI to economic growth. However, the impact of FDI on economic growth is different in each country, because the conditions of each country are different (M. A. Almfraji et al. 2014; B. Lin et al. 2018; C. Li et al. 2019). Also, FDI inflow, for K. Zhang et al. (2000), positively impacted export performance in China. Besides, the more export is promoted by FDI inflow, the more FDI is desired by the host government. The nations, attracting more FDI inflows, could pump capital into potential industries to develop local firms and make them able to compete internationally (A. Alici, et al. 2003; S. Girma et al. 2015; F.H. Liang, 2017). Through the global linkages of multinational corporations (MNCs), FDI could facilitate local firms' access to international markets easier (Ahmad, Q.M. et al. 2000; B. Lin et al. 2018). The nation's effort to attract FDI is proved with a remarkable achievement (Basu, P. et al. 2003; Frank, S.T. Hsiao, et al. 2006). For example, the study of M.H. Ahmad et al. (2003) showed FDI's essential role in the policy reform process of Pakistan as it promoted not only Pakistani export but also its economic growth. Besides, the effects of FDI could be wide-spreading and impact significantly on trade, employment, and factor cost, etc. on the host country's economy (K. Zhang et al. 2000; M.A. Almfraji et

al. 2014). Moreover, the liberalization process is expected to increase not only trade but also foreign investment (M.H Ahmad et al. 2003; Trinh, et al. 2015). Thus, FDI was considered an essential factor for the growth process in the host country (J.B. Durham, 2004; B. Lin et al. 2018; C. Li et al. 2019).

The topical research amongst FDI, export, and economic growth has also had attention from Vietnamese researchers. By making use of a panel dataset, that covered 61 provinces of Vietnam over 1996–2005, S. Anwar & Nguyen, L.P (2010) showed that FDI had a positive impact on national economy. At the same time, the effects of FDI on economic growth in Vietnam would have become even more significant if more resources had been invested in education and training, financial market development, and in reducing the technological gap between the foreign and local firms. The study of Nguyen, T.K.N (2017) showed that in the long-run, FDI could have a significant positive impact on Vietnam economic growth while the effect of export might be negative. However, FDI and export did not have any significant impact on growth in the short run. Pham, M.A (2008) used the VAR model to see if Vietnam's economy was driven by export or by investment. The result was that investment was the main factor behind Vietnam's economic growth. In contrast, the impact of export on the country's GDP growth was so insignificant. Also, neither investment nor export helped improve local productivity, which in turn was assumed to promote economic growth (Nguyen, N.T et al, 2017). Nguyen, Q.H (2018) used the gravity model to analyze the actual export situation in Vietnam. The result was about FDI, playing a significant role in promoting Vietnamese exports. FDI inflow helped Vietnam's economy deepened integration into the region and world market to expand the export market. Nguyen, T.X & Y. Xing (2008) even proved that FDI was one of the major factors driving the rapid export growth in Vietnam. It considerably facilitated the expansion of Vietnam's exports to FDI source countries. Thus, the success of exports became a driving force for Vietnam's economic growth since the 1986 reform.

In short, there has been a lot of research on the relationship among FDI, export, and economic growth. However, previous studies' results are heterogeneous. Therefore, this study is conducted to explain the result above.

III. DATA AND SPECIFICATION MODEL

Based on previous literature, this study uses the VAR model to examine the causal relationship between FDI, export, and economic growth in Vietnam. The basic equation to explore the relationship between the variables in the following form:

$$GDP = f(FDI, X) \quad (1)$$

Where: GDP is gross domestic product; FDI is foreign direct investment; X is exports.

The data describing the variables are obtained from the World Bank, the General Statistics Office of Vietnam (GSO), and the calculation unit is million USD. Individual data were calculated by logarithm before the testing. Calculation by logarithm was performed for the time series smaller dispersion and consequently to ensure stationarity of the time series. Individual time series calculated by logarithm are market with capital letter "Ln" before the each time series' title.

