IMPACT ASSESSMENT OF FOREIGN DIRECT INVESTMENT (FDI) ON THE GRDP PER CAPITA OF VINH PHUC PROVINCE (2010-2022).

BY

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Abstract

Foreign Direct Investment (FDI) is often seen as an important catalyst for economic growth in developing countries. It affects the economic growth of the host country by stimulating domestic investment, increasing human capital formation, and facilitating technology transfer. Gross Regional Domestic Product per capita is often considered the indicators to evaluate the contribution of FDI on the economy of a province.

The main purpose of the study is to investigate impacts of FDI on the Gross Regional Domestic Product per capita of Vinh Phuc province. The study uses annual data series for the period of 2010-2022. The relationship between FDI and GRDP per capita is analyzed by using Distributed-Lag models. The results of the study show positive and statistically insignificant relations between FDI inflows and the Gross Regional Domestic Product per capita respectively in Vinh Phuc. Policy recommendations are suggested in the light of the results obtained, regarding the FDI in the province.

Keywords: FDI, GRDP per capita, Vinh Phuc province.

I.   Introduction

In Vietnam, the important role of FDI has been acknowledged for the last 30 years. Since the launch of market-oriented economic reforms in 1986, Vietnam has been among the fastest-growing countries in the Southeast Asia with the active participation of foreign investors in all fields of the economy. The Vietnamese government has quickly jointed competition for foreign direct investment into regional and global markets by restructuring of the domestic economy and opening up of the economy to the external trade and investment. The FDI capital has been supporting provinces to restructure the economy towards industrialization and modernization, to create many new industries and products. It also contributed to improving management capacity, increasing labor productivity, developing technology, expanding export markets, creating jobs, and improving living standards of workers.

Vinh Phuc is a delta province, located in the key economic zone of Northern Vietnam. It has advantages of natural conditions and infrastructure. After the Foreign Investment Law was issued (in December 1987), Vinh Phuc has attracted FDI capital to some key industries and contributed much to the restructuring of the province economy. The attraction and use of FDI capital not only contribute to economic development of the province but also promote economic development of the whole of key economic zone of Northern Vietnam.

Vinh Phuc's economy has changed very much since the FDI activities were implemented. Therefore, assessing the impact of FDI on the economy of Vinh Phuc province is very necessary. This assessment would be a good basis for the authority to issue appropriate policies on economic development of the province.

The relationship between FDI and GRDP per capita in the province will be discussed, and the contribution of FDI to growth will be investigated. To achieve these, scholarly opinions and suggestions will be discussed and empirical analysis on FDI will be carried out.

The study shall become noteworthy to the followings:

1. To the management of the province: The result of the study can serve as a basis to revise some policies, devise an appropriate attraction FDI strategy for the development of the province.
2. To the investor: The result of the study may help investors realize the advantages they can have in dealing business with the province then they may get interested to make new or increase existing investments in the province.

3. To students of business and future researchers: This study can serve as benchmark information for related studies.
4. To the researcher: This work is a test of his/her knowledge in business and his/her ability to engage in a research work.

II. Methodology

The regression analysis method with one econometric model will be used. The impacts of FDI on the GRDP per capita are measured by using the Goss Regional Domestic Product per capita as a dependent variable, while FDI inflows and its lags are the independent variables of interest. Method to solve problem is:

- Set up the analytical models
- Collect the data of variables
- Estimate model
- Test the appropriateness of the model
- Analysis and conclusions.

III. The impacts of FDI on GRDP per capita of Vinh Phuc province

Step 1: Set up the analytical model

The approach taken by Alt (1942) and Tinbergen (1949) is used to set up the analytical models. They suggest that to estimate a distributed-lag model in one explanatory variable, for example $Y_t = \alpha + \beta_0 X_t + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \beta_3 X_{t-3} + \ldots + U_t$. Since the explanatory variable X_t is assumed to be non-stochastic (or at least uncorrelated with the disturbance term u_t), X_{t-1}, X_{t-2}, and so on, are non-stochastic, too. Therefore, in principle, the OLS method can be applied to model. We may proceed sequentially; that is, first regress Y_t on X_t, then regress Y_t on X_t and X_{t-1}, then regress Y_t on X_t, X_{t-1} and X_{t-2}, and so on. This sequential procedure stops when the regression coefficients of the lagged variables start becoming statistically insignificant or the coefficient of at least one of the variables changes signs from positive to negative or vice versa.

