HOW DOES FOREIGN DIRECT INVESTMENT AFFECT GROWTH IN DEVELOPING COUNTRIES? AN EMPIRICAL INVESTIGATION

E. M. Ekanayake, Bethune-Cookman University, Daytona Beach
John R. Ledgerwood, Embry-Riddle Aeronautical University, Daytona Beach

ABSTRACT

This paper analyzes the effects of foreign direct investment on the economic growth of developing countries. The study uses annual data on a group of 85 developing countries covering Asia, Africa, and Latin America and the Caribbean for the period 1980-2007. We explore the hypothesis that foreign direct investment can promote growth in developing countries. We test this hypothesis using panel data series for foreign direct investment, while accounting for regional differences in Asian, African, Latin American, and the Caribbean countries as well as the differences in income levels. While the findings of previous studies are generally mixed, our results indicate that foreign direct investment has positive and significant effect on economic growth.

JEL: F21, F43, O40

KEYWORDS: Foreign direct investment, developing countries, economic growth

INTRODUCTION

The role of foreign direct investment in the growth process of developing countries has been a topic of intense debate. Previous empirical studies on inward foreign direct investment (FDI) and economic growth generate mixed results. Foreign direct investment makes several contributions to the economies of host countries. Such contributions include: (a) foreign firms are making important contributions to the technological capacity of host countries; (b) the competition, standards and knowledge of foreign markets that foreign firms bring to the domestic market can have important spillover effects; and (c) many firms in developing countries have increased their access to cutting-edge technology by purchasing technologically sophisticated firms domiciled in high-income countries.

Foreign direct investment has dramatically increased in the past several decades to become a major force in the worldwide allocation of funds and technology (see Table 1). Prior to 1970, world trade generally grew at a greater pace than that of FDI , but in the decades since then the flow of FDI has grown at more than twice the rate of the growth of worldwide exports. According to the World Bank (2008), FDI inflows to developing countries have almost doubled as a percentage of GDP over the past 15 years. The data presented in Table 1 shows that the value of FDI flows to developing countries increased from $7.7 billions in 1980 to $499.7 billion in 2007, a 65-fold increase. Of the total FDI flows to developing countries, nearly 65% was accounted for by Asian developing countries. As a percent of total FDI flows, the share of developing countries increased from 13.9% in 1980 to 27.3% in 2007.

Given the importance of foreign direct investment to the economies of developing countries, it is important to understand its contribution to economic growth of developing countries. This paper analyzes the effects of foreign direct investment on the economic growth of developing countries. We analyze these effects using panel data series for foreign direct investment, while accounting for regional differences in Asian, African, Latin American, and the Caribbean countries as well as the differences in income levels. The main contribution of this paper is to analyze the effects of foreign direct investment on economic growth of developing countries covering a large number of developing countries as well as a

longer time period. The study focuses on the time period 1980-2007. In order to better understand the effect of FDI on growth as well as any change of its effect over time, we also estimated three separate models for shorter time periods, namely, 1980-1989, 1990-1999, and 2000-2007.

The paper is structured as follows: The next section presents a survey of literature, whereas Section 3 presents the specification of the econometric model and data sources. The empirical results are presented and discussed in Section 4 and finally, Section 5 summarizes the main results and concludes with some policy implications.