Base on (1) equation, the VAR equation can be rewritten as follows:

$$LnGDP_t = \beta_0 + \beta_1 LnFDI_t + \beta_2 LnX_t + \varepsilon_t \quad (2)$$

Where β_0 is a vector of constants; β_1 and β_2 are regression coefficients; ε_t is a vector of error terms (white noise processes).

The VAR method uses to test for relations among the variables in this study. The procedure is performed as follows:

• Step 1: Unit root and stationarity test

This study relies on the Augmented Dickey-Fuller (ADF), Phillips-Perron (PP), and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests to test stationarity for all variables was chosen. The KPSS test differs from the ADF and PP tests in that it involves examining the null hypothesis that the relevant time series is stationarity and complementary to unit root testing based on the ADF and PP tests.

• Step 2: Johansen's test

Johansen's test uses to test for co-integration among the series since Johansen's method is a multivariate approach. Also, the Johansen approach allows estimating more than one co-integration relationship if the data set contains two or more time series as well as gives the maximum rank of co-integration.

• Step 3: Granger causality test

The endogeneity tests are necessary as a tool for determining whether the explanatory variable can be regarded as exogenous or endogenous. This can be tested based on the Pairwise Granger causality test to indicates the extent to which two variables can Granger-cause each other. The type of model under study can be identified through either the presence or absence of Granger-cause.

• Step 4: The variance decomposition technique The Cholesky forecast error variance decomposition technique to measure the contribution of each shock to the innovations of each variable in the VAR system.

IV. RESULTS AND DISCUSSION

4.1 Unit root and Stationary test results

We use the ADF, PP, and KPSS tests to test whether or not the variables included in the model are stationary. The results in Table 1 show the LnFDI series is stationary in the original series with a significance level of 1%; the remaining variables are non-stationary. The KPSS test rejects the null hypothesis that the

Table 1: Unit root and Stationary Test Results

Variables	ADF test		PP test		KPSS test	
	Level	First Difference	Level	First Difference	Level	First Difference
LnGDP	-1.416 (0.5593)	-5.352*** (0.0002)	-2.263 (0.1901)	-5.249*** (0.0002)	0.692*** (0.0000)	0.293*** (0.0912)
LnFDI	-9.236*** (0.0000)	-23.717*** (0.0001)	-6.566*** (0.0000)	-20.904*** (0.0001)	0.635*** (0.0000)	0.373*** (0.1149)
LnX	-0.475 (0.8819)	-6.057*** (0.0000)	-0.612 (0.8524)	-6.195*** (0.0000)	0.689*** (0.0000)	0.171*** (0.2101)

Note: "****" denotes significance at the 1% level; p-values are in parentheses

series is stationary. However, when taking the first difference, both the ADF and PP tests show the LnGDP and LnX variables all are stationary with a significance level of 1 %, and the KPSS test does

not reject the null hypothesis of stationary. Therefore, we can conclude that all variables included in the VAR model are integrated of order one.

Table2: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	69.31567	NA	1.22e-06	-5.101205	-4.956040*	-5.059403
1	80.29878	18.58681*	1.06e-06	-5.253752	-4.673092	-5.086543*
2	90.10521	14.33248	1.03e-06*	-5.315786*	-4.299631	-5.023170

Source: results extracted from EViews 10

The results in Table2 show that have two criteria that suggest the delay is 2, which is (1) FPE, (2) AIC. After determining the optimal number of lags is 2, the existence of the long-term equilibrium relationship is done between variables in the model, and the co-integration tests proposed by Johansen are applied.

Stability test for VAR model in Figure1 demonstrates that most of the roots are inside the unit circle. Therefore, this model is highly stable.

