Foreign Aid, FDI and Economic Growth in East European Countries

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Abstract

This paper examines the effectiveness of foreign aid and foreign direct investment in the Czech Republic, Estonia, Hungary, Latvia, Lithuania and Poland. The model includes the labor force, capital stock, foreign aid and foreign direct investment, and is estimated using pooled annual time series data from 1993 to 2002. Before carrying out the estimation, the time series properties of the data are diagnosed and an error-correction model is developed and estimated using a fixed-effects estimator. The results indicate that an increase in the stock of domestic capital and inflow of foreign direct investment are significant factors that positively affect economic growth in these countries. Foreign aid did not seem to have any significant effect on real GDP.

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I.   Introduction

Since the end of World War II, official development assistance has been one of the major sources of external finance for developing countries. Foreign assistance has been provided primarily for the development of infrastructures, alleviation of poverty, emergency relief and peacekeeping efforts. After the collapse of the Soviet Union and its East European allies, the direction as well as the volume of development assistance from developed nations changed significantly. For instance, foreign aid to developing countries declined by one-third in real terms in the 1990s because donor countries diverted some of their development assistance funds from developing nations to the former East European countries (World Bank, 1998).

In recent years East European economies have been attracting foreign capital at a significant rate. This capital includes both development assistance funds as well as foreign direct investment (FDI). Whether this external capital has been able to stimulate economic growth in these countries is, essentially, an empirical issue. Moreover, given the relative dearth of such studies, this paper makes an attempt to estimate and analyze the effect of foreign aid and FDI on economic growth in the former socialist countries of East Europe. Our study is based on panel data for the Czech Republic, Estonia, Hungary, Latvia, Lithuania and Poland for the period 1993-2002. The data are derived from various issues of the *International Financial Statistics* published by the International Monetary Fund. The next section presents a review of some relevant literature. Section III presents the theoretical background and methodology. The estimation and analysis of the empirical findings are reported in section IV. Finally, section V reports the summary and main conclusions.

II.   Review of Literature

A.   Foreign Aid

There has been significant debate as to the effectiveness of foreign aid in economic development. In an early study, Chenery and Strout (1966) consider foreign aid as a factor that relaxes either the domestic saving constraint or the foreign exchange constraint, whichever is binding. They argue that foreign aid increases the rate of investment and the level of income in the economy by supplementing its available resources. However, Griffin and Enos (1970) argue that foreign aid does not contribute to economic growth and that it fails to foster democratic political regimes. Instead, foreign economic assistance could retard economic development by lowering the domestic saving rate. The authors test this hypothesis using a bivariate regression model with cross sectional data for 32 less developed countries (LDCs) and conclude that foreign aid inflows to LDCs cause the domestic saving rate to fall.

Papanek (1973) arrives at conclusions that are consistent with the finding of Griffin and Enos of a negative association between foreign aid and domestic savings, but he challenges their assertion of a causal relationship, with foreign aid leading to reduced domestic savings. According to Papanek, a country receives more foreign aid during times of economic crisis when the domestic saving rate is low. Therefore, the causality should run from the general economic condition, of which domestic savings is one indicator, to the inflow of foreign aid. Bowels (1987) applies a Granger causality test to this relationship, using annual data from 1960-1981 for 20 LDCs but his findings are inconclusive given that the nature and the direction of causality varied across countries. In addition, results for half of the sample countries did not show any causal relationship between savings and foreign aid.

In order to analyze the relationship between foreign aid and economic growth, some researchers have directly regressed GNP on foreign aid, with contradictory results. For example, Papanek (1973) reports a positive and significant relationship between foreign aid and economic growth, while Vivodas (1973) finds a negative relationship. Mosely, Hudson, and Horrel (1987), using aggregate, cross-sectional data, report a negative and significant relationship for the period 1960-1970, but a negative and insignificant relationship for the 1970-1980 and 1980-1983 time frames. More recently, Dhakal, Upadhyaya and Upadhyay (1996) conduct a causality test between foreign aid and economic growth for four Asian and four African countries and find that except for Kenya and Nepal, foreign aid is positively and significantly related to economic growth.

