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Employment Effects of Foreign Direct Investment in Central and Eastern Europe

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Employment Effects of Foreign Direct Investment in Central and Eastern Europe

August 2005

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**Employment Effects
of Foreign Direct
Investment in Central
and Eastern Europe**

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Summary

The paper starts with a discussion of the development of the number of manufacturing sector jobs in the framework of economic transformation and industrial restructuring in Central and Eastern Europe. Over the past decade, domestically-owned manufacturing companies reduced the number employed while foreign-owned enterprises expanded that number. Job losses due to FDI have resulted from restructuring of privatized state-owned companies. A reduction of employment has also resulted from foreign companies cutting domestic supplier linkages after taking over state-owned enterprises.

A database with indicators of foreign affiliates allows to identify countries and industries with various levels of foreign penetration and employment development. Foreign affiliates show higher labour productivity and better capital endowment and use more up-to-date technology than domestic companies; as a result, they tend to increase the performance in the host economy as a whole.

Ownership-specific differences in productivity are clearly reflected in relative wages. Young skilled workers employed by foreign enterprises have higher wages relative to both their unskilled and skilled older colleagues and also relative to their counterparts in domestic firms. The more efficient matching of new technologies and new skills in foreign than domestic enterprises has benefited younger generations.

A major question for the future is whether the present high regional concentration of FDI within the countries is likely to diminish. Agglomeration effects work against this happening, while improvements in transport and telecommunications make it more feasible. Thus, for instance, larger towns in peripheral regions have started receiving more FDI after becoming accessible by motorway.

In the second part of the paper, empirical results from a gravity model are discussed; these suggest that FDI in non-manufacturing sectors tends to be of a horizontal type, while this is less the case in manufacturing. With a modest pace of convergence towards the level of GDP per head in the EU-15, non-manufacturing FDI is likely to remain constant or even decline, except in the Czech Republic, where non-manufacturing FDI would grow at a similar rate as in manufacturing. With stronger convergence, FDI in non-manufacturing is likely to show more robust growth.

Further econometric analysis suggests that FDI is a significant determinant of the skill composition in the new EU members and is biased against skilled manual workers (i.e. FDI results in more employment of high-skill non-manual workers and low-skill workers). The magnitude of this effect is, however, modest and partly offset by other factors.

Keywords: *FDI, employment, EU enlargement*

JEL classification: *C53, F21, J21, O57, L60*

Employment effects of foreign direct investment in Central and Eastern Europe

1 Inward FDI and its effects on growth and restructuring

Around the year 1989, the liberalization of trade and FDI became important vehicles of the transformation to a market economy in the Central and East European countries (CEECs)¹ and of their reintegration into the world economy. When FDI became possible, transnational companies (TNCs) from economically more advanced countries started to expand to these new markets and cheap production sites. Both the factors attracting FDI and the factors driving investment abroad have changed during the past 15 years. At an early stage of transformation, basic institutional factors such as the functioning of a market economy, the efficiency of public governance and the degree of corruption are the main determinants of FDI. Fundamentals given, macroeconomic factors such as labour costs and skills, productivity, the exchange rate, inflation and taxation become more important. At a higher stage of development, regional networking and agglomeration effects can attract further FDI.

Due to their relatively small size, the CEECs play a marginal role in global and European FDI flows. Their share in global FDI inflows remained at about 1% in the early 1990s, but rose to nearly 4% by 1995. In 2000, it fell back to 1.6%, just to rise again to 3.6% in 2002. This fluctuation was due to the more rapid increase of FDI between developed countries in 2000 and its decline thereafter, against a constant increase in the NMS until 2002. A setback of FDI in NMS and an increase in candidate countries in 2003 resulted in a declining global share, to 2.6% (UNCTAD, 2004). The NMS received only 3.8% of the FDI inflow to the EU-25 in 2003. (See data on FDI inflow and stock in Appendix Tables A1 and A2; for more recent data see wiiw, 2005).

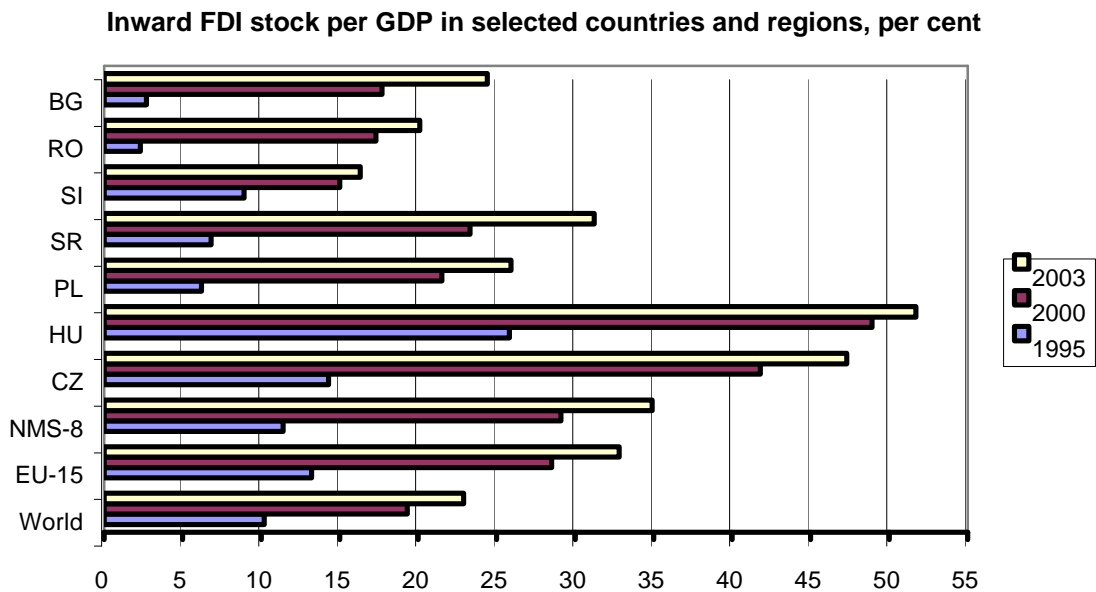
The behaviour of multinational companies in CEECs reflects world-wide economic cycles as well as firm-specific determinants, while the attractiveness of a host country depends on location-specific characteristics including macroeconomic, institutional and agglomeration features. In the first half of the 1990s, Hungary was the most important recipient of FDI in the region as it opened up its economy to foreign investors ahead of others. Hungary implemented privatization through foreign take-overs from the very beginning, while other governments preferred domestic investors, insider privatization or voucher schemes. In the

* Ingo Geishecker is the author of sections 8 and 9.

