Foreign Direct Investment and Economic Growth: Some Empirical Evidence from the Philippines

Abstract

Although there has been extensive theoretical evidence of the positive impact of foreign direct investment (FDI) on economic growth, the empirical evidence is not well established for the Philippines. This paper empirically investigates the impact of foreign direct investment on economic growth in the Philippines, in a time-series theoretic framework, and using data spanning the period 1970 to 2006. The result indicates that FDI is an important vehicle for achieving economic growth only in the presence of sufficient absorptive capacity as created through increased private investment in the Philippines. The increased government expenditure is found to crowd out private investment, resulting in reduced economic growth within the Philippine economy. The result also suggests that economic growth in economies of Philippines' major trading partners does not greatly enhance economic growth within its economy, thereby providing justification for the Philippine government's stance on diversification of its exports to other emerging trading partners. Population growth is found to stimulate economic growth within the Philippine economy. The findings of this study provides strong empirical evidence to confirm the generally held view that, under favourable economic environment, FDI does have the capacity to impact positively on economic growth in the Philippines.

Key words: Foreign direct investment, economic growth, unit root, co-integration, Philippines.
JEL codes: C22, C14, F21, F43

1. Introduction

Philippine, like many other developing countries is heavily dependent on the rest of the world. Philippines economic development over the last two decades or so can be characterised as that of recurring ups and downs. This development path has been influenced greatly by the Philippine government policy. In the mid 1980s, the Philippine government's policy was characterised by economic liberalisation with a focus on trade and investment, and with the associated privatisation of government-controlled companies. The 1990s was characterised by sector-wise reforms in the financial and transportation sectors of the economy. Coupled with this was the private initiative in infrastructure projects in the areas of electricity power generation and railway construction. These reforms attracted massive inflow of foreign direct investment into the Philippine economy. Prior to the Asian financial crisis, the Philippines became the destination of foreign direct investment (FDI). The foreign direct investment soared,

rising from 4 percent of gross domestic product (GDP) in the mid-1980s to 19.5 percent of GDP in 1996 (IMF, 2007).

Following the Asian crisis there was massive outflow of FDI from the Philippine economy. The early part of the 2000s was characterised by the continuance of the basic policy of liberalising the economy. Despite global uncertainties in the early part of the 2000s, the Philippine economy showed some resilience with the economy. Much of the growth experienced in the 2000s has come from increased private consumer spending, buoyed substantially by remittances by overseas workers (ADB, 2003). Other factors that have contributed to economic growth have been the recovery in the services and manufacturing sectors. Agriculture's contribution to economic growth declined slightly. Domestic investment continued its slump reaching 15.6% of gross national product in 2002, the lowest since the mid 1990s and the lowest among major economies of ASEAN (ADB, 2003). During the early 2000s the FDI as a share of GDP declined to reach 5.7 percent by 2006 (IMF, 2007).

Despite the fiscal pressures, the prudent monetary management by the Philippine government facilitated the lowering of inflation. Within this context unemployment had remained high, estimated to be over 11 percent (ADB, 2003). Although personal spending has grown, the ratio of gross domestic investment to gross national product has fallen from its high of 23.8 percent in 1997 to 18.1 percent in 2002. The tight financial situation has meant that government public expenditure as a ratio of gross national product has stagnated at 18 to 19 percent during the period 1997 to 2002 (ADB, 2003). The private sector is an important sector of the Philippine economy, accounting for over 90 percent of gross domestic product and employment. In order to promote private sector investment, the Philippine government is pursuing the strategy of addressing the bottlenecks of the private sector, the most significant being the infrastructure constraints, weaknesses in the financial sector and the need to effectively enforce contracts. In addition, in response to these challenges, the Philippines government has implemented a series of legal reforms aimed at improving the economic and governance situation within the economy.

