

Measuring the Impacts of FDI

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Introduction

It is about five years since I last surveyed the literature on impacts of FDI on host countries. There has been a flood of studies, and I try to keep track of them, but the research community writes faster than I can read.

In one sense the issue seems to have been decided. Policy making has come to ignore the ambiguous and inconclusive academic literature and, in most countries, has shifted away from measures restricting and discouraging inward FDI. Many countries have not only reduced or eliminated such restrictions, but also moved toward encouraging FDI with tax and other incentives. UNCTAD's compilations of regulatory changes by host countries since 1991 show that they have been overwhelmingly favorable to inward FDI, although recent years have seen more unfavorable changes, up to 20 percent in 2005, the highest share in the compilation. The unfavorable changes were concentrated in extractive industries and in Latin America (UNCTAD, 2006, pp. 24-25).

Something must have happened to influence so many countries' policies. I think I know what that something is. It is the success that a few countries have had in achieving rapid economic growth after moving from virtual prohibition of direct investment to active encouragement of it. Ireland and China are two notable and conspicuous examples of countries that reversed a long standing antipathy toward foreign

investors and have achieved rapid growth in which foreign-owned firms have played a very large part.

An aspect of the role of FDI that I think is almost beyond dispute is that much of the world's stock of technological knowledge is possessed by multinational firms. That can be seen partly in the fact that labor is so much more productive in these firms than outside them; multinationals probably produce more than 10 percent of the world's output, but employ only 1 or at most 2 percent of the world's labor. Whenever comparisons are made within countries, it appears that not only are foreign multinationals more productive than domestic firms in general, as measured by labor productivity or TFP, but among domestically-owned firms, those that are multinational are more efficient than non-multinational firms, even within the same industries and taking account of other factors affecting efficiency..

What is it that we want to know about the impacts of FDI? Quite often the issue is put in the context of the use of subsidies or other incentives specific to foreign-owned firms and the question posed is whether these subsidies are worth while. I think that that is the wrong context, and distorts the issue. The most important measures favorable to inward FDI in my view, are to remove prohibitions against it, to remove other measures that discriminate against foreign firms, to reduce or remove impediments to trade and open markets, and to improve governance.

One of the main technological advantages of foreign-owned firms is their knowledge of international markets and the ability to judge and compare the costs of different locations for production, particularly locations for fragments in long lines of production that extend across several countries. Subsidies and other preferential

arrangements can distort the choices of locations, leaving uneconomic white elephants after the preferential arrangements end. In some of the most successful cases of growth through exploiting foreign investment, the foreign firms have been able to look past host countries' current comparative advantages in exporting and to see potential comparative advantages that exploit the combination of the host country's resources with the technology and other knowledge of the foreign firms.

Many studies have asked whether attracting foreign firms will make a recipient country grow faster than it would without foreign investment or with only portfolio investment. Another economy-wide question that could be studied was the effect of inward investment on the growth of exports and the recipient country's share of world trade. Still another issue that used to absorb a lot of attention was the long-run effect of inward FDI on the host country's balance of payments, but that is a topic that I rarely see mentioned now. We seem to have decided that there are other factors that determine a country's balance of payments surpluses or deficits over long periods.

There is little reason to expect that the effects of inward investment should be the same for all host countries. A country with a long history of forbidding or discouraging inward investment that then opens up to it may have an industrial structure with large gaps in newer or more technologically advanced industries that investors can fill, while a country that has been open to investment may present a much more competitive milieu. A country that is open to trade may attract elements of firms' worldwide production that are combined with those in other countries before becoming final products, while a country that restricts trade or hinders it by inefficiency or corruption may not attract such investment. More generally, countries that provide reliable and predictable legal systems

and efficient public administration may receive more investment and profit more from it than countries with poor governance.

FDI flows very unevenly to the various sectors of an economy. As more disaggregated data became available, one could ask about the effects of FDI inflows on particular industrial sectors or regions, particularly the industries or regions receiving the investment, but also others that buy from or sell to those sectors. These questions have not usually been studied with balance of payments data, because their sectoral detail is poor in most countries and often is not closely related to the sectoral breakdown of employment, sales, physical capital stock, or production. Instead, these questions have been studied using data from production censuses in recipient countries, often confined to the manufacturing sector, or manufacturing and mining.