¹ The region includes both the eight new EU member states (NMS) of Central and Eastern Europe – the Czech Republic, Hungary, Poland, Slovakia, Slovenia, Estonia, Latvia and Lithuania – and the two candidate countries (CC) Bulgaria and Romania.

second half of the 1990s, other countries were catching up: Poland surpassed Hungary in terms of the amount of FDI inflow in 1996. The Czech Republic became the second most important FDI receiver in 1998, advancing to first rank in 2002. The relatively large size of these economies, the start of privatization by sale and the introduction of FDI-friendly policies proved attractive. In 2000 Slovakia changed its policy as well; it has won several important contests for new greenfield investments lately. Quite unexpectedly, FDI inflows to the five Central European new EU members² declined from EUR 22 billion in 2002 to a mere EUR 9 billion in 2003. In the Czech Republic, Slovakia and Slovenia the record high FDI in the previous years had been exceptional, related to one-time privatization revenues. In Poland the decline against 2002 was not so pronounced as privatization deals had taken place a few years earlier. Hungary and the Czech Republic even suffered withdrawals of foreign investment capital. Global manufacturers in the electronics industry closed some subsidiaries due to recession and because of more attractive locations in China. Light industry subsidiaries migrated to Southeastern Europe. The decline just at the time of EU enlargement was an unexpected development and had to do mainly with investor-specific problems, i.e. the economic downturn in Western Europe. But the end of privatization and the achieved high level of FDI indicate that no rapid recovery of inflows is in sight.

Figure 1



While small in absolute terms, FDI in CEECs is at an international standard if compared to the size of these economies (Figure 1). The inward FDI stock amounted to 23% of GDP worldwide and 33% in the EU-15 in 2003 (UNCTAD, 2004). The NMS-8, with 35%, were

² NMS-5: Czech Republic, Hungary, Poland, Slovakia, Slovenia.

slightly above the EU-15 average; thus there is no need of any further catching-up and FDI may grow in the future in line with the pace of economic development. Hungary, Estonia and the Czech Republic have received above-average amounts similar to smaller EU members such as the Netherlands or Sweden. Poland, the largest among the NMS, received relatively little FDI/GDP, but this is in line with data on the larger EU incumbent countries. Only Slovenia is an outlier due to its FDI-averse policy in the 1990s. Poland and Slovakia as well as the candidate countries Bulgaria and Romania may become the major receivers of new FDI projects in the future, while in the more advanced NMS FDI will depend on profit reinvestment of established TNCs.

FDI can be market-seeking (local market-oriented) and efficiency-seeking (export-oriented). Local market-oriented FDI is set up by horizontally integrated multinationals to penetrate a market, increase their market share, diversify the source of sale, and minimize competition risk (Zhang and Markusen, 1999). Export-oriented subsidiaries are set up by a vertically integrated multinational company in a host country with the aim to lower production costs or to seek, secure and diversify resources (Narula and Dunning, 2000). In the first stage of FDI inflows to the NMS, market-seeking FDI prevailed. In the second half of the 1990s, more and more efficiency-seeking FDI emerged in manufacturing. At the same time market-seeking FDI expanded in financial and other business services. In the most recent years market-seeking FDI has been confined to newly liberalized utilities. Efficiency-seeking FDI has also appeared in market services. Manufacturing FDI developed from simple efficiency-seeking to a more complex network-type of integrated production.

Export-oriented FDI in the CEECs is almost exclusively confined to NMS close to the EU: Estonia, the Czech Republic, Hungary, Poland and Slovakia. These provide the best transport facilities and lowest transaction costs for investing companies, while investors enjoy relatively low labour costs. They are more advanced in terms of transformation, have thus more efficient institutions and more advanced FDI policies than other transition countries. Lately also Romania and Bulgaria joined the race for export-oriented FDI. While local market-oriented FDI in the more advanced countries may increase in line with the expansion of these markets, export-oriented FDI may grow much faster.

2 Macroeconomic effects of FDI

While there is generally a correlation between the speed of economic growth and the inflow of FDI, the direction of causality is not clear.³ The time sequence between FDI and economic growth can be twofold: direct capital inflow either (i) stimulates economic growth

³ It must be noted that measuring the contribution of FDI to economic growth does not generally lead to robust results. A link between the two phenomena is proved, but the direction in which it works is not all that clear. See Lipsey (2000).

and transformation or (ii) reacts to opportunities arising from economic growth and progress of transformation. Growth can be generated by FDI through additional investment resources and the transfer of technology and capabilities, as well as through improved access to export markets. On the other hand, foreign investors react positively to the consolidation of market-economy rules and the resumption of economic growth.

A fast and successful transition to a market economy was usually not possible without the knowledge and capital of foreign direct investors.⁴ Inward FDI played a role in the strengthening of the private sector and the emergence of market-economy behaviour. Industrial restructuring, including through privatization, was stepped up when the inflows of FDI accelerated. Output and employment suffered setbacks after foreign takeover, but firms became more efficient and resistant to subsequent competitive pressure. Therefore, there is no simple correlation between the amount of FDI and the rate of economic growth in transition countries. FDI usually peaked in years with big privatization transactions and these often took place in years with low growth when governments were in need of budget revenues.⁵

A real contribution to fixed capital formation is only that part of FDI which is not invested in the acquisition of existing assets. About half of the FDI in NMS between 1990 and 1998 was in the form of privatization-related acquisition. The restructuring of former state-owned enterprises in the wake of privatization often meant massive labour shedding. In later years, particularly in manufacturing, most of the FDI has been investment in new assets. FDI in most cases incorporated more modern technology than domestically available and increased productivity in the host economy. New capacities usually increased employment while technological progress also triggered lay-offs.

