Impact of FDI on Provincial Economic Growth in Vietnam

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ABSTRACT

The impact of foreign direct imvestment (FDI) on economic growth is still a highly controversial issue as remarked by many researchers (Aitken et al.; 1997; Carkovic & Levine, 2002; Bende-Nabende et al., 2003; Durham, 2004; and Hsiao, 2006). Using a panel dataset of 43 provinces in Vietnam during 1997 – 2012 and the Granger causality test by Arellano-Bond GMM and PMG estimation, this paper shows that: (i) FDI does Granger-cause private investment, human resources, taxation, infrastructure, trade openness and local technology; (ii) FDI has a positive impacts on provincial economic growth in the long term; and (iii) FDI flows vary over provinces due to differences in geographical conditions and level of development.

1. INTRODUCTION

According to OECD (2002), benefits that developing countries may obtain from FDI are obviously certified. Several studies indicate that FDI can create spillover effects on technological advances, encourage investment in human resources, contribute to internationally commercial integration, improve competitive business environment, and strengthen development of firms. All these effects contribute to higher growth rates and are considered to be effective instruments for economic growth of developing countries.

Besides economic benefits, FDI can improve social and environmental conditions of the host country by technology transfer and adjustments to corporate policies to make them more socially responsible. Furthermore, FDI flows serve as a catalyst for faster economic growth as seen in East Asia countries where it helps them move to higher stages of development and catch up with Western developed countries. Additionally, FDI also helps improve social norms considerably by playing a leading role in development projects of host countries (Sun, 2002).

In our opinion, the leap in investment in East Asian countries in the period from the end of the World War II to the 1980s is a convincing evidence of the important role of foreign investment in sustainable economic development.

As a developing country, Vietnam has been continuously reforming and adopting new policies to attract FDI. Since the economic reform launched in 1986, Vietnam has achieved high growth rates and better living standard, and become a middle-income country.

Many authors has examined the impact of FDI on economic growth in Vietnam, such as Nguyễn (2003), Nguyen (2004), Nguyễn (2006), and Le (2007) at national level, and Anwar & Nguyen (2010), and Nguyen *et al.* (2012) at provincial level.

The research results show that the impact of FDI on economic growth is positive. However, exploiting advanced research methods to ensure robustness of estimates is not done properly. In other words, whether FDI plays a positive role in Vietnam's economic growth or not is still an interesting topic to many economists and policy makers.

Using the Granger causality test, Arellano-Bond difference GMM and PMG estimation to deal with panel data of 43 provinces from 1997 to 2012, this paper aims

to examine (i) spillover effects of FDI on factors of economic growth; and (ii) impacts of FDI on long-term provincial economic growth.

2. LITERATURE REVIEW

Many researches on relationship between FDI and economic growth are conducted with a variety of research scope, data and methods. The presence of FDI can promote export activities of domestic enterprises in the same sectors, thereby creating spillover effects on the economy through horizontal combination. In the period 1970 – 1985, the role of FDI in economic growth in 46 developing countries characterized by differences in trade, policies and regimes is analyzed by Balasubramanyam *et al.* (1996). Their findings indicate that the role of FDI is more important to export growth of those countries.

Through panel data of 2,014 Mexican companies in the period 1986-1990, Aitken, Hanson & Harrison (1997) find that multinational enterprises may create positive spillover effects on export by domestic companies. Additionally, Hsiao & Hsiao (2006) construct the panel data model for eight economies (China, Korea, Taiwan, Hongkong, Singapore, Malaysia, the Philippines and Thailand), and the research results show that FDI has unidirectional impacts directly on the GDP and indirectly through export.

However, many other researches cannot detect any relationship between FDI and economic growth. Karikari (1992) examines their causal relationship in Ghana from 1961 to 1988 and finds that FDI does not affect economic growth, but economic growth makes FDI inflows decrease slightly. Additionally, Karikati states that the results are due to insignificant volume of FDI inflows in time series data, and FDI promotes trade liberalization more than economic growth. Haddad and Harrison (1993) do not detect significant impacts of FDI on the rate of productivity growth of domestic companies when testing spillover effect of FDI on economic growth among Moroccan firms during the period 1985 – 1989.

