# CRISIS EXACERBATED FISCAL DEFICITS AND POSSIBLE IMPACT ON FDI FLOWS: AN EMPIRICAL ANALYSIS OF EMERGING EUROPE AND INDIA

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**Abstract**
Several developing economies impacted by the recent global financial crisis, are experiencing large increases in fiscal deficits and are also concurrently facing a loss of long term stable capital inflows like FDI. In this paper we try to determine the FDI encouraging or debilitating effect of government balances relative to other determinants of inward FDI. In a dynamic panel regression with data from 14 European countries and India, fiscal health by itself is found to be a very significant determinant of FDI inflows *vis-à-vis* certain other economic and developmental policy indicators, underlining the significance of pruning government deficits for sustainable FDI in the post-crisis scenario. We find growth, market size and past FDI inflows and the policy variables related to business and trade environment, to be the other key determinants of inward FDI flows.

Key words: FDI, Fiscal Balance/Deficit, Global Crisis, Dynamic Panel Regression
JEL Classification: F33, C33

## 1. Introduction

This study initiated amidst the global financial crisis focuses on implications of deteriorating government balances for foreign direct capital inflows to emerging market economies. Due to the global financial crisis and recession, which began in late 2007, several developing economies are experiencing large increases in fiscal deficits and consequently in country risk premiums. Given the adverse external circumstances, these countries face the risk of loss of even longer term stable capital inflows like Foreign Direct Investment (FDI). This is particularly true of a number of East European transition economies. Many of these economies prior to the crisis had been experiencing high growth driven primarily by large FDI. They are facing problems of widening fiscal deficits and sharp declines in FDI on account of the recent crisis. India, the Asian emerging market and a favored destination for FDI flows, despite strong growth performance, has also been experiencing contraction of flows in the post-crisis period. As India's fiscal position is one of the weakest among major emerging markets, there is a strong perception that the contraction may intensify in the face of external weaknesses, if the government fails to narrow its ballooning deficit soon. In this empirical study, we consider the relative importance of determinants of sustainable inward FDI flows to emerging market economies and try to estimate the significance of fiscal prudence in determining FDI flows to the host country, *vis-à-vis* some other macro-economic and long term policy-related determinants of FDI identified in the literature. Using two sets of dynamic panel regression models with data for the period 1996 to 2009 from a group of East European countries (EECs) we try to draw lessons for (and from) India, by incorporating comparable Indian data in our regressions.

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The rest of the paper is planned as follows: the second section which forms the background of our study summarizes the predictions of several international organizations on the concerns regarding fiscal balances and prospects for global capital flows. The third section brings together findings from previous empirical studies on the significance of various determinants of FDI inflows with a focus on countries of our interest. The fourth section covers the data and methodology of our empirical analysis and the results from it. The last section concludes with some observations.

## 2. Concerns on Fiscal Deficits and Capital Flows

As an antidote to the recent financial crisis, governments of almost all countries had to use major stimulus measures and thus been forced to push fiscal prudence to the background. Since the emergence of the crisis, reports of several international organizations, underlined the growing concern that increasing risk aversion throughout the global financial system may result in drying up of credit, especially to developing economies with high and rising fiscal deficits, causing setbacks to their speed of development (IMF, April, 2009a and b).

Particularly vulnerable was the situation for several EECs, which had experienced higher growth in the boom years of FDI and whose fiscal consolidation process has been hampered in the current crisis (*Table 1*).

**Table 1: Growth & Fiscal Deficit Indicators of Selected Countries**

**Table 1.A: Annual Percent Change in Real GDP**

| | ***Pre-Crisis*** | | ***Crisis*** | | ***Post Crisis*** |
|---|---|---|---|---|---|
| **Sample Countries** | **2006** | **2007** | **2008** | **2009** | **2010** |
| Albania | 5.4 | 5.9 | 7.7 | 3.3 | 2.6 |
| Bosnia and Herzegovina | 6.1 | 6.1 | 5.7 | -3.1 | 0.5 |
| Bulgaria | 6.3 | 6.2 | 6.0 | -5.0 | 0.0 |
| Croatia | 4.7 | 5.5 | 2.4 | -5.8 | -1.5 |
| Czech Republic | 6.8 | 6.1 | 2.5 | -4.1 | 2.0 |
| Estonia | 10.6 | 6.9 | -5.1 | -13.9 | 1.8 |
| Hungary | 4.0 | 1.0 | 0.6 | -6.3 | 0.6 |
| Latvia | 12.2 | 10.0 | -4.2 | -18.0 | -1.0 |
| Lithuania | 7.8 | 9.8 | 2.8 | -14.8 | 1.3 |
| Poland | 6.2 | 6.8 | 5.0 | 1.7 | 3.4 |
| Romania | 7.9 | 6.3 | 7.4 | -7.1 | -1.9 |
| Slovak Republic | 8.5 | 10.6 | 6.2 | -4.7 | 4.1 |
| Slovenia | 5.8 | 6.8 | 3.5 | -7.8 | 0.8 |
| Turkey | 6.9 | 4.7 | 0.7 | -4.7 | 7.8 |
| *Average of EU countries* | 7.8 | 7.1 | 2.1 | -8.3 | 1.2 |
| *Average of non-EU countries* | 5.9 | 5.7 | 4.5 | -3.1 | 1.9 |
| India | 9.7 | 9.9 | 6.4 | 5.7 | 9.7 |