Table 1: Foreign Direct Investment Flows, 1980-2007

	FDI Flows (US$ Billions)						
Region	**1980**	**1985**	**1990**	**1995**	**2000**	**2005**	**2007**
World	55.3	58.0	201.6	342.6	1,411.4	958.7	1,833.3
Developed Economies	47.6	43.7	165.6	222.0	1,146.2	611.3	1,247.7
Europe	21.6	16.7	97.0	136.0	721.9	505.5	848.5
North America	22.7	21.9	56.0	68.0	380.8	131.8	341.6
Developing Economies	7.7	14.2	35.9	116.0	256.1	316.4	499.7
Africa	0.4	2.4	2.8	5.7	9.7	29.5	53.0
Latin America and the Caribbean	6.5	6.2	9.7	29.6	97.8	76.4	126.2
South and Central America	6.1	5.9	8.9	29.1	77.7	69.1	103.6
Caribbean	0.4	0.3	0.8	0.5	20.1	7.3	22.6
Asia and Oceania	0.8	5.5	23.3	80.7	148.6	210.6	320.5
Asia	0.7	5.4	22.6	80.0	148.3	210.0	319.3
Oceania	0.1	0.1	0.7	0.7	0.3	0.5	1.2
South-East Europe and the CIS	0.0	0.0	0.1	4.6	9.0	26.0	76.5
	Share of FDI Flows (%)						
Region	**1980**	**1985**	**1990**	**1995**	**2000**	**2005**	**2007**
World	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Developed Economies	86.1	75.5	82.2	64.8	81.2	63.8	68.1
Europe	39.0	28.8	48.1	39.7	51.2	52.7	46.3
North America	41.1	37.7	27.8	19.9	27.0	13.7	18.6
Developing Economies	13.9	24.5	17.8	33.8	18.1	33.0	27.3
Africa	0.7	4.2	1.4	1.7	0.7	3.1	2.9
Latin America and the Caribbean	11.7	10.8	4.8	8.6	6.9	8.0	6.9
South and Central America	11.0	10.3	4.4	8.5	5.5	7.2	5.7
Caribbean	0.7	0.5	0.4	0.2	1.4	0.8	1.2
Asia and Oceania	1.4	9.5	11.6	23.6	10.5	22.0	17.5
Asia	1.2	9.4	11.2	23.4	10.5	21.9	17.4
Oceania	0.2	0.2	0.3	0.2	0.0	0.1	0.1
South-East Europe and the CIS	0.0	0.0	0.0	1.4	0.6	2.7	4.2

This table shows the flow of foreign direct investment during the period 1980-2007. The top part of the table shows the value of investment flows while the bottom part shows the share of investment flows. The figures were taken from the United Nations Conference on Trade and Development, World Investment Report 2008.

LITERATURE REVIEW

The relationship between FDI and economic growth has drawn great attention for years, but the empirical results are mixed. For a recent comprehensive survey of the theoretical and empirical literature on foreign direct investment and growth see Lim (2001). The relationship between FDI and economic growth has drawn great attention for years, but the empirical results are mixed. The impact of FDI on growth is manifold. Through capital accumulation in the recipient economy, FDI is expected to be growth enhancing through encouraging the incorporation of new inputs and technologies in the production process (Li and Liu, 2005). Bengoa and Sanchez-Robles (2003) show that FDI is positively correlated with economic growth, but host countries require human capital, economic stability, and liberalized markets in order to benefit from long term FDI inflows. Using data on 80 countries for the period 1979–98, Durham (2004) fails to identify a positive relationship between FDI and economic growth, but instead suggests that the effects of FDI are contingent on the ‘‘absorptive capability’’ of host countries.

The literature on foreign direct investment and growth has gone a long way to identify different channels through which FDI affects growth. For instance, Borensztein, Gregorio and Lee (1998) suggests that FDI enhances growth via increasing domestic capital formation, technology and improved productivity only if the host country has a threshold level of human capital. Balasubramanyam, Salisu and Sapsford (1996) assert that endogenous growth theory provides a new conceptual framework to analyze the effect of FDI on growth through its effect on host countries exports. Bhagawati (1978) points out that volume and efficiency of FDI are more pronounced in export oriented host countries.

Ram and Zhang (2002), in a cross-sectional regression framework, find some evidence that FDI is boosting host economies' income growth rates, based on data for the 1990s while noting that the results are not robust to all their model specifications. Dutt (1997), on the other hand, fails to find a clear linkage between foreign investment and per capita growth rates. Nonetheless, using a panel of data for the 1970-1999 period for 84 countries, Li and Liu (2005) establish a clear linkage between FDI and growth rates. They confirm this outcome for different econometric techniques, including a simultaneous equation system. In contrast, Carkovic and Levine (2005) also use a panel setting and control for simultaneity bias, but do not find robust results for positive growth effects of FDI inflows in their sample of 72 countries for the period 1960-1995. They note that this outcome (and the inconclusive evidence in the literature in general) might be due to the specific empirical approaches and the different time periods used.

A recent study by Wang (2009), using the sector-level FDI inflows to 12 Asian economies over the period 1987 to 1997, find strong evidence for a positive and significant effect on FDI inflows and economic growth in the host economies. The study also finds that FDI inflows in non-manufacturing sectors do not play a significant role in enhancing economic growth. Furthermore, without the decomposition of total FDI inflows, the effect of manufacturing FDI on host country's economic growth is understated by at least 48%.

