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DO NET INFLOWS OF FOREIGN DIRECT INVESTMENT AFFECT ECONOMIC GROWTH? A PANEL DATA ANALYSIS

In this study we apply panel data analysis to investigate quantitative and qualitative nature of the impact of net inflows of foreign direct investment as a percentage of GDP (FDI) on economic growth in selected emerging market economies as a group. In theory, FDI is expected to have positive impact on the long-run growth rate of GDP. We test this hypothesis by running a growth regression based on the annual panel data on the sample of 10 emerging market economies. Our growth equation, in addition to FDI, includes the rate of domestic investment, inflation rate and the degree of trade openness (proxied by the share of exports in GDP) as explanatory variables.

Keywords: foreign direct investment; economic growth; GDP; inflation rate; trade openness.

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ЧИ ВПЛИВАЄ ЧИСТИЙ ПРИПЛИВ ПРЯМИХ ІНОЗЕМНИХ ІНВЕСТИЦІЙ НА ЕКОНОМІЧНЕ ЗРОСТАННЯ? АНАЛІЗ ПАНЕЛЬНИХ ДАНИХ

У статті застосовано аналіз панельних даних для дослідження кількісної і якісної природи впливу чистого припливу прямих іноземних інвестицій (ПІІ) як відсотка ВВП на економічне зростання в економіці деяких країн, що розвиваються, як в окремій групі. У теорії очікується, що ПІІ мають позитивний вплив на довгостроковий рівень зростання ВВП. Гіпотеза перевірена методом застосування регресії зростання на основі річних панельних даних до виборки з 10 ринкових економік, що розвиваються. Рівняння зростання, окрім ПІІ, включає рівень внутрішніх інвестицій, рівень інфляції і міру відкритості торгівлі (представлену показником частки експорту у ВВП) як пояснювальні змінні.

Ключові слова: прями іноземні інвестиції; економічне зростання; ВВП; рівень інфляції; відкритість торгівлі.

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ВЛИЯЕТ ЛИ ЧИСТЫЙ ПРИТОК ПРЯМЫХ ИНОСТРАННЫХ ИНВЕСТИЦИЙ НА ЭКОНОМИЧЕСКИЙ РОСТ? АНАЛИЗ ПАНЕЛЬНЫХ ДАННЫХ

В статье применен анализ панельных данных для исследования количественной и качественной природы влияния чистого притока прямых иностранных инвестиций (ПИИ) как процента ВВП на экономический рост в экономике некоторых развивающихся стран как в отдельной группе. В теории ожидается, что ПИИ оказывают положительное влияние на долгосрочный уровень роста ВВП. Гипотеза проверена методом применения регрессии роста на основе годовых панельных данных к выборке из 10 развивающихся рыночных экономик. Уравнение роста, помимо ПИИ, включает уровень внутренних инвестиций, уровень инфляции и степень открытости торговли (представленную показателем доли экспорта в ВВП) как поясняющие переменные.

Ключевые слова: прямые иностранные инвестиции; экономический рост; ВВП; уровень инфляции; открытость торговли.

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1. Introduction. Normally foreign direct investment (FDI hereafter) has two forms: greenfield investments and acquisitions (or merging). Greenfield investments are those investment activities which involve establishing new operations and facilities in a foreign country. On the other hand, acquisitions refer to the purchases of at least 10% of the voting stock of foreign firms with the intention of acquiring lasting management interest in the corresponding business enterprises. Acquisitions can sometimes be the preferred form of FDI simply because they are faster to execute, easier and less risky relative to greenfield investments and foreign firms can believe that they can increase efficiency of acquired firms by injecting capital, management skills or technology. 'New Growth Theory' has predicted that economic growth is likely to be positively affected by FDI due to introduction of new types of inputs, technologies, organizational and managerial changes, as well as likely increase in the rate of accumulation of human capital (Romer, 1986, 1990; Grossman, Helpman, 1991; Marino, 2000).