As ADB (2007) notes, the Philippine's recent economic performance is marked by the success of fiscal consolidation. In response to the rising government budget deficit, which peaked at 5.3 percent of gross domestic product in 2002, the government responded by launching rigorous campaign to increase tax revenue and enhance public expenditure management. This was achieved through the revision of the value added tax system and an improvement in the administration of the scheme. Coupled with this has been the

introduction of tight spending controls. The effect has been a rise in government tax revenue by 20% in 2006, and consequently, a reduction in budget deficit to 1 percent of gross domestic product in 2006 (ADB, 2007). Despite the Philippine government's successes in implementing monetary and fiscal policies many challenges still remain. The most important being how to raise annual GDP growth to reach the 5 to 6 percent target set by the government, in order to provide productive employment for the rapidly growing and often times high unemployment (see ADB, 2007).

Bernal *et al*. (2004), on the 2005 World Development Report (WDR), point out that it is argued that improvements in the investment climate in developing countries is the key to attracting increased flow of foreign direct investment, and consequently a higher level of economic growth and development. The WDR identifies improvements in the investment climate such as those location-specific factors that shape the opportunities and incentives for firms to invest productively to create jobs and expand as the key driving forces for achieving sustained economic growth. In recent times, the Philippine government has pursued the policy of establishing international rules and standards relating to investment in an attempt to reverse the declining trend in FDI inflow into the country. While these efforts are capable of creating a favourable climate for investment in terms of enhancing the credibility of government investment policies, reducing international transaction costs, and addressing international spillovers (Bernal *et al*., 2004).

Recent developments in growth theory have been primarily theoretical, although significant progress has also been made in growth empirics (de Mello, Jr., 1999). As de Mello Jr notes, the study of determinants of economic growth has been arduous in the recent literature. A growing number of studies have found that while the absorptive capacity of the recipient country affects the volume and type of FDI inflow, the institutional factors, such as the recipient economy's trade regime, legislation, political stability, and the scale factors, such as balance of payment constraints and the size of the domestic market for goods and services produced via FDI influences the impact of FDI on economic growth and development (de Mello, Jr., 1999). For the Philippines, very little, if any, country-specific empirical study has been conducted to examine the determinants of economic growth. The focus of this paper is therefore to examine the impact of FDI on economic growth and development of the Philippine economy during a period of dramatic policy change and institutional reforms.

The rest of the paper is organised as follows. Section 2 introduces the theoretical and empirical framework employed in the analyses. Section 3 describes the sources of data and data employed in the analyses. Section 4 reports and discusses the empirical results of application of an economic growth model to Philippine annual time-series data spanning the period 1970 to 2006. Section 5 provides further discussion on the results presented in the paper and concludes.

2. Theoretical and Empirical Considerations

We begin by briefly reviewing the theoretical framework developed by Borensztein *et al*. (1998) that is employed in this study. We focus on the model's implication for a time-series data. Consider an economy where technical progress is the result of capital deepening whereby there is an increase in the type of capital goods available (see Romer, 1990; Grossman and Helpman, 1991; Barro and Sala-i-Martin, 1995). Following the parametisation of Borensztein *et al*. (1998), the production function is expressed as

$$Y_t = A H_t^{\alpha} K_t^{1-\alpha} \tag{1}$$

where Y represents output, A represents the exogenous state of environment, H denotes human capital, and K stands for physical capital.

As Borensztein *et al*. (1998) emphasise, the state of environment comprises of various control and policy variables influencing the level of productivity within the economy. Now, if the level of human capital of an economy is a given endowment, and physical capital consists of an aggregate of different varieties of capital such that capital accumulation takes place through the expansion of the different varieties of capital, then the stock of domestic capital can be expressed as

$$K = \left\{ \int_0^N x(j)^{1-\alpha} \, dj \right\}^{\frac{1}{(1-\alpha)}} \tag{2}$$

where x(j) denotes a vector of the different types of capital good available within the economy, and N represents the total number of capital goods. Now, two types of firms are assumed to be producing capital goods. These are domestic and foreign firms. If domestic and foreign firms produce n and n^* varieties of capital goods, respectively, then the total number of capital goods within the economy can be expressed as

$$N = n + n^* \tag{3}$$

Now, if specialised firms within the economy produce a variety of capital goods, then they have the capacity to rent it out at a rental rate of *m*(j) (Borensztein *et al*., 1998). Based on the optimality condition, the firm will equate the rental rate to the marginal productivity of the capital good in the production of the final good. This can be expressed mathematically as