Borensztein, et al. (1998) report that the association between FDI from OECD countries and economic growth is positive for a sample of 69 developing countries but only for those countries with relatively high levels of human capital. They argue that FDI from more technologically advanced countries creates technological spillovers that countries with high levels of human capital are able to capture. Hermes and Lensink (2003) report that a sufficiently advanced financial sector is necessary for FDI to promote economic growth. De Mello (1999) examines complementarities between domestic investment and FDI and finds that whether or not FDI matters for economic growth depends on the substitutability between FDI and domestic investment.

Others find little effect of FDI on growth. Hein (1992) reports little association between FDI and economic growth once he controlled for policies denoting an overall strategy of inward development. Tsai (1994) develops a simultaneous equation model with economic growth and FDI per capita as dependent variables but does not find any strong, general effects from FDI on growth in a sample of developing countries taken from the 1970s and 1980s.

METHODOLOGY AND DATA

Specification of Model

This section discusses the model specifications to examine the relationships between foreign direct investment and per capita GDP growth. The models specified are estimated using panel least squares estimation method. The model is derived, in conventional manner, from a production function in which FDI is introduced as an input in addition to labor and domestic capital. FDI is the prime source of human capital and new technology to developing countries and this variable is included in the production

function in order to capture the externalities, learning by watching and spill-over effects associated with FDI .
In the usual notation the production function can be written as follows:

$$Y = f(L, K, F) \tag{1}$$

where Y is gross domestic product (GDP) in real terms, L is labor input, K is domestic capital stock, and F is stock of foreign direct investment.

Assuming (1) to be linear in logs, taking logs and differencing, we obtain the following expression describing the determinants of the growth rate of real GDP:

$$y = \alpha + \beta l + \delta k + \phi f \tag{2}$$

where lower case letters denote the rate of growth of individual variables. Following the precedent set in numerous previous studies, we approximate the rate of growth of the capital stock by the share of investment in GDP. This is necessary due to the formidable problems associated with attempts to measure the capital stock, especially in the context of developing countries. In addition, we also replace the rate of change in labor input by the growth rate of population. Following Ram and Zhang (2002) and others, we also include an education variable representing human capital since it is often believed to have a favorable effect on growth. These changes yield the following growth equation:

$$GGDP_{it} = \beta_0 + \beta_1 GPOP_{it} + \beta_2\left(\frac{INV}{GDP}\right)_{it} + \beta_3\left(\frac{FDI}{GDP}\right)_{it} + \beta_4 EDU_{it} + \beta_5 INF_{it} + e_{it} \tag{3}$$

where $GGDP_{it}$ is the growth rate of real GDP of country i in year t, $GPOP_{it}$ is the growth rate of population of country i in year t, INV is the investment of country i in year t, FDI is the foreign direct investment of country i in year t, EDU_{it} is the mean years of educations for the population 15 years and older of country i in year t, and INF_{it} is the inflation rate of country i in year t. The growth rate of population is a proxy for the growth rate of labor force, and the investment/GDP ratio represents the growth rate of capital stock. The FDI /GDP variable represents the growth rate of the stock of foreign direct investment. Regional dummies, a dummy variable representing ethnic wars, and a variable representing the economic freedom are also introduced. We are interested in testing whether the marginal impact of foreign direct investment on growth, β_3, is positive and statistically significant. The expected signs of the coefficients β_1, β_2, β_3, and β_4 are positive, and that of β_5 is negative. In order to see whether there is complementarity between FDI and the host country's human capital, equation (3) can be augmented by adding an education- FDI interaction term, which will have a positive coefficient if there is such a complementarity. We experimented by adding such an interaction term and the results are reported in Tables 2, 3 and 4.

Variable Description and Data Sources

In order to test the implications of our models, we collected a panel of aggregate data on foreign direct investment on a large number of developing countries. The entire data set includes 85 countries for which foreign direct investment and all other relevant variables are reported over the 1980–2007 period. The sample of countries consists of 26 low-income countries, 29 low-middle-income countries, 23 high-middle-income countries, and 7 high-income countries. The list of countries used in the empirical analysis is given in Appendix Table 1.