Not only are sectors affected differently, but not every firm within a sector is likely to be affected in the same way by the entrance or expansion of foreign-owned firms. The firms with the most up-to-date technologies may respond differently from those that were laggards. Large firms may fare differently from small firms. Exporting firms may respond differently from completely domestic firms. All these questions require a different kind of data for research. The questions can be reliably answered only with the use of firm or establishment microdata, in which individual firms' attributes can be related to their subsequent performance. With these individual firm data, we can now sometimes ask what happens to a particular domestically-owned firm that becomes foreign-owned or to a foreign-owned firm that becomes domestically-owned, and to other firms in the same industry or location.

The latest development, still at an early stage, is that we are beginning to get data on individual workers within the individual firms. With such data we can begin to see what happens to workers of different types, different skills, experience, and education, when their employers become foreign-owned, or cease to be so.

I may appear somewhat cavalierly dismissive of country studies based on balance-of-payments measures, but I will explain why. And with my dismissal I will add the confession that I have done a number of such studies, and what I say about them applies to my studies as well as to others'.

Impacts of Inward FDI on Multicountry Host Country Growth

There have many attempts over the years to test whether any general relationship could be found between inflows of FDI to a host country and host country economic growth. The only data on such inflows, or the resulting stocks of direct investment capital, covering many countries and long periods, are those based on financial flows, as recorded in balances of payments and national accounts.

In contrast, most theories about how FDI might accelerate growth in a host country rely on the effects of foreign-owned production taking place there. Production by foreign multinationals might raise the level of competition in the host economy, bring superior technology that could be used by the foreign-owned producer or imitated by domestic firms, train host country workers in more efficient production methods, which they would use in working for the foreign firm or carry with them to other firms, etc. I don't want to catalogue all the possible channels of transmission, but to emphasize that they depend on a foreign presence that involves production in the host country.

Data on such FDI exist for only a few countries, mostly for short periods. Where they do exist, such as for the United States, we can compare them with the FDI flow and stock data. Are the balance of payments and national accounts data good indicators of the extent of FDI production, capital stock, or employment in a country? The short answer is that they are not wholly inaccurate, but very rough, measures of the country distribution of FDI production, employment, and fixed capital at any one time, but very poor measures of changes over time. Thus, when we use the balance of payments measures to proxy for FDI production or employment changes, we are observing the latter through a thick fog. I have dealt with this issue elsewhere, but just a couple of examples make the point. Hong Kong is the largest outward investor among developing countries, but half of Hong Kong's stock of outward FDI was in four tax havens, the British Virgin Islands, Bermuda, Panama, and the Cayman Islands, according to UNCTAD (2004, p. 26). I think we can be sure that the productive activity involved, if there was any, was not in those locations. Luxembourg was reported to be the world's largest recipient of FDI in 2002, accounting for 19 percent of all the world's inflows "...because it offers favorable conditions for holding companies and for corporate HQ, such as certain tax exemptions" (UNCTAD 2003, p. 69). We can be sure that if any production was being financed, it did not take place in Luxembourg. The BEA reported (Koncz and Yorgason, 2005, p. 45) that the share of holding companies in the U.S. investment position abroad reached more than a third in 2004, concealing both the location and the industry composition of any associated production.

I have taken my turn at trying to measure FDI-growth relationships with these balance of payments data (Lipsey, 2000 and 2003), but found answers elusive. I

concluded (Lipsev, 2004) that "...attempts to find a consistent relation between the extent of FDI inflows and national economic growth do not produce strong and consistent relationships" p. 371).

A recent and more sophisticated analysis of the same basic type of data by Carkovic and Levine (2005) concluded that "...the exogenous component of FDI does not exert a robust, positive influence on economic growth" and that "...there is no reliable cross-country empirical evidence supporting the claim that FDI per se accelerates economic growth" (p. 197). The negative conclusion is expressed cautiously: "...after controlling for the joint determination of growth and foreign capital flows, country-specific factors and other growth determinants, the data do not suggest a strong, independent impact of FDI on economic growth" (p. 198). The policy indications drawn are that the study's analyses "do not support special tax breaks and subsidies to attract foreign capital...sound policies encourage economic growth and also provide an attractive environment for foreign investment" (p. 198). Finally, "...the results are inconsistent with the view that FDI exerts a positive impact on growth that is independent of other growth determinants" (p. 219).

