

HOW TO ASSESS THE IMPACT OF FDI ON AN ECONOMY



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FORWARD

This concept paper has been prepared by Gábor Hunya, Mario Holzner and Julia Wörz of the Vienna Institute for International Economic Studies (wiiw). It was commissioned by the OECD Investment Compact as part of the European Commission 2003 Community Assistance for Reconstruction, Development and Stabilisation (CARDS) funded project, Strengthening Development and Implementation of Investment and Trade Policy in the Western Balkans (SEESat).

SEESat was initiated to help governments improve their policies to encourage more and better foreign direct investment (FDI). The SEESat Project has two objectives. The first is to coach countries on improving the quality of their investment statistics, especially by ensuring that they are in line with international standards (i.e. IMF/OECD standards on compiling FDI statistics). The second objective involves improving the ability of users of FDI statistics to evaluate the economic impact of FDI.

This concept paper was commissioned to assist in meeting the second objective by providing SEE countries with a beginning overview of how to conduct FDI impact evaluations. An earlier draft was presented on 30 October 2006 in Zagreb, Croatia, at the SEESat workshop on 'Evaluating the Impact of Foreign Direct Investment in the Western Balkans – Case Studies and Practical Tools,' where it was well-received. This workshop was attended by government officials, international organisations and independent research organisations. It was organised by the Investment Compact, in collaboration with the Croatian Ministry of Economy, Labour and Entrepreneurship and the Croatian Trade and Investment Promotion Agency.

This concept paper is one in a series of SEESat studies. The other titles in the series are: *The Role of Foreign Direct Investment in the Croatian Economy*, *The Impact of Foreign Direct Investment on the Restructuring of the Metal Processing Industry in Bosnia and Herzegovina*, and *How South East European Countries' Statistics Measure FDI*.

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1 INTRODUCTION

The aim of this paper is to show how statistical resources can be used to support economic policy and government decision-making. The policy area under discussion is the impact of FDI on a host economy.

In Part I we go through all the main categories of available statistical resources. We indicate for what purpose, and using what methodology, they can be analysed. This part presents simple analytical methods, and the ways in which different data resources can be linked. We look at FDI statistics provided by national banks (Section I/A), foreign investment enterprise (FIE) data (Section I/B) and company level data and information (e.g. derived from in-company surveys) (Section I/C).

In Part II we present a sample of basic analytical tools applied in FDI impact analysis. A series of simple regression equations are provided. Their purpose is to explain the impact of FDI on economic growth, GDP, exports, productivity and employment.

In Part III we examine the current stage of empirical research concerning FDI's impact on a host economy, based on the international literature. These sources are sophisticated in their methodology, but rely on more simple, internationally available data than those available to national governments. We include sources from two main areas of FDI research: international economics and international business. These sources refer to the impact of FDI on economic growth, the absorption capacity of host countries, and export-oriented vs. local market-oriented FDI. The methods in the sources cited are adaptable to situations in individual countries. Readers interested in the basic problems of FDI impact analysis may wish to start with Part III, and then proceed to Part I.

2 FDI IMPACT ANALYSIS SUPPORTED BY NATIONAL AND COMPANY DATA¹

2.1 Analysis using FDI data from the balance of payments and international investment position (national bank data)

1. *Net FDI position*

The aim here is to ascertain a country's position on the investment-development path. FDI inflow minus outflow – net FDI – shows this position (Dunning and Narula, 1996; Bellak, 2001). FDI inflow received by countries in the process of development take-off is usually greater than the amount they invest abroad. At an advanced stage, countries become net FDI exporters or their investment position fluctuates around neutral. National FDI data are available in the UN Conference on Trade and Development (UNCTAD) *World Investment Report* (www.unctad.org/Templates/WebFlyer.asp?intItemID=3968&lang=1). For CEE and SEE countries, the wiiw Database on FDI can be used (Hunya and Schwarzhappel, 2005; <http://wiiw.ac.at>). These data sources may be used for all the types of analysis described in this section.

2. *Relative size of FDI inflow*

A country's size and level of development influence the size of FDI it receives. For international comparisons, it is appropriate to use the relative size of FDI. The most widespread indicators are FDI per capita and FDI per gross fixed capital formation.

3. *Inward FDI stock*

The cumulated amount of FDI in a country reflects its longer-term attractiveness. International comparisons can be made on a per capita or per GDP basis.