The economic growth rate is measured in this study as the growth of real GDP in constant (2000) U.S. dollars. The data on real GDP are from the World Bank, *World Development Indicators* database. The growth rate of population is used as a proxy for the growth rate of the labor force. The data on population are from the World Bank, *World Development Indicators* database. The investment/GDP ratio is used as a proxy for the growth rate of the capital stock. Since the investment/GDP ratio is not reported for the majority of the developing countries, gross fixed capital formation as a share of GDP is used to represent investment/GDP ratio.

The data on investment/GDP ratio are also from the World Bank, *World Development Indicators* database. The data on foreign direct investment are from the United Nations Conference on Trade and Development (UNCTAD), *World Investment Report 2008*. Inflation rate is defined as the annual percentage change in Consumer Price Index (CPI). The data on inflation rate are from the International Monetary Fund, *World Economic Outlook* database, October 2008. The variable EDU is measured as mean years of education for the population aged 15 years and older and is taken from the compilation by Robert Barro and Jong-Wha Lee. The data on ethnic war variable are from the World Bank. The data on economic freedom are from the Freedom House, *The Freedom in the World 2008* database.

EMPIRICAL RESULTS

The results of our empirical analysis are presented in Tables 2, 3 and 4. First, we estimated model (3) for four different time periods: 1980-1989, 1990-1999, 2000-2007 as well as for the entire period of 1980-2007. The results of this analysis are presented in Table 2. Then we estimated the model for different regions, namely, Asia, Africa, and Latin America and the Caribbean. The results of this analysis are presented in Table 3. Finally we estimated the model for different income levels, namely, low income, low middle income, upper middle income and all income levels. The results of this analysis are presented in Table 4. Models were estimated using several dummy variables to incorporate regional differences as well as the differences in income levels. Refer first to Table 2 which presents the estimated results of growth equation (3), estimated for four different time periods.

The investment ratio has the expected positive sign and is highly statistically significant in all cases. This result is similar to the finding of recent studies by Ram and Zhang (2002) and Li and Liu (2005). Population growth variable, which also represents the growth of labor force, has the expected positive sign in all four cases but statistically significant only for the period 2000-2007. These finding is also consistent with the findings of previous studies.

The growth rate of foreign direct investment has a positive impact on economic growth of developing countries. The coefficient of this variable is positive in all four models and statistically significant during the time periods 2000-2007 and 1980-2007. While the previous studies on the impact of foreign direct investment on growth have generated mixed results, our results suggest that the foreign direct investment can have a positive impact on economic growth in developing countries. For example, Ram and Zhang (2002), Li and Liu (2005), Bengoa and Sanchez-Robles (2003), Olofsdotter (1998) and Borensztein et al. (1998) show that FDI is positively correlated with economic growth. Durham (2004) fails to identify a positive relationship between FDI and economic growth.

The estimated coefficient of the education variable, which a proxy for human capital, has the expected positive sign in three of the four models estimated. However, this coefficient is statistically significant only in one case. The findings of previous studies are also consistent with the findings of this study. The evidence in favor of complementarity between FDI and the host country's human capital is lacking. In most estimates of equation (3), the interaction term has the "wrong" (negative) sign. However, the interaction term is significant in three of the four cases considered. Ram and Zhang (2002) also could not find evidence of complementarity in their study conducted using the data for the 1990s. However,

Borensztein, De Gregorio, and Lee (1998), find evidence of complementarity in the 1980s which is consistent with our findings.

Table 2: Effects of Foreign Direct Investment on Growth in Developing Countries Dependent Variable: Real GDP Growth

