The Impact of Net Inflows of Foreign Direct Investment on Economic Growth, Unemployment and Openness: A Panel Data Analysis of nine Central and East European Countries

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ABSTRACT

This paper investigates the nature of the annual effects of changes in the ratio of Net Foreign Direct Investment (NFDIGDP) to GDP on economic growth, unemployment rate, openness and sectoral composition of GDP and employment in nine Central and East European countries. Panel data analysis is used to disentangle the time invariant country-specific effect and capture relationship between the ratio of NFDIGDP to GDP and the relevant dependent variables over the period 1995-2003. We can attribute our findings based on both the fixed effect model and Pooled Classical Regression as follows: economic growth and unemployment rate are found to be adversely affected by the increases in NFDIGDP whereas the relationship between Openness and NFDIGDP indicates positive correlation. In addition, the increases in NFDIGDP stimulate the share of services in both GDP and total employment. However, both the total share of manufacturing and agriculture as well as the individual share of manufacturing in GDP has been found to be negatively correlated to increases in NFDIGDP over the sample period.

JEL classification: F21, F23
Keywords: Foreign Direct Investment, Economic growth, Unemployment, Openness, Services, Manufacturing.

INTRODUCTION

The empirical literature investigating the effects of foreign direct investment inflows (FDI, hereafter) have yielded mixed results in contrast to the predictions of particularly ‘new growth theory’ which implied that the introduction of new types of inputs, technologies, organizational, and managerial changes as well as likely increase in the rate of accumulation of human capital resulting from FDI should positively affect economic growth (Marino, 2000; Romer, 1986, 1990; Grossman and Helpman, 1991).

Some of the empirical work which reported positive effects of FDI on economic growth includes Li and Liu (2005), Blomstrom et al. (1996), Shan et al. (1997). Some others suggested that positive effects are significant depending on a variety of factors such as the ‘level of development’, the ‘level of human capital’, the ‘degree of openness’ and the sector into which FDI is flowing (Alfaro, 2003; Borensztein et.al., 1998; Balasubramanyam et. al., 1996; Soysa and Oneal, 1999). The literature which have either produced evidence of a negative causal relationship or been unable to detect a positive relationship between FDI inflows and economic growth include (among others) Mencinger (2003) and Townsend (2003).

The results of causality tests based on data of 8 EU candidate countries for the period 1994-2001 have suggested that the impact of FDI inflows on economic growth has been negative (Mencinger, 2003). The author attributes this negative effect of FDI to the observation that FDI in these countries have largely taken the form of acquisition of fixed assets owned by public and the proceeds of the sales of these assets were used to finance additional consumption instead of productive investment leading to increase in imports and current account deficits. These results are in sharp contrast to those of another study by UN/ECE (2002) which claimed to have detected a positive association between FDI and economic growth in transition economies between 1991 and 1999.

The main focus of most of the literature on FDI has been exclusively on the nature of the effects of FDI inflows which, by definition, does not include FDI outflows from a given country. In this study we attempt to estimate the
effects of the ratio of Net Inflows of FDI to GDP on not only economic growth but also on unemployment rate, openness—measured by the share of exports in GDP and sectoral composition of output and employment particularly in relation to services and manufacturing.

Our panel data analysis is based on running simple regressions for each dependent variable on the ratio of Net Inflows of FDI to GDP. The specification of the model for each panel regression is chosen based on the result of the corresponding F test. The panel data is that of a sample of nine Central and East European countries and spans the period between 1995 and 2003. Our selected sample includes Slovakia, Czech Republic, Hungary, Slovenia, Poland, Bulgaria, Romania, Croatia and Macedonia.

The organization of the rest of the paper is as follows: Section 2 explains the empirical methodology, the source of the data, and the countries included in the sample. Section 3 is devoted to the presentation and interpretation of empirical results, and the last section concluded with a summary and the basic insights of results of the paper.

THE EMPIRICAL METHODOLOGY AND DATA

Some authors who have used cross-sectional and time series analysis in empirical work, have argued that when the main motivation of the study is to investigate the nature of the effect of a specific independent variable on a certain dependent variable (or when the independent variables suggested by the underlying theory are highly correlated), it may be preferable to run simple regressions which include, as explanatory variable, only one independent variable. This is the approach we adopt in this study in estimating the effects of the changes in the ratio of Net FDI inflows to GDP on various macroeconomic indicators in the following models:

The general specification of the “fixed effects” model that we assume to represent the behaviour of the panel data in relation to respective effects of the independent variable (NFDIGDP) on each one of the dependent variables is employed by Equation 1:

\[ Y_{it} = a_i + b X_{it} + \varepsilon_{it} \]  