In his comments on these results, Melitz (2005) challenged part of the interpretation, pointing out that the results that do not include controls for trade openness, but do control for many other country characteristics, show a positive relation of FDI to growth. Melitz noted that vertical FDI implies trade, and that both are determined by country policy toward trade and investment. In that case, controlling for trade openness wipes out the relationship between the combination of trade and investment and economic growth. Another possible interpretation of the role of trade openness is that

the combination of FDI and with trade tends to distinguish what I am tempted to call “genuine” FDI stocks, that is, FDI stocks associated with production, from financial FDI stocks that have no production attached to them.

The connection between the benefits from inward FDI and the trade policy of the host country echoes an earlier suggestion by Bhagwati (1978), confirmed to some extent by Balasubramanian, Salisu, and Sapsford (1996), that growth effects of FDI could be positive or negative, with negative effects associated with import-substitution policies. Carkovic and Levine do use an interaction term between openness to trade and FDI in some formulations and report that it is significant in some panel regressions but not in others, a result that they report as a finding that the connection is “not robust” (p. 211).

One lesson that Carkovic and Levine draw from their study is that the results “...do not support special tax breaks and subsidies to attract foreign capital” (p. 198). In one sense this conclusion does not clash with the comment by Melitz. Inward FDI attracted by an open trade regime may conform to existing or potential comparative advantages in trade, but FDI attracted by tax breaks or subsidies, especially if protection is part of the incentives, may be more likely to fit badly with the host country’s comparative advantages and may be less likely to be associated with enlarged trade. Moran’s (2005) paper in the same volume gives many examples of such ill-fitting foreign investments.

A recent strand in these multicountry studies has been to suggest that well developed financial markets in host countries are the key to host country productivity benefits. Some of this literature and empirical studies along the same lines, mostly

pointing to productivity gains in upstream industries, are discussed in Alfaro, Chanda, Kalemli-Ozcan, and Sayek (2006).

All of these analyses assume that the balance of payments data on FDI really do measure the amount of foreign-owned production in a host country. In fact, they do not, for many reasons. Even if they are correctly measured by the principles laid down by the IMF (1993), and many countries' reports do not, the data do not measure either output or input in the host country. For one thing, the reported country of location of FDI represents only the first stop on what may be a long trek from the originating country to the location where production takes place, a stop determined by tax or other financial considerations rather than suitability as a production location. Furthermore, since a large part of the exported FDI capital may be intangible, or intellectual, capital, it has no discernable geographical location. Its only real location is its ownership within the multinational firm. The parent firm can choose a nominal geographical location, usually for tax minimization, but use the asset in production anywhere in the world.

In view of the ambiguity in the meaning of the location of financial flows and stocks of FDI, a better summary of the results of analyzing these data might be that the conventional measures of flows and stocks of FDI do not appear to unambiguously determine or affect host country economic growth, but that the combination of FDI and open trade policy serves to distinguish those flows or stocks of FDI that are associated with production in a country from those that are just passing through or represent an internal allocation of intangible property to that country without any link to local production. These flows or stocks or these combined with open trade policy do seem to

promote host country growth. I might note also that even the studies that take a skeptical view of this relationship rarely find a negative effect of FDI.

One study of FDI inflows and aggregate economic growth was confined to the CEE countries and those of the former Soviet Union, justifying that scope by the argument that the backwardness of these countries meant that the FDI there represented more of a pure case of technology transfer than elsewhere (Campos and Kinoshita, 2002). The conclusion in that case was that for these countries, the relationship was "...positive, significant, and robust" (p. 417).

Given the defects of the balance of payments data, and the lack of a clear connection with FDI production, my conclusion is that, for large groups of countries, they are a dead end for research on the effects of FDI and are not worth further pursuit or efforts at refinement. Aside from the deficiencies of the data I have described, my suspicion is that, despite the efforts of the IMF to push for uniform standards of reporting, the FDI data are deteriorating, rather than improving, because they are dependent on firms' bookkeeping, and, as I have described elsewhere, firms are becoming more adept at manipulating the bookkeeping for tax minimization purposes.