3 Industrial specialization of FDI

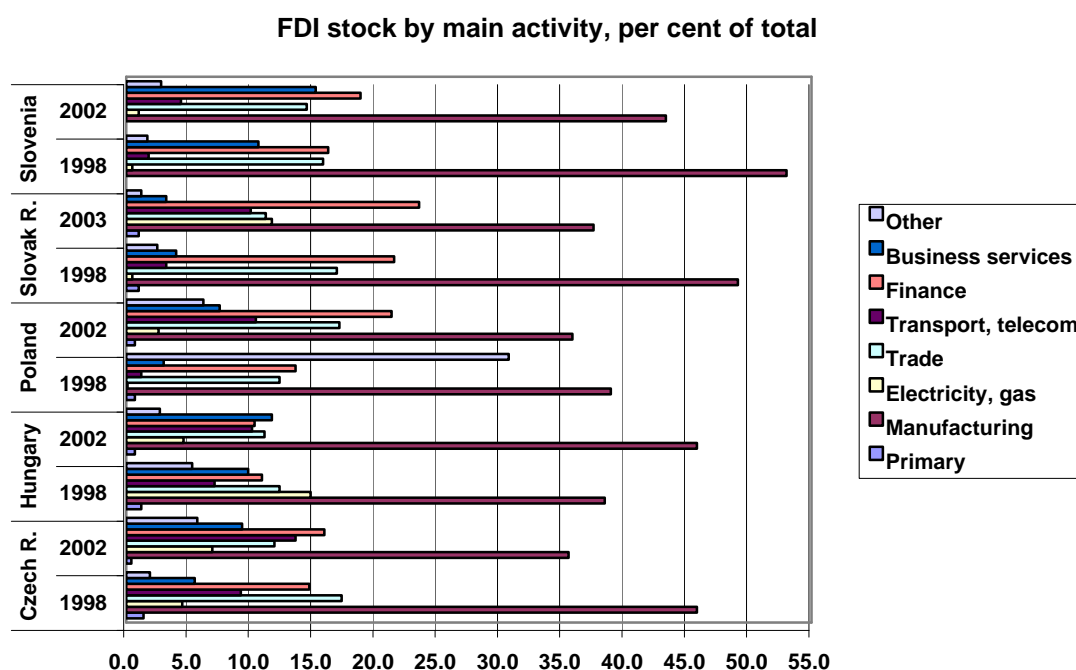
The amount and share of economic activities in the stock of FDI reflects the sequencing in economic opening-up and privatization as well as investors' interest in setting up export-oriented subsidiaries. By the time of EU accession, all economic sectors were opened to foreign investments, with the exception of some utilities. The main receiver of FDI has been services, first of all banking, telecommunications, retail trade and real estate (see Figure 2 and Appendix Table A3). These branches are nearly exclusively local market-oriented. Some business services have started to internationalize recently, the Czech Republic, Hungary and Poland have benefited from offshoring.

⁴ The only exception is Slovenia, which had an economy integrated into the EU already before transformation; furthermore, constant devaluation compensated for the potential loss of competitiveness.

⁵ Mencinger (2003) gives a sceptical overview of FDI in transition countries based on negative correlation between FDI and economic growth. In our view, it is inappropriate to correlate FDI inflows that helped transition countries to get out of the transformational recession with the negative economic growth rate suffered due to transition.

The manufacturing industry attracted 38% of the NMS-5 FDI stock as of end-2002. This share had been higher five to ten years earlier when the manufacturing sector was in the process of privatization and the major TNCs established their subsidiaries. In recent years very few manufacturing-sector privatizations have occurred, except for some companies in the steel industry and in chemicals, while new investments have increasingly been export-oriented greenfield projects or expansions. As of 2002, the highest amount was invested in Polish manufacturing; Hungary ranked second, the Czech Republic third, and Slovakia followed with some distance.

Figure 2



The food industry is usually the main, yet not export-oriented, FDI target and therefore shows declining shares in FDI stocks. The largest export-oriented industries are the production of motor vehicles, electrical and optical equipment as well as the chemical industry (see Appendix Table A4). The transport equipment industry is quite evenly spread among the three main receiver countries. Hungary is ahead of the others concerning the amount invested. This will change in the years to come due to new greenfield investments in the Czech Republic and in Slovakia. The electrical and optical equipment industry has its main production hub in Hungary, while the Czech Republic is a strong second. Poland is weak in the electrical and electronics industry, but has a much stronger position in the chemical industry. Textiles and clothing is a declining industry in the NMS-5 as investors are moving further east. In the steel industry, slated for privatization later than other sectors, FDI has increased in recent years. However, after some modernization investments following the takeover, this industry will again receive little new inflows. In the

near future the car industry and electrical engineering and electronics will remain the main manufacturing sectors attracting export-oriented FDI.

4 Impact of foreign penetration on employment in CEE host economies

In FDI-related literature little attention has so far been paid to the employment effects by inward FDI. However, the topic is all the more relevant as concern has increased that the relocation of production by TNCs takes away jobs from higher-wage countries and places them in lower-wage countries. In the wider European context this would mean a relocation of jobs from EU incumbents to the new member states. Konings (2004) studied the employment effects of FDI in home and host countries in Europe. Based on 1995-2000 company data he showed that, despite high wage cost differentials between East and West in Europe, relocation of employment did not take place. Labour productivity differences compensated for the wage differences. Employment relocation mainly took place between subsidiaries in Western Europe and not to NMS. When looking at data not at the country level but at the level of TNCs and using 1998 data, he shows a similar rigidity of regional employment patterns. His findings prove that competition from low-wage locations does not necessarily constitute a threat to employment in the parent company. In fact, the penetration of NMS markets and establishment of local subsidiaries there may even have increased employment in parent firms due to increasing company-wide turnover. Altzinger et al. (1999) arrived at similar results when comparing employment in Austrian firms with and without a subsidiary in NMS. The problem with such findings is that they are confined to a time period when capturing the NMS market was the main driving force of FDI. Another qualification should be added, namely, that taking averages across companies in different industries does not mean that in certain specific industries or in one or the other TNC no such relocation could take place. Some field research on CEECs suggests that the growth of certain industries through FDI has not been the result of direct relocation of production, but of more rapid market growth in the NMS (Radošević and Rozeik, 2004).

Foreign penetration has been unavoidable and on the whole advantageous for transition countries. The superior technology and knowledge incorporated in foreign affiliates have speeded up the transformation of the former centrally planned economies. Integration into international corporate structures has been necessary for transition-country firms to survive under market competition even at the price of becoming subsidiaries of TNCs. Successful privatization required massive restructuring of former state-owned enterprises, needing capital investment and know-how that had to be imported in the form of FDI. Privatization and restructuring amplified the intensity of employment changes. Job losses and job creation occurred simultaneously, but to different degrees and with different outcomes in the various economic activities. The main driving forces of this process in the enterprise sector have been the following: decline and privatization of former state-owned enterprises,

the emergence of new domestic firms and the establishment of foreign subsidiaries. TNCs were the major investors in the competitive sectors and thus had a primary influence on job creation and job destruction.

A high number of new jobs in an industry could be created mainly in the framework of efficiency-seeking greenfield investment or expansion of companies after privatization. Greenfield investments have been most wide-spread in trade and real estate as well as in medium-high-tech industries. Privatization-related restructuring took place simultaneously with expansion and job creation through FDI in the financial sector and telecommunications while in manufacturing labour shedding prevailed.

Declining employment was mostly related to restructuring in the wake of privatization, most intensive after privatization to foreign owners. But enterprises staying under public control usually could not save workplaces by postponed restructuring either. Inefficient companies preserved under state ownership usually did not manage to become viable; they were liquidated and their assets sold to new investors. Also many firms privatized to incumbents or locals found it at some stage necessary to involve a stronger foreign owner who provided funds for modernization.

The direct and indirect effects of FDI on host-country employment in the NMS may be summarized as follows:

Direct effects:

- Job loss through restructuring of privatized formerly inefficient state-owned companies. The need for such restructuring was obvious, but reducing the adverse effect on employment has also been an objective of policymakers. Delaying privatization or imposing employment requirements on the new owner could only temporarily and under favourable circumstances mitigate the loss of workplaces.
- Job creation through greenfield investment. This has been the main hope of NMS and most of the FDI policy has actually targeted such investments in the manufacturing sector. These hopes have only partially materialized. Most of the greenfield jobs have been created in the services sector such as banking, retail and real estate.