Although Boone (1996) finds that foreign aid does not increase economic growth rates in the typical poor country, Burnside and Dollar (2000) show that, in poor countries with sound economic policies, aid accelerates economic growth. Conversely, the authors report that in highly distorted economies, aid is dissipated in unproductive government expenditures. This interpretation suggests that aid acts as an income transfer which may or may not lead to growth and that the outcome depends on whether aid is used to finance capital investment or consumption expenditures. To the extent that aid is invested, it will be effective; to the extent that it is consumed, it will be ineffective.

B.   Foreign Direct Investment

In recent decades private capital has flowed to developing countries at a considerable rate. For instance, total private capital flows to developing countries increased from $43 billion in 1990 to $243 billion in 1999. As economic growth accelerates around the world, this flow will continue to increase further. One of the major components of this private capital flow is foreign direct investment (FDI). In the last two decades FDI has grown faster than the flow of trade or foreign aid. It is often argued that FDI stimulates economic development by complementing itself with the local economy of the host country (Trevino and Upadhyaya, 2003). In addition, FDI can increase economic growth by encouraging the incorporation of new inputs and foreign technologies in the production function of the host country (Dunning, 1993; Borenzstein, *et al.,* 1998). Another positive impact is that FDI augments the level of knowledge in the host country through labor training and skill acquisition (De Mello, 1999).

Most of the empirical studies have supported the argument that FDI is growth enhancing to host countries. For example, Borenzstein, Gregorio and Lee (1998) test the effect of FDI on economic growth in 69 developing countries over two decades. Their

findings suggest that FDI is an important vehicle for the transfer of technology and it contributes more to growth than does domestic investment. Their findings, however, also suggest that FDI is more effective in enhancing economic growth only in countries where the level of education (a measure of absorptive capacity) is high. Bosworth and Collins (1999) also conduct a comprehensive examination of the effect of FDI in 58 developing countries of Asia, Africa and Latin America from 1978 to 1995. Their empirical analyses indicate that a one-dollar increase in capital inflow (of all types) is associated with a fifty-cent increase in domestic investment. Separately, FDI has a one-to-one dollar increase in domestic investment. A recent study by Trevino and Upadhyaya (2003) using pooled time series data from five developing Asian countries finds that FDI positively contributes to economic growth and in open economies the impact of FDI on economic growth is more effective than that of foreign aid.

III.   Theoretical Background, Methodology and Data

The factors of production and the production technology determine the level of output in an economy which can be summarized as:

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

where Y denotes the output level (real GDP), K denotes the amount of capital, and L denotes the amount of labor. Assuming constant technology, any increase in the amount of labor and/or capital will increase the level of output in the economy. After adding foreign aid (AID) and foreign direct investment (FDI), equation (1) can be written as:

$$Y = f(K, L, AID, FDI, Y_{-1}) \tag{2}$$

where Y_{-1} is the lag of the dependent variable and is included to take inertia into account. We would expect the coefficients of K and L, measures of domestic capital and labor supply, to be positively related to Y. Similarly, foreign aid should generally be expected to exert a positive effect on real output. However, as discussed above, some studies suggest that foreign aid might have a negative impact on the economy. Therefore, the effect of foreign aid on the level of output might be expected to be ambiguous. In contrast, given the emerging consensus in the extant literature linking FDI to economic development, we expect FDI to have a positive effect on the level of output.

IV.   Estimation and Empirical Results

As indicated above, this study uses panel data from the Czech Republic, Estonia, Hungary, Latvia, Lithuania and Poland from 1993 to 2002. Since the use of non-stationary data can produce spurious regression, it is first necessary to ensure that the panel data series are stationary. We do so using the Levin, Lin and Chu (2002) and Breitung (2000) tests. Since the data series are not found to be stationary at level, the same tests are performed with the first difference level of the data. The test results indicate that all the series are stationary at the first difference level. The test results are reported in Table 1.