4. *FDI potential and performance*

To obtain a more sophisticated picture concerning the international position of a country, it is necessary to look at the FDI potential and FDI performance indices. This information is published in the annual UNCTAD *World Investment Report*. Policymakers can find out whether a certain country's attractiveness is below or above its potential, and the reason for this can be identified by comparing the components of each indicator.

5. *Impact of FDI on economic growth*

1. This chapter is by Gábor Hunya, wiiw.

For an analysis of impact on growth, exports, etc. there is a wide literature concerning various regression models. Most models use FDI flow or stock data and relate these data to various economic and social indicators. (See Sections II and III.)

6. FDI flows by form (equity capital, reinvestment, other capital)

The aim here is to find out: What form of FDI is arriving in a country? And which form of FDI is more stable or more volatile? Investment promotion must be aware of differences between the behaviour of each investment type. Mature economies get more FDI in the form of reinvestment than in the form of new equity. While at an early stage of FDI attracting new equity investment can be a predominant target, in mature countries reinvestment of FDI earnings may need to be stimulated.

7. FDI by investing countries

All the above exercises can be repeated with bilateral FDI data which reveal the specific behaviour of investors from one or the other country. Specific FDI impacts or forms may imply specific promotion strategies. If important investing countries are missing in a host country, the specific reasons can be discovered and corrected. Policy may determine whether diversification of FDI between countries, or a concentrated deepening of FDI from major home countries, is encouraged.

8. FDI inward stock and inflow by economic activity

The aim here is to support sectoral policy. The more detailed the available breakdown of inflows and stocks, the better. The NACE 2-digit level is basic; the 3-digit level can be more useful. Trends in time, and comparisons with similar target countries, can reveal the direction of a country's specialisation and its strong and weak points.

When one is not interested in specialisation by individual industries, manufacturing industries can be grouped by technological levels. There is a whole literature on structural shifts and upgrading (Damijan and Rojec, 2004). A comparison of the FDI structure with that of exports is useful. Econometric studies can help to determine more precisely the impact of FDI on exports. For these studies it is better to use manufacturing sector FDI than total FDI, as it is mainly manufacturing that produces internationally traded goods.

9. FDI-related incomes

Income outflow related to inward FDI, in the form of profits and other earnings, is available from the current account. The relative size of income related to FDI stock can be calculated to show the rate of return enjoyed by owners of FDI capital. This is a reminder that FDI is not a free lunch. The inflow of capital implies the outflow of earnings. Look at the breakdown of FDI income into repatriated and reinvested earnings: a high share of repatriation may suggest that investors are not satisfied with a country's business environment and growth prospects.

10. FDI by entry mode

This information is available if requested in the company survey of the national bank. Equity capital can be sorted by entry modes: establishment of a new company, privatisation and M&A² of a private company. There can also be follow-up investments in these three types. Different types of FDI in different industries can be found. If greenfield FDI is missing in manufacturing, it may need promotion. The problem with analysing such data is that we are not able to do much international comparison, and we do not have a standard method to determine what type of investment is too little or too much.

11. Further information

Questionnaires by national banks surveying FDI inflows and forms of FDI may ask more than just the standard questions. They may also ask companies to identify FDI by entry mode: greenfield investments vs. M&A. This is very useful for promotion purposes in order to obtain the amount of greenfield FDI. Further information can also be requested by the questionnaire, e.g. production, employment, exports, and investments in each industry and by mode of establishment. In this way, the impact of FDI through the two forms of entry on other indicators can be determined. The analysis can be carried out by industry and over time. For example, a relevant question would be: How does employment develop in foreign acquired companies one, two or three years (etc.) after foreign takeover? (See impact analysis below.)

Examples are given below of possible information concerning the entry mode of FDI and types of foreign affiliates, as found in the Croatian National Bank database. Equity inflows are broken down into eight categories, according to transaction type or mode of entry. First, each foreign investment enterprise (FIE) that is required to report its direct investment must define the foreign direct investor's mode of entry. This could be:

- Newly established company, completely owned by foreign investor(s);
- Newly established company, partly owned by foreign investor(s) (10% threshold is applied for an individual investor);
- Privatisation-related mode of entry;
- Acquisitions other than privatisation-related.

This information on type of FIE is further combined with an individual equity transaction code describing the transaction type. This could be:

- Set-up capital;
- New (fresh) capital;
- Privatisation-related transaction;
- Acquisition other than through privatisation.