Where \( i=1,\ldots, n \) (the number of countries), \( t=1,\ldots, T \) (t-the number of years), \( Y_{it} \) is the dependent variable (i.e. Growth rate of GDP - GRGDP, Unemployment rate - UR, share of exports in GDP - EGDP which is taken as a measure of openness, total share of major tradable sectors in GDP - STGDP. This proxy indicates that major tradable sectors are assumed to be manufacturing and agriculture and STGDP is the sum of their respective shares in GDP, Share of Services in GDP - SSGDP and share of services in total employment - SSEMP. \( X_{it} \) is the independent variable (i.e. NFDIGDP),

\( b \) is a Coefficient representing marginal effect of \( X_{it} \) (assumed to be common across i and t), \( a_i \) is an Intercept which represents individual (country- specific) effect and assumed to be fixed (constant) over time and \( \varepsilon_{it} \) is an error term for each observation distributed normally with zero mean and constant variance - \( \varepsilon_{it} \sim N(0, \sigma^2) \).

We also assume that there are two possibilities regarding the nature of the individual country-specific effects captured by the intercept term \( a_i \). Either they vary between countries or are common across all the countries in the sample in where the specification of the general model is reduced to a model known as “Pooled Classical Regression” model provided by Equation 2:

\[ Y_{it} = a_0 + b X_{it} + \varepsilon_{it} \]  

The choice between two alternative specifications for estimation of each panel regression is made based on the result of the relevant F-test. If the F-test does not reject the null hypothesis of equal intercepts (i.e: \( a_1=a_2=\ldots=a_n \)), the specification given by Equation 2 is preferred. Otherwise, the “fixed effects” model given by Equation 1 is preferred for estimation of the corresponding panel regression.

INTERPRETATION OF THE EMPIRICAL RESULTS

The results of F-tests for all the cases investigated suggested that the fixed effects version of the model represented by Equation 1 is the preferred model for all the panel regressions. The estimated value of the coefficient representing the
marginal effect of the independent variable (NFDIGDP) on each one of the dependent variables mentioned earlier in the previous section, the corresponding heteroscedasticity consistent t-statistics, the F-statistics (computed for testing the equality of intercepts across all the countries in our sample) and the number of observations used for estimation of each panel regression are reported in Table 1 in the form of a list ranging from A to G.

<table>
<thead>
<tr>
<th>Regression</th>
<th>Dependent Variable</th>
<th>Coefficienta</th>
<th>Fb</th>
<th>Adj. R²</th>
<th>Number of Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>GRCDP</td>
<td>-0.17</td>
<td>7.08*</td>
<td>0.11</td>
<td>73</td>
</tr>
<tr>
<td>B</td>
<td>UR</td>
<td>0.26</td>
<td>121.4*</td>
<td>0.93</td>
<td>69</td>
</tr>
<tr>
<td>C</td>
<td>EGDP</td>
<td>0.64</td>
<td>40.9*</td>
<td>0.84</td>
<td>73</td>
</tr>
<tr>
<td>D</td>
<td>SMGDP</td>
<td>-0.20</td>
<td>6.64*</td>
<td>0.44</td>
<td>62</td>
</tr>
<tr>
<td>E</td>
<td>STGDP</td>
<td>-0.40</td>
<td>25.36*</td>
<td>0.74</td>
<td>72</td>
</tr>
<tr>
<td>F</td>
<td>SSGDP</td>
<td>0.40</td>
<td>25.34*</td>
<td>0.74</td>
<td>72</td>
</tr>
<tr>
<td>G</td>
<td>SSEMP</td>
<td>0.41</td>
<td>325.5*</td>
<td>0.97</td>
<td>55</td>
</tr>
</tbody>
</table>

*a-Values in parenthesis under coefficient estimates are heteroscedasticity consistent t statistics, b-F statistics used for testing the equality of intercepts across countries. They are computed based on the results of estimation of panel data with both “fixed effects” and “pooled classical regression” models. They have (n-1) and (nT-n-1) degrees of freedom for numerator and denominator respectively and n and T are as defined before in section two.* Significant at %1 level and ** Significant at 10% level.

The estimation results of regressions A and B suggest that the increase in the ratio of Net FDI to GDP (NFDIGDP), contrary to theoretical expectations, has exerted adverse effects on both economic growth and unemployment rate of an average (transition) economy in our sample over the sample period, 1995-2003. Even though the estimated coefficient of the independent variable is significant only at 10% level in regression A whilst it is significant at 1% level in regression B, these results lend support to those of Mencinger (2003) briefly stated earlier in the first section. The estimation results for regression B are noteworthy that they are not only highly significant in statistical sense but also they are suggestive of strong adverse effects of NFDIGDP on unemployment rate. The estimated coefficient of the regressor in regression B (0.26) suggests that a 10% increase in NFDIGDP has led to approximately 2.6% increase in the unemployment rate of an average country in our sample. On the other hand, the reported results for regression A imply that the same increase in NFDIGDP could have led to 1.7% decrease in the annual growth rate of GDP of an average country. The fact that most of the FDI inflows in transition economies over the sample period have taken the form of acquisition of fixed assets, public enterprises and banks instead of additions to existing productive capacity can, to a certain extent, help to explain theoretically this counterintuitive result.