In this study, the model with dependent variable GRDP per capita (BQN) is estimated and the result shows that the regression coefficients of FDI_{t-3} changes signs from positive to negative. Therefore, to test the hypothesis empirically, the effects of FDI on BQN, the model used can be specified as follows:

$$BQN_t = \alpha + \beta_0 FDI_t + \beta_1 FDI_{t-1} + \beta_2 FDI_{t-2} + U_t$$

Where: FDI presents Foreign Direct Investment to Vinh Phuc (Bill. USD),

BQN is the Gross Regional Domestic Product per capita of Vinh Phuc (USD).

Step 2. Collect the data of variables.

Foreign Direct Investment (FDI) – Investment directly into production or services in a country by a company located in another country, either by buying a company of the host country or expanding the existing business to the host country.

Gross Regional Domestic Product per capita (BQN) is the total value of all the goods and services produced in a region in a particular year, divided by the number of people living there.

For the empirical analysis, data of aggregate BQN and FDI inflows to Vinh Phuc will be used. Data sources for the empirical works are obtained from reports, statistics of the Statistical Department of Vinh Phuc (www.thongkevinhphuc.gov.vn). The Regression Analysis shall be applied to point out the impact of FDI on the BQN. The model is estimated using annual data for the period 2010-2022.

Before estimating the relationship between FDI and BQN, we consider the trend of variables. Figure 1 and 2 describe the trend of two time series.
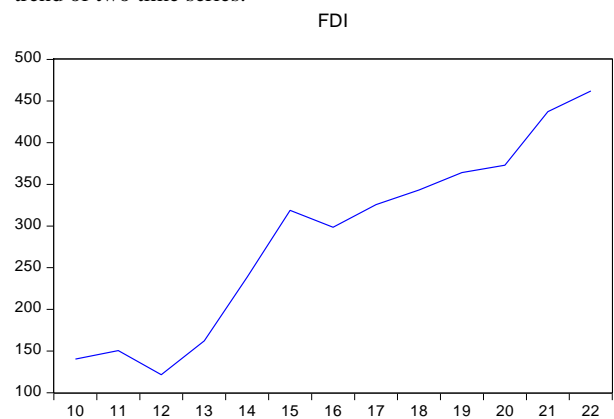
Source: The Vinh Phuc Statistical Department

Figure 1: The development trend of FDI
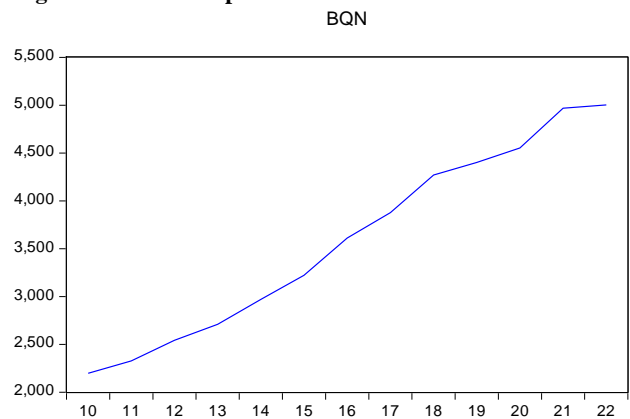
Source: The Vinh Phuc Statistical Department
Figure 2: The development trend of BQN

Step 3. Estimate model.

The model is estimated by the method of ordinary least squares (OLS) with the help of Eviews software. The method of ordinary least squares is attributed to Carl Friedrich Gauss, a German mathematician. Under assumptions (tested in step 4), the method of ordinary least squares has some very attractive statistical properties that have it one of the most powerful and popular methods of regression analysis.

Table 1: The result of the model estimation

Dependent Variable: BQN
Method: Least Squares
Sample (adjusted): 2012 2022
Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1306.673	154.9684	8.431868	0.0001
FDI	3.907749	1.397194	2.796855	0.0266
FDI(-1)	0.120210	1.980885	0.060685	0.9533
FDI(-2)	4.903622	1.446020	3.391116	0.0116

R-squared	0.978118	Mean dependent var	3829.636
Adjusted R-squared	0.968739	S.D. dependent var	881.9546
S.E. of regression	155.9356	Akaike info criterion	13.21205
Sum squared resid	170211.3	Schwarz criterion	13.35674
Log-likelihood	-68.66628	Hannan-Quinn criter.	13.12084
F-statistic	104.2970	Durbin-Watson stat	2.029192
Prob(F-statistic)	0.000004		

Source: Calculation of the author by Eviews software

Table 1 expresses the result of the model estimation. The estimated value for R^2 is very high, which shows that the FDI and its lags explained 97.81% of the variation of BQN. P-value of F-statistics is very low (0.000004), which shows that the regression is overall good fitted on 1% level of significance (as the $F > F_{0.01}$ (n-1, n-k)), which means that we can reject the null hypothesis that the regression function is not appropriate. The statistically significance of the regressions parameters is tested by the usual p-values. The p-values of C, FDI, and FDI(-2) are less than 5%, which show that all the regression coefficients of the FDI and FDI(-2) are statistically significant at 5% level of significance as well as the intercept. The p-value of FDI(-1) is more than 5%, which show that all the regression coefficient of the FDI(-1) is not statistically significant at 5% level of significance.