Some of the past empirical research reporting positive effects of FDI on economic growth (as predicted by 'New Growth Theory') include Li and Liu (2005), Blomstrom et al. (1996) and Shan et al. (1997). However, the findings of some others have not confirmed this theoretically expected positive effect. For example, Ciftcioglu, Fethi and Begovic (2007) have applied panel regression analysis to investigate the nature of the effects of FDI on economic growth and unemployment rate for the sample of transition economies in CEE over the period of 1991-2003. Their estimation results have been in sharp contrast to those who reported positive effects; net inflows of FDI (as % of GDP) have been found to be negatively associated with both growth rate of GDP and unemployment rate. These results are consistent with the earlier findings of Mencinger (2003) who reported similar results for the effects of FDI in transition economies of Eastern Europe. One possible explanation of these theoretically unexpected negative effects of FDI (on economic growth and unemployment) could be related to the fact that FDI inflows (in transition economies), most of the time, have taken the form of acquisition of fixed assets, public enterprises and banks instead of additions to productive capacity. And furthermore the proceeds from the sales of these assets to foreign investors have been (to a great extent) used to finance additional consumption and imports instead of investment in productive assets (Mencinger, 2003). In addition to Mencinger, Townsend (2003) is another example of those studies which have either reported a negative causal relationship, or been unable to detect a positive relationship between FDI inflows and economic growth.

The main focus of the past literature on the effects of FDI has been exclusively limited to the investigation of the nature of the effects of FDI inflows which, by definition, does not include FDI outflows. In this study we chose to analyze the nature of the relationship between net inflows of FDI (as % of GDP) on economic growth measured as growth rate of GDP. Our methodology is based on panel regression of a growth equation which, in addition to FDI variable (described above) includes several other explanatory variables that are theoretically expected to be associated with economic growth in the long run. It is important to note that our main goal is to test the hypothesis that FDI is positively associated with economic growth and not to attempt to identify and estimate the best possible specification of a growth equation

in terms of explanatory variables. Our panel data set is made up of annual data (of the dependent and independent variables) on 10 selected emerging market economies listed in the next section.

The organization of the rest of the paper is as follows: section 2 is devoted to a brief explanation of not only the empirical methodology and source of the data but also discussion of theoretically expected sign of the coefficient of each independent variable we have chosen to include on the right hand side of our growth equation. Section 3 presents and interprets the estimation results based on our panel regression. The last section concludes with a brief summary and policy implications of the results.

2. The Empirical Methodology. The general specification of the model we used for panel regression of economic growth is known as classical pooled regression model which is given by the equation (1) below:

$$y_{it} = a_0 + b' x_{it} + \varepsilon_{it} \quad (1)$$

where $i=1, \dots, n$ (n — the number of countries);

$T=1, \dots, T$ (T — the number of periods);

y_{it} — growth rate of GDP for country i in period t ;

x_{it} — the vector of k regressors (independent variables);

b' — the vector of k coefficients;

a_0 — common intercept for all the countries;

ε_{it} — error term for each observation distributed normally with "0" mean and constant variance.

The independent variables (regressors) that we include on the right hand side of equation (1) are listed below in Table 1.

Table 1. Independent Variables

FDI	Net inflows of FDI as % of GDP
INV	The share of domestic investment in GDP
IR	Inflation rate
EXP	The share of exports in GDP

Now, we briefly discuss the theoretically expected nature of the relationship between the independent variables and economic growth as measured by the growth rate of GDP (GR):

As discussed in the first section, theoretically one would expect FDI to be positively related to GR. However, as the mixed nature of the past empirical research has suggested, this hypothesized positive relationship between FDI and GR may not be universally true and may depend on a variety of factors overlooked previously. Some of these factors include (i) the dynamic effects of FDI on sectoral composition of output and employment in terms of tradables vs. non-tradables sectors, (ii) the extent of increase in the volume of profits transferred by foreign investors (from host countries) to their home countries in the years following FDI and (iii) the nature of the effect of FDI on current account balance in the future years. If a given FDI changes the sectoral composition of output and employment in favor of sectors producing non-tradables, this could negatively affect the long run growth rate of the economy through its possible adverse effects on total factor productivity growth (Gehrels, 1991). Similarly, if foreign investors tend to transfer the profits they earn from their investments in host countries to their home (or