2. Merger and acquisition.

If we ignore impossible combinations (e.g. set-up capital for a privatised company), combining the above classifications leads to 12 possible equity investment types. These are:

1. Set-up capital in newly established FIEs, completely owned by foreigners;
2. Set-up capital in newly established FIEs, partly owned by foreigners;
3. New (fresh) capital in newly established FIEs, completely owned by foreigners;
4. New (fresh) capital in newly established FIEs, partly owned by foreigners;
5. Acquisition of newly established FIEs, completely owned by foreigners;
6. Acquisition of newly established FIEs, partly owned by foreigners;
7. Privatisation-related equity transaction;
8. New (fresh) capital in privatised FIEs;
9. Acquisition of previously privatised FIEs;
10. Acquisition other than through privatisation;
11. New (fresh) capital in acquired FIEs;
12. Further acquisitions of already acquired FIEs.

Information from the Croatian National Bank database has been widely analysed by Hunya and Skudar (2007).

Another example is the Austrian National Bank's publication of the results of the annual FDI survey. Among other indicators, it contains employment, turnover and intra-company trade data on Austrian subsidiaries abroad and foreign subsidiaries in Austria. This database is used to identify various characteristics and to develop policy conclusions (Siebner, 2006).

2.2 Analysis using foreign investment enterprise data

Information on the employment, output and other balance sheet data of foreign investment enterprises (FIEs) (i.e. at least one foreign owner holds 10% or more of the company's equity) or of foreign affiliated companies (more than 50% of equity is foreign-owned) is necessary in order to acquire detailed information on the foreign sector and compare its characteristics with those of domestically owned companies.

EU Eurostat has started to publish its data on foreign affiliations (http://europa.eu/estatref/info/sdds/en/fats/fats_base.htm). This is the primary international source. Such data are collected for CEECs on an ad hoc basis by wiiw; the data are available nationally but usually not published, although they can be accessed for research and government decision-making (<http://wiiw.ac.at>). The data rely on three sources:

1. Companies report their financial statements to statistical offices or tax authorities. This database may identify ownership, and thus allow data to be separated by foreign and domestic ownership of companies. For example, the Hungarian Central Statistical Office publishes NACE 2-digit level information on foreign affiliates in that country.
2. If the financial statements do not include information on ownership, this information has to be taken from the national bank matching the company codes. This linking of data is done in the offices responsible for collecting the statistics, keeping in mind rules of confidentiality (Hunya and Skudar, 2007).
3. As a third alternative, the national bank FDI questionnaire may request information beyond the amount of FDI. This could include information otherwise available from company financial reports (see the examples of Austria and Croatia, above).

Whatever the source of data, the database would contain the following indicators:

- Number of companies;
- Nominal or own capital;
- Foreign investment in the nominal capital;
- Total assets;
- Foreign assets;
- Output or sales;
- Value added;
- Average number employed;
- Annual average monthly wage, or annual wage fund per employee;
- Revenues from exports or export sales;
- Profits before tax;
- Profits after tax;
- Value of investment outlays.

The indicators will be absolute numbers, or values in national currency. Computed data include the share of total foreign affiliates and the share of each industry in total manufacturing for each indicator. It is useful to calculate labour productivity, capital productivity, profit rate, export propensity, etc.

All three types of data allow analysis at the industry level. The database aggregated at NACE 2- or 3-digit level can be used to point out characteristics in each industry, measure structural

dispersion of data across industries and observe the speed of structural change. Company level data must also be made available in the form of panel data for econometric research. Most contemporary literature on FDI impact analysis relies on company level data. However, researchers usually do not have access to data collected by governments and rely on privately collected data (e.g. the Amadeus database: <http://www.bvdep.com/en/amadeus.html>). It is in the interest of decision-makers to rely on the findings of these new methods of research, and to supply researchers with the necessary data. Company level data could be used in an anonymous form for panel analysis; thus, it would not violate the rules of confidentiality.

Aggregate NACE 2-digit data can be used in descriptive work pointing out specialisation patterns (Hunya, 2001) or using simple econometric methods for the same purpose (Damijan and Rojec, 2004). Application to the analysis of FDI's impact on employment is provided in Radosevic, Varblane and Mickiewicz, 2003.

Company level data can be used in econometric analysis that selects one or the other indicator as a dependent variable. In addition, research that uses company level data from surveys can be repeated, relying on this more comprehensive database and limiting the exercise to a specific country (e.g. see Bosco, 2001). An application to innovation, where an innovation survey and FIE data are combined, is presented in Balcet and Evangelista (2005).