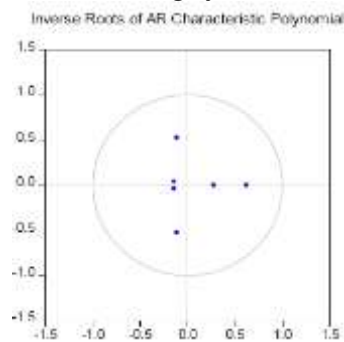


Figure 1: Stability test of VAR model

4.2 Johansen's test result

Long-term relationships test between FDI, export, and GDP was performed based on the (2) equation. The dependent variable is LnGDP and independent variables are LnFDI and LnX.

The relationship between variables in the Johansen test is examined based on two Trace and Max-eigenvalue

analysis. The co-integration test result in Table3 shows that the Trace and the Maximum Eigenvalues test have different results. We also fail to reject the null hypothesis of the Trace test and the Max test ($H_0: r \leq 1$ and $H_0: r \leq 2$) at the 5% level of significance, because when apply Pantula's principle (Pantula, 1989) suggests that one can stop at the point where either of the two tests fails to reject the null. Therefore, we conclude that there exists one co-integrating vector. In other words, there exists a long-run relationship between FDI, export, and GDP in Vietnam. This result is not so same as the study's results of Nguyen, T.K.N (2017) and Nguyen, Q.H (2018).

After finding evidence for the existence of the long-term equilibrium relationship between variables in the model, VAR model is used to estimate with one co-integration equation. The results are as follows:

$$\begin{aligned} \text{LnGDP}_t &= 0.2868 * \text{LnGDP}_{t-1} + 0.1561 * \text{LnGDP}_{t-2} \\ &+ 0.0884 * \text{LnFDI}_{t-1} + 0.0115 * \text{LnFDI}_{t-2} \\ &+ 0.0934 * \text{LnX}_{t-1} - 0.2041 * \text{LnX}_{t-2} + 0.0666(3) \end{aligned}$$

The (3) equation shows that if the FDI increases by 1 % then there is a growth in GDP of 0.0884 % and if export increases by 1 % there is an increase in GDP of 0.0934 %.

Table3: Johansen co-integration test

Hypothesized No. of CE(s)	Eigen- value	H_0	Trace test			Max test		
			Trace	CV(5%)	p-value	Max-Eigen	CV (5%)	p-value
None *	0.526935	$r = 0$	42.4940	29.7971	0.0011	19.4616	21.1316	0.0842
At most 1 *	0.477167	$r \leq 1$	23.0324	15.4947	0.0030	16.8608	14.2646	0.0190
At most 2 *	0.211301	$r \leq 2$	6.1716	3.8415	0.0130	6.1716	3.8415	0.0130

Note: * denotes rejection of the hypothesis at the 0.05 level; CV is Critical Value.

4.3 Granger causality test result

We using the multivariate Granger causality/Block exogeneity Wald tests to examine the short-run dynamics among the variables in the VAR model.

Table 4: VAR Granger Causality/Block Exogeneity Wald Tests

Dependent variable	Excluded Variables		
	LnGDP	LnFDI	LnX
LnGDP		2.291204 (0.3180)	2.552312 (0.2791)
LnFDI	0.724515 (0.6961)		1.527029 (0.4660)
LnX	1.401518 (0.4962)	1.448145 (0.4848)	

Source: results extracted from EViews 10

The results in Table 4 show that there is not a short-run causal link between GDP, FDI, and export in Vietnam. This result is as same as the study of Nguyen, T.K.N (2017), but it is not same as the study of Nguyen, N.T et al. (2017).

Table 5: Pairwise Granger Causality Tests

Null Hypothesis H_0 :	F-Statistic	P-value
LnFDI does not impact LnGDP	5.54886	0.0116
LnGDP does not impact LnFDI	0.02766	0.9728
LnX does not impact LnGDP	5.74568	0.0102
LnGDP does not impact LnX	0.88526	0.4275
LnX does not impact LnFDI	0.45599	0.6399
LnFDI does not impact LnX	0.91128	0.4173

Source: results extracted from EViews 10

We continue to use the Pairwise Granger test to examine the short-run relationship between the variables. The results in Table 5 also show, in the short-term, FDI and export do not impact economic growth. Besides, FDI does not also impact on export. This is surprised, since, in recent years, the export of FDI firms has gradually made up a big share in the gross export product. At the same time, FDI is recorded as an essential factor to promote export in Vietnam (Nguyen, T.X, 2008; Pham, M.A 2008; Nguyen, T.K.N, 2017; Nguyen, Q.H 2018).