Indirect effects:

- Job destruction by cutting former domestic linkages after the foreign takeover of a former state-owned enterprise. Foreign investors replace traditional domestic suppliers by imports, generating negative spillovers.
- Job destruction in the domestic SME sector through the competition of larger and technologically more advanced subsidiaries of TNCs. For instance, super-market chains drove out small shops and their suppliers.

- Job creation by establishing new domestic linkages. Initially a large part of the components assembled in manufacturing subsidiaries or products sold at retail chains were of foreign origin. Cost reduction efforts vindicated a search for cheaper local supplies or encouraged foreign suppliers to produce in the host country. There has been a tendency of increasing local content in foreign subsidiaries.

5 Foreign penetration in NMS manufacturing and employment

Foreign- and domestic-owned companies differ in the sense that the former are more internationalized. They have specific dependencies and cooperation patterns with other foreign and domestic firms. Foreign subsidiaries usually have a higher technological level than domestic companies and can benefit from the technological advance of their mother TNCs. Their integration into the economy of the host country is usually lower than of domestic-owned companies, they rely more on imported components and services and are also more export-oriented.

We distinguish between two types of firms: foreign investment enterprises (FIEs) and domestic enterprises.⁶ The share of FIEs in the economy or in a sector measures the size of foreign penetration. Two indicators, employment and sales (Table 1) may be used to demonstrate the size of foreign penetration in an economy and in different industries as well as its change over time.

Table 1

Foreign penetration in manufacturing: share of FIEs in employment and sales

	Employment			Sales		
	1996	1998	2001	1996	1998	2001
Estonia	16.8	20.8	30.8	26.6	28.2	36.7
Czech R.	13.1	19.2	34.1	22.6	31.6	53.3
Hungary	36.1	44.9	45.2	61.4	70.0	72.5
Poland	12.0	26.0	32.9	17.4	40.0	52.0
Slovakia	13.0	18.5	36.4	21.6	36.2	59.3
Slovenia	10.1	13.1	17.6	19.6	24.4	29.3
Romania	n.a.	13.7	30.7	n.a.	24.3	48.9

Size coverage: Hungary, Romania, Slovenia: all firms; Estonia and Czech Republic: firms with more than 100 employees plus firms with more than 20 employees partially estimated; Poland: firms with more than 5 employees in 1996 and 1998, with more than 10 employees in 2001.

FIE – Foreign Investment Enterprise: companies with at least 10% foreign equity ownership. Hungary 2001: companies with at least 10% foreign equity of at least one foreign owner. Estonia: majority foreign owned firms.

Source: wiiw Database on foreign investment enterprises relying on national sources.

Foreign penetration can change due to two factors: the shift of domestic companies to the foreign sector through merger and acquisition, notably privatization, or the differences in the direction and speed of employment change in companies under different ownership. The two processes cannot be distinguished in data based on corporate income statements. But whatever the way in which employment shifts from the domestic to the foreign sector, it comes under new circumstances in terms of organization and capital equipment which allow for higher labour productivity.⁷ The CEECs differ in speed and depth of foreign penetration.

As of 2001, the highest level of foreign penetration in terms of both indicators was reached in Hungary. Even here, FIEs do not employ the majority of the manufacturing workforce (45%) and penetration did not increase in the past three years. In more recent years the Hungarian industry grew both in the foreign and the domestic sectors and the share of foreign affiliates rose only marginally. Next comes a group of countries comprising Slovakia, the Czech Republic and Poland, with foreign penetration rates between 33% and 36% and strong growth. Earlier privatization policies benefited insiders and did not trigger a profound restructuring process. When the latter could no longer be avoided due to the worsening financial situation of companies, privatization turned to foreign investors and new greenfield or brownfield investors replaced inefficient domestic producers. In Slovakia these processes started later than in the Czech Republic and Poland but speeded up in the period 1998-2001. Slovakia shows now the second highest foreign penetration among the countries under survey. If foreign penetration develops in the same way as in 1998-2001, the 2001 foreign penetration level of Hungary can be reached in Slovakia and the Czech Republic in 2004 or 2005.

Romania and Estonia show lower foreign penetration, with close to 31% foreign employment shares. Estonia, in 1996, had higher rates of foreign penetration in manufacturing than the Czech Republic, Poland and Slovakia, but the increase in later years was slower. In 2001 it was already below those of the other three countries but still ahead of Slovenia. Romania represents an important case of catching-up in terms of restructuring through FDI. It repeated the processes that took place in the forerunners with intensive foreign penetration in 1998-2001. Low and slowly increasing foreign penetration

⁶ The term foreign investment enterprise is applied to firms with more than 10% equity share of a foreign owner in line with the standard definition of FDI. In practice most FIEs in NMS are majority foreign-owned and are under direct control of the mother company. The term foreign subsidiary is used in this paper interchangeably with FIE.

⁷ The number of employees usually differ in statistical surveys done by different methodologies. Company balance sheet data differ from those included in the "industry" chapter of statistical yearbooks as well as from labour force survey statistics. This difference is not very big if the size coverage of companies is the same.

Size coverage of companies: Hungary, Romania, Slovenia: all firms; Estonia and Czech Republic: firms with more than 100 employees plus firms with more than 20 employees partially estimated; Poland: firms with more than 5 employees in 1996 and 1998, with more than 10 employees in 2001. These size limits coincide with those widely applied in the statistical publications of individual countries. In the case of the Czech Republic the methodology differs and comparison of data over time is problematic.

is characteristic of Slovenian manufacturing. The reasons lie mainly in the domestic economic policy which has not encouraged capital inflows and privatization to domestic owners. Such a policy could be sustained as the need for restructuring was smaller than elsewhere. Slovenian companies had been integrated internationally and were largely competitive already at the outset of transformation and competitiveness was supported through a policy of a stable real exchange rate.

Foreign penetration measured by sales is higher than by employment in all countries. The sales shares of FIEs are about or above 50% in five countries, in Hungary over 70%. In Estonia and Slovenia they are far below this mark. The differences between the sales shares and the employment shares point to the higher level of labour productivity in FIEs than in DEs. Superior labour productivity in foreign affiliates is partly due to their better capital endowment and easier access to foreign multinationals' management, know-how and access to markets. On the other hand, higher productivity is also due to narrower specialization on assembly and component production using economies of scale. Headquarter functions, R&D and production-related services are rarely found in subsidiaries.