Step 4. Test the appropriateness of the model.

- **Autocorrelation test**

The Breusch-Godfrey Serial Correlation LM Test is used for autocorrelation test where the null hypothesis is there is no autocorrelation between the disturbances.

Table 2: **The result of the Serial Correlation test in model**

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.004002	Prob. F(1,6)	0.9516
Obs*R-squared	0.007332	Prob. Chi-Square(1)	0.9318

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Sample: 2012 2022

Included observations: 11

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.566234	169.1510	-0.009259	0.9929
FDI	0.041685	1.646268	0.025321	0.9806
FDI(-1)	-0.042683	2.242788	-0.019031	0.9854

FDI(-2)	0.002520	1.561868	0.001613	0.9988
RESID(-1)	-0.028180	0.445457	-0.063260	0.9516

R-squared	0.000667	Mean dependent var	-1.36E-13
Adjusted R-squared	-0.665556	S.D. dependent var	130.4651
S.E. of regression	168.3735	Akaike info criterion	13.39320
Sum squared resid	170097.8	Schwarz criterion	13.57406
Log likelihood	-68.66261	Hannan-Quinn criter.	13.27919
F-statistic	0.001000	Durbin-Watson stat	1.969695
Prob(F-statistic)	0.999997		

Source: Calculation of the author by Eviews software

The result in Table 2 shows that the p-value of F-statistic is 0.9516, so it is larger than 0.05. Hence, the null hypothesis that no autocorrelation between the disturbances in model can be accepted.

- **Heteroskedasticity test**

The result of White test suggests accepting the null hypothesis that there are not Heteroskedasticity in the models. This is a test for heteroskedasticity in the residuals from a least squares regression (White, 1980).

Table 3: **The result of the White test in model**

Heteroskedasticity Test: White

F-statistic	1.105319	Prob. F(9,1)	0.6336
Obs*R-squared	9.995239	Prob. Chi-Square(9)	0.3509
Scaled explained SS	5.365734	Prob. Chi-Square(9)	0.8013

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Sample: 2012 2022

Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	548861.3	436098.9	1.258571	0.4274
FDI^2	-74.59865	59.99969	-1.243317	0.4312
FDI*FDI(-1)	145.4816	113.8256	1.278109	0.4227

Source: Calculation of the author by Eviews software

As shown in Table 3, the p-value of F-statistic is 0.6336, larger than 0.05. So the null hypothesis of no Heteroskedasticity in the model can be accepted.

- **Normal Distribution test**

The Jarque-Bera test [of Jarque and Bera (1987)] in the Eviews software is utilized to test if the null hypothesis that residuals are the Normal Distribution is accepted.
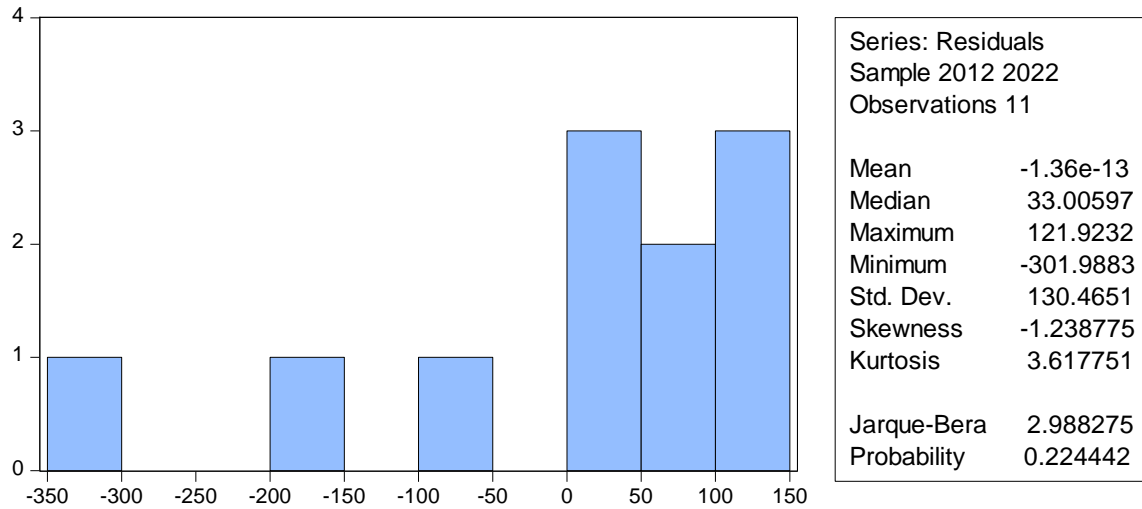