On the other hand, the estimated negative effects of NFDIGDP on economic growth suggest that the possible efficiency gains resulting from foreign ownership of privatized state enterprises and banks have been either minimal or they have been more than offset by the growth retarding effects of such foreign take-overs. The possible growth retarding effects of foreign take-overs in the transition economies could be related not only to the decrease in the percentage of labor force employed but also to the argument that the proceeds from the sales of domestic assets to foreign investors have been used to finance additional consumption and imports instead of productive investment (Mencinger, 2003).

By regression C, we investigated the effect of increase in NFDIGDP on the degree of openness of an average country in our sample. The estimated coefficient, 0.64, is both positive and significant at 10% level; when openness is
measured as the share of exports in GDP, a given 10% increase in NFDIGDP seems to have led to approximately 6.4% increase in EGDP. This result is important in terms of its implications for long-run economic growth. There is a vast literature which suggests that there is a positive relationship between exports and economic growth (Balassa, 1978; Thornton, 1996; and Doyle, 1998).

With panel regressions ranging from D to H in Table 1, we attempted to estimate the impact of increases in NFDIGDP on sectoral composition of GDP and employment particularly in relation to manufacturing and services sectors. There is some evidence that total factor productivity growth in manufacturing industry has been historically higher than that of services (Weil, 2005). Therefore an increase in the relative output and employment share of services sector which, particularly for developing countries, could be considered to be producing largely non-tradables as opposed to manufacturing (which is a major sector producing tradables) can have adverse effects on aggregate total factor productivity growth and therefore an economic growth in the long-run. The estimation results given by panel regressions D, E, and F show that increase in NFDIGDP have exerted strong effects which are highly significant on sectoral composition of GDP in favor of services and at the expense of major tradables sectors in general and manufacturing in particular.

Results corresponding to panel regressions D and E suggest that a 10% increase in NFDIGDP has, on average, led to 2% decrease in the share of manufacturing sector in GDP by itself, whereas the resulting decrease in the total share of manufacturing and agriculture together is 4%. The fact that the estimated coefficient of NFDIGDP in panel regression F is 0.40 which is highly significant can be taken as a sign that changes in the ratio of Net FDI to GDP have affected the respective GDP shares of major tradables and non-tradables sectors symmetrically but in opposite directions.

It is highly interesting to analyze the results of panel regression G that the share of services in total employment (SMEMP) has been affected by the changes in NFDIGDP in almost exactly same way as SSGDP both quantitatively and qualitatively. The estimated coefficient (0.41) suggests that a 10% increase in NFDIGDP has led to approximately 4.1% increase in the employment share of services.

CONCLUSIONS

The literature on the effects of FDI inflows have exclusively focused on its effects on economic growth. Despite the predictions of the relevant theory in favor of positive growth effects, the empirical work has produced mixed results. In this study, we used panel data from a sample of nine Central and East European countries to estimate the effects of (annual) changes in the ratio of Net FDI to GDP on not only (annual) growth rate of GDP, but also unemployment rate, sectoral composition of GDP and total employment share of services.

The relevant F-statistics computed based on the results of estimation of the panel data with both “Fixed Effects” and “Pooled Classical Regression” models have rejected the hypothesis of equal country-specific fixed effects (i.e.: common intercept) for all the countries in all cases investigated. The estimation results based on “Fixed Effects” specification of each panel regression have yielded the following results: first, it is found that economic growth and unemployment rate of an average country have been adversely affected by the increase in the ratio of Net FDI to GDP; second is a concluding remark that openness as measured by the share of exports in GDP has been positively affected by the increases in NFDIGDP; third is the one that the share of services sector in both GDP and total employment has been found to be positively correlated to the increases in NFDIGDP; finally, we found that Both the total share of manufacturing and agriculture, as well as the individual share of manufacturing in GDP have been found to be negatively correlated to increases in NFDIGDP over the sample period.

Our results suggest that the findings of Alfaro (2003) who showed that the sector into which FDI flows is critical in determining the nature of the overall effects on economic growth, and while for manufacturing sector the effects are positive there are ambiguous effects for services, should be taken seriously. Historically, the total factor productivity growth in manufacturing sector (which is a major sector producing tradables) has been higher than that of services. Therefore the falling share of the sector in output in response to increased Net FDI inflows (relative to GDP) could negatively affect the aggregate growth of total factor productivity and therefore economic growth. In light of this and other basic insights of our results, we believe that the future research should focus on investigating the mechanisms
through which both FDI inflows (and outflows) can lead to negative outcomes for economic growth, employment, productivity growth and technological progress both at aggregate and sectoral level. Based on these results of such studies, the policy makers will be in a better position to design policies and regulations that can increase the likelihood of positive effects of FDI inflows on particularly productivity growth, technological progress and economy growth.

REFERENCES