other) countries, this will negatively affect the volume of (domestic) financial savings available for domestic investment. And this is likely to exert negative impact on the rate of accumulation of physical capital and therefore economic growth. Similar adverse effects of a given FDI on the rate of accumulation of physical capital (and therefore economic growth) could be possible if it leads to rising current account deficits in case it leads to sustained increase in the volume of imports. Under these conditions, financing higher current account deficits may require higher rate of external borrowing and/or decrease in the stock of net international reserves of central bank which may increase both the perceived risks associated with a currency crises and future interest and principal payments (debt servicing) on accumulated stock of external debt. And both of these are likely to affect rate of domestic investment and financial stability negatively (Desphande, 1997).

The points raised above suggest that the issue of whether or not a higher rate of FDI leads to higher rate of economic growth is ultimately an empirical matter. And this is the main motivation of this study.

The neoclassical growth theory suggests that the rate of investment can possibly affect the rate of output at least in the medium term (Foryen, 1998). On the other hand, lower inflation rate is likely to improve total factor productivity growth as it enables agents to perceive the actual prices correctly so that they can make rational investment decisions (Harberger, 1998). Similarly, degree of trade openness (as measured by the share of exports in GDP or the share of sum of exports and imports in GDP) can positively affect economic growth through various channels ; producing relatively larger share of domestic output for global markets and increased availability of a range of imported products can raise total factor productivity growth both through competitive pressure on domestic firms for improvements in efficiency and higher rate of technological progress (Grossman and Helpman, 1991).

Finally we conclude this section by noting that the source of our (annual) panel data is the World Bank database² and made up of the data set of 10 emerging market economies that include Argentina, Bolivia, Brazil, Chile, Colombia, China, Indonesia, South Korea, Malaysia and Singapore.

3. The Empirical Results. The statistical results of estimation of growth equation based on the classical pooled regression model and 300 units of observations (coming for 10 different countries for the period 1979-2008) are summarized below in the form of equation (2). We note that in order to deal with possible problem of heteroskedasticity we applied white heteroskedasticity consistent covariance estimator so that the resulting standard errors and t-statistics are respectively heteroskedasticity-robust and heteroskedasticity-consistent. As specified in the previous section, the dependent variable of our estimated growth equation is the (annual) growth rate of GDP (GR).

$$GR^* = -0.026 + 0.06 FDI + 0.30 INV - 0.0008 IR - 0.001 EXP \quad (2)$$

$$(-3.53)** \quad (0.72) \quad (10.98)** \quad (-2.86)** \quad (-0.14)$$

$$R\text{-squared} = 0.34$$

*values in parenthesis under the coefficient estimates are the respective heteroskedasticity-consistent t-statistics.

** significant at the 1% level

² The World Bank database : <http://devdata.worldbank.org/dataonline>.

As the estimation results reported in (2) show, even though the sign of the estimated coefficient of FDI is positive, it is statistically insignificant. In other words, for the average country in our sample, we have been unable to obtain statistical support for the hypothesis that “increases in FDI are positively associated with higher growth rate of GDP in the long run”. The coefficient of “trade openness” variable (EXP) is not only statistically insignificant, but also has the opposite sign of what is theoretically expected. In other words, the hypothesis that trade openness (as measured by the share of exports in GDP) is positively associated with the rate of GDP growth is rejected by the data for the average country in our sample.

The estimated coefficients of INV and IR variables (0.30 and -0.0008 respectively) not only are statistically significant but also have the correct (theoretically expected) signs; the estimated coefficient of INV variable (0.30) suggests that a given 1% increase in the rate of investment is likely to be associated with (on average) 0.3% increase in the growth rate of GDP in the long run. And negative sign of the coefficient of IR variable (-0.0008) suggests that, as theoretically expected, higher inflation has been found to be associated with lower growth rate of GDP for an average country in our sample. However, the fact that the absolute magnitude of the estimated coefficient is very small suggests that the negative impact of higher inflation on long-run economic growth has been very minor for the average country (in our sample) over the sample period (1979–2008).