Variable	1980-1989	1990-1999	2000-2007	1980-2007
Constant	0.214	1.514	-0.061	0.791
	(0.16)	(1.21)	(1.07)	(1.02)
Capital Growth	0.119***	0.104***	0.127***	0.108***
	(6.05)	(6.07)	(9.19)	(9.41)
Labor Growth	0.067	0.141	0.920*	0.077
	(0.47)	(0.88)	(6.07)	(1.64)
FDI/GDP	0.029	0.023	0.017**	0.021**
	(1.22)	(1.11)	(1.85)	(2.27)
Education	-0.129	0.052	0.189**	0.093
	(-1.07)	(0.49)	(2.39)	(1.39)
(FDI/GDP) x Education	0.009**	-0.007	-0.004**	-0.003**
	(2.01)	(-1.24)	(-2.35)	(-2.20)
Inflation	-0.001***	-0.001***	-0.002**	-0.001*
	(-2.67)	(-2.78)	(-1.87)	(-4.84)
Economic Freedom	-0.576**	-0.102	-0.051	-0.098
	(-2.55)	(-0.53)	(-1.39)	(-1.09)
Ethnic Wars dummy	-0.324	-1.381***	-1.731***	-0.940***
	(-0.93)	(-4.75)	(-4.20)	(-4.47)
Asia dummy	3.292***	1.010	1.953***	1.743***
	(5.39)	(1.64)	(5.12)	(4.54)
Latin America dummy	0.315	-0.981	-0.042	-0.852**
	(0.50)	(-1.60)	(-1.12)	(-2.25)
Sub-Saharan Africa	1.897***	-1.395**	0.392	-0.062
dummy	(3.21)	(-2.34)	(1.14)	(-0.17)
Low Income countries	-0.313	-0.025	-1.576***	-0.142
dummy	(-0.42)	(-0.64)	(-2.89)	(-0.34)
Low Middle Income	0.545	0.292	-1.658***	0.397
countries dummy	(0.84)	(0.52)	(-3.51)	(1.11)
Upper Middle Income	0.920	0.204	-1.551***	0.246
countries dummy	(1.43)	(0.36)	(-3.12)	(1.24)
Number of countries	85	85	85	85
Number of observations	850	850	680	2,380
Adjusted R2	0.352	0.441	0.674	0.356

*This table shows the empirical results of the models estimated for different time period, as given in equation (3). The results indicate that foreign direct investment has a positive effect on economic growth. Figures in parentheses are t-values. *** and ** indicate the statistical significance at the 1% and 5% level, respectively.*

Inflation rate variable has the expected negative sign and it is statistically significant for all four cases. These findings are also consistent with the findings of previous studies. The variable representing the economic freedom has a negative sign in all four cases. This variable is defined as follows: 1 if free; 2 if partly free; and 3 in not free. Therefore, the negative sign can be interpreted as countries which are relatively free tend to have a higher economic growth. The ethnic war dummy variable has a negative sign in all cases and highly statistically significant, implying that ethnic wars have an adverse effect of economic growth.

Of the three regional dummy variables used in the model, Asia dummy variable consistently has a positive sign and statistically significant in three of the four cases. This result is not surprising given the fact that nearly two thirds of foreign direct investment flows to developing countries went to an Asian country. Dummy variables for the other two regions have mixed results. The dummy variables representing the different income levels indicate that the estimated coefficients are negative for low-income countries and mostly positive for low middle income and upper income countries. These findings are not surprising given that they are ones lacking less distorted market systems, more stable macroeconomic environments, and better human resources. Let us now discuss the estimated results that are presented in Table 3.

The conventional variables behave very much the same way as the model predicts, and several estimated coefficients are statistically significant. The adjusted R^2 values range from a low of 0.140 to a high of 0.571. These values, though relatively low, are acceptable for a cross-sectional study and are comparable to those obtained in other studies.

The coefficients of the first two variables in model (3) are expected to be positive and our results are consistent. Although the capital growth variable is statistically significant in all four regions, labor growth variable is statistically significant only for Latin American region. The growth rate of foreign direct investment has a positive impact on economic growth of developing countries. The coefficient of this variable is positive in all four models. However, this variable is positive for African region indicating that foreign direct investment has a significantly positive effect on economic growth in African countries. The evidence in favor of complementarity between FDI and the host country's human capital is lacking in this case as well.

Table 3: Regional Differences and the Effects of FDI on Growth in Developing Countries Dependent Variable: Real GDP Growth