Similarly, examining data of 72 developed and developing countries with OLS and GMM methods, Carkovic and Levine (2002) find no strong relationship between FDI and the economic growth. Durham (2004) investigates the role of FDI in the growth in 80 countries in the years 1979-1998. He cannot find any relationship between two variables and argues that impacts of FDI are dependent on absorptive capacity of host countries. In the study by Bende-Nabende *et al.* (2003), FDI has significant effects on

output in such less developed countries in Asia as the Philippines and Thailand but plays a negative role in the context of such developed countries as Japan and Taiwan.

Employing panel data of 61 provinces/cities in Vietnam in the period 1996 – 2005 and GMM estimator, Anwar and Nguyễn (2010) examine impacts of FDI on economic growth and find a two-way link between FDI and provincial economic growth. Additionally, using data from 63 provinces/cities in Vietnam from 2000 to 2010 and FE estimator, Chien and Zhang (2012) also indicate that FDI has positive effects on Vietnam's economic growth. These effects in provinces with better socioeconomic conditions are stronger than ones in provinces with poorer socioeconomic conditions. Regarding local economies, the estimation results show that FDI impacts positivesly economic growth in four out of six regions: Northern Midland, Central Highlands, Southeast and Mekong River Delta. Nguyễn and Hồ (2013) use panel data of 63 provinces/cities in the period 2000 – 2001 and apply fixed-effects estimated method (FE) to explore the relationship between FDI and economic growth in Vietnam. The research results indicate that "there is positive bi-directional linkage between FDI and GDP per capita growth." When considering different regions, the results show that the causal relationship exists in only five out of six regions of Vietnam. Particularly, this interaction becomes stronger and more positive in remote areas where socioeconomic conditions are not favorable. This finding is contrary to results of previous empirical researches.

Practically, researches on zonal economies have many advantages and show an obvious relationship between FDI and economic growth, thereby overcoming shortcomings of researches on national economy. However, the problem with researches on zonal economies is how to transform data to make them appropriate with the regions and secure reliability of estimating methods. As the result, there appear different empirical evidences in the researches on the role of FDI in economic growth. This impact can be positive, negative or statistically insignificant.

3. RESEARCH MODELS

The empirical model is based on a panel dataset of provinces/cities in Vietnam during 1997 – 2012. Based on theories of impacts from FDI on host countries by many authors, such as MacDougall (1960), Hymer (1960), Buckley & Casson (1976), Caves (1971), Dunning (1973), Kindleberger (1969), and Vernon (1966), this paper suggests

the following model for assessing impact of FDI and relevant factors on economic growth:

$$Y_{it} = \beta_0 + \beta_1 Y_{it-1} + \beta_2 X_{it} + \beta_3 CONTROL_{it} + e_{it} \quad (1)$$

where

i: provinces/cities ; *t*: time

Y: Provincial GDP per capita is used as a proxy for provincial economic growth.

X_{it}: This set of variables in Cobb-Douglas model includes: FDI: Foreign direct investment; PINV: Private investment; and LABO: Labor.

$CONTROL_{it}$: This set of control variables includes:

(i) Fiscal variables (revenue, public expenditure and current expenditure): Among above strands of endogenous growth models, tax revenue and government expenditure play important roles in the long-term economic growth (Barro, 1990).

- BREV (budget revenue): Tax policy, in endogenous growth models, has an impact on the long - term economic growth. Moreover, high tax rates can distort an economy and hinder economic growth (Barro, 1990; Jin & Zou, 2005; Zhang & Zou, 1998).

- GINV (government investment): Provincial public investment has a positive impact on economic growth because it helps improve infrastructure and promote accumulation of human capital. Through public expenditures in education service, according to Blankenau & Simpson (2004), governments play essential roles in human capital accumulation. The direct effect of education expenditure on human capital accumulation can impact economic growth in the long term.

- CBEXP (current budget expenditure): Current provincial budget expenditure for consumption, including spendings on administrative machinery and its operations, and expenditures on educational, scientific and technological activities. In their theory of growth, Bose *et al*. (2007) maintain that education, science, technology, environment and health care are considered important keys to the future economic prosperity.

(ii) Other control variables:

- TELE: This variable represents mobile and fixed-line telephone subscribers (per 1,000 people) and is used as a proxy for infrastructure to express the impact of infrastructure on economic growth (Lumbila, 2005; Asiedu, 2002; Ancharaz, 2003).