2.3 Analysis using company level information, including from company surveys

Data and other information collected at the national level are not always satisfactory for finding answers to specific research questions. To obtain specific answers to specific questions, companies may be surveyed directly. A review of press reports and international company databanks could be a supplementary source of information. Questionnaires and in-depth interviews can be used. The main questions for companies include:

- Motivation for investing in the country, investment barriers and significance of FDI policy. This can provide feedback on the efficiency of policy tools (Holland et al., 2000; Bosco, 2001).
- Status of the FIE in regard to its mandate and level of competence in the multinational corporate framework. Both autonomy and deep integration can help long-term development of the subsidiary and enhance the possibility for spillovers and local linkages (Majcen, Radosevic and Rojec, 2003; Damijan and Rojec, 2004).
- Mapping domestic and international networks and clustering of FIEs. To generate spillovers, upstream and downstream linkages are necessary and may be supported by government policy. Mapping of international linkages may be used as orientation for foreign (economic) policy.
- Investigation of company strategies, R&D, production, investment and employment plans. Company strategies are necessary in order to develop government strategies to improve the business environment, and to assess and support technological development and other line policies.

- Company surveys can also be used to obtain feedback on governments' economic policies (e.g. see Hong and Gray, 2003). Consultation with foreign investors' associations can be supplemented by questionnaire surveys.

3 BASIC ECONOMETRIC TOOLS APPLIED IN FDI IMPACT ANALYSIS³

One way to analyse the impact of FDI on various economic variables is to use econometric methods. In the following we present a set of simple regression equations which aim to explain the impact of FDI on economic growth, level of GDP, exports, productivity and employment. In principle, these analyses can be performed at the aggregate, industry or company level, for one country or a panel of countries, using annual, quarterly or monthly data as well as growth, share or level data. In the end, the choice of data and econometric model will very much depend on the availability of data and the precise research question. Here we will make some suggestions and provide information on possible extensions and different specifications of the models presented. We will also quote papers in which similar methods have been applied. It should be noted that regressions based on the equations presented are generally unable to explain causal relationships but can describe past correlations. Moreover, it has to be mentioned that the following equations are just shown as examples; different specifications, including as well as leaving out certain variables, can be estimated and compared. This is seen as a general introduction to the issue of econometric analysis of the economic impact of FDI.

3.1 FDI impact on economic growth

One of the most obvious variables to check for the impact of FDI is economic growth. In this first section, we want to present the steps in formulating a theoretical model that should be tested empirically in more detail than in the following. This is done to show how such an equation can be derived from theory. Here the research question would be: What is the impact of FDI on economic growth, given the influence of traditional growth explaining variables? For this purpose we can employ a cross-country analysis (if we want to look at the impact of FDI with respect to a set of countries) based on a growth model similar to the Solow model, with Cobb-Douglas production including physical and human capital (see Romer, 1996). In this framework, output is characterised as follows:

$$Y = K^\alpha H^\beta [AL]^{1-\alpha-\beta}, \quad \alpha > 0, \beta > 0, \alpha + \beta < 1, \quad (1)$$

where Y denotes output, K physical capital, H human capital, A the effectiveness of labour and L labour. Defining $k = K/AL$, $h = H/AL$, and $y = Y/AL$, and using equation (1) yields:

$$y = k^\alpha h^\beta. \quad (2)$$

Taking logs of equation (2) results in:

3 . This chapter is by Mario Holzner, wiiw.

$$\ln y = \alpha \ln k + \beta \ln h. \quad (3)$$

However, considering the dynamics of output under the conditional convergence theory and the need for the empirical application of the researched relationship in a cross-country analysis setting, based on the standard literature by Barro (1991), Levine and Renelt (1992), Barro and Sala-i-Martin (1995) and Sachs and Warner (2001), the following equation emerges:

$$y_T/y_0 = F[y_0, k, h], \quad (4)$$

where the growth of output per effective labour unit y_T/y_0 is a function F of the initial output per effective labour unit y_0 , k and h . Using the interpretation of Mo (2001), which is based on Schumpeter (1912, 1939), the described relationship reflects two main classes of influence on the evolution of an economy in the long run. One is the growth component, which is due to changes in the factor availability of capital and labour (i.e. variables K and AL). The other is the development component of social and technological changes driving total factor productivity (i.e. variables Y_0 and H). As this research aims at analysing the relationship between FDI and growth, the basic growth function as described in equation (4) will be augmented by the variable f , which should be an indicator of the FDI penetration of a country. This yields the following equation:

$$y_T/y_0 = F[y_0, k, h, f]. \quad (5)$$

Using (5), a testable equation in logarithmic form can be defined as:

$$\ln(y_T/y_0) = \alpha \ln y_0 + \beta \ln k + \gamma \ln h + \delta \ln f. \quad (6)$$