The lead of foreign affiliates in terms of labour productivity is not specific to the NMS-5, only its exceptionally large size. In OECD countries, the productivity advantage of foreign affiliates compared with the average productivity of the manufacturing sector is only 30% (OECD, 1996). The larger and the more specialized the foreign sector, the larger is its lead over the domestically owned sector. The higher productivity of foreign affiliates is due to lower labour inputs for the same size of production as a result of narrower specialization and the absence of management and research functions. In addition, foreign affiliates usually possess more advanced technology, management and marketing capabilities compared with domestic, especially state-owned, enterprises. The productivity advantage exists both in technical terms and in terms of higher output values due to higher sales prices. Recent research indicates that the productivity gap has little to do with ownership; it is mainly related to industry, firm size and the level of internationalization (Bellak and Pfaffermayr, 2000). Productivity is generally higher in multinational than in uni-national companies. While this may be the case in well-established market economies, in NMS ownership matters.

The productivity gap between foreign and domestic companies is much higher in NMS than in other OECD countries. This has to do with the special features of transition economies, where restructuring was faster under foreign than domestic ownership. The firm-specific managerial and technological knowledge can be much higher in companies with foreign than with domestic ownership.

Labour productivity in manufacturing foreign affiliates in 1996 and 1998 was almost two times higher than in domestic firms (Table 2). But in 2001 the gap became narrower in five countries and increased only marginally in the remaining two. A 60% lead of FIEs over DEs is the rate shared by six countries, a gap two times larger than the OECD average quoted above. These data do not control for industry and firm size. Decreasing concentration of FIEs by industry decreased their difference in comparison to the domestic sector. The smallest gap can be found in Estonia where FIEs concentrate in low-tech industries that are characterized by an only small labour productivity gap.

Table 2

Labour productivity gap between FIEs and DEs in manufacturing

	1996	1998	2001
Estonia	1.58	1.36	1.19
Czech R.	1.73	1.65	1.56
Hungary	1.7	1.56	1.60
Poland	1.45	1.54	1.58
Slovakia	1.66	1.96	1.63
Slovenia	1.94	1.86	1.66
Romania		1.77	1.57

Source: wiiw Database on foreign investment enterprises relying on national sources.

Ownership-specific differences in productivity are usually high and are clearly reflected in relative wages. Young skilled workers employed by foreign enterprises have higher wages relative to their unskilled and skilled old colleagues and also relative to their counterparts in domestic firms. A more efficient matching of new technologies and new skills in foreign than in domestic enterprises was the driving force behind the appreciation of younger generations. The returns to skills in domestic firms has started to follow the foreign-firm pattern lately.

TNC activities resulted in an increase in the wages of the high-skilled relative to the low-skilled employees. This rise in skill premium can be observed in most transition economies. It provides an incentive to individuals to invest in human capital formation. At least in the case of Hungary, there is no doubt that TNCs have contributed substantially to the upgrading of skills of the workforce (see Box 1). As FDI is regionally concentrated in the more affluent capital and Western regions, labour market effects are also concentrated (see Box 2).

Box 1

Skill upgrade through FDI in the Hungarian electronics industry

(based on Kataria and Trabold, 2004)

The international business literature suggests that FDI by TNCs can have two possible outcomes on the skill composition of their employees. The first one is a downgrade of skills, which might occur if TNCs locate labour-intensive stages of the production process in low-tech industries. They take advantage of low labour costs, often hiring workers overqualified for the simple assembly jobs offered in that particular location. As almost no training is provided and only a small fraction of the employees' capabilities is used, the skills of the workers deteriorate.

A second possible outcome from FDI is a skill upgrade, which is often the result from the TNC transferring advanced technology. In that case TNCs take advantage of the availability of a highly qualified labour force and comparatively low wages. As workers need to learn new production or management techniques, their skills upgrade. Evidence from Hungary clearly supports this argument. A number of TNCs undertake training programmes for their employees in Hungary. IBM, Nokia and Flextronics have opened their own training centres. Other companies, at least during the initial stages of their market entry to Hungary, sent their host-country staff back to the home country for training. Samsung, which provided training to Hungarian engineers in South Korea, is a case in point. India's Tata Consultancy Services (TCS), a newcomer to the Hungarian market, plans to train its employees partly in India and partly in Hungary. In addition to training their own employees, multinationals like IBM offer training opportunities to other companies (domestic and multinationals) who have no specialized training programmes of their own.

Sometimes TNCs do not only set up production but also R&D facilities in the host country. This gives local employees the possibility to conduct research, develop new products or enhance production processes. Usually, R&D leads to a substantial skill upgrade of the employees involved in such activities. The recent developments in Hungary clearly show the contribution of TNCs in this respect. A number of multinationals (e.g. Bosch, Electrolux, Fujitsu and Motorola) have started or expanded R&D activities in Hungary. Even some companies that originally came in as low-cost manufacturers or assemblers are now undertaking R&D operations in Hungary. These include companies like Compaq, Hewlett Packard, Nokia, IBM and Flextronics.

Box 2

Regional labour markets in Hungary

(based on Fazekas and Ozsvald, 2004)

Local labour markets are closed and fragmented in Hungary due to the relatively high cost of commuting and the underdeveloped housing market and transport infrastructure. Grouping micro-regions into quartiles according to their employment rates gives a clear east-west, core-periphery division. The central agglomeration and regions along the main east-west transport routes from Budapest in the direction of Graz and Vienna in Austria have the highest employment rates while most of the low employment regions are located in the periphery. Core-periphery division of micro-regions had become stronger over the 1990s. While the intensity of job destruction show an equal regional distribution, the intensity of job creation concentrates on core areas. After 2000, net job destruction of FIEs was more concentrated in high employment regions decreasing regional employment differences. The effect was counterbalanced by the spatial distribution of job

creation/job destruction of domestic firms. In sum, for the whole period between 1993-2002 we can observe a net job destruction (-1% of the working-age population) in the low-employment regions and a net job creation (+11%) in the high-employment regions.

Due to the productivity advantage of high employment regions the same wage level means much higher unit labour costs in the 'bad' regions than in the 'good' ones. Firms moving from the most developed regions to the less developed regions could save only 2-7% in unit labour costs. The regional gaps of productivity and unit labour costs have substantially increased over the last ten years. Increasing returns to agglomerations constitute an important part of the explanation. The higher the density of foreign firms in the high employment regions, the stronger the spillover effect towards domestic (and foreign) firms and, as a consequence, the higher the productivity advantages of these regions. The increasing density of FIEs has a significant positive effect also on the productivity of domestic firms.

6 Employment changes in foreign- and domestic-owned manufacturing

About one third of the manufacturing workforce was employed in the foreign sector in the Czech Republic, Poland, Slovakia and Romania in 2001. The growth of foreign employment was higher in 1998-2001 in these countries than in the others having either a very high rate of foreign penetration, Hungary, or low rates, Estonia and Slovenia. Due to the restructuring needs in the process of economic transformation the domestic sector released labour while the foreign sector expanded employment.