Variable	Asia	Africa	Latin America	All Countries
Constant	-2.619	-1.597	-0.576	-0.561**
	(-1.50)	(-0.98)	(-0.45)	(-0.81)
Capital Growth	0.231***	0.066***	0.130***	0.135***
	(6.34)	(3.87)	(6.90)	(9.87)
Labor Growth	0.096	0.118	0.319*	0.013
	(1.24)	(0.69)	(1.80)	(1.14)
FDI Growth	0.021	0.033*	0.005	0.006
	(1.34)	(1.74)	(1.32)	(1.57)
Education (EDU)	0.040	0.172	0.128	0.220***
	(1.38)	(1.12)	(0.95)	(3.21)
(FDI Growth) x EDU	-0.001	-0.004	-0.002	-0.002
	(-0.22)	(-0.91)	(-0.87)	(-1.27)
Inflation	-0.001***	-0.001***	-0.002***	-0.001***
	(-2.72)	(-2.63)	(-4.44)	(-5.42)
Economic Freedom	-0.423	-0.880***	-0.549**	-0.112
	(-1.56)	(-3.94)	(-2.02)	(-0.10)
Ethnic Wars dummy	-0.836*	-1.747***	-0.075	-0.579***
	(-1.84)	(-4.36)	(-0.20)	(-2.74)
Low Income countries dummy	1.953	3.827***	-1.066	1.094***
	(1.60)	(3.80)	(-1.13)	(2.62)
Low Middle Income countries dummy	2.029*	4.829***	0.731	0.511
	(1.83)	(4.15)	(1.30)	(1.43)
Upper Middle Income countries dummy	1.685	4.493***	0.736	0.063
	(1.39)	(3.87)	(1.48)	(1.02)
Number of countries	14	32	29	85
Number of observations	392	896	812	2,380
Adjusted R^2	0.571	0.236	0.140	0.226

*This table shows the empirical results of the models estimated for different regions, as given in equation (3). The results indicate that foreign direct investment has a positive effect on economic growth. Figures in parentheses are t-values. *** and ** indicate the statistical significance at the 1% and 5% level, respectively.*

Finally, let us now discuss the estimated results that are presented in Table 4. The conventional variables behave very much the same way as the model predicts, and several estimated coefficients are statistically significant. The adjusted R^2 values range from a low of 0.212 to a high of 0.418. These values, though relatively low, are acceptable for a cross-sectional study and are comparable to those obtained in other studies.

The coefficients of the first two variables in model (3) are expected to be positive and our results are consistent. Although the capital growth variable is statistically significant in all four regions, labor growth variable is statistically significant only for upper-middle income countries. The growth rate of foreign direct investment has a statistically positive impact on economic growth of low-income developing

countries. The coefficient of this variable is negative for low-middle-income countries. The evidence in favor of complementarity between FDI and the host country's human capital is found only in the case of low-middle-income countries. Based on the results presented in Tables 2-4, it can be concluded that foreign direct investment has a positive effect on economic growth in developing countries.

Table 4. Income Differences and the Effects of FDI on Growth in Developing Countries Dependent Variable: Real GDP Growth

Variable	Low-Income Countries	Low-Middle-Income	Upper-Middle-Income	All Countries
Constant	-3.083**	1.394	0.267	1.252**
	(-2.30)	(1.21)	(0.30)	(1.78)
Capital Growth	0.147***	0.070*	0.115*	0.108*
	(6.49)	(6.21)	(9.36)	(9.80)
Labor Growth	0.248	0.154	0.918*	0.060
	(1.12)	(0.99)	(6.39)	(1.61)
FDI Growth	0.062**	0.005	0.015	0.001
	(2.36)	(1.63)	(1.24)	(1.27)
Education (EDU)	0.018	0.024	0.038	0.044
	(1.10)	(0.26)	(0.48)	(0.74)
(FDI Growth) x EDU	-0.010	0.001	0.008*	-0.001
	(-1.30)	(0.12)	(3.72)	(-0.10)
Inflation	-0.001**	-0.001*	-0.002**	-0.001*
	(-2.54)	(-2.83)	(-1.89)	(-4.83)
Economic Freedom	-0.063	-0.114	-0.103	-0.106
	(-1.27)	(-0.66)	(-0.82)	(-0.87)
Ethnic Wars dummy	-1.070	-1.155*	-1.458*	-0.967*
	(-1.59)	(-4.38)	(-3.58)	(-4.83)
Asia dummy	4.415***	-0.027	-1.427*	-0.201
	(5.18)	(-0.65)	(-2.77)	(-0.49)
Latin America dummy	0.189	0.475	-1.535*	0.363
	(0.18)	(0.89)	(-3.54)	(1.03)
Sub-Saharan Africa	2.496***	0.393	-1.483*	0.162
dummy	(3.02)	(0.71)	(-3.20)	(1.46)
Number of countries	26	85	85	85
Number of observations	728	850	680	2350
Adjusted R^2	0.418	0.634	0.672	0.355