Regarding data, average annual growth of the natural logs of real GDP per capita at purchasing power parities (PPP) can be used as a proxy of the growth of y . For y_0 we can use the natural log of real GDP per capita at PPP in the initial year of analysis. For k the natural log of the investment share of the real GDP per capita, averaged over the period of analysis, can be used as a proxy. The natural log of the gross secondary school enrolment ratio, averaged over the period analysed, can be used as a proxy for h . Finally, f can be proxied using the natural log of the foreign direct investment share in real GDP per capita, averaged over the respective period. Here FDI data on either flows or stocks can be used; however, this will have an influence on the outcome of the analysis. Thus, the choice has to be made with caution.

This type of analysis not only provides general information on the relationship of FDI and economic growth across many countries, but can also be used for the analysis of single countries. First, within the framework described above, it is possible to calculate the distance of an individual country's variables from the average regression line. From this, a whole range of conclusions for a single country can be derived. Second, the same exercise can be conducted for one country only. However, some modifications of equation 6 are needed, given that there might be a lack of data for a proper time series analysis. This could be thought of as employing quarterly

data. In this case, dummy variables for three of the four quarters have to be included in the regression to eliminate seasonality effects. Also, initial GDP is no longer useful as it does not vary over time. Similarly, one might think about another proxy for human capital, given that secondary school enrolment does not greatly vary over time. In general, data for single years or quarters would be employed instead of period averages.

Finally, the models employed have to be tested with regard to the underlying assumptions of the regression analysis, e.g. the normal distribution of the residuals, heteroskedasticity and multicollinearity in the case of a cross-country analysis. Also, a sensitivity analysis, e.g. including additional variables, can be very useful for a better understanding of the analysed relationship. In principle, cross-country and time series analysis can even be performed with simple spreadsheet programmes such as Excel. To do a regression in Excel, one needs the Analysis Toolpak add-in to be installed; this was an option when Excel was installed, but it might not have been selected. If it was not installed, Excel will ask for the CD when one tries to add the Toolpak by choosing add-ins from the tools menu.

3.2 FDI impact on GDP levels

A more sophisticated method consists of panel regressions analysing data, e.g. across countries i and time t . Here professional econometric software such as Stata or EViews has to be employed. These models can be used, for instance, in the analysis of FDI's impact on the level of GDP. Our starting point for investigating the impact of FDI on GDP in a panel data Cobb-Douglas production function setting is a common worldwide production function given by

$$y_{it} = a_i + b_t + F(k_{it}, h_{it}, f_{it}), \quad (7)$$

where y is the log output per capita, a is a country-specific level of total factor productivity, and b is a time dummy capturing worldwide changes in total factor productivity, while k , h and f represent the log of per capita inputs of physical capital, human capital and FDI, respectively. In this section we allow the production function F to be Cobb-Douglas, so that, in logs, we have

$$F(k_{it}, h_{it}, f_{it}) = \alpha k_{it} + \beta h_{it} + \gamma f_{it}. \quad (8)$$

In regard to estimating this production function, Canning (1999) emphasis that possible reverse causality might be a major problem where capital inputs may determine output, but output may also have a feedback into capital accumulation. Canning notes that the output and capital variables might be non-stationary. As a consequence, the production function may represent a long-run cointegrating relationship. In this case, Canning suggests using the panel data cointegration methods of Kao and Chiang (1997), which allow each country to have its own short-run dynamic interactions and feedbacks. This should give consistent estimates of the parameters of the production function that are robust to reverse causality. Thus, while the same production function is assumed to hold worldwide, the short-run effects of the relationship between investment and income are allowed to vary across countries.

This type of analysis is very demanding and can even be extended with tools such as the trans-log specification developed in Canning and Bennathan (2000), which makes it possible to avoid the assumption of a constant elasticity of output with respect to input, imposed by the Cobb-Douglas production function, as well as to examine the pattern of complementarity and substitutability between inputs into the production function. The usefulness of this method for the analysis of a single country is rather limited, although it could be thought of as replacing country data by industry or company level data for one country only.