Table 3

Directions of change in the number of employed persons in the foreign and domestic sectors, 1998-2001

	Total	Foreign	Domestic
Estonia	0	+	-
Czech Republic	+	+	-
Hungary	+	+	+
Poland	-	0	-
Slovak Republic	-	+	-
Slovenia	0	+	-
Romania	-	+	-

Source: wiiw Database on foreign investment enterprises relying on national sources.

The analysis of employment movements in 1998-2001 reveal important country differences (Table 3). *Hungary* is a post-transition economy, where employment expands in both the foreign and the domestic sectors. Employment increased in 1998-2001 mainly in the high and high-medium-tech industries like office machinery, electrical machinery, radio and TV sets production. Cheap labour light industries started to lose jobs in both the foreign and the domestic sectors. Contrary to the 1998-2001 period, between 2000 and 2002 the number of FIE employees decreased by 6% in Hungary and the distribution of FIE

employees among economic sectors changed (Fazekas and Ozsvald, 2004). Within the manufacturing sector, the share of FIE employees working in the rubber and plastic production and of transport equipment increased while the share of the textile industry and of the electrical and optical equipment industry decreased. The highest net job destruction took place in the low-technology industries (-10.4 %) while employment in medium-low technology industries increased by a remarkable 16% in two years. The diminishing of high-tech jobs can be a result of the global slump in the electronics industry.

The *Czech Republic* underwent transformation-related restructuring later than Hungary, but at the same time building a more modern industry. There was even room for light industries using low labour costs to expand employment in 1998-2001. Due to privatization, many workplaces were transferred from the domestic to the foreign sector. Also *Slovakia* underwent a process of transformational restructuring and foreign takeover. But overall employment in manufacturing fell, the foreign sector replaced only two thirds of the jobs lost in the domestic sector. This is in sharp contrast to *Poland*, where the domestic sector lost employment on a massive scale and the foreign sector did not create new ones. As pointed out earlier, FDI/GDP is relatively small in Poland and especially the export-oriented green-field investments are missing. The country would need much more FDI to benefit from a turnaround in the employment trends.

In *Estonia* and in *Slovenia*, which had the smallest degree of foreign penetration among the countries under survey, overall employment increased marginally due to an expansion of the foreign sector. *Romania* is in a relatively early stage of restructuring when the manufacturing sector massively loses employment. The foreign sector has substituted only half of the jobs lost in the domestic sector.

By the time of EU accession, the new members have basically passed over the period of rapid restructuring of the formerly state-owned economy and adaptation to market economy conditions. The processes described above for Hungary may now characterize also other countries. This means that the foreign sector no longer grows via privatization, but through new investments and to some extent by taking over private domestic firms. New FDI inflows can increase employment but there is also room for improving productivity.

The share of foreign affiliates in employment differs by industry (Appendix Table A5). NMS show the highest rate of foreign penetration in the following industries: rubber and plastics, electrical machinery, radio and TV sets production, motor vehicles. The motor industry has been one of the success stories in several NMS (see Box 3). It is a top job creator and exporter in Hungary, the Czech Republic, and Slovakia. The development of the car industry has been led by foreign investors which created not only assembly lines but

developed the supplier networks as well. Further development of this industry depends upon the broadening of the local supply base.

Box 3

The automotive industry

(based on Radošević and Rozeik, 2004)

The restructuring of the CEE automotive industry has been entirely foreign-led. Foreign investment enterprises have substantially increased their share in employment in the car industry. In the Czech Republic, in Hungary and Poland foreign firms accounted for about 70% of overall employment. The effects of FDI on growth, restructuring and employment in the car-industry are positive. The integration of Central and Eastern Europe into a network of major European automotive TNCs has made it possible to produce different models in different countries and to reorganize the value chain in a way that creates bigger value added for TNCs. Only a minority of activities have been relocated from Western Europe, the majority of internationalization took the form of expansions and extensions, which suggests that the EU enlargement has been a positive sum game in the automotive industry. Those CEECs that have attracted FDI in this industry have benefited through preserved employment, increased productivity and export and through a great potential for developing a local supply base. Development and integration into international networks have been most profound in the Czech Republic and Hungary; it faces difficulties in Poland and has just started in Slovakia and Romania.

Productivity in the automotive industry is well above the industry average and company evidence points to large productivity gains. The arrival of large assemblers has produced quite substantial effects, which need to deepen through further development of the local supply base. We expect a further arrival of suppliers. However, whether or not this will happen will depend on the CEECs' ability to develop sector-specific policies to support the upgrading of local automotive suppliers. A crucial policy issue is whether the current national and EU policies are addressing this next stage of automotive industry upgrading.

Most of the CEECs have been active through FDI policy to attract automotive TNCs. This policy focus has become far from sufficient for industrial upgrading, which requires integration between FDI and vocational training and innovation policies. In order to assist industrial upgrading, the CEECs should take into account the network character of local and global companies. This has already been recognized (implicitly or explicitly) through the national subcontracting programmes (Czech Republic) and the Hungarian 'integrator programme', which aim to integrate domestic firms with foreign firms through supply linkages. Inter-firm linkages, which have emerged through automotive value chains, should be further deepened. Job and retraining grants as tools of FDI policy and innovation policy should be expanded throughout the region, possibly linked to Structural Funds programmes. This could be complemented with clustering policies and the promotion of 'learning networks' which would closely connect suppliers and assemblers.

NMS have little employment and also low foreign penetration in high-tech industries. Office machinery as well as medical and other instruments production has high foreign penetration only in the Czech Republic. The electronics industry employs the highest number of persons in Hungary and the Czech Republic is catching up. Both countries are

engaged in promoting the further development of this industry and its local linkages. Electronics firms are engaged in R&D activity, education and training and can thus have positive spillover effects.

Lower than average foreign penetration can be found in the food industry, basic and fabricated metals production, general machinery and other transport equipment production. These are industries which used to have large overcapacities in the previous system. Production and employment have been shrinking due to narrowing demand and import competition. Foreign investors came into these industries only to the extent they saw a market potential. Low tech industries, like textile, clothing and leather are less than average penetrated by foreign investors except in Romania.

7 Effects of EU accession and prospects of FDI-related employment

We expect a slow recovery of FDI inflows from the 2003 low due to global and regional factors. Following EU accession, some FDI locational factors will improve while others may become more complicated. Especially lower transaction costs (e.g. the fall of customs procedure) and increasing perceived stability can make these countries a more attractive investment target in the coming years especially by small and medium-sized companies. But new members will have some cost of compliance with EU norms and restrictions on FDI subsidies that may increase the cost of investment.