$$m(j) = A(1-\alpha)\, H^{\alpha}\, x(j)^{-\alpha} \tag{4}$$

Let us assume that it is costly for the domestic economy benefiting from FDI to acquire technology to increase production of capital goods. By denoting the setup cost of adapting the technology by F, and following Borensztein *et al*. (1998), the fixed setup cost is assumed to depend negatively on the ratio of the number of foreign firms operating in the host country to the total number of firms (*n**/*N*). This assumption is based on the premise that foreign firms operating in the domestic economy have advanced technology for producing new capital goods. Following Nelson and Phelps (1966) we assume a technology gap between foreign and domestic firms such that there is a *catch-up* effect in technological progress (see also, Borensztein *et al*., 1998). If the setup cost depends positively on the number of capital goods produced domestically relative to advanced countries (*N**), then the setup cost can be expressed as follows:

$$F = F(n^*/N,\ N/N^*), \quad where\ \frac{\partial F}{\partial (n^*/N)} \prec 0 \quad and \quad \frac{\partial F}{\partial (N/N^*)} \succ 0 \tag{5}$$

where the variables are as defined above.

Now, if we assume that the domestic firm faces a constant maintenance cost per period of time, under a steady-state condition, the profit of the firm can be expressed, following Borensztein *et al*. (1998), as

$$\pi(j) = -F(n_t^*/N_t, N_1/N_t^*) + \int_t^{\infty} [m(j)x(j) - x(j)]e^{-r(s-t)}\, ds \tag{6}$$

where the variables are as defined above.

Maximisation of equation (6) subject to the demand equation (4) yields the following equilibrium level for the production of each capital good *x*(j) as

$$x(j) = HA^{1/\alpha}\,(1-\alpha)^{2/\alpha} \tag{7}$$

The expression in equation (7) demonstrates that at a given point in time the level of production of each new capital good is the same. The assumption of symmetry among producers, that is domestic and foreign producers, ensures that the level of production of the different varieties of capital goods is the same. Substituting equation (7) into (4) and simplifying yields

$$m(j) = 1/(1-\alpha) \tag{8}$$

The expression in equation (8) represents the rental rate markup over maintenance costs. If we assume that the capital goods market is perfectly competitive such that there is free entry and exit, then the rate of return will ensure that profit equals zero. We can then derive an expression of the rate of return, following Borensztein *et al*. (1998) as

$$r = A^{1/\alpha}\, \phi\, F(n^*/N, N/N^*)^{-1}\, H \tag{9}$$

where

$$\phi = \alpha(1-\alpha)^{(2-\alpha)/\alpha} \tag{10}$$

By assuming that the objective of an individual is to maximise intertemporal utility, this utility can be expressed, following Borensztein *et al*. (1998), as follows:

$$U_t = \int_t^{\infty} \frac{C_s^{1-\sigma}}{1-\sigma}\, e^{-\rho(s-t)}\, ds \tag{11}$$

where C represents the units of consumption of the final goods Y. Now, given that the rate of return is equal to r, the optimal consumption path is given by

$$\frac{\dot{C}_t}{C_t} = \frac{1}{\sigma}(r-p) \tag{12}$$

Arguably, the rate of growth of consumption, must, in steady state equilibrium, be equal to the rate of growth of output. Substituting equation (9) into (12) and rearranging, we obtain an expression for the rate of growth of the economy as

$$g = \frac{1}{\sigma}\left[A^{1/\alpha}\, \phi\, F(n^*/N, N/N^*)^{-1}\, H - p\right] \tag{13}$$

The expression in equation (13) indicates that foreign direct investment, as measured by the fraction of products produced by foreign firms to the total number of products (n^*/N) reduces the cost of introducing new varieties of capital goods, thus increasing the rate at which new capital goods are introduced. Borensztein *et al*. (1998) argue that the expression in equation (13) also indicates that the cost of introducing new capital goods is also smaller for more backward counties, that is countries that produce fewer varieties of capital goods than the leading countries with lower N/N^*, thus enjoying lower cost of adoption of technology, and thus tend to grow faster. In addition, Borensztein *et al*. argues that the expression in equation (13) also indicates that the effect of FDI on the growth rate of the economy is positively associated with the level of human capital, that is the higher the level of human capital in the recipient country the higher the effect of FDI on the growth rate of the economy.