3.3 FDI impact on exports

A good example for industry level analysis is provided by Vuksic (2005). Here the impact of FDI on exports of various industries j is analysed, The following model was estimated, *inter alia*:

$$\ln EX_{jt} = \alpha_j + \beta_1 \ln PD_{jt} + \beta_2 \ln ULC_{jt} + \beta_3 \ln REER_t + \beta_4 \ln I_{j(t-1)} + \beta_5 \ln FDI_{j(t-1)}. \quad (9)$$

Vuksic explains the variables used as follows. The dependent variable $\ln EX$ is the natural logarithm of real exports. The independent variables are the natural logarithms of a productivity index $\ln PD$, a unit labour costs index $\ln ULC$ and the real effective exchange rate $\ln REER$. Subscript $j = 1 \dots 21$ denotes different branches and t stands for different years. A fixed effects one-way error component model is used for the estimation. The constant term α_j denotes the branch-specific fixed effects. Domestic investment ($\ln I$) and FDI stock ($\ln FDI$) variables enter the regression with a one-year lag. This can be justified by the fact that some time is needed before the new investment becomes effective. In the case of FDI, using lagged values should help to alleviate a potential simultaneity problem between exports and FDI variables. Using FDI stock values instead of inflows should also help in this regard. In addition, FDI stock should better capture the relevance of the presence of foreign capital in some branch, which is important as a source of potential indirect effects. If only FDI inflow values were used, there might be cases in which a substantial inflow took place at the beginning of the observed period without there being any inflows afterwards. In this way, the values of this variable would be zero for all the subsequent years, which would neglect the strong presence of the foreign capital already invested; this could be a source of potentially important side effects. The above model specification is a modification and extension of the models estimated at the aggregated, macroeconomic level in Sun (2001) and Zhang and Song (2000).

3.4 FDI impact on productivity

Vuksic (2005) also estimated the impact of FDI on the productivity of various industries j as follows:

$$\ln PD_{jt} = \alpha_j + \beta_1 \ln EMP_{j(t-1)} + \beta_2 \ln \Delta EMP_{j(t-1)} + \beta_3 \ln I_{j(t-1)} + \beta_4 \ln FDI_{j(t-1)}. \quad (10)$$

In the above equation, $\ln EMP$ stands for the lagged value of the employment index, while ΔEMP denotes the percentage change of the employment index in the previous period. All other variables are same as before. In fact, Vuksic estimated this and similar other models in order to check for the potential endogeneity of the productivity variable in the equation of the previous

section, possibly arising because of a simultaneous causal relationship between productivity and exports (see Kunst and Marin, 1989). These models were estimated in order to find appropriate instruments for productivity in the latter instrumental variables estimation. In any case, this type of model can also stand on its own.

3.5 FDI impact on employment

The impact of FDI on employment can be estimated, too, as was done by Jenkins (2006). Jenkins used the following employment growth model:

$$\ln\Delta EMP_j = \beta_1 \ln\Delta Y_j + \beta_2 \ln\Delta W_j + \beta_3 \ln\Delta F_j + \beta_4 \ln SE_j + \beta_5 \ln\Delta X_j \quad (11)$$

Here the dependent variable ΔEMP represents sectoral employment growth averaged over the period analysed. On the right side of the equation we find the growth of industrial output ΔY , the growth of wages per person employed ΔW , the change of the share of foreign affiliates in gross output as an alternative proxy for FDI ΔF , the share of state-owned enterprises in gross output SE , and the change in the ratio of exports to gross output ΔX over the respective period.

As stated in the introduction to this chapter, the intention here is to provide some examples of how to estimate the impact of FDI. Details of other specifications have to be checked in the respective literature. The impact of FDI on many other economic variables can be analysed, too, and much more sophisticated specifications can be applied.

There are also sources which survey the available literature and compare methods of analysis. A recent survey in Blonigen (2005) discusses the literature on the determinants of FDI, the motivation of multinational companies in their location choice. Further main issues, research findings and methodology are included in Bora (2002). A list of recent literature can be found on the World Bank homepage (<http://rru.worldbank.org/PapersLinks/>) by choosing 'Foreign direct investment: its impact'. There is a list of papers, web sites and case studies in the fields of: FDI impact on growth, trade effects, employment and skills development, technology diffusion and upgrading, linkages and domestic companies. Holland, et al. (2000) is a methodological paper in which the benefits and shortcomings of surveys and econometric analysis are set out. FDI policy issues are dealt with in several UNCTAD publications, most comprehensively in UNCTAD (2002).