Figure 3: The result of the Normal Distribution test for residual in model

Source: Calculation of the author by Eviews software

As can be seen in figure 3, the p-value of the Jarque-Bera statistic is 0.2244, larger than 0.05. Therefore, the null hypothesis that residuals in model are the Normal Distribution can be accepted. On the other hand, the random errors in model are the Normal Distribution.

- **Correct functional form test**

Finally, we test the null hypothesis that the correct functional form and does not omitted variables in models by RESET test. RESET stands for Regression Specification Error Test and was proposed by Ramsey (1969). The results of tests show that p-values of F-statistics (Prob(Ramsey) in table 4) larger than 0.05. We accept the null hypothesis. The estimations satisfied the assumptions of OLS method.

Table 4: The result of the Ramsey Reset test in model

Ramsey RESET Test

Equation: UNTITLED

Specification: BQN C FDI FDI(-1) FDI(-2)

Omitted Variables: Powers of fitted values from 2 to 3

	Value	Df	Probability
F-statistic	1.345414	(2, 5)	0.3408
Likelihood ratio	4.736497	2	0.0936

F-test summary:

	Sum of Sq.	Df	Mean Squares
Test SSR	59552.68	2	29776.34
Restricted SSR	170211.3	7	24315.90
Unrestricted SSR	110658.6	5	22131.72

LR test summary:

	Value
Restricted LogL	-68.66628
Unrestricted LogL	-66.29803

Step 5. Analysis and conclusions.

The effect of FDI and its lags on BQN of Vinh Phuc province can be seen in the result of regression of model. The regression coefficient of FDI is positive, statistically significant and the value 3,9077 can be treated as FDI elasticity of BQN. An increase of one Bill. USD in FDI in the current year induces an average increase of 3,9077 USD in the GRDP per capita of Vinh Phuc increases. This shows the contribution of FDI to GRDP per capita in Vinh Phuc province is positive, for the 2010-2022 period. The regression coefficient of FDI(-1) is positive and significant and the value 0,1202 can be treated as FDI(-1) elasticity of BQN. For one Bill. USD increase in FDI in the previous year [in FDI(-1)], the average of the GRDP per capita of Vinh Phuc increases by almost 0,1202 USD. This shows the contribution of FDI in the previous year to GRDP per capita in Vinh Phuc province in the current year is positive, for 2010-2022. The regression coefficient of FDI(-2) is positive and statistically significant and the value 4,9036 can be treated as FDI(-2) elasticity of GRDP per capita in the year before the last year. For one Bill. USD increase in FDI in the year before the last year [in FDI(-2)], the average of the GRDP per capita of Vinh Phuc in the current year increases by almost 4,9036 USD. This shows the contribution of FDI in the year before the last year to GDP in Vinh Phuc province in the current year is positive, for the period 2010-2022. The regression analysis shows that FDI inflows play a substantial role in influencing GRDP. FDI inflows not only impact on GRDP of Vinh Phuc province in the current year but also impact on GDP of Vinh Phuc province in the two subsequent years.

Based on the above finding results, this research yields some following recommendations for economy in Vinh Phuc province to enhance the attractiveness of the province in order to attract more foreign investors and to sustain the path of growth and economic development. Although the impacts of FDI on the economy in Vinh Phuc were positive from 2010 to 2022 but it is not high as possible. In fact, almost of FDI enterprises in Vinh Phuc are operating in production sector with underdeveloped technology, so environment is polluted very much. Moreover, when the economy changed, the traditional culture is affected negatively. To perform well in attracting investment and improve the efficiency of FDI projects, the province's authority should:

(1) Diversify the investment promotion activities to attract more FDI, hence generate more GRDP per capita.
(2) Do not to end the investment promotion at the time of licensing, but remain it throughout the course of the project activities.
(3) Pay adequate attention to the selection of investment partners.
(4) Quickly increase the rate of trained labors in the economy, particularly in domestic enterprises, to meet the requirement for a high-skill labor force of high-tech industries.
(5) To improve the management capability of the province in attracting FDI in the modern global context.

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