Some of the benefits of accession have already been anticipated by investors. Markets in the new members are to a large extent in the hands of foreign multinationals thus local market oriented FDI can expand in the future only in parallel with the growth of the market but hardly by acquiring additional market shares. Further increase in FDI seems possible only if it is export oriented. But FDI may increase in construction (e.g. roads, environmental facilities) when new members access EU funds and investments in physical infrastructure can be carried out by any European contractor. FDI in agriculture can also increase due to the gradual liberalization of land ownership.

Labour cost advantages in comparison to EU-15 will remain for quite some time and stimulate export oriented FDI in the NMS. Geographic segmentation of production can strengthen the competitive position of the multinational companies as a whole and thus stabilize workplaces in headquarters and subsidiaries alike.

FDI-related workplaces are expected to shift between the new members due to concentration and specialization of foreign subsidiaries. Some of the production capacities that have been established in each country one by one, will be closed down, others will be enlarged and supply more than one country. New FDI projects take into consideration the

easy transgression of borders also for suppliers. This opens up more opportunities for smaller countries like Slovenia and the Baltics.

8 The potential for FDI in NMS⁸

Towards the end of the 1990's FDI in Central and Eastern European countries (CEECs) was mainly geared towards the non-manufacturing sector. At the same time, figures on exported intermediate goods suggest that manufacturing industries in the CEECs were able to establish vertical links with manufacturing industries in the European Union right from the beginning of the 1990's. There is however no indication that the subsequent inflow of foreign capital has significantly fostered vertical integration.

Evidence indicates that foreign direct investment and production sharing in Central and Eastern Europe are only loosely related. Foreign direct investment appears to be primarily undertaken by horizontal multinational firms. In order to examine this hypothesis more thoroughly we assess the determinants for foreign direct investment in Europe in a multivariate gravity model (see Box 4). We evaluate the role of overall market size, market size differences, endowment differences, trade costs and unobserved characteristics as determinants for bilateral FDI. This model also forms the basis to simulate future developments of FDI in CEECs. But the determinants of FDI should, differ between different economic sectors. To test this hypothesis we decompose FDI into manufacturing and non-manufacturing FDI and assess the determinants separately.

To summarize the empirical findings, the determinants of FDI in non-manufacturing as opposed to manufacturing industries significantly differ from each other. The parameter estimates for FDI in non-manufacturing activities indicate a dominating role of horizontal multinational firms. In manufacturing industries, however, support for the horizontal model of FDI is much weaker. First, the coefficients of market size and market size differences are significantly smaller than in non-manufacturing. Second, the insignificance of the coefficient on the endowment difference measure indicates that low-wage seeking investment may indeed play a larger role in manufacturing than in non-manufacturing. Third, trade and FDI in manufacturing are not found to be substitutes. To clarify, we do not find strong support for the vertical model of FDI, rather FDI in manufacturing is somewhat more ambiguous in its nature than FDI in non-manufacturing, encompassing horizontal and vertical elements simultaneously.

⁸ This section was written by Ingo Geishecker, based on a full background study (Geishecker, 2004a).

Box 4

The gravity model determining foreign direct investment

We estimate a gravity equation for an unbalanced bilateral panel of 27 reporting and partner countries (including the NMS and CC of Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania, Slovak Republic) for which the FDI inward stock in manufacturing and non-manufacturing industries is available from Eurostat's New Cronos Balance of Payments statistics.

Following and expanding on Carr et al. (2001) and Bloningen et al. (2002) we specify the following model:

$$\begin{aligned} FDI_{ijt} = & \mathbf{a} + \mathbf{b}_{GS} GDPsum_{ijt} + \mathbf{b}_{GD} GDPdiff_{ijt} + \mathbf{b}_{ED} ENDOWdiff_{ijt} \\ & + \mathbf{b}_{GED} (GDPdiff * ENDOWdiff)_{ijt} \\ & + \mathbf{b}_{TCI} IMPT_{jt} + \mathbf{b}_{TCE} + EXPT_{ijt} \\ & + \mathbf{b}_{TED} (IMPT * ENDOWdiff)_{ijt} \\ & + \mathbf{d}_t + \mathbf{J}_{ij} + \mathbf{e}_{ijt} \end{aligned}$$

where FDI_{ijt} denotes the total inward stock of foreign direct investment from country j in country i at time t in real terms. $GDPsum$ denotes overall bilateral market size and $GDPdiff$ the difference in market size. According to the *knowledge-capital-model* we expect total market size to have a positive impact on foreign direct investment. Dissimilarities are however expected to lower foreign direct investment according to the model. $ENDOWdiff$ denotes endowment differences, which we approximate by absolute GDP per capita differences following conventional literature. The term $IMPT$ denotes trade costs for imports from country j . Since in the model horizontal foreign direct investment and trade are substitutes we expect a positive impact of trade costs on foreign direct investment. The term $EXPT$ on the other hand denotes export costs. If the coefficient is significant at all, we expect a negative sign as vertical foreign direct investment should be negatively affected by export costs.

The model also includes the interaction terms of size and endowment differences ($GDPdiff * ENDOWdiff$) and import costs and endowment differences ($IMPT * ENDOWdiff$) to take account of model nonlinearities. Finally we decompose the error term into time specific components \mathbf{d}_t and bilateral fixed components \mathbf{J}_{ij} . The remaining error term \mathbf{e}_{ijt} is assumed to be idiosyncratic.

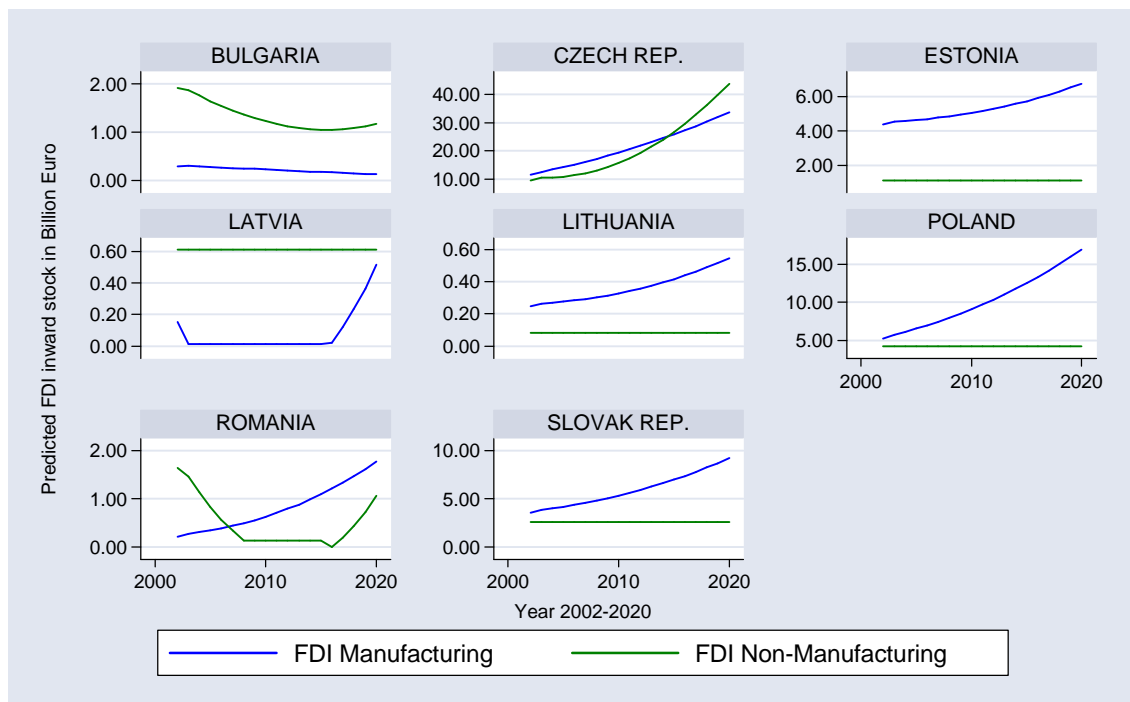
Allowing for bilateral fixed effects as well as common time effects allows us to avoid omitted variable bias by comprehensively controlling for macro economic influences and institutional and cultural factors such as investment regulations and language that may determine foreign direct investment. The detailed estimation results are reported in Appendix Table A6.