**Table 1.B: Budget Balance as Percent of GDP**

| | ***Pre-Crisis*** | | ***Crisis*** | | ***Post Crisis*** |
|---|---|---|---|---|---|
| **Sample Countries** | **2006** | **2007** | **2008** | **2009** | **2010** |
| Albania | -3.3 | -3.5 | -5.5 | -7.4 | -5.2 |
| Bosnia and Herzegovina | 2.0 | -0.1 | -4.2 | -4.6 | -5.0 |
| Bulgaria | 3.4 | 3.3 | 2.9 | -3.9 | -3.8 |
| Croatia | -3.1 | -2.5 | -1.4 | -3.3 | -4.7 |
| Czech Republic | -2.6 | -0.7 | -2.7 | -5.9 | -5.7 |
| Estonia | 2.9 | 2.6 | -2.7 | -1.7 | -2.4 |
| Hungary | -9.2 | -5.0 | -3.8 | -4.0 | -4.1 |
| Latvia | -0.5 | -0.3 | -4.1 | -9.0 | -8.6 |
| Lithuania | -0.4 | -1.0 | -3.3 | -8.9 | -8.4 |
| Poland | -3.9 | -1.9 | -3.7 | -7.1 | -7.3 |
| Romania | -2.2 | -2.5 | -5.4 | -8.3 | -8.0 |
| Slovak Republic | -3.5 | -1.9 | -2.3 | -6.8 | -6.0 |
| Slovenia | -1.3 | 0.0 | -1.7 | -5.5 | -6.1 |
| Turkey | -0.8 | -1.7 | -1.9 | -5.5 | -4.1 |
| *Average of EU countries* | -2.3 | -1.2 | -3.3 | -6.4 | -6.3 |
| *Average of non-EU countries* | -0.4 | -0.9 | -2.0 | -5.0 | -4.5 |
| India* | 3.3 | 2.6 | 5.9 | 6.7 | 5.5 |

Note: *Data corresponds to India's fiscal year (April-March). Sources: 1. GDP growth rate: IMF's *World Economic Outlook* Database, October 2010; for India *Central Statistical Organisation* 2. Budget balance, for EU countries: European Commission's Report *on Public Finances in EMU-2010*, April 2010; for Non-EU countries: *EBRD*; for India: *Economic Survey, 2009-10* and *Union Budget Document*, 2010-2011, Ministry of Finance, GOI.

The worst-affected countries were those dependent on the Euro zone for investment and export markets, while EU economies, Bulgaria and Romania, were also at risk from large current account deficits. Hungary, where macro and financial vulnerabilities before the crisis were most pronounced with high levels of public and external debt was one of the worst affected. In contrast, the Czech Republic and Poland were less exposed to swings in investor sentiment because of sounder macroeconomic fundamentals. Estonia's pre-crisis fiscal position was stronger than that of its two Baltic neighbours; Lithuania had a lower level of external debt, while Latvia was weaker on both counts.

Among this group of countries Hungary (in November 2008), Latvia (in December 2008), Romania (in May 2009) and Bosnia-Herzegovina (in July 2009) had to take recourse to IMF support under the stand-by agreement to meet their financing needs, while, Poland had sought access to a flexible credit line from the IMF and Turkey was already into a stand-by agreement with the IMF at the onset of the crisis.

On the other hand the Asian emerging economy, India, had brought down (central government) fiscal deficit to 2.6 per cent in 2007-08 through the *Fiscal Responsibility and Budget Management (FRBM) Act 2003* when the global crisis called for extended

fiscal and monetary stimulus and as a result the deficit shot up to 6.0 and 6.6 per cent in the next two fiscal years.