To empirically investigate the impact of FDI on economic growth, we can specify a growth model for the Philippines based on the expression in equation (13) as follows:

$$g_t = c_0 + c_1 FDI_t + c_2 FDI_t \; xH_t + c_3 H_t + c_4 Y_0 + c_5 A_t + \varepsilon_t \qquad (14)$$

where g is economic growth rate, FDI is foreign direct investment, H is the stock of human capital, Y_0 is initial GDP per capita, and A is a vector of other explanatory variables that affect economic growth. The other explanatory variables included in the model are based on the extant literature, and includes: government stability (GOVS) variable, inflation rate (INF) variable, average gross domestic product of Philippines major trading partners (MTGR) variable, population growth (POPGR) variable, government expenditure (GEXP) variable, private investment (PINV) variable, telephone lines (TEL) variable, and unemployment rate (UER) variable.

This study adopts the definition of FDI proposed by de Mello Jr. (1999) whereby FDI is defined as a form of international inter-firm cooperation that involves significant equity stake and effective management decision power in ownership control of foreign enterprises. Arguably, in the presence of FDI, aggregate production in the recipient country is carried out by combining labour and physical capital. The physical capital is sourced domestically (K_d) or from the foreign market (K_w). The impact of FDI on the stock of capital is that it impacts growth directly through the increase in the stock of physical capital within the recipient economy as K_w is accumulated. It also impacts indirectly on growth within the recipient economy through its impact on human capital development and the promotion of technological upgrading (see de Mello Jr., 1999). It is important in the study of the impact of FDI on economic growth to recognise the potential complementarity and substitution effects that may arise between domestic investment and FDI. On the one hand, as emphasised by Young (1993) and espoused by de Mello Jr. (1999), under complementarity, innovations embodied in FDI may create, rather than reduce rents accruing to older technologies. The positive impact of FDI on economic growth is therefore based on the premise that some degree of complementarity exists between FDI and domestic investment as the domestic investment serves as factor endowment in the recipient country and acts as a determinant of FDI (see also de Mello Jr., 1999). On the other hand, FDI has the potential to have a negative impact on economic growth of the recipient country. As de Mello Jr notes, under constant returns to domestic capital, there is the potential of an existing saddle point-stability with FDI causing negative consumption and consequently making FDI to become immiserising or

inefficient. This sentiment has been shared by earlier studies such as those by Bhagwati (1973), Brecher and Diaz Alejandro (1977) and Calvo *et al*. (1996), among others.

3. Data

The data used in this study are from International Monetary Fund's *International Financial Statistics* (IFS) database (IMF, 2007). The data set includes real income as measured by gross domestic product, government expenditure, private investment, population growth, unemployment rate, inflation rate, and are derived from IFS. The income variable was measured using gross domestic product, in purchasing power parity (PPP) terms and is obtained from IFS. In order to be consistent with the extant literature, we express foreign direct investment, government expenditure, and domestic private investment as a percentage of GDP. Data on telephone lines and human capital was obtained from The World Bank's *World Development Indicators* database (WB, 2007). The average gross domestic product growth rate of Philippines major trading partners was derived using gross domestic product of China, Hong Kong, Korea, Malaysia, Netherlands, Singapore, Thailand and Unites States of America, expressed in US dollars, and obtained from IFS. Government stability variable was derived as the frequency of change in government leadership and the number of attempted and successful uprising against the Philippine government. Data on population was obtained from IFS. The data are annual and cover the period 1970 to 2006.