If we accept the idea that little can be learned from studies in which FDI is represented by balance of payments flows and stocks, we are led to studies that measure FDI by production, sales, labor input, or capital input. These variables are available for much smaller groups of countries, but they have the advantage that they can be subdivided by industry. In some cases, they can be subdivided also into individual firms or establishments, or into groupings of firms based on their individual characteristics. I will review some of these industry and firm studies concentrating on Central and Eastern

Europe where the individual countries have had the common experience of moving from economies based on central planning, with little foreign involvement, to various degrees of private enterprise, encouragement of inward investment, attractiveness to foreign firms, and different trade policy. After a quick survey of FDI in Central and Eastern Europe, I will summarize recent studies of effects on productivity and wages, including impacts on domestically-owned firms, and studies on the location of FDI in the CEE countries.

The countries of Central and Eastern Europe as Locations for FDI

For someone who has studied mainly intercontinental flows of FDI, the countries of Central and Eastern Europe (CEE) were always a minor footnote. And of course, until 1990, they hardly merited even a footnote. They are very recent arrivals in the FDI landscape.

The CEE countries are, along with China and Ireland, interesting laboratories in which to observe the impact of inward FDI. For the most part, they had not been recipients of FDI to any important degree before 1990 (the conversion of Ireland to welcoming FDI had come much earlier). In 1990, the CEE countries were far below the average country with respect to inward FDI stocks, considering their size. For example, if we fit a log equation explaining the reported inward FDI stock across about 150 countries in 1990 by real (purchasing power adjusted) gross output, it explains about 60 percent of the variance across countries. Most of the CEE countries did not report any inward FDI at all, and the ones that did, Czechoslovakia, Hungary, and Poland, reported stocks that were 40 percent of the predicted value (Czechoslovakia) or much less. After 1990, the CEE countries lowered the barriers to FDI to varying degrees. Of course, many

other developments were taking place at the same time: increasing openness to trade, privatization of previously government-owned production, and many other changes as these countries moved in various degrees from socialist to market economies and democratic governments.

By 2003, the last year for which we have a full set of countries reporting inward FDI stocks, a similar log equation explained about two thirds of the variance in inward FDI stocks, and all of the CEE countries reported some amounts. The equation predicted inward FDI levels far higher than those predicted for 1990, four to six times as high, but by that time the inward stocks in the Czech Republic, Estonia, Hungary, Poland, and the Slovak Republic far surpassed the predicted levels (Table 1). FDI in Latvia, Lithuania, Romania, and Slovenia was close to the predicted values and only Bulgaria was well below, as was China, despite the huge flows to that country.

Many studies of the location of FDI now include measures of governance or other institutional quality that are not readily quantifiable but seem to influence corporate decisions. The World Bank has been issuing governance indicators covering almost a decade now, and these provide some picture of the changes taking place in the CEE countries in this respect.

The most striking change for the CEE countries has been the improvement in all their measures of governance since the first ones in 1996. For the six governance measures calculated by the World Bank (Kaufmann, Kraay, and Mastruzzi, 2006), the average score for the CEE countries in 1996 was only 22 percent of the average of the 15 pre-1995 EU members (Table 2). By 2005, the ratio had reached 48 percent. Some of

Table 1: Inward FDI Stocks and Stocks Predicted From Country Real Gross Product, CEE Countries and China, 2003 [Millions of USD]

$$(\text{Log FDI Stock}) = -1.7487 + 0.9505 \times (\text{Log RGDP})^a$$

Country	Actual FDI Stock	Predicted FDI Stock
China	228,371	546,708
Bulgaria	5,082	6,848
Czech Republic	45,287	16,127
Estonia	6,511	2,140
Hungary	48,320	13,973
Latvia	3,282	2,892
Lithuania	4,960	4,453
Poland	55,268	34,729
Romania	12,815	14,193
Slovak Republic	11,864	6,285
Slovenia	4,446	4,319

Note:

a). Adj. R-squared = 0.6694; Prob. F = 0.0000; No. of obs. = 154

Source:

Penn World Table 6.2 by Heston, Summers and Aten (Sept. 2006).