4.4 The variance decomposition technique

Table 6: Variance Decomposition of LnGDP

Period	S.E.	LnGDP	LnFDI	LnX
1	0.0543	100.000	0.000	0.000
2	0.0652	92.558	6.496	0.946
3	0.0693	83.694	9.058	7.248
4	0.0705	81.486	10.575	7.939
5	0.0712	80.720	11.491	7.789
6	0.0714	80.414	11.773	7.813
7	0.0715	80.256	11.863	7.881
8	0.0715	80.212	11.911	7.877
9	0.0716	80.195	11.930	7.875
10	0.0716	80.187	11.936	7.877

Source: results extracted from EViews 10

And finally, the results presented in Table 6 indicated that the level of GDP growth mainly by endogenous shocks from Vietnam's economy (from 80% to 93%). FDI and export variables had explained a relatively portion of the economy's variation. Specifically, FDI variables had explained from 6.5 % to 11.9 %; export variables had explained from 0.9% to 7.9% for economic growth in Vietnam. This result suggests that the current performance of the economy plays a crucial part in forecasting the future economic growth of Vietnam.

V. CONCLUSION AND POLICY IMPLICATIONS

This research aims to study the impacts of foreign direct investment and export on the economic growth of Vietnam during 1990-2018. VAR model is used to examine this relation. The co-integration Johansen test confirms the existence of a long-run relationship among variables. In other words, in the long-term, FDI and exports will have a considerable positive effect on Vietnam's economy. In the short term, FDI and export do not have a causal relationship with GDP. Similarly, FDI does not have a causal relationship with exports. This implies that it may take a long time for FDI to influence export growth in Vietnam. However, there is no definite econometric evidence, supporting that promoted export is a driver of long-term Vietnamese economic growth.

The above empirical findings provide some important implications for policymakers in Vietnam. Firstly, they should design policies that aim to attract more FDI for Vietnam. Secondly, in recent years, the role of export has gradually made up a big share in GDP. Thus, the policymakers might base on this result to build appropriate policies for economic growth in Vietnam. If Vietnam's economy wants to achieve sustainable growth in the future, the policymakers need attention on the role of FDI and export on the economic growth in Vietnam.

REFERENCE

- [1] A.A. Alici & M.S. Ucal, "FDI, exports and output growth of Turkey: Causality analysis", European trade and study, 2003.
- [2] Ahmad, J. & A.C.C. Kwan, "Causality between exports and economic growth: Empirical evidence from Africa". Economics Letters, 37(3): 243-248, 1991.