4. Results

We start by testing the existence of unit root in all the variables used in the estimation of the growth model using the augmented Dickey-Fuller (ADF) (Dickey and Fuller, 1979) and Phillip-Perron (PP) (Phillips-Perron, 1988) tests. The auxiliary regression is run with an intercept and a time trend and is specified as,

$$\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \sum_{j=1}^{P} \gamma_j \Delta y_{t-j} + \varepsilon_t \qquad (15)$$

where y_t is the variable whose time-series properties are being investigated, t is a time-trend variable, Δ is the difference operator, and where ε_t is the random error term with t = 1,…, N is assumed to be Gaussian white noise. The augmentation terms are added to

convert the residuals into white noise without affecting the distribution of the test statistics under the null hypothesis of a unit root.

The usefulness of the PP test over the ADF, Hamilton (1994) notes, is that it allows for the possibility of heteroskedastic error terms. The lag length in the PP test was selected based on the Newey-West criteria (Newey and West, 1994). Table 1 reports the ADF and the PP test results of variables in levels and first difference. The results are mixed but with most of the variables indicating that the variables are generally non-stationary in levels but become stationary in first difference. The results are available from the author. Given that the ADF and PP tests are sensitive to small samples, the conclusion, with caution, is that that all the variables are I(1) in levels but I(0) in first difference. The results of the unit root provide evidence of the presence of non-stationarity in the data series and the potential adverse consequences of neglecting it.

Now, if two or more variables are cointegrated, i.e., they exhibit long-run equilibrium relationship(s), and therefore share common trend(s), the cointegration among variables rules out the possibility of the estimated relationships being "spurious" (Engel and Granger, 1987). The Engle and Granger's two-step approach is the most commonly used test for cointegration. Despite the limitation of the Engle-Granger approach of assuming the existence of at most a single cointegrating vector and the fact that it is sensitive to the choice of dependent variable, and the assumption that all variables are endogenous (Agbola and Damoense, 2005), this study uses the Engel-Granger testing procedure due to its ease and extensive use in econometric literature as a preliminary test. The test results revealed that the variables included in the economic growth model for the Philippines are cointegrated.

To determine the presence of an equilibrium-type relationship between variables in the economic growth model, we proceed further to test for cointegration among the variables. The Johansen approach used here, unlike the Engel-Granger approach, does not *a priori*, assume the existence of at most a single cointegrating vector. Rather, it tests for the number of cointegrating relationships (Agbola and Damoense, 2005). Furthermore, unlike the Engel-Granger procedure, which is sensitive to the choice of the dependent variable in the cointegrating regression, the Johansen procedure assumes all variables to be endogenous. The maximum likelihood framework of the Johansen (1988) and Johansen-Juselius (1990) test procedure is known to offer better properties than the traditional Engel and Granger approach, which is residual based.

Consider a *p*-dimensional vector auto-regression

$$X_t = \sum_{i=1}^{k} \pi_t X_{t-1} + c + \varepsilon_t \tag{16}$$

which can also be written as

$$\Delta X_t = \sum_{i=1}^{k} \Gamma_i \Delta X_{t-k} - \pi X_{t-k} + c + \varepsilon_t \tag{17}$$

where $\Gamma_i = -I + \pi_1 + \pi_2 + ... + \pi_t$

$i = 1, 2, ..., k-1$ *and*

$$\pi = I - \pi_1 - \pi_2 - ... - \pi_k \tag{18}$$

where *p* is equal to the number of variables under consideration. The matrix π captures the long-run relationship between the *p*-variables.

Now, for the Johansen test, we employ the Eigenvalue test, which is based on the comparison of $H_0(r\text{-}1)$ against the alternative $H_1(r)$, where *r* represents the number of cointegrating vectors. Since the results of the Eigenvalue test depends on the lag length of the vector error correction model (VECM), we use the Akaike's Final Prediction Error Criteria (FPE) (see, Cathbertson, *et al*., 1992, and for a survey, Muscatelli and Hurn, 1992) to evaluate the robustness of the empirical results. Table 1 reports the results from the Johansen test. Comparing the Eigenvalue statistics with the corresponding critical values, due to MacKinnon *et al*. (1999), it can be concluded that there exists at least six cointegrated vectors at a 5% level of significance. This confirms the existence of an underlying long-run stationary steady-state relationship between the dependent and explanatory variables in the economic growth model.