- OPEN (trade openness): The endogenous growth theories (Romer, 1986; Lucas, 1988) provide compelling evidences that increases in import and export compared with GDP impact economic growth. Grossman and Helpman (1991) and Barro and Sala-i-Martin (2004) argue that the trade openness can lead to greater ability to absorb technological advances and export products, which stimulates economic growth. Additionally, Grossman and Helpman (1991) and Rodrik (1992) also indicate that export can generate economic growth, and the findings of Balasubramanyam *et al.* (1996), Yanikkaya (2003) and Makki & Somwaru (2004) show the positive impacts of trade openness on economic growth.

- CPI (Consumer price index): Important effects of CPI on economic growth are confirmed by many authors, such as Friedman (1977). CPI can impact positively or negatively on economic growth. Deriving from potential benefits of CPI, its positive impact can improve savings and investment, while its negative effect can cause damage to the economy due to increases in transaction costs of economic activities (Jin & Zou, 2005).

- GAP: This variable denotes gaps in technology or labor productivity. Sjoholm (1999) argues that narrowing technology gap can promote better economic growth. Based on studies by Lim & McAleer (2002), Li & Liu (2005), and Krogstrup & Matar (2005), this paper measures regional technology gaps by the difference between national GDP per capita and provincial GDP per capita. In this calculation, national GDP per capita is considered as the average labor productivity. The difference in GDP between a country and a region presents the gaps in technology or labor productivity between provincial and national averages. This gap may be positive when a region or province has a level of technology or labor productivity higher than the national average and vice versa.

4. ESTIMATION METHODS

This paper uses Arellano-Bond difference GMM suggested by Holtz-Eakin, Newey & Rosen (1988), which is appropriately designed for panel data with limited T and N (Judson & Owen, 1999). Sargan and Arellano-Bond tests are also used. The latter aims at estimating appropriateness of instrumental variables in the GMM model and detecting overidentifying restrictions with the hypothesis H_0 assuming that instrumental variables are exogenous, that is, they have no correlations to errors. Therefore, the p-value of Sargan statistics should be as large as possible. On the other

hand, Arellano-Bond test is used to estimate autocorrelation of the error variances of the first difference in GMM model. Thus, the differences series automatically has first-ordered correlation - AR(1) - the testing results are ignored. Second-ordered correlation - AR(2) - is tested on the differences series of errors in order to detect autocorrelation of errors in first order - AR(1).

However, GMM test also has several shortcomings:

(i) intercept coefficients are only allowed to change along with each panel unit. According to Pesaran *et al.* (1999), the assumption of homogeinety of slope coefficients is often inappropriate as panel dataset is quite long; and

(ii) short-term dynamic characteristics and long-term cointegration are not well demonstrated.

The PMG estimator (Pooled Mean Group) is used to overcome the aforementioned shortcomings. According to Pesaran & Smith (1995), this PMG estimator can produce parameters of consistent average values. Also according to Pirotte (1999), PMG estimator produces long-term estimation that is applicable to large samples. It also allows independent parameters in all groups and disregard possible homogeneity of groups. Hence, this estimator can allow: (i) estimation of long-term elastic coefficients; (ii) identification of speed of adjustment for returning to the long-run equilibrium; and (iii) test of robustness of GMM estimator.

5. DATA

Since the 1987 Foreign Investment Law and up to Sep. 20, 2013, Vietnam has attracted a total registered capital of US$223 billions for 15,298 FDI projects as shown in Table 1. However, this source of investment is not evenly distributed among regions. Table 1 indicates that Southeast accounts for 44.55% of total registered FDI; Hồng River Delta, 24.35%; North Central Coast and South Central Coast, 21.66%; and the lowest, Central Highlands, 0.37%. Regarding the chartered capital, Southeast accounts for 46.02% followed by Hồng River Delta, 21.88%.