- [3] Asma Salman, H.X. Feng, "Negative impact of FDI: A Co-integrated approach", International Journal of Organizational Innovation, 2009.
- [4] Ahmad, Q. M., M. S. Butt, & S. Alam "Economic growth, export, and external debt causality: The Case of Asian Countries". The Pakistan development review, 39: 4, 591-608, 2000.
- [5] A. Omri & B. Kahouli, "Causal relationships between energy consumption, FDI and economic growth: Fresh evidence from dynamic simultaneous-equations models," Energy Policy, vol. 67, 2014.
- [6] Anwar, S. & L.P. Nguyen, "FDI and economic growth in Vietnam", Asia Pacific Business Review, 16(1-2): 183-202, 2010.
- [7] Anwar, S. & L.P. Nguyen, "FDI and trade: The case of Vietnam", Research in International Business and Finance 25 (2011) 39-52, 2011.
- [8] Basu, P.; Chakraborty, C.; & Reagle, D. "Liberalization, FDI, and growth in developing countries: A panel co-integration approaches", Economic Inquiry, 41(3), 510-516, (2003).
- [9] B. Lin & Nelson, "Causal relationships between energy consumption, FDI and economic growth for MINT: Evidence from panel dynamic ordinary least square" Journal of Cleaner Production, 2018.
- [10] C. Li & S. Tanna, "The impact of FDI on productivity: New evidence for developing countries", Economic Modelling 80, vol. 14, pp. 453-466, 2019.
- [11] F.H. Liang, "Does FDI improve the productivity of domestic firms? Technology spillovers, industry linkages, and firm capabilities." Research Policy, vol. 46, pp. 138-159, 2017.
- [12] Frank S.T. Hsiao, Mei-Chu W. Hsiao, "FDI, exports, and GDP in East and Southeast Asia Panel data versus time-series causality analyses". Journal of Asian Economics, 17 (2006) 1082-1106.
- [13] J. B. Durham, "Absorptive capacity and the effects of FDI and equity foreign portfolio investment on economic growth," European Economic Review, vol. 48, pp., 2004.
- [14] Jung, W.S. & P.J. Marshall, "Exports, growth and causality in developing countries". Journal of Development Economics, 18(1): 1-12, 1985.
- [15] Griffin, K. B., & Enos, J. L. (1970), Foreign Assistance: Objectives and Consequences. Economic Development and Cultural Change, 18(3), 313-327.
- [16] K.H. Zhang & S. Song, "Promoting exports, the role of inward FDI in China", China Economic Review 11 (2000) 385-396.
- [17] Leff, N.H. (1969). "Dependency Rates and Saving Rates", American Economic Review. New York: American Economic Association. 59(5)
- [18] M. A. Almfraji & M. K. Almsafir, "FDI and Economic Growth Literature Review from 1994 to 2012," Procedia - Social and Behavioral Sciences, vol. 129, , 2014.
- [19] Mencinger, J. "Does FDI Always Enhance Economic Growth?" Kyklos, Vol 56, 2003.
- [20] Mencinger, J. "The Addiction with FDI and current account balance", Working Paper No.16/2008.
- [21] M.H. Ahmad, S. Alam, & M.S. Butt, "FDI, exports, and domestic output in Pakistan", the Pakistan development review; 42: 4 Part II (Winter 2003) pp. 715-723.
- [22] Nguyen, T.K.N, "The Long Run and Short Run Impacts of FDI and Export on Economic Growth of Vietnam," Asian Economic and Financial Review, vol. 7, pp. 519-527, 2017.
- [23] Nguyen, T.X, and Y. Xing, "Foreign direct investment and exports: the experiences of Vietnam", Economics of Transition, Volume 16(2) 2008, 183-197.
- [24] Nguyen, Q.H, "Determinants of Vietnam's exports: An application of the gravity model," Journal of Economic Development, vol. 25, pp. 103-116, 2018.
- [25] Pham, M.A., "Can Vietnam's economic growth be explained by investment or export. A VAR analysis?" Vietnam Development Forum Working Paper Series No.0815, 2008.
- [26] R.B. Tekin, "Economic growth, exports and foreign direct investment in Least Developed Countries: A panel Granger causality analysis". Journal Economic Modelling 29, (2012), vol 11. 868-878.
- [27] Seng Sothan, "FDI, Exports, and Long-Run Economic Growth in Asia: Panel Co-integration and Causality Analysis", Inter-national Journal of Economics and Finance Vol. 8; 2016.
- [28] S. Girma, Y. Gong, "Estimating direct and indirect effects of FDI on firm productivity in the presence of interactions between firms," Journal of International Economics, vol. 95, pp. 157-169, 2015.
- [29] Trinh, H.N. & Q.A. Nguyen, 2015. "The impact of foreign direct investment on economic growth: Evidence from Vietnam." Developing Country Studies, 5(20): 1-19.
- [30] T. Vissak, T. Roolah, "The negative impact of foreign direct investment on the Estonian economic". Problems of Economic Transition, 48:2, 43-66, 2005.