UNCTAD Foreign Direct Investment Database (downloaded on Nov. 3rd, 2006).

Table 2: World Bank Average of Governance Ratings, 1996 and 2003, and Global Competitiveness Rankings, 2005

Country	Governance Scores		Global Competitiveness Rankings
	1996	2003	2005
China	-0.33	-0.50	48
EU-15	1.44	1.42	18
Spain	1.03	1.17	28
Portugal	1.21	1.25	31
Italy	0.74	0.83	38
Greece	0.64	0.79	47
CEE Countries	0.32	0.67	40
Bulgaria	-0.25	0.20	61
Czech Republic	0.77	0.78	29
Estonia	0.58	1.01	26
Hungary	0.62	0.89	35
Latvia	0.11	0.76	39
Lithuania	0.16	0.81	34
Poland	0.52	0.63	43
Romania	-0.29	-0.04	67
Slovak Republic	0.28	0.67	36
Slovenia	0.74	1.00	30

Source:

Kaufmann, Kraay, and Mastruzzi (2006).

World Economic Forum (2006).

countries score higher than Italy or Greece in 2005, but only the Czech Republic had scored higher than both of them in 1996. The improvement in governance may have helped to attract inflows of FDI, but it could also be that the hope of attracting FDI led to the improvements in governance.

Another rating of the economic environment in each country is provided by the overall competitiveness rankings of the Global Competitiveness Reports (World Economic Forum, 2006). For 2006, the average ranking of the CEE countries was 43, while the average among the EU-15 was 19. Estonia, followed by the Czech Republic, followed by Slovenia, were the leaders among the CEE countries, not far behind the EU average, but some of the CEE countries ranked much lower. In this ranking, the more attractive CEE countries outranked both Greece and Italy, and were close to Portugal and Spain.

Most of the progress in the governance ratings for CEE countries since 1996 took place between 1996 and 2003. Since then, the average has been roughly constant, even slipping back a little. It may be no coincidence that they applied for EU membership between 1994 and 1996 and most of them entered the EU in 2004. The improvement in governance, intended to facilitate or permit EU entry, may have had the secondary effect of encouraging inward FDI. That reflects a persistent problem of analysis; the effects of joining the EU or of receiving inward FDI are mixed with the effects of actions aimed at achieving EU membership or encouraging inward investment.

If we add the World Bank governance scores (in arithmetic form, since they can be negative) to the prediction of the level of inward FDI, the percent of variance in FDI

levels explained rises from 67 to 77 percent, and the predicted values for most countries listed are higher (Table 3), a little closer to the actual values, but still below them, except in Estonia, Latvia, Lithuania, and Slovenia, four of the smallest countries. That discrepancy points to non-linearity in the relation of host country GDP to inward investment.

Outward FDI data from U.S. surveys provide the fullest information on what foreign affiliates actually do, but the CEE countries have never been a major destination for U.S. investment. In 2003, they accounted for about 2.7 percent of the employment in U.S. affiliates, 0.4 percent of assets, and 1.5 percent of net property, plant, and equipment (U.S., BEA Web site).. What we can see from the data that do exist, dominated by the Czech Republic, Hungary, and Poland, is that for U.S. multinationals, the attraction of these countries is for labor-intensive activities. The average assets per worker of U.S. affiliates in the CEE countries in 2003 was around \$150,000, lower than the ratio in Latin America, at a little over \$200 thousand, and much lower than that in Developing Asia, at about \$430 thousand. The average for affiliates in the pre-1995 EU was around \$1.3 million (Table 4). The U.S. investments were concentrated in manufacturing and, within manufacturing, in Transport equipment, plus, Electrical machinery in Hungary and Foods in Poland (Mataloni, 2005).

For Germany, in contrast to the United States, the CEE countries were a major location for FDI. In 2004, they accounted for over 16 percent of the employment in German firms' affiliates, but for only 3 percent of assets. That large difference reflects the low capital intensity of these investments. The average assets per employee in 2003, 1.2 million euros worldwide, 1.5 million euros in the United States, and 1.8 million

Euros in the 15 pre-1995 EU area, were only about 200 thousand euros in the CEE countries as a group. That was above the 170 thousand levels in Latin American affiliates and the 160 thousand in China, but far below that in Other Developing Asia, at over 600,000 euros (Table 5).