An acute degree of stress in mature markets and its concentration in the banking system suggested early on in the crisis that capital flows to emerging economies will suffer large declines and will recover only slowly. As for post-crisis expected FDI flows to different regions of the globe, UNCTAD, estimated that in 2008, FDI inflows to South-East Europe and the CIS increased for the eighth consecutive year, reaching $123 billion (*Table 2*), however, inflows were unevenly distributed, with three countries (the Russian Federation, Kazakhstan and Ukraine, in that order) accounting for over 80 per cent of the region's total, while in South-East Europe most of the FDI inflows were still driven by the privatization of state-owned assets[1]. FDI flows to the transition economies of South-East Europe and the CIS slumped by over 40 per cent during 2009; in South-East Europe, the economic and financial crisis, coupled with the near-exhaustion of major privatization opportunities and the structural weakness of their economies, were found to be major contributing factors. UNCTAD (WIPS, 2009) survey results also confirmed that the global economic and financial crisis has had a strongly negative impact on TNCs' international investment plans. However, the survey also showed that TNCs expected a progressive recovery of FDI, starting slowly in 2010 and gaining momentum in 2011.Comparing 2009 country rankings by TNCs with the previous year's, a few changes had been observed; India along with the rest of the BRIC countries is among the top five destinations for FDI[2], while East, South and South-East Asia already receives the largest FDI among the developing regions. On the other hand, prospects for the EECs in next three years were reported to be rather mixed possibly due to negative government balances and GDP growth prospects, as a result of falling exports and a severe crisis in the local financial system.

The overall volume of private sector external financing flows to developing economies projected by the Institute of International Finance (IIF, 2009) for 2009 also had some important regional divergences to highlight. Most significantly, IIF revised its

[1] The transformation of the onetime planned economies to market economies and integration into the world economy began in the countries of Eastern Europe since 1989. Though till recently, the FDI driven growth process faced constraints (Hartarska and Thompson, 2008), during the last few years particularly, the progress of the privatization process and favorable policies for attracting FDI has produced a manifold increase of FDI into the region coupled with strong growth performance.

[2] India opened up FDI in 1991; liberalization can be divided into two major eras - the first, between 1991 and 1999, when unless specifically permitted in a particular area, FDI was generally prohibited. Initially FDI even in permitted areas needed prior government approval in most cases, however, gradually more and more activities moved into the automatic approval list. In early 1999, a fundamental shift occurred; under the new regime, which coincided with Foreign Exchange Management Act (FEMA) being legislated, FDI in any activity became freely permitted barring a few specific areas which were still prohibited or regulated. FDI in sectors /activities to the extent permitted under automatic route now does not require any prior approval by the authorities. It is during the second phase that India began to attract large inflows.

projections of flows to developing Asia and Latin America upwards somewhat, while revising down estimates of net flows to developing Europe. According to the IIF, major challenges remain for the European region, especially in Eastern Europe, where local banks and non-financial companies face challenges to refinance maturing debt, and where fixed exchange rate regimes in a number of smaller countries are likely to come under pressure as economic weakness cumulates.

**Table 2: Region-wise FDI Flows: Inward FDI Flows in Billion of US Dollar**

| Group of Countries | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|
| World | 1459 | 2100 | 1771 | 1114 |
| Developed economies | 970 (66.5) | 1444 (68.8) | 1018 (57.5) | 566 (50.8) |
| *of which* G8 | 643 (44.1) | 851 (40.5) | 675 (38.1) | 371 (33.3) |
| Developing economies | 434 (29.8) | 565 (26.9) | 630 (35.6) | 478 (42.9) |
| *of which* Developing economies: Africa | 55 (3.8) | 63 (3.0) | 72 (4.1) | 59 (5.3) |
| Developing economies: America | 95 (6.5) | 164 (7.8) | 183 (10.3) | 117 (10.5) |
| Developing economies: Asia | 283 (19.4) | 337 (16.0) | 373 (21.0) | 301 (27.0) |
| *of which* Eastern, Southern and South-Eastern Asia | 216 (14.8) | 259 (12.3) | 282 (15.9) | 233 (20.9) |
| Transition economies (mainly SEE and CIS) | 55 (3.7) | 91 (4.3) | 123 (6.9) | 70 (6.3) |
| Commonwealth of Independent States (CIS) | 44 (3.0) | 76 (3.6) | 108 (6.1) | 62 (5.5) |

Note: Figures in parenthesis represents percentage of total world. Source: UNCTAD WIR 2010.

## 3. Cues from Previous Studies on FDI

The explanatory variables for capital flows are generally classified as *push* and *pull* variables, where the former represent external factors and the latter internal or domestic factors with respect to the country receiving foreign investment. *Pull variables* are those that are endogenous to the host country and can be classified into broad categories like (a) Host country economic conditions which include factors like location and availability of resources (labour availability, cost, skills, trainability, managerial and technical skills, access to inputs; physical infrastructure, supplier base, technology support), market size, income levels, urbanization and access to regional markets and also stability and growth prospects, infrastructure development and efficient financial markets; and (b) Host country policies which include macro-economic policies (management of crucial macro variables like interest rates and foreign exchange rates); privatization policies (promotion of private ownership and ease of entry/exit), trade strategy (regional integration and access to markets; ownership controls, competition policies) and FDI policies (ease of entry; ownership, incentives, access to inputs, ease of remittance and access to foreign exchange).