Table 1: FDI by Regions and in Oil Business (up to Sep. 20, 2013)

TT No.	Economic Region	Project	Registered FDI		Chartered Capital (US$ mil.)	Average investment per Project (US$ mil.)
			US$ million	As %		
1	Hồng River Delta	4,333	54,300.99	24.35	16,823.73	12.53
2	Northern Midland and Mountainous region	412	6,433.37	2.88	2,451.94	15.61
3	North and South Central Coast	914	48,307.94	21.66	14,504.82	52.85
4	Central Highlands	140	816.75	0.37	345.21	5.83
5	Southeast	8,647	99,353.88	44.55	35,386.40	11.49
6	Mekong River Delta	802	11,058.66	4.96	4,976.88	13.79
7	Oil	50	2,768.69	1.24	2,401.69	55.37
	Total	15,298	223,040.29	100.00	76,890.68	14.58

Source: MPI, 2013

Accumulative average registered FDI per province up to Sep. 20, 2013 shows that the Southeast is the most attractive region with the average FDI of US$16.5 billion per province while the Central Highlands attract the smallest FDI with an average of US$163.35 billion per province. The results show that the gap in FDI between economic regions in Vietnam is quite large (the highest average FDI is 100 times higher than the lowest one). Obviously, this indicates that the gap in FDI flows into Vietnam is decided by regional features, especially in a region with favorable socioeconomic conditions. Additionally, it is very hard to attract FDI to regions with unfavorable socioeconomic conditions.

Based on equation (1), the authors estimate panel data of 43 out of 63 provinces/cities in Vietnam in the period 1997 – 2012, including: (i) Hà Nội, Vĩnh Phúc, Bắc Ninh, Quảng Ninh, Hải Dương, Hải Phòng, Hưng Yên, Nam Định, and Ninh Bình in the Hồng River Delta; (ii) Cao Bằng, Lào Cai, Yên Bái, Thái Nguyên, Lạng Sơn, Bắc Giang, Phú Thọ, Sơn La, and Hòa Bình in Northern Midland and Mountainous zone; (iii) Thanh Hóa, Nghệ An, Quảng Trị, Thừa Thiên Huế, Đà Nẵng, Quảng Nam, Quảng Ngãi, Bình Định, Phú Yên, Khánh Hòa, and Bình Thuận in North

and South Central Coast; (iv) Lâm Đồng in Central Highlands; (v): Long An, Tiền Giang, Bến Tre, Vĩnh Long, An Giang, Kiên Giang, and Cần Thơ in Mekong River Delta; and (vi) Bình Phước, Tây Ninh, Bình Dương, Đồng Nai, Bà Rịa -Vũng Tàu, and HCMC in Southeast. Statistics of FDI from these provinces/cities are considered sufficient, continuous and appropriate to balanced panel data. Twenty provinces, mostly in Central Highlands, and Northern Midland and Mountainous regions are removed due to their insufficient and interrupted statistical data for variables relating to FDI, revenue, and expenditure of local budgets.

All research data are supplied by Center of Statistical Data and Services – GSO in October 2013 and the data are fairly consistent. During estimation, the data are appropriately adjusted to make them appropriate to features of variables in the research model. Calculations and expectation of variables' signs are presented in Table 2 and descriptive statistics of variables are presented in Table 3.

Table 2: Calculations and Expectation of Variables' Signs

Variable	Description	Calculation	Expected sign
PINV	Private investment	Logarithm of real private investment	+
FDI	Foreign direct investment	Logarithm of real FDI	+
GIVN	Local public investment	Public investment/GDP	+
LABO	Labor	Persons of working age/ population	+
BREV	Provincial tax revenue	Budget revenue/ GDP	+/-
CBEXP	Current provincial budget expenditure	Current expenditure/ GDP	+/-
OPEN	Trade openness	Total export and import/ GDP	+
TELE	Infrastructure	Logarithm of average telephone subscribers	+
CPI	Consumer Price Index	Logarithm of CPI	+/-
GAP	Technology gap	[(Provincial GDP – National GDP)/ National GDP]	+

Table 3: Descriptive Statistics of Variables in Research Models

Variable	Obs.	Mean	Std. dev.	Min	Max
Economic growth	670	1.333	0.663	0.155	4.068
Private investment	670	6.745	1.057	3.727	10.239
FDI	670	4.533	2.235	-3.953	9.107
Labor	670	0.521	0.055	0.357	0.676
Public investment	670	0.197	0.142	0.027	1.806
Tax revenue	670	0.179	0.132	0.024	0.730
Current expenditure	670	0.103	0.080	0.057	0.555
Infrastructure	670	4.569	1.224	1.512	7.822
Trade openness	670	0.766	1.120	0.070	7.491
Consumer Price Index	670	4.680	0.070	4.508	5.561
Technology gap	670	-0.027	1.188	-0.653	9.450

Table 3 shows that the mean, minimum and maximun values of GDP growth are 1.33, 0.15 and 4.06 respectively, and its standard deviation is 0.66; and of FDI are 4.53, 2.23 and 9.10 respectively, and its standard deviation is 2.23. Thus, there exists a considerable difference in the volume of FDI between provinces in Vietnam.