*This table shows the empirical results of the models estimated for different income levels, as given in equation (3). The results indicate that foreign direct investment has a positive effect on economic growth. Figures in parentheses are t-values. *** and ** indicate the statistical significance at the 1% and 5% level, respectively.*

CONCLUDING REMARKS

This paper analyzes the effects of foreign direct investment on the economic growth of developing countries. We analyze these effects using panel data series for foreign direct investment, while accounting for regional differences in Asian, African, Latin American, and the Caribbean countries as well as the differences in income levels. The main contribution of this paper is to analyze the effects of foreign direct investment on economic growth of developing countries covering a large number of developing countries as well as a longer time period. The major point emerging from this work is that foreign direct investment has a positive impact on economic growth of developing countries. First, when the model was estimated for different time periods, foreign aid variable has a positive sign in all four cases, indicating that foreign direct investment appears to have a positive effect on economic growth in developing countries.

Second, when the model was estimated for different regions, foreign direct investment variable still has a positive sign in all four cases, indicating that foreign direct investment appears to have a favorable effect on economic growth in developing countries. Finally, when the model was estimated for different income levels, foreign direct investment variable has a positive sign in three out of four cases. However, this variable is negative for low-middle-income countries indicating that foreign aid has a negative effect on

economic growth in these countries. The findings of this study are, for the most part, consistent with findings of previous studies on the effects of foreign direct investment on economic growth.

The policy implications of this paper are straightforward. First, foreign direct investment may promote economic growth significantly in the process of development. Second, increase of FDI in quantity enhances economic growth only under some conditions. A less distorted market system, more stable macroeconomic environment, better human resources, export-oriented strategy, diversified economic and export structure will improve the relationship between growth and FDI in developing countries.

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APPENDIX

Table 1: List of Developing Countries Included in the Study

Income Group	Countries
Low-Income Countries	Bangladesh, Burundi, Central African Republic, Congo, Dem. Rep., Gambia, Ghana, Guinea-Bissau, Haiti, Malawi, Mali, Mauritania, Mozambique, Myanmar, Nepal, Niger, Pakistan, Papua New Guinea, Senegal, Sierra Leone, Solomon Islands, Tanzania, Togo, Uganda, Vietnam, Zambia, and Zimbabwe.
Low-Middle-Income Countries	Algeria, Bolivia, Cameroon, China, Colombia, Congo, Rep. of, Dominican Republic, Ecuador, Egypt, El Salvador, Guatemala, Guyana, Honduras, India, Indonesia, Iran, Jordan, Kenya, Lesotho, Nicaragua, Paraguay, Peru, Philippines, Sri Lanka, Sudan, Swaziland, Syrian Arab Republic, Thailand, and Tunisia.
Upper-Middle-Income Countries	Argentina, Belize, Botswana, Brazil, Chile, Costa Rica, Dominica, Fiji, Jamaica, Libya, Malaysia, Mauritius, Mexico, Panama, Seychelles, South Africa, South Korea, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Turkey, Uruguay, and Venezuela.
High-Income Countries	Antigua and Barbuda, Bahrain, Barbados, Kuwait, Singapore, Trinidad and Tobago, and United Arab Emirates.

BIOGRAPHY

Dr. E. M. Ekanayake is an Associate Professor of Economics at Bethune-Cookman University, Daytona Beach, Florida, USA and an Adjunct Professor of Economics at Embry-Riddle Aeronautical University, Daytona Beach. He earned his Ph.D. in Economics at the Florida International University, Miami in 1996. He has many publications to his credit. Contact information: School of Business, Bethune-Cookman University, 640 Dr. Mary McLeod Bethune Blvd., Daytona Beach, FL 32114, USA. Phone: (386) 481-2819. E-mail: ekanayakee@cookman.edu.

John R. Ledgerwood is an Assistant Professor of Accounting at Embry-Riddle Aeronautical University, Daytona Beach, Florida. He earned a Master of Science in Accounting from the University of Central Florida and is a Certified Public Accountant. He is a member of the Florida Institute of Certified Public Accountants, the Volusia Chapter of the Florida Institute of Certified Public Accountants, and the Institute of Management Accountants. Contact information: College of Business, Embry-Riddle Aeronautical University, 600 South Clyde Morris Blvd., Daytona Beach, FL 32114, USA. Phone: (386) 226-4965. E-mail: ledgerwj@erau.edu.