Of these determinants, market size, generally measured by GDP, GDP per capita or size of the population in a particular income bracket is expected to be a positive and

significant determinant of FDI inflows as a large economy ensures larger potential demand in the host country. Well established and quality infrastructure and any improvements in the investment climate within the host country encourage FDI and are expected to be important determinants of FDI inflows. Trade openness or bilateral trade relationships, as gauged by the ratio of export plus import divided by GDP, is generally expected to be a positive and significant determinant of FDI.A greater role of the private sector is often associated with a more efficient business environment and is therefore expected to encourage FDI. Higher labour cost, generally measured by manufacturing wages in the host country, would result in higher cost of production and is expected to limit FDI inflows; therefore, a negative relationship is usually expected between labour cost and FDI. The stability of the macroeconomic environment, usually gauged from government finance indicators and vulnerability indicators, is important for investment as investors prefer to invest in more stable economies that reflect a lesser degree of uncertainty. Amongst other indicators like inflation and interest rates, the fiscal health of the governments of host countries are likely to be an important indicator as the fiscal position limits the ability of the government to carry out other stabilizing policies effectively and thus is an important component of a country's risk rating. Fiscal health of an economy would also determine the nature of developmental policies and extent to which infrastructure enhancement can be carried out. Further, prolonged fiscal deficits would also mean that at some stage the government may very well burden industry or consumers with additional taxes and thus add to the costs of the investor.

In a study of 26 transition economies (CIS and CEE) Garibaldi *et al*, 2002, showed that FDI increases with good macro-economic performance, as measured by GDP growth and a high fiscal balance. Bevan *et al* (2000) using a panel dataset containing information on FDI flows from matured market to transition economies, establish the determinants of FDI inflows to Central and Eastern Europe as country risk, unit labour costs, host market size and gravity factors. In their analysis country risk is influenced by private sector development, industrial development, the government balance, reserves and corruption. Holland and Pain (1998) from a panel data analysis of the factors affecting aggregate inflows of FDI in eight Eastern European economies over 1992 to 1996 indicate that the direct privatization, proximity to the EU and the extent of trade linkages with the advanced economies can have significant effects on the level of investment. A composite indicator of risk constituting growth, inflation and measures of external stability such as the debt/GDP ratio or the level of reserve cover (in terms of months of imports) and the Transition Indicators published by the EBRD, is found to be significant in their analysis. Carlos and Rowland (2004) using both cross-sectional analysis and panel data techniques with data for 46 developing countries, find the size of the economy (measured as nominal GDP in US-dollar terms) and the level of government debt to revenues, to be significant explanatory variables. Further, low external interest rates, open recipient economies, and strong fiscal balance are found to foster FDI flows to developing economies. In their cross-section analysis of the 46 countries, the significance of the two fiscal variables (the ratio of government debt to revenues, or the ratio of government interest payments to government revenue)for FDI stress the fact that investors prefer countries that have a sound fiscal policy. Merlevede and Schoors (2005) considering the determinants of FDI stocks of EU-members in ten accession countries find lagged FDI stock to be statistically significant in explaining the current FDI stock.

Also the significant positive impact of GDP suggests that the market access mechanism is present, an increase in bilateral trade integration is associated with an increase in FDI and direct privatization has a significant positive impact on FDI. Demekas et al (2005) find that there is significant potential for generating further FDI in all Central and Southeastern European countries[3]. The gap between actual and potential FDI stock is found to be relatively small in the Central European and Baltic countries, particularly, in Bulgaria and Hungary. For Poland and Serbia and Montenegro, the gap is around 50 per cent, and it reaches over 65 per cent for Croatia or Albania, and even above 80 per cent for Bosnia-Herzegovina. A recent study (Vijaykumar et al, 2010), which examines the factors determining FDI inflows to BRIC countries using an annual panel dataset from the period 1975 to 2007, finds that the selected variables market size, labour cost, infrastructure, and gross capital formation are the potential determinants of FDI inflows to BRIC countries. Economic stability and growth prospects (measured by inflation rate and industrial production respectively), trade openness (measured by the ratio of total trade to GDP) seem to be insignificant in determining FDI inflows to the BRIC countries. In a study comparing India and other leading emerging markets in terms of FDI potential and performance, Vazquez-Rozas and Vadlamannati (2009) identify GDP growth, per capita GDP (in PPP terms), trade openness and certain measures from the Economic Freedom Indices as indicators appropriate for constructing a FDI Potential Index.

## 4. A Dynamic Panel Regression to Gauge the Relative Significance of Fiscal Health in Determining FDI Inflows

***Data:*** In our analysis we use two sets of panel data; one which gives results exclusively for the EECs and one which includes Indian data[4] [5]. The determining (policy-related) variables are different in the two sets as not all comparable data relating to the developmental policy variables is available for India. The panel data sets as described below include annual information over the period 1996 to 2009.