6. ESTIMATION RESULTS

a. Stationarity Test:

Before performing regression analysis, panel unit root tests including ADF-Fisher and PP-Fisher are applied to check the stationarity of variables in stationary and non-stationary trends respectively. Length of the lags is automatically identified by Schwarz Information Criterion. The results show that all variables are stationary, I(0) (i.e. integrated of order zero) in at least one of tests such as PINV, FDI, LABO, GINV, BREV, CBEXP, TELE, OPEN and CPI, and the rest are stationary in the first difference, I(1).

b. Granger Causality Test:

Theoretically, FDI impacts vertically and horizontally the economic growth. The Granger causality test aims to find out vertical and horizontal spillover effects of FDI on privave investment, labor, tax revenue, infrastructure, trade openness and technology gap (technological spillover). To indetify the causal relationship between

FDI and economic growth, this study uses restricted model of Granger causality test in which the model uses the independent variable of original form and its first and second-order lagged variables. Statistical siginificance of the relationship is established through the significance of Wald test (F test) and partial significance of one of regression coefficients.

Table 4 indicates the causal relationship between FDI and private investment, labor, tax revenue, infrastructure, trade openness and techonological gap. This shows that FDI inflows create spillover effects on factors that affect economic growth.

Table 4: Granger Causality Tests

Dependent variable	Independent variable	Original variable	Lagged variable (-1)	Lagged variable (-2)	Cons	Wald test
FDI	Private investment	.294	.289	.411**	-210.13***	0.000***
Private investment	FDI	.174***	.065***	.072**	547.132***	0.000***
FDI	Labor	11.363***	3.519	3.564	-503.590***	0.000***
Labor	FDI	.010***	.004***	.004***	43.438***	0.000***
FDI	Tax revenue	.009***	.004	-.002	13.260***	0.000***
Tax Revenue	FDI	11.363***	3.519	3.564	-503.590***	0.000***
FDI	Infrastructure	-.007	.083	.724***	105.482***	0.000***
Infrastructure	FDI	.277***	.105***	.063**	277.556***	0.000***
FDI	Trade openness	.348***	.069	.276**	406.531***	0.000***
Trade openness	FDI	.087***	.043	.050**	2.195	0.000***
FDI	Δ Technology gap	.344	.091	.499**	463.125***	0.000***
Δ Technology gap	FDI	.028**	.014	.004	-22.007***	0.0009***

(***), (**) and (*) denote statistical significance levels of 1%, 5% and 10% respectively.

c. Impacts of FDI on Economic Growth by Difference GMM:

GMM method along with instrumental variables are employed to explore provincial dimensions:

GEO: Reflecting local geographical features, this variable measures municipal/regional charactersistics. Special municipalities are encoded as 6; centrally controlled ones, 3; municipalities in key economic regions, 2; and 1 otherwise.

WEA: This variable measures level of provincial development and wealth based on proportion of its revenue sent to the central budget over the years. This proportion may vary from over 60%, 50-60%, 10-50%, and to under10% and be encoded 4, 3, 2, and 1 respectively; and otherwise, 0.

ΔFDI: The gap between provincial FDI and national average reflects the volume of FDI flowing to a province compared to the one whose FDI is close to the national average.

WEA*ΔFDI: Measuring attraction of FDI based on level of local development.

WEA*GEO*ΔFDI: Reflects attraction of FDI inflows based on both municipality characteristics and provincial development and wealth.

Table 5 presents regression results by Arellano-Bond panel GMM method with three models. Variables representing provincial dimensions are included one by one in model (2) and (3). The results show that FDI positively impacts economic growth with statistical significance of 1% in model (1) and 5% in models (2) and (3). These findings are similar to ones detected by Nguyễn (2006), Le (2007), Wei (2007), Anwar & Nguyen (2010), Tiwari & Mutascu (2010), and Nguyen *et al.* (2012).