Table 2 shows the correlation matrix. From Table 2, the correlation estimates indicate significant positive co-movement of foreign direct investment and human capital, between foreign direct investment and government consumption, and a negative co-movement with government stability and population growth. The positive co-movement between foreign direct investment and human capital is consistent with *a priori* expectations. It is interesting to see that there exists a positive correlation between foreign direct investment and government consumption. An important finding is the positive co-movement of human capital and government consumption. This suggests that government expenditure in important in developing human capital capacity in the Philippines. Another important finding is the negative co-movement of human capital and government consumption, perhaps reflecting the fact that there exists a negative co-movement of population growth and human capital. An increase in population means the inability of the

government to meet the needs of the populace particularly in the area of education, resulting in the decrease in human capital development.

Table 3 reports the empirical results of the estimation of the economic growth model for the Philippines. For the BGL model, the foreign direct investment variable has a positive and statistically significant effect in influencing economic growth. Although positive, the coefficient of the FDI variable is statistically non-significant in the MRW and EAST model. The significance of the FDI variable indicates that it is an important determinant of economic growth in the Philippines. In assessing the effect of FDI on economic growth, one important issue relates to the possibility of reverse causality. As Compas and Kinoshita (2002) emphasise, if foreign investors believe that the host country's high growth state is sustainable, this expectation serves as an additional reason to invest in the country. The Granger causality test has revealed that FDI does not Granger –cause economic growth and vice versa. This is surprising given that FDI has a positive impact on economic growth in the BGL model.

The coefficient of the human capital variable (HK) on economic growth is found to be positive but statistically non-significant in the BGL model, but negative and statistically significant in the MRW and EAST models. The result indicates that an increase in human capital results in a decrease in economic growth. This result is similar to those reported by Compas and Kinoshita (2002) for a panel of 22 Central and Eastern European and Former Soviet Union transition countries between 1990 and 1998. One possible explanation for the negative impact of human capital on economic growth is that despite economic growth experienced in the Philippines human capital development has declined a consequence of the decline in government expenditure.

The government expenditure (GEXP) variable is negative and statistically non-significant in the BLG model, but positive and statistically non-significant in the MRW model. The result indicates that government expenditure has no statistically significant impact on economic growth in the Philippines. A Granger-causality test has revealed that government expenditure Granger causes human capital development but not the reverse. This suggests that government expenditure could have an indirect impact on economic growth through its effect on human capital development. Over the course of the last three decades or so, government expenditure of education has declined quite significantly resulting in a decrease in human capital development. The effect has been that the decline in human capital, and consequently, this has meant that human capital has contributed less than expected to economic growth in the Philippines.

Another plausible explanation for the negative impact of HK on economic growth draws from the argument of Campos and Kinoshita (2002). Arguably, the additional friction generated within the Philippine economy as it transforms from a protected economy to a liberalised one, through trade liberalisation, a consequence of problems associated with occupational structure within the Philippine labour market, has meant that the labour market was not flexible enough to adjust to the changing economic trends. This suggests the need for labour market reforms in the Philippines. With regard to the type of labour reforms that are needed is beyond the scope of this study, but certainly an area of future research. However, a Granger-causality has revealed that FDI does Granger-cause HK but not the reverse. The result suggests that the increased flow of FDI into the Philippine economy could stimulate human capital development. This was examined further by performing a joint test of whether FDI and HK jointly influence economic growth. The Chi-square test statistic was found to be 0.45 with a *p*-value of 0.501 and this is higher than the critical value resulting in the non-rejection of the null hypothesis and the conclusion that FDI and HK do not jointly influence economic growth in the Philippines.

The coefficient of government stability variable, which captures the number of attempts and successful coups and change of government, is positive and statistically significant in the BGL and MRW models. This is quite surprising given that the increase in the number of coup attempts and successful coups and change of government may introduce instability within the economy and should cause economic growth to decline. It is possible that frequent coup attempts and successful coups as well as the return to a democratic government has meant that these governments attempt to reform the public service and in so doing causes an improvement in the quality of bureaucracy thereby resulting in a positive effect on economic growth. This finding needs to be interpreted with caution. More research is warranted to examine more closely the effect of quality of bureaucracy on economic growth in the Philippines.