**Table 3: Equation Predicting Inward FDI Stock From Host Country
Real Output and Governance, 2003 [Millions of USD]**

$$(\text{Log FDI Stock}) = -0.6311 + 0.8399 \times (\text{Log RGDP}) + 0.9681 \times \text{Governance}^a$$

Country	Actual FDI Stock	Predicted FDI Stock
China	228,371	180,979
Bulgaria	5,082	7,437
Czech Republic	45,287	27,830
Estonia	6,511	5,797
Hungary	48,320	27,158
Latvia	3,282	5,973
Lithuania	4,960	9,146
Poland	55,268	47,040
Romania	12,815	11,198
Slovak Republic	11,864	10,868
Slovenia	4,446	10,747

Source:

Penn World Table 6.2 by Heston, Summers and Aten (Sept. 2006).

UNCTAD Foreign Direct Investment Database (downloaded on Nov. 3rd, 2006).

Kaufmann, Kraay, and Mastruzzi (2006).

**Table 4: Characteristics of U.S. FDI in CEE Countries and Other Locations, 2003
[Millions of USD]**

	Compensation Per Employee	Assets Per Employee	Compensation Relative to Sales
World	0.035	0.893	0.102
EU-15	0.050	1.295	0.125
China	0.008	0.131	0.057
Latin America	0.016	0.207	0.096
Developing Asia ¹	0.016	0.431	0.056
CEE ²	0.013	0.148	0.081
Bulgaria	0.007	0.059	0.142
Czech Republic	0.012	0.148	0.083
Estonia	0.011	0.098	0.101
Hungary	0.015	0.178	0.075
Latvia	0.018	0.263	0.060
Lithuania	0.015	0.127	0.111
Poland	0.014	0.162	0.081
Romania	0.007	0.066	0.083
Slovak Republic	0.013	0.107	0.086
Slovenia	0.020	0.187	0.126

Note:

1. Asia and Pacific, except Australia, Japan, and New Zealand.
2. For employment data, if an interval is given, the midpoint is used for calculation.

Source:

BEA Website

Table 5: Total Assets Per Employee of German FDI in CEE Countries and Other Locations, 2003 [Millions of USD]

	Total Assets Per Employee
World	1.209
EU-15	1.814
China	0.161
Latin America	0.168
Developing Asia ¹	0.635
CEE ²	0.207
Bulgaria	0.134
Czech Republic	0.222
Estonia	0.113
Hungary	0.259
Latvia	0.090
Lithuania	0.106
Poland	0.226
Romania	0.054
Slovak Republic	0.163
Slovenia	0.213

Note:

1. Asia and Pacific, except Australia, Japan, and New Zealand.

2. For employment data, if an interval is given, the average is used for calculation.

Source:

Deutsche Bundesbank (2006)

Table 6: Industry Distribution of German Direct Investment In Manufacturing In CEE Countries, 1991-2004 [%]

	Total CEE	Poland	Slovakia	Czech Republic	Hungary	Romania
1992 -1994						
Chemicals				7	12	
Non-Electrical Machinery & Equipment				15	12	
Electrical Machinery				18	11	
Motor Vehicles				60	45	
2002-2004						
Chemicals	10	24	6	7	6	21
Non-Electrical Machinery & Equipment	10	13	16	9	8	21
Electrical Machinery	12	11	3	20	7	31
Motor Vehicles	68	53	74	64	78	27

Source: Deutsche Bundesbank (1997) and (2006).

German manufacturing investment in the CEE countries was remarkably concentrated in Motor vehicles, even in 1992-94, in the two countries for which we have data by industry (Table 6). By 2002-2004, the concentration in that industry had increased, and was quite general across the CEE countries. By then, two thirds of the German investment was in Motor vehicles and it was the leading industry group in the Czech Republic, Hungary, Poland, and Slovakia. Romania was the exception, with Electrical machinery the leading sector, followed by Motor vehicles, Chemicals, and Non-electrical machinery.

One probable result of the industry concentration of German FDI in these countries can be seen in the changes that took place in the revealed export comparative advantages of the countries. In 9 of the 11 countries during the 1990s, the comparative advantage in Machinery and transport equipment increased or the comparative disadvantage decreased.