Our research results show that the effect on economic growth by private investments is positive with statistical significance of 1% in all three models; the effect of labor is positive with statistical significance at 5% in modela (1) and (2) and 10% in model (3); trade openness with the first-order lag has a positive impact on economic growth with a significance level of 5% in all three models and interaction variable (WEA*GEO*ΔFDI) affects positively economic growth in model (3). Through these models, the research finds that public investment has a negative impact on provincial economic growth, similar to what Anwar & Nguyen (2010) detected, while effects of infrastructure on the growth are very weak.

P-values of Sargan and Arellano-Bond statistics have statistical significance greater than 10% in three models, which confirms that instrumental variables used in GMM estimators are exogenous ones that have no correlation with residual, and variables in these models do not have autocorrelation.

Table 5: Regression of Economic Growth and Impacts of FDI by Difference GMM
Dependent Variable: Economic Growth

Variable	GMM Estimation (Model 1)		GMM Estimation (Model 2)		GMM Estimation (Model 3)	
	Coeff	Prob	Coeff	Prob	Coeff	Prob
Economic Growth (-1)	.267	0.001***	.267	0.001***	.224	0.005***
Economic Growth (-2)	.107	0.084*	.104	0.096*	.141	0.024**
Private Investment	.275	0.000***	.280	0.000***	.276	0.000***
FDI inflows	.032	0.010***	.031	0.012**	.025	0.040**
Labor	.460	0.075*	.454	0.084*	.507	0.042**
Public Investment	-.202	0.026**	-.205	0.026**	-.182	0.038**
Tax Revenue	-.132	0.145	-.137	0.137	-.081	0.377
Current Expenditure	.277	0.106	.265	0.132	.249	0.138
Infrastructure	.029	0.119	.028	0.140	.031	0.086*
Trade Openness(-1)	.019	0.040**	.019	0.043**	.021	0.023**
Consumer Price Index	-.123	0.226	-.125	0.226	-.108	0.273
Technology Gap	-.008	0.808	-.008	0.821	.029	0.424
WEA*ΔFDI			.002	0.634	-.021	0.102
WEA*GEO*ΔFDI					.006	0.072*
Obs	541		541		541	
Sargan test	0.209		0.251		0.167	
AR(2)	0.372		0.369		0.473	

(***), (**) and (*) denote statistical significance levels of 1%, 5% and 10% respectively.

d. Estimating the Dynamism of FDI and Economic Growth:

The dynamism of FDI and economic growth are estimated by adding variables private investment, labor, public investment and tax revenue. Method developed by Westerlund (2007) is used to test for conintegration between these variables. The results in Table 6 show that there is a cointegration between these variables and

economic growth. Next, authors use PMG estimator and the regression result obtained by PMG cointegrating vector model is presented in Table 7.

Table 6: Westerlund cointegration tests

Dependent Variable: Economic Growth

Variables	G_t	G_α	P_t	P_α
Private Investment	0.000***	0.000***	0.024**	0.000***
FDI inflows	0.049**	0.000***	0.000***	0.000***
Labor	0.000***	0.000***	0.000***	0.000***
Public Investment	0.000***	0.000***	0.042**	0.000***
Tax Revenue	0.000***	0.000***	0.000***	0.000***

(***) and (**) denote statistical significance levels of 1% and 5% respectively.

Table 7: Results of Estimations of Long-term and Short-term Dynamism by PMG Method

Long-term cointegrating vectors

Dependent Variable: Economic Growth

Variables	Coeff	Std	Prob
Private Investment	.857	.034	0.000***
FDI inflows	.226	.011	0.000***
Labor	1.979	.477	0.000***
Public Investment	-.995	.104	0.000***
Tax Revenue	1.281	.195	0.000***

Short-term dynamism

Dependent Variable: Economic Growth

Correction coefficient	.077	.036	0.037**
Δ Private Investment	.044	.021	0.040**
Δ FDI inflows	.002	.005	0.637
Δ Labor	.585	.418	0.162
Δ Public Investment	-.371	.230	0.106

Δ Revenue	.026	.101	0.795
Infrastructure	.053	.015	0.001***
Trade Openness	-.180	.102	0.079*
Cons	33.051	16.904	0.051**
Obs		627	
Log Likelihood		-1455.111	

(***), (**) and (*) denote statistical significance levels of 1%, 5% and 10% respectively.