4. Conclusions. In this study, we carried out the panel data analysis of the possible impact of net inflows of FDI (as % of GDP) on economic growth based on the annual data set of 10 different countries. The panel regression results have not been able to produce statistical support for the hypothesis that net inflows of FDI are positively associated with higher rate of economic growth in the long run. Even though the sign of the estimated coefficient of the relevant variable is positive (as theoretically expected), it is statistically (highly) insignificant. This result suggests that the postulated positive impact of FDI on economic growth may not be generalized and taken as universally true. To understand the economic logic behind this theoretically unexpected result, it is critical to note that FDI (more often than not) may take the form of purchase of (all or part of the ownership) of domestic (private and public) enterprises. And the long-term dynamic effects of such purchases on economic growth may critically depend on the variety of issues related to such inflows of capital. Some of these issues may be captured in the form of following set of questions: (i) Are the proceeds from the sales of domestic real assets used to finance additional investment in productive capacity or (private and/or public) consumption?; (ii) Is the sector into which FDI flowing a 'tradable sector' (such as manufacturing) where total factor productivity growth is likely to be relatively higher or a 'non-tradable sector' (such as banking, insurance, construction and retail trade) where productivity growth has been historically relatively lower (Gehrels, 1991)?; (iii) Is the FDI leading to an improvement or deterioration in current account balance and stock of external debt in the future years?; (iv) Is the FDI leading to a sustained reduction or an increase in budget deficit of the central government?; (v) Is the FDI leading to a sustained increase in the amount of profit income transferred (by foreign investors) out of the host country?. All these issues are likely to affect the overall nature of the long term dynamic effect of FDI (in addition to positive factors proposed by standard theory)

on economic growth. And that's why as our results have shown that the issue of the relationship between FDI and economic growth is likely to stay as an empirical matter.

Our estimation results have produced strong statistical evidence of a positive correlation of domestic investment rate and economic growth. The estimated magnitude of the coefficient of INV variable (0.30) suggested that, in the long run, a 10% increase in share of domestic investment in GDP has been associated with 3% growth of GDP (of an average country in our sample). These results have critical insights for policy makers in emerging market economies (particularly for those in our sample): Domestic investment rate (and therefore domestic saving rate) are likely to play a relatively much more critical role (than FDI) in the process of economic growth for developing countries. And therefore formulation of policies that are likely to positively affect the respective rate both domestic savings and domestic investment should be the main focus of the policy agenda in such countries.

One other interesting policy insight of our estimation result is related to significance (or non-significance) of the relationship between inflation and economic growth. The fact that the estimated coefficient of IR variable is numerically highly insignificant (while it is statistically significant) may be taken as an indication that possible adverse effects of higher inflation on economic growth (that may operate particularly through worsening of allocative efficiency of investment decisions) might not have played a critical role in determining the rate of economic growth for the average country in our sample. And therefore for such countries, making control over inflation a primary target of monetary and fiscal policy making may not always be justified in terms of expected benefits from lower inflation. Or alternatively one can argue that the extent to which inflation rate is likely to have significant adverse effects on economic growth may vary from one country to another (or from one group of countries to another) and therefore the issue is ultimately an empirical matter for each country's policy makers.

Finally, we note that we have been unable to detect any kind of a positive association of trade openness (as measured by the share of exports in GDP) and economic growth. The estimated coefficient of EXP variable is not only negative (contrary to theoretically expected) but also highly statistically significant. In our view, this theoretically unexpected result could arise if the exporting sectors are highly subsidized through various policy instruments such as directed credit programs, export subsidies, preferential credit and tax rates, tax breaks, preferential import duties. Under certain conditions, the negative effects of such export incentive policies on efficiency of resource allocation may more than offset the positive effects resulting from exposure to global competition and production of higher volumes of output (through exporting) on the long run economic growth. And therefore, whether or not producing a relatively bigger share of domestic output for exports will have positive effects on long run economic growth will also likely to be a controversial issue not only for academia but also for policy makers.

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