A few observations are suggested by the aggregate inflows from balance of payments data. One is that there was a clear positive relationship between countries' average governance scores and per capita FDI inflows over the 1990s. Bulgaria and Romania had the lowest governance scores and the lowest inflows of FDI per capita. The Czech Republic, Hungary, and Estonia had the highest governance scores and the highest inflows per capita. The main outlier was Slovenia, with the highest average governance score but only average FDI inflows per capita. Governance scores did not have as clear a relation to the ratio of inflows to nominal GDP, although the relationship was mostly positive, except again for the Slovenia outlier.

Studies Based on Firm and Industry Data

The CEE countries have been a focus of studies based on firm microdata, some performed or financed by the World Bank. Some of these distinguished foreign-owned from domestically-owned firms. Unfortunately, the periods covered are usually short, rarely more than five years, so the span over which any effects of foreign ownership can be observed is necessarily a short one.

All the CEE countries have received some attention, but the more important FDI destinations have received more attention than the smaller ones. An impressive degree of care has been given to problems of dealing with short panels, unbalanced panels, endogeneity, the clustering of observations and its effect on measures of standard errors, and different ways of dealing with panel data. Studies have examined effects of foreign investment on the recipient firm, spillovers of productivity to indigenous firms, and the entry and exit of indigenous firms.

On the whole, the microdata studies on the CEE countries, based on firm rather than establishment data sets, suggest most strongly that foreign participation increases the productivity of the affiliate itself (for example, Evenett and Voicu (2001) for the Czech Republic, Hannula and Tamm, 2002, for Estonia, Damijan, Knell, Majcen, and Rojec, 2003, for 10 countries). In a study concerned with the effects of privatization in two CEE countries (Hungary and Romania) and Russia and Ukraine, Brown, Earle, and Telegdy found that privatizations to foreigners led to growth in the privatized firms' total wage bills. In the two CEE countries, the growth consisted of both increases in employment and increases in average wage levels. The wage gains reflected gains in productivity in these privatizations.

There is some, but weaker evidence for intra-industry productivity spillovers from foreign-owned to domestically-owned firms (Hannula and Tamm, 2002, for Estonia), and evidence for intra-industry spillovers from wholly-owned foreign firms, but not joint ventures in Romania according to Javorcik and Spatareanu (2003). Another study of Romania (Altomonte and Pennings, 2005) found positive intra-industry effects on domestic firms' productivity from initial foreign investments in an industry and region, but weaker effects and eventually negative ones as the foreign share grew. In a study mainly devoted to the question of "crowding out" of domestically-owned firms by foreign-owned ones, Kosová (2005) found evidence of intra-industry technology spillovers in the Czech Republic. She also found evidence that the entry of foreign-owned firms initially increased the exit rate of domestically-owned firms in the same industry, but that after the initial setback, higher growth of foreign-owned firms represented domestic demand creation that increased both the growth rates and the survival of domestically-owned firms.

Javorcik and Spatareanu (2003) found that joint ventures produced positive upstream spillovers to suppliers, while wholly-owned foreign firms produced negative upstream spillovers, probably because joint ventures tended to continue long-standing relationships with suppliers while wholly-owned foreign firms, using more advanced technology, require more sophisticated suppliers from abroad. It might also be, although that is not suggested by the authors, that wholly-owned firms are more likely to be part of multinationals' internal supply chains and therefore more likely to depend on associated firms in other countries for intermediate products, although that may not be an important aspect of supplier choices for affiliates in the CEE countries. An earlier paper by

Javorcik (2004), this one for Lithuania, had also found evidence of spillovers to upstream industries but not intra-industry, and also, as in the Romanian study, for joint ventures but not for firms that were wholly foreign-owned.