4 FDI IMPACT ANALYSIS IN ECONOMICS AND INTERNATIONAL BUSINESS LITERATURE⁴

4.1 Impact of FDI on economic growth: theoretical background

Economic theory provides us with many reasons why foreign direct investment may result in enhanced growth performance of the receiving country. In the neoclassical growth literature, FDI is associated positively with output growth because it either increases the volume of investment and/or its productivity, thus putting the economy on a path of higher long-term growth. In an exogenous growth model, FDI has only a level effect in the steady state and no permanent impact on the growth rate, except during the transitional dynamics to the new steady state. The potential role of FDI is much greater in endogenous growth models. In a neoclassical production function, output is generated using capital and labour in the production process. With this framework in mind, FDI can exert an influence on each argument in the production function. FDI increases capital; it may qualitatively improve the factor labour (explained below); and by transferring new technologies, it also has the potential to raise total factor productivity. Further, as discussed in more recent theoretical growth models (e.g. Grossman and Helpman, 1991), by raising the number of varieties for intermediate goods or capital equipments FDI can also increase productivity (see Borensztein, Gregorio and Lee, 1998 for an empirical analysis of this channel).⁵ Thus, in addition to the direct, capital-augmenting effect, FDI may also have additional indirect (and thus permanent) effects on the growth rate. Most importantly, FDI can permanently increase the growth rate through spillovers⁶ and the transfer and diffusion of technologies, ideas, management processes and the like.

The literature mentions basically four channels that allow for technological spillovers from FDI to the host economy (Kinoshita, 2001; Halpern and Muraközy, 2005):

- First, the classical indirect channel for the transmission of technology from FDI to the domestic economy functions via imitation. The effect of FDI depends crucially on factors such as the legal system, regulations, infrastructure and human capital endowments, as well as the complexity of the technology.
- Secondly, and often considered the most important channel, training of local workers in foreign-owned companies generates positive spillovers through the acquisition of human capital. Empirical evidence concerning the labour market implications of foreign-owned

4 . This section relies on work by Julia Wörz, wiiw.

5 . The same effect can be achieved through imports of such goods. In this sense, FDI represents an alternative means of increasing the number of available varieties in addition to trade, even if there are qualitative differences between the two.

6 . Spillovers occur when multinationals are unable to capture all the productivity effects that follow in the host country's local companies as a result of the presence of the multinational (Caves, 1996).

companies is mixed. On the one hand, foreign companies spend on average more on training of workers than do local companies. On the other hand, foreign-owned companies may skim the market of well-trained workers and – at least in the short run – free-ride on previous training by domestic companies. The smaller the wage differential between foreign and domestic companies, the greater the scope for positive spillovers since this would also allow domestic companies to attract well-trained workers from foreign companies. In addition, an important question relates to the specificity of knowledge acquired through training in foreign-owned companies. Based on meta-analysis, Görg and Strobl (2004) find evidence that the managerial skills of owners of domestic companies who were previously employed by multinationals were industry-specific but not company-specific, which points towards a large potential for intra-industry spillovers.

- Thirdly, foreign presence increases competition in a market. The impact of FDI on the market structure depends on the size of the technology gap, as well as on entry and exit behaviour in the market.
- Fourthly, there are vertical or backward spillovers. By purchasing intermediates from foreign suppliers or by selling output to foreign companies, local companies will be affected positively in terms of efficiency and quality of output. Thus, the increased variety of intermediate goods may induce a more effective international specialisation in production and this, together with increasing returns to scale in production, will result in higher productivity growth.

A potential problem at the micro-level, where the spillovers arise, is the evidence for self-selection bias: while there is a general consensus that FDI increases the productivity of receiving companies, part of this effect is in fact due to FDI selecting better companies as targets for takeover (Bellak, 2004). At the more aggregate level, this translates into the imminent causality or endogeneity problem, faced by all empirical studies on the effects of FDI.