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[3] To estimate a realistic level of "potential" FDI they use the *best* level of the policy variables across the sample. That is the highest value of the foreign exchange and trade liberalization and infrastructure reform indices, and the lowest unit labor cost, tariff level, and corporate tax burden across the countries in Central and Southeastern Europe in 2003.

[4] The countries and country codes are as follows: 1.Albania-ALB; 2. Bosnia and Herzegovina-BH; 3. Bulgaria-BG; 4. Croatia-CR; 5. Czech Republic-CZ; 6. Estonia-EST; 7. Hungary-HG; 8. Latvia-LAT; 9. Lithuania-LI; 10.Poland-POL; 11.Romania-ROM; 12.Slovak Republic-SVK; 13.Slovenia-SVN; 14.Turkey-TUR and 15.India-IND.

[5] Though our choice of the panel of countries seems a little unusual we feel that a comparative study with India is not unjustified. We consider this group of European countries as they have been the worst affected by the crisis in terms of expected FDI flows as well as fiscal health. Somewhat similar to the Indian context, FDI is considered to be of particular importance in the transformation of the formerly centrally planned economies, as prior to transition in the Central and East European countries, strict limitations were imposed on access to foreign technology. Lifting the barriers to foreign capital, combined with an expansion in trade linkages with the major industrialized economies created the potential for rapid increases in productivity and paved the way for necessary reforms to market structures. Further, survey evidence suggests that national and regional market access is the prime factor that has influenced potential investors in the transition economies, which again is possibly true for India.

**Table 3. Variables: description and source**

| | Variable | Description | Proxy *for* or Indicator *of* | Source |
|---|---|---|---|---|
| Dependent Variable | | | | |
| -- | **FDII** | Inward net FDI inflows into the host country in each year, in USD terms | --- | UNCTAD, WIR 2009 |
| Independent Variables | | | | |
| 1 | **GB** | General government balances as percentage of GDP | Fiscal health | EBRD; RBI |
| 2 | **PPP** | GDP per capita in purchasing power parity terms | Host country market size | IMF, WEO |
| 3 | **GDP** | Growth rate of real GDP | Health of the economy | IMF, WEO |
| 4 | **MW/MWI** | Ratio of US dollar wages in manufacturing and GDP per capita/ Manufacturing Wages and salaries indices | Labour costs in the country | ILO KILM |
| 5 | **PVT** | Index for Privatisation | Level of large scale privatization achieved* | EBRD |
| 6 | **INFR** | Index of Infrastructure Reform | Reforms process advancement | EBRD |
| 7 | **TR/ TR01/TR02** | Total trade to GDP ratio/ Merchandise trade to GDP ratio/A sub-index measuring Trade Freedom a constituent of the Index of Economic Freedom | Trade liberalization/openness** | WTO; Heritage Foundation |
| 8 | **IBF** | A sub-index measuring Business Freedom a constituent of the Index of Economic Freedom | Ease with which businesses can be set-up and operated in (and wound-up from) the host country*** | Heritage Foundation |
| 9 | **INV** | A sub-index measuring Investment Freedom a constituent of the Index of Economic Freedom | Ease with which (foreign) investment can be done in a country# | Heritage Foundation |

Notes: *Private sector development is a key factor in determining perceived country risk as privatisation is taken to be associated with ease of entry; ownership, incentives; and transparent and stable policies. **Higher levels of openness are an indicator for integration with the rest of the world markets; the empirical literature has ascertained that open economies attract more flows than heavily protectd economies. ***It involves issues like the time taken to set up a business, ease of obtaining a business license and bankruptcy procedures. #It involves issues like legal limitations and binding requirements, procedural discrimination against foreign companies, limitations on foreign exchange holdings and transactions etc. WEO database, October 2009

Different indicators, such as fiscal balance, government debt to GDP and to revenues, and government expenditure to GDP may be taken as proxies for fiscal health of a country;

following Bevan *et al* (2000) here we consider the Fiscal Balance/Deficit as the key indicator, while additional determining variables in our analysis include gravity, labour cost and policy variables which measure degree of openness in industry and trade as well as progress in reforms[6]:

**Figure 1: Relation between Government Balance and Change in FDII in 2008**

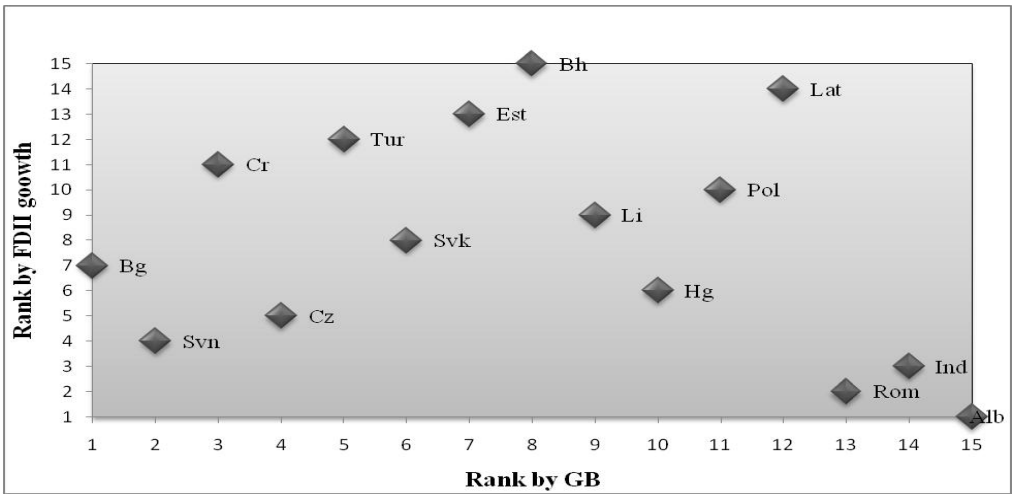


**Table 3: Cross-Correlation of FDII & Government Balance**

| Country | Correlation |
|---|---|
| ALB | 0.55 |
| BH | 0.33 |
| BG | 0.56 |
| CR | 0.19 |
| CZ | -0.03 |
| EST | 0.32 |
| HG | -0.14 |
| LAT | 0.19 |
| LI | 0.39 |
| POL | 0.46 |
| ROM | 0.18 |
| SVK | 0.12 |
| SVN | 0.16 |
| TUR | 0.79 |
| IND | 0.65 |

[6] The EBRD and IEF indicators are used as they provide a convenient method of summarizing a wide range of legislative developments in host economies.

Notably, the cross -correlations between FDI inflows and GB for the sample countries through the sample period (*Table 3*) show that government finances seem to be an important covariant of FDI in countries like Turkey or India, whereas they are less important in EU member states[7].

***Methodology***

FDI flows have been characterized as *cold flows* as opposed to portfolio flows which are regarded as *hot money*; thus an important caveat while working with FDI data is that it is highly autoregressive in nature. Since reversal of FDI is costly, one may expect it to adjust with delay to changes in the other determining variables. As the process of adjustment can depend on the difference between an equilibrium level of FDI and the previous year's actual level, it justifies a dynamic model, in which lags of the dependent variable are also regressors. Further all explanatory variables of FDI flows may not be strictly exogenous i.e., causality may run in both directions, say for example, higher GDP may both cause and be caused by higher FDI flows. These make traditional panel data estimation biased and/ or inefficient, hence we take recourse to the dynamic panel regression estimation (proposed by Holtz-Eakin, Newey and Rosen (1988) and) developed in Arellano and Bond (1991) and Arellano and Bover (1995). This estimation is also appropriate for panels with few time periods and larger number of cross-sections, fixed individual effects and heteroskedasticity and autocorrelation within cross-sections, but not across them.
The model may be written as:

$$Y_{it} = \alpha Y_{it-1} + X'_{it}\beta + \epsilon_{it} \quad (1)$$

$$\epsilon_{it} = u_i + v_{it}$$

$$E[u_i] = E[v_{it}] = E[u_i, v_{it}]$$

where *Y* denotes FDII and *X* is the vector of determining variables. Time-invariant country characteristics (fixed effects), such as geography and demographics, may be correlated with the explanatory variables. The fixed effects are contained in the error term in equation (1), which consists of the unobserved country-specific effects, and the observation-specific errors. In equation (1) $Y_{it-1}$ may be endogenous to the fixed effects in the error term, which gives rise to a dynamic panel bias. To deal with this endogeneity, we can use the Arellano-Bond estimation which transforms all regressors by *first differencing*, and uses Generalized Method of Moments estimation (difference GMM). Applying the difference transform to (1) gives:

$$\Delta Y_{it} = \alpha \Delta Y_{it-1} + \Delta X'_{it}\beta + \Delta v_{it} \quad (2)$$

[7] These correlations are generally low or even negative as there could be a number of other factors which gained importance in determining flows particularly during the boom years for the EU countries as EU membership could have acted as a warranty for future fiscal consolidation.