There have been quite a few recent studies attempting to explain what attracts FDI, or particularly, German FDI to the CEE countries. A paper by Bellak and Leibnecht (2005) studies FDI inflows into eight CEE countries from seven home countries, arguing that for those countries, FDI flows are "...a reasonable proxy of the annual change in property, plant, and equipment..." (p. 8). Since six of the seven home countries are in Europe, the coefficient of the distance variable, sometimes significant and sometimes not, may be strongly influenced by U.S. investment flows. As expected, host country size is positively related to the inflow and the actual, rather than the statutory, bilateral tax rate is negatively related. Another paper using balance of payments measures, in this case the inward FDI stock, but including also the countries of the former Soviet Union, Kinoshita and Campos (2003), refers to these as forming "a unique situation akin to a natural experiment..." (p. 1). Since the data are not bilateral, the distance is measured from Brussels for all host countries. The results point to institutions, specifically rule of law and quality of bureaucracy, low labor costs, trade openness, progress towards economic reform, and past FDI, interpreted as agglomeration advantages. No tax variable is included.

Another gravity model paper, Borrmann, Jungnickel, and Keller (2005) explains German FDI production, rather than bilateral financial flows), but with no tax variable. It finds that German FDI production in "core" CEE countries already exceeded "normal"

levels in 2001, but is reluctant to describe this high level as “overshooting” that would imply future reductions or even a slowing of growth.

Although German affiliates in the CEE countries are clearly more labor intensive than those in the rest of Europe, Buch and Kleinert (2006) find that market access, and not only low production cost, is a major incentive to invest in the CEE countries. Low parent labor intensity is associated with outward FDI in general, in the West as well as in the East.

The issue of what determines the choice of locations among the CEE countries is less important for political and policy discussions in home countries than the choice between home production in Germany and production in the CEE countries. Becker and Müндler (2006) calculate the effects of changes in wages in Germany and in the CEE countries on the allocation of employment by German multinational firms. The effects are on the establishment of new foreign locations, the locations of which then tend to be stable, and on the allocation of jobs between home and existing foreign locations. They find significant effects on a firm’s location of employment from wage changes both at home and abroad, which they describe as “...a salient impact on multinational labor substitution...” (p. 44).

The omission of tax rates from many studies was something of a surprise. However, I might mention that in response to a call for papers for a workshop on studies of FDI based on microdata, we received many proposals for papers dealing with the influence of tax rates, including proposals dealing with European FDI. That seems to suggest that the issue is becoming more important for European countries.

Despite my belief that microdata are the road to progress in understanding FDI, there are some general issues that I think should be kept in mind.

One issue in studies comparing domestically-owned and foreign-owned plants or firms is whether the differences that are observed are the consequence of foreign ownership, with its accompanying superior technology and efficiency, or are only the result of differences in the size of plants, their use of intermediate inputs, their dependence on imported intermediate inputs, their capital intensity, or other measurable differences in their structure. If all these differences are taken into account, it is presumably possible to know, provided that there is substantial overlap between domestic and foreign plants in their characteristics, and that they are producing the same goods or services, of the same quality, whether foreign- owned and domestically-owned plants produce on different production functions.

My impression is that usually these conditions are not met. Industrial data rarely are detailed enough to permit comparisons of quality, domestically-owned plants are usually much smaller on average than foreign-owned plants (that is true in the United States as it is in developing countries), inputs of intermediate products are often proprietary and not available to domestically-owned firms, and the technology needed to operate a large plant may be unavailable to a domestic producer. My conclusion is that we should not confine our interest to differences between foreign-owned and domestically-owned plants that can be unequivocally attributed to foreignness. We should study also differences that are associated with foreign ownership but cannot be attributed unequivocally to that foreign origin.

Another general problem is how to draw conclusions about the economy as a whole from microdata. For example, a finding that a rise in wages at home leads multinationals to substitute X jobs in its foreign affiliates for jobs at home tells us what will happen to that firm's employment at home but does not tell us what the effect on aggregate home employment will be, if any, or whether the effect will be on home wages or the distribution of employment among firms or the composition of home production. It is difficult to go from the effects on the firm, which are in the microdata set, to broader impacts that may be outside the data. When a state or locality in the United States offers incentives to a large new foreign manufacturing operation, it may be hoping for, and/or fearing, impacts on agriculture and retail trade, as farm and retail workers shift to better paying manufacturing jobs, and on wages in these industries as well as in manufacturing. There may also be impacts on local and state government budgets, as subsidy costs compete with traditional government activities, and changes in the population and labor force in response to the industrial changes. It is a challenge to keep in mind, and preferably to explore, these broader consequences of industrial change.

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