4.2 The absorptive capacity of host economies – how to become attractive for FDI

While in theory the nexus between FDI and growth (in terms of output and productivity) is generally positive, the empirical literature is far less conclusive. Some studies find positive effects from outward FDI for the investing country (Van Pottelsberghe and Lichtenberg, 2001; Nachum, Dunning and Jones, 2000), but suggest a potential negative impact of inward FDI on the host country. This results from a possible decrease in indigenous innovative capacity or crowding out of domestic companies or domestic investment. Thus, in their view and in line with the standard literature on the determinants of FDI (i.e. Dunning's OLI paradigm; see Dunning, 1988), inward FDI is intended to take advantage of host country (locational) characteristics instead of disseminating new technologies originating in the sending country. Other studies report more positive findings: Nadiri (1993) finds positive and significant effects from US-sourced capital on the productivity growth of manufacturing industries in France, Germany, Japan and the UK. Also Borensztein, Gregorio and Lee (1998) find a positive influence of FDI flows from industrial countries on developing countries' growth. However, they also report a minimum threshold level of human capital for the productivity enhancing impact of FDI, emphasising the role of absorptive capacity. Absorptive capacity or minimum threshold levels in a country's ability to profit from

inward FDI is frequently mentioned in the literature (see also Blomström, Lipsey and Zejan, 1994). Consequently, the effect of FDI depends among other things, to a large extent, on the characteristics of the country receiving the FDI. The resulting issue of cross-country heterogeneity, however, has largely been neglected in the literature so far with a few exceptions. Bloningen and Wang (2005) explicitly stress cross-country heterogeneity as the crucial factor which determines the effect of FDI on growth. Further, Nair-Reichert and Weinhold (2001) and Mayer-Foulkes and Nunnenkamp (2005) explicitly take up this aspect in their analysis.

The importance of absorptive capacity – often captured by differences in the stage of development between donor and host country – has been a central finding in many empirical studies on the FDI-growth link (Bloningen and Wang, 2005; Borensztein, Gregorio and Lee (1998); De Mello, 1999). There are also theoretical justifications for the importance of a certain amount of absorptive capacity. For example, Markusen and Rutherford (2004) develop a three-period model in which they show that the speed and degree of positive spillovers from FDI is positively related to the absorptive capacity of the host country. In an earlier paper and using a new economic geography model, Rodriguez-Clare (1996) relates the developmental impact of multinational companies to the type of the linkages they create. Positive linkage effects are the stronger the more intensive the multinational is in the use of intermediate goods, the larger the costs of communication and trade are between headquarters and local plants, and the more similar home and host country are in terms of the variety of intermediate goods produced. This implies stronger linkages – and thus greater positive effects – if the developmental gap between donor and host country is smaller.

For all of the channels outlined above, one may argue that positive spillovers will only occur in a suitable setting. If the host economy does not provide an adequate environment in terms of human capital, private and public infrastructure, legal environment and the like, many of the spillovers that may potentially arise from FDI cannot materialise. Public infrastructure such as educational institutions and publicly funded R&D collaborations can significantly support potential spillovers. A high structural match between the donor and the host country would imply proximity in stage of development, and thus also a good precondition for the absorptive capacity of the receiving country to be high.

Potential for positive spillovers does not depend solely on a country's overall absorptive capacity, but also on the industrial structure of the economy (Caste Jon and Wörz, 2006). Thus, the impact of FDI differs depending on country-specific absorptive capacity or stage of development, as well as on the sectoral and industrial structure and allocation of FDI. Since the two are generally related, this implies a relationship between the industrial pattern of inward FDI and its effect on the host country. The economy-wide effect of industry-specific FDI inflows will then further depend on the extent of intra-industry versus inter-industry spillovers.

4.3 Export-oriented and local market oriented location factors

Export-oriented subsidiaries are set up by a vertically integrated multinational company in a host country with the aim of lowering production costs and seeking, securing and diversifying resources (Narula and Dunning, 2000). Export-oriented FDI involves fragmenting the production process geographically by different stages, based on labour intensity and resource endowment. The important location factors that influence this type of FDI include labour costs, abundance of

physical resources, infrastructure, trade barriers, exchange restriction, and FDI-favourable policies. Local market-oriented FDI is set up by horizontally integrated multinationals to penetrate a market, increasing market share, diversifying the source of sale and minimising competition risk (Zhang and Markusen, 1999). The determinants of this type of FDI include local market size, the level of human capital, infrastructure, political stability, FDI policy, and cultural barriers. Export-oriented FDI is more footloose, because the locational requirements are less specific. Competition may rise among countries that can provide the same resource at the same cost for the same production stage. Since most of the FDI is in non-tradable services, local market orientation characterises the major part. Only a small but undisclosed part of these services is internationally oriented and attracts customers from abroad.

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