But here, though the fixed effects are removed, the lagged dependent variable is still endogenous, since the $Y_{it-1}$term in $Y_{it-1} = Y_{it-1} - Y_{it-2}$ correlates with the $v_{it-1}$ in $v_{it} = v_{it} - v_{it-1}$. Likewise, any predetermined variables in *X* that are not strictly exogenous become potentially endogenous because they too may be related to $v_{it-1}$. But deeper lags of the regressors remain orthogonal to the error, and available as instruments. Arellano and Bover (1995) found that if the autoregressive process is too persistent, then the lagged-levels are weak instruments and proposed using additional moment conditions in which lagged differences of the dependent variable are orthogonal to levels of the disturbances. The forward orthogonal deviations transform, proposed by Arellano and Bover (1995), is preferred instead of differencing. Contrary to *first-difference* transformation which subtracts the previous observation from the contemporaneous, the *orthogonal deviations* transformation expresses each observation as the deviation from the average of all available future observations in the sample, weighting each deviation to standardize the variance. Since lagged observations do not enter the formula, they are valid as instruments and this transform has the desirable property that if the original errors are serially uncorrelated and homoskedastic the transformed errors will also be the same. The main advantage is that it preserves sample size in panels with gaps. We use this transformation in our analysis, where if *w* is a variable then the transform is:

$$w^{\perp}_{i,T+1} \equiv c_{it}\left(w_{it} - \frac{1}{T_{it}}\sum_{s>t} w_{is}\right)$$

where the sum is taken over available future observations, $T_{it}$ is the number of such observations, and the scale factor $c_{it}$ is $\sqrt{T_{it}/(T_{it}+1)}$.

***Results:***

We experiment with a stepwise analysis, keeping lagged FDII and GB constant in all regressions while including and excluding certain variables at each step in the above framework with (log of ) FDII as our dependant variable. *Table 4* presents some of the results (where specifications S4 to S7 include only the EECs while the rest include the EECs and India). In our study of 14 emerging European countries and India, fiscal health (indicated by GB), is indeed found to be a very significant determinant of FDI inflows (FDII), either on its own or in conjunction with the market size, growth, labour cost and all of the development, openness and policy variables (S1-12). The stepwise panel regression results also bring out very clearly the dominance of the gravity variable, market size (as indicated by GDP in PPP terms) (included in S1, S3, S6, S8-9) and health of the economy as indicated by the GDP growth rate (included in S2, S4-5, S11-12) along with past levels of FDI (S1-12), as determinants of FDI to the EEC countries. The degree of openness indicated by the trade freedom indicator turns out to be significant in all regressions (included in S3, S7 and S9-12). From our overall analysis it also clear that privatization and infrastructure are indeed the important determinants of total FDI inflows to the EEC countries, however, we have found that their effects are sometimes

overshadowed by the effect of market size or trade (as in S6 or S7). In the second set of regressions with developmental indicators that are available both for the EECs and India, while the index of business freedom is mostly found to be significant (as in S8-9, but not in S12) determinants of inward FDI, the indicator for (foreign) investment climate is not found to be significant (S10-11), when combined with other indicators, possibly as this index has shown a stable value over the past years for most sample countries. The effect of the labour cost variable summed by overall manufacturing wages or the manufacturing wages index is not unambiguous[8]. Thus previous year's FDI and growth, market size, government balances and the openness of trade indicators clearly stand out as the key determinants of inward FDI to emerging markets from our analyses.

**Table 4: Results from Dynamic Panel Regression**

| **Variables** (Expected sign)/ **Coefficients** (*t*-statistic) | **LOG (FDII_1)** **(+)** | **GB** **(+)** | **LOG (PPP)** **(+)** | **GDP_1** **(+)** | **INFR** **(+)** | **PVT** **(+)** | **TR** **(+)** |
|---|---|---|---|---|---|---|---|
| **S1** | 0.194*** | 0.093*** | 1.886*** | | | | |
| | *2.58* | *6.04* | *8.05* | | | | |
| **S2** | 0.727*** | 0.094*** | | 0.060*** | | | |
| | *14.23* | *4.57* | | *6.89* | | | |
| **S3** | 0.138 | 0.108*** | 1.324*** | | | | 0.023*** |
| | *1.48* | *4.13* | *3.68* | | | | *3.02* |
| **S4** | 0.306*** | 0.097** | | 0.054*** | 0.767*** | | |
| | *5.23* | *2.03* | | *5.36* | *5.21* | | |
| **S5** | 0.299*** | 0.118*** | | 0.038*** | 0.533*** | 0.565*** | |
| | *4.51* | *4.95* | | *4.95* | *3.67* | *2.83* | |
| **S6** | 0.105 | 0.127*** | 1.785*** | | | 0.020 | |
| | *1.09* | *4.02* | *6.31* | | | *0.13* | |
| **S7** | 0.256** | 0.128*** | | | -0.080 | 0.775*** | 0.040*** |
| | *2.44* | *4.96* | | | *-0.26* | *2.51* | *3.42* |

[8] May be because development is associated with higher wages in EMEs, the relationship between wages and FDI inflows is not clear.