After establishing the stationarity of the data series, a cointegration test is conducted which tests for the existence of unit root in the estimated error term from

equation (1). The test results are reported at the bottom of Table 1. The null hypothesis of no unit root is rejected in all three tests suggesting an existence of a long-run relationship among the variables. Therefore, following Engle and Granger (1987) an error-correction model is developed in order to capture the long-run relationship among the variables. This procedure involves estimating equation (2) in the first-difference form and adding the error-correction term (EC) as another explanatory variable. The error-correction term is the lag of the estimated error term from equation (2). The error-correction model developed is as follows:

$$\Delta Y = b_0 + b_1 \Delta K + b_2 \Delta L + b_3 \Delta AID + b_4 \Delta FDI + b_5 \Delta Y_{-1} + b_6 EC_{-1} + v \qquad (3)$$

where v is the error term. Since the data used in this study is a panel data from different countries, equation (3) is estimated using a fixed-effects estimator. A GLS estimation is used in order to take care of the possible cross-section heteroskedasticity. The estimation of equation (3) is as follows :

$$\Delta Y = 3121 - 0.03\,\Delta L + 0.08\,\Delta FDI + 2.02\,\Delta K + 0.71\,\Delta\,AID + 0.14\,\Delta Y_{-1} - 0.23\,EC_{-1} \qquad (4)$$
$$\quad (7.40)^{**}\ (4.39)^{**}\ \ (2.47)^{*}\qquad (11.72)^{**}\quad (0.56)\qquad\quad (1.95)^{*}\quad (4.06)^{**}$$

Weighted $R^2 = 0.817$ Unweighted $R^2 = 0.69$ D.W. = 1.714   n = 57

Figures in parentheses are t-values for the corresponding coefficients; ** and * indicate significant at 1% and 5% critical levels, respectively.

The estimated results reported in equation (4) seem to be consistent in terms of the signs of the coefficients, the weighted as well as the unweighted coefficients of determinations and the Durbin-Watson statistic. The coefficient of labor (ΔL) carries a negative and significant coefficient which contradicts our *a priori* expectation. In a country with abundant labor and scarce capital, the marginal productivity of labor may be negative. In such a case, the coefficient of labor may be negative and statistically significant. As expected, the coefficient of capital (ΔK) is positive and statistically significant at a very high level. In addition, the coefficient itself is very high which suggests that a one-million dollar change in the stock of capital leads to a 2.2 million-dollar change in real GDP. The coefficient of foreign aid (ΔAID), though positive, is not statistically significant. This finding is consistent with Boon (1996) and others who cast doubt on the effectiveness of foreign aid in economic growth. The coefficient of foreign direct investment (ΔFDI) is positive and statistically significant indicating that the inflow of FDI has been a significant contributor to economic growth in these countries. As expected, the coefficient of the lag of the dependent variable (ΔY_{-1}) carries a positive and significant sign, and the error correction term (EC_{-1}) carries a negative and statistically significant coefficient confirming that the variables in the model are indeed cointegrated.

V.   Summary and Conclusions
This paper has examined the effectiveness of foreign aid and foreign direct investment in the Czech Republic, Estonia, Hungary, Latvia, Lithuania and Poland. The model used in the study includes total labor force, capital stock, foreign aid and foreign direct investment. The estimated model uses pooled annual time series data from 1993 to

2002. Before carrying out the estimation, the time series properties of the data are diagnosed and an error-correction model is developed and estimated using a fixed-effects estimator. The coefficients of the estimated equation suggest that an increase in the stock of domestic capital and inflow of foreign direct investment are significant factors that positively affect economic growth in these countries. Foreign aid, however, seems to be ineffective. Since these countries are relatively labor abundant, an increase in the labor force seems to have a negative impact on real GDP.

Table 1
Unit Root Test

Variable	Levin, Lin & Chu Test	Breitung Test
ΔY	-1.69**	-3.81***
ΔAID	-6.94***	-4.69***
ΔFDI	-3.15***	-3.49***
ΔK	-2.70***	-3.17***
ΔL	-4.41***	-1.99*
ER	-2.66***	-1.88**

Notes: *ER* is the estimated error term from equation (1)
      *** significant at 1% critical level
      ** significant at 5% critical level
      * significant at 10% critical level

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