Table 7 indicates that impacts of all variables on economic growth have statistical significance of 1% in the long term. This implies a long-term cointegration between economic growth and FDI, private investment, public investment, tax revenue and labor, and this fact is worth considering when making plan for provincial economic development. In the short term, private investment, infrastructure and trade openness have statistically significant impacts on economic growth. In the models, correction coefficient has a statistical significance of 5%, but its positive correlation coefficient shows that economic shocks make economic growth deviate from the trend of long-term equilibrium. Additionally, low correction coefficient (0.07) also implies a low speed of correction.

7. CONCLUSION AND POLICY IMPLICATIONS

This study examines the relationship between FDI and economic growth by regions using panel data of 43 provinces/cities in the period 1997 – 2012 and the Granger tests, difference GMM estimators, and PMG estimators. The research results are as follows:

(i) FDI Granger-causes private investment, labor, tax revenue, infrastructure, trade openness and technology gap.

(ii) The results of GMM estimates show that impacts of FDI on economic growth have a statistical siginificance of 5%. Results of the test for long-term dynamism by PMG estimator show similar impacts with statistical significance of 1%. These findings imply that FDI has a great significance for economic growth of regional level in Vietnam. This conclusion is also supported by many empirical researches such as Nguyễn (2006), Le (2007), Wei (2007), Anwar & Nguyễn (2010), Tiwari & Mutascu (2010), and Nguyễn & Zhang (2012).

(iii) This research indicates that FDI inflows into Vietnam are not evenly distributed, especially among regions. In provinces/cities such as HCMC and Hà Nội where urban characteristics (of special municipalities) are favorable or level of development and wealth (having great contribution to national budget) is high, impacts of FDI on economic growth are positive and significant.

In addition, the estimation results by both methods confirm that:

- Private investment has a positive impact on economic growth.

- Labor has a positive impact on economic growth.

- Public investment has a negative impact on economic growth, which is not supporting the expectation on signs in both estimation methods in this paper. The results are in compliance with findings by Anwar & Nguyễn (2010).

Current expenditure has a positive impact on provincial economic growth.

Infrastructure has a positive impact on economic growth, as found by Asiedu (2002), Ancharaz (2003), Lumbila (2005) and Liu (2012).

Trade openness has a positive impact on economic growth as detected by Balasubramanyam *et al.* (1996), Blomstrom & Kokko (1998), Yao & Wei (2007) and Anwar & Nguyễn (2011).

The empirical results show that FDI plays an important role in regional economic growth in Vietnam. Thus, in order to increase FDI inflows for regional economic growth, full attention should be paid to factors that bulid up long-term cointegration between FDI flows and economic growth by developing human resources, encouraging domestic private investment, improving quality of public investment and reforming tax policies in order to promote investments. Futhermore, the following basic measures could be taken:

First, government needs to strengthen trade promotion in Vietnam and potential markets;

Second, investment environment should be properly improved, including physical environment (infrastructure, ports, traffic, financial market, etc.) and non-physical environment such as policies and institutions. Moreover, the policies should show consistency and transperancy to ensure legal benefits to foreign investors;

Third, the output for FDI projects should be properly attended to;

Fourth, economic benefits for FDI investors need to be in harmony with public interests at provincial and national levels.

In addition, several measures to exploit local characteristics and potentials for development of provinces/cities could be taken to enhance positive impacts of FDI on economic growth. In this direction, potentials of two special municipalities, Hà Nội and HCMC, should be fully tapped because they can play leading roles and set examples of exploitation of FDI for economic growth. Other centrally controlled municipalities (such as Hải Phòng, Đà Nẵng, and Cần Thơ), which also enjoy favorable conditions for attracting FDI inflows, can act as driving forces for key economic zones: Hải Phòng in the North, Đà Nẵng in Central Vietnam, and Cần Thơ in the Mekong River Delta. Moreover, it is necessary to select carefully investors and investment projects to ensure that they produce positive effects and minimize their negative impacts on economic growth■

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