| **Variables** (Expected sign)/**Coefficients** (t-statistic) | **LOG (FDII_1)** **(+)** | **GB** **(+)** | **LOG (PPP)** **(+)** | **GDP_1** **(+)** | **IBF** **(+)** | **INV** **(+)** | **TR** **(+)** |
|---|---|---|---|---|---|---|---|
| **S8** | 0.210* | 0.087*** | 1.946*** | | 0.013*** | | |
| | *1.83* | *3.58* | *5.61* | | *4.05* | | |
| **S9** | 0.225* | 0.093*** | 1.145** | | 0.013*** | | 0.029** |
| | *1.66* | *3.18* | *2.04* | | *3.61* | | *2.23* |
| **S10** | 0.504*** | 0.137** | | | | -0.012 | 0.027*** |
| | *7.72* | *5.04* | | | | *-1.00* | *3.06* |
| **S11** | 0.580*** | 0.095*** | | 0.043*** | | -0.016 | 0.024*** |
| | *6.23* | *3.35* | | *4.09* | | *-1.13* | *2.64* |
| **S12** | 0.578*** | 0.092*** | | 0.043*** | 0.006 | | 0.032*** |
| | *6.84* | *3.07* | | *4.34* | *1.12* | | *3.94* |

Notes: 1) *, ** and *** denote significance at the 10, 5 and 1% levels;2) The Wald test for joint significance of coefficients and the Sargan/Hansen (J-stat) test for validity of instruments was accepted for all reported results; 3) India's government balance data corresponds to the fiscal year and not calendar year.

Here it is interesting to note that in an earlier analysis of the same set of countries in a country-specific fixed effects model with data up to 2008, government balances, though found to be a very significant determinant of FDI inflows, seemed to be less important when compared to the indicator of privatization and infrastructure development, which had unambiguously stood out to be very important determinants of FDII to the EECs (Bose and Jha, 2011). While in the earlier study only the market size variable was found to be significant we now find both market size and GDP growth to be significant when considered with the rest of the determinants. From the fixed-effect regression model with quite strong country specific fixed effects we also estimate *actual* and *potential* FDI for the sample countries for 2009. Following Demekas et al (2005) and taking the government budget surplus of 1.5 per cent achieved by Bulgaria as a benchmark we find that the shortfall of (estimated) *actual* FDI from *potential* ranges between near 10 per cent to 35 per cent depending on the level of actual government deficit of each country.

## 5. Some Observations

Our study of capital flows to 15 emerging economies, undertaken just as the global recession was bottoming out, confirms that fiscal deficits of developing

economies, which have been enlarged by the current crisis leads to contraction even in long term stable foreign investment flows to these economies. In most studies so far government balances have been considered only as part of an overall macro-economic stability measure, which is taken as a determining variable for FDI inflows to a host country. This study establishes government finances as a key determining factor implying that in the current post-crisis scenario with lower global risk appetite, as global capital flows start to pick up countries with weaker government balances will be at a greater disadvantage. Our estimates also confirm the significant loss of FDI inflows which results from fiscal deficits not being maintained at sound levels. This underlines the significance of pruning of government deficits for FDI, once an economy is back on a stronger growth path. The strong autoregressive nature of FDI flows certainly implies that any reversal of flows, though apparently temporary, would be dangerous as that itself could lead to further continued depletion of flows.

The importance of fiscal consolidation is possibly greater for the Asian emerging market India, as the business climate, privatization and foreign investment regimes and infrastructure development in India is not yet comparable to many of the developing European economies[9]. The importance of market size and growth as key determinants explains why India remains a favored destination for FDI flows despite certain policy restrictions and deterioration in fiscal health. India has also made significant progress in the measure of openness of trade over the years, where the index has moved from showing *repression* (a low score of 13 in 1996 according to the Index of Economic Freedom) to *fairly open* (above 50 by 2007), this too goes a long way in explaining the strengthening of FDI flows to the country. Results from the EEC economies indicate that since large scale privatization is not on the radar, India needs to invest intensively in infrastructure development in order to receive sustained FDI flows, even if it means a trade off with higher government deficits in the short to medium term.

For the emerging European economies whose corporate sector is now facing an enormous challenge in terms of demand deficiency[10], the role of fiscal prudence could well become critical in attracting FDI in the near future. These countries are known to be export-dependent and have much of their trade with Western Europe, where the economic growth prospects are not very robust either. Thus trade an important determining factor is currently not encouraging FDI to the region. Also privatization opportunities which have so far fuelled FDI flows to these countries may eventually dry out while further infrastructure development as a means to attract FDI flows is definitely dependent on the level of fiscal balances which limits the government's ability to spend on development and maintain investor friendly tax-regimes.

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[9] This is very evident from the negative correlation between inward FDI to India and the indicators for success of reforms relating to business and foreign investment climate in the country. Particularly *IBF* denoting progress in ease of doing business has remained more or less stagnant over years in India, while the *INV*, denoting the ease of domestic and foreign investment in the country, has fluctuated and in fact fallen during recent years. As we have mentioned earlier India still does not have a comparable index to measure infrastructure development a factor that is understandably found to be a very important determinant of FDI to EECs in our country specific fixed-effects model.

[10] See for example Correa and Lootty (2010).

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