The inflation rate (INF) variable has the expected negative and statistically significant effect on economic growth in all the models. The results indicate that an increase in inflation is associated with a decreased economic growth. A Granger-causality test result indicates that FDI does Granger-cause inflation in the Philippines. The result demonstrates that the inflow of capital stimulates increased investment and consequently an increase in inflation within the Philippine economy.

It is interesting to note that although the coefficient of the private investment (PINV) variable is not statistically significant, it has a positive sign in the economic

growth model. The result indicates that private investment has the potential to stimulate economic growth in the Philippines. A close examination of the Granger-causality test results revealed that FDI does Granger-cause PINV, and vice versa. This suggests that the statistically non-significant effect of private investment on economic growth may be due to the outflow of foreign direct investment during the Asian financial crisis. That, the FDI inflow in recent times has not recovered to its pre-crisis levels to stimulate increased private investment to translate to increased economic growth. In recent times, the Philippines government has put in place policies to encourage increased private investment as well as stimulate FDI flow back into the country. These policies are likely to result in economic growth of the Philippine economy.

The coefficient of the number of telephone lines (TEL) variable, which is a proxy for infrastructure quality, is found to have a positive and statistically significant effect in the EAST model, but a positive and statistically non-significant effect in the BGL model. The positive sign indicates that an improvement in infrastructure will lead to an increase in economic growth, as expected. Although TEL does not directly influence economic growth it influences it through its indirect effect via FDI. The Granger-causality test result indicates that FDI Granger cause TEL, and vice versa. Infrastructure development is positively and highly correlated with human capital development and this could potentially stimulate increased growth within the Philippine economy.

The coefficient of population growth rate (POPGR) variable is positive and statistically significant in influencing economic growth. The result indicates that an increase in population is associated with an increase in economic growth, as expected. The unemployment rate (UER) variable is found to be negative and highly statistically significant in influencing economic growth. This indicates that an increase in the level of unemployment causes economic growth to decline, as expected.

The coefficient of the average growth in economies of Philippines major trading partners (MTGR) is positive but statistically non-significant in all the estimated models. The result indicates that economic growth in major trading partners does not influence economic growth in the Philippines. This result is interesting and possible explanation is the trade reversal that occurred following the Asian crisis where there was massive capital outflow from the Philippines. The implication is that there is the need for the Philippine government to explore other markets beyond the traditional trading partner markets. This result lends support to the Philippine government's stance on diversification of its exports to other emerging trading partners. However, it is important to note that economic growth

in Philippines major trading partners Granger causes government expenditure, but not the reverse. This suggests that economic growth of major trading partners indirectly influences economic growth through its effect on government expenditure and to a lesser extent human capital.

5. Summary and Conclusions

The objective of this paper was to empirically investigate the impact of foreign direct investment on economic growth in the Philippines. Over the past decade Philippines has been recovering from the Asian financial crisis, although it has experienced ups and downs. Several factors have contributed to this recovery, including foreign direct investment. However, there is yet to be a country-specific study to examine the determinants of economic growth in the Philippines, particularly the impact of FDI on economic growth. The main finding is that the effect of FDI on economic growth in the Philippines is positive and statistically significant. The result suggests that FDI may be more productive in influencing economic growth than domestic private investment. A plausible explanation is that the foreign firms that invest in the Philippines may be enjoying lower cost of production and higher productive efficiency than its domestic competitors. And given that the Philippine is undergoing trade and institutional reforms as a way of stimulating the inflow of FDI, these flows could potentially encourage the entry of foreign firms primarily on profit grounds rather than on higher efficiency ground with the effect being the loss of positive spill over effects of advanced technology transfer to domestic firms to stimulate domestic investment.

Another important finding is that FDI is an important vehicle for achieving economic growth only in the presence of absorptive capacity as created through increased domestic private investment and infrastructure development. The negative impact of human capital development on economic growth perhaps reflects the decline in public investment in education and training or the excessive specialisation in the educational system in the Philippines and with an inflexible labour market; firms are unable to benefit from the recent trade and institutional reforms. The implication is that there is the need for labour market reforms and to make the educational system more flexible. The results also indicate that economic malaise, as reflected by high inflation and unemployment, lowers economic growth. Population growth is found to stimulate economic growth in the Philippines. An interesting finding is that economic growth in the Philippines is not

influenced by economic growth of its major trading partners partly because of the slowdown in these economies. With the changing trend in the geographical and historical proximity to these trading partners through Philippine government's diversification of exports and it focus on other emerging markets, one is expected to see a declining influence of these traditional trading partners in Philippine's economic growth of the future.

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Table 1
Co-integration results for Philippine economic growth model

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value
None *	0.994	178.47	73.94
At most 1 *	0.982	140.57	67.91
At most 2 *	0.966	118.65	61.81
At most 3 *	0.942	99.71	55.73
At most 4 *	0.890	77.13	49.59
At most 5 *	0.809	57.99	43.42
At most 6	0.653	37.04	37.16
At most 7	0.579	30.29	30.82
At most 8	0.464	21.83	24.25
At most 9	0.290	11.98	17.15
At most 10	0.065	2.34	3.84

Notes: *denotes rejection of the hypothesis at 5% (1%) significance level.
Test indicates 6 co-integrating equation(s) at 5% significance.

Table 2
Correlation Matrix of Variables in the Economic Growth Model for
The Philippines, 1970-2006

	GDPGR	HK	FDI	GOVS	IR	MTGR	POP	GEXP	PINV	TEL	UR
HK	-0.09										
FDI	0.00	**0.72**									
GOVS	0.21	-0.15	**-0.60**								
IR	-0.53	**-0.42**	-0.37	-0.04							
MTGR	0.24	-0.07	-0.05	0.22	-0.10						
POPGR	0.05	**-0.74**	**-0.39**	-0.15	0.33	0.00					
GEXP	0.20	**0.71**	**0.81**	**-0.47**	-0.51	-0.19	**-0.44**				
PINV	0.00	0.27	0.28	**-0.49**	-0.16	**-0.51**	-0.15	0.57			
TEL	0.10	**0.82**	0.37	0.16	**-0.41**	-0.01	**-0.85**	**0.60**	0.27		
UR	**-0.55**	**0.48**	0.14	0.15	-0.09	0.04	-0.22	-0.01	-0.10	0.25	
Yo	0.00	-0.28	-0.24	0.02	0.07	0.00	0.20	-0.17	-0.12	-0.14	-0.22

Table 3
Empirical Results of the Economic Growth Model
for the Philippines, 1970-2006

	BGL	MRW	EAST
Constant	-11.134	127.58**	109.71**
	(-0.367)	(2.164)	(2.695)
Initial income	-0.002***	-0.001	-0.002***
	(-4.430)	(-1.145)	(-2.849)
Human capital	0.278	-1.448*	-1.178**
	(0.676)	(-2.027)	(-2.505)
Foreign direct investment	1.035	1.810	1.480
	(2.029)*	(1.224)	(1.182)
Government stability	2.592***	1.626*	
	(3.445)	(1.818)	
Inflation rate	-0.186***	-0.181***	-0.224***
	(-4.810)	(-3.589)	(-4.665)
GDP growth in trading economies	0.118	0.112	0.083
	(1.385)	(1.045)	(0.943)
Population growth	3.710***		
	(8.864)		
Government expenditure	-0.012	0.026	
	(-0.751)	(1.508)	
Private investment	0.002		
	(1.553)		
Telephone lines	0.059		0.118*
	(1.066)		(1.968)
Unemployment rate	-2.163***		
	(-4.674)		
R^2*-adjusted*	0.77	0.44	0.42
S.E. of regression	1.62	2.49	2.56
F-statistic	11.79	5.20	5.37
	(0.000)	(0.001)	(0.001)

Notes: Dependent variable is real GDP growth, and *t*-ratios are in parentheses. BGL is a variant of the model from Borensztein *et al*.(1998) and espoused by Campos and Kinoshita (2002), MRW is a variant of the model from Mankiw *et al*. (1992) and EAST is a variant of model from Easterly (2001).