On the basis of the estimated gravity model for manufacturing and non-manufacturing FDI we can simulate the future development of FDI under different convergence scenarios which also later allows us to simulate future effects of FDI.

Our first scenario is what may be described as modest convergence. We assume that endowment differences (approximated by GDP per capita) converge with an annual rate of 3% (beta convergence).⁹ Accordingly, in this scenario it would take about 25 years to halve an initial endowment difference. Figure 3 depicts the simulation results for this modest convergence scenario. While in most countries predicted FDI in non-manufacturing is fairly flat and predicted FDI in manufacturing grows significantly there are some interesting country-specific patterns. In the Czech Republic both non-manufacturing and manufacturing FDI will grow impressively over the next 20 years. For Bulgaria, however, one has to be less optimistic: manufacturing as well as non-manufacturing FDI will decline over the next two decades. For Romania the picture is mixed: FDI in manufacturing grows significantly and FDI in non-manufacturing industries is expected to decrease. Generally speaking, our simulations indicate that with the exception of the Czech Republic, the GDP per head growth rates implied by the modest convergence scenario are not sufficient to generate enough non-manufacturing FDI to overcompensate the decline in non-manufacturing FDI due to falling trade costs. For Bulgaria, the only country with falling manufacturing FDI, the decline in trade costs is not sufficient to compensate the decline in manufacturing FDI due to decreasing endowment differences.

Figure 3

FDI simulation, modest convergence

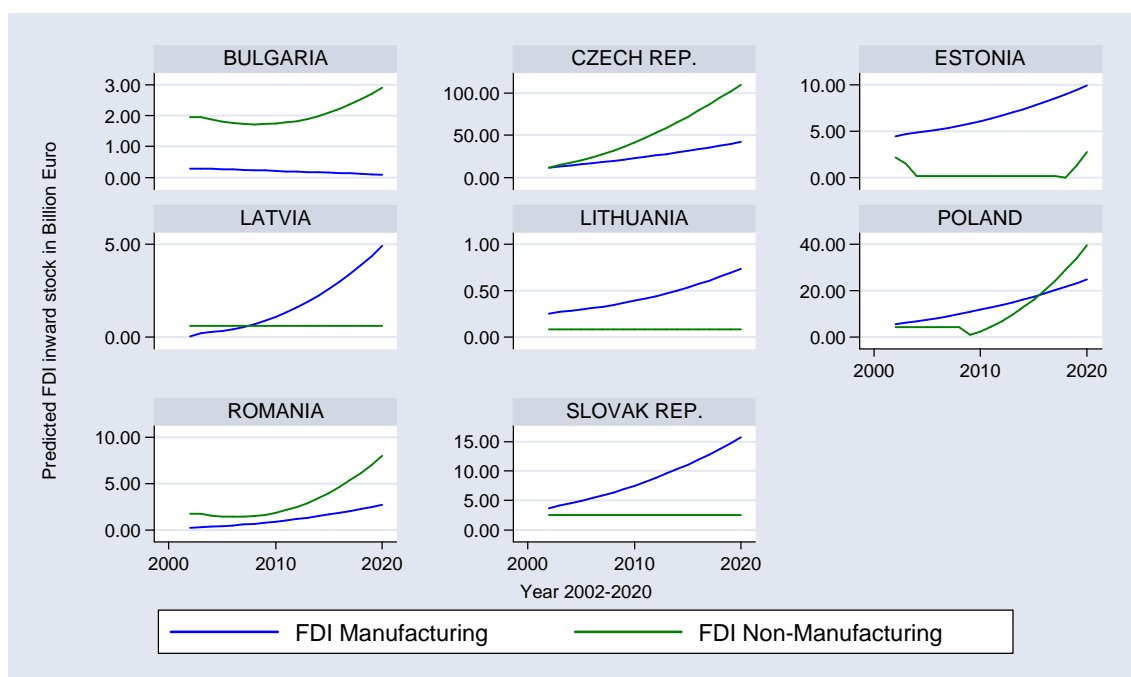


⁹ Convergence of Country GDP per head to Non-CEEC average of GDP per head.

Our second scenario may best be described as optimistic. We now assume a convergence rate of 4% (beta convergence). That implies that an initial endowment difference is halved after approximately 16 years. Again, we assume that total GDP grows at the same rate as GDP per head and follow the same trade cost trends as in the modest scenario. The results of this simulation are depicted in Figure 4. For half of the analysed countries we expect significant increases in non-manufacturing FDI while for the other half non-manufacturing FDI is at least not decreasing and remains fairly flat. With the exception of, again, Bulgaria manufacturing FDI significantly grows in all CEECs.

Figure 4

FDI simulation, optimistic convergence



9 The skill effects of FDI in NMS¹⁰

By utilizing predictions for future FDI the next goal of the analysis is to provide benchmark simulations for the changing demand for workers' skills under different convergence scenarios in Central and Eastern European new member states. Although FDI and international outsourcing are related, the two only partly overlap. Even if one shares the view that FDI forms the basis for international outsourcing, in practice outsourcing is also possible purely on the basis of subcontracting without substantial FDI. At the same time, empirical studies analysing the determinants of FDI suggest that a large share of FDI is actually of the horizontal type and aimed at serving host country markets instead of establishing vertical linkages. To clarify what labour demand effect

¹⁰ This section was written by Ingo Geishecker, based on a full background study (Geishecker, 2004b).

is attributable to international outsourcing and knowledge spillovers through FDI we expand on the existing literature and control for both determinants simultaneously. We estimate industry level employment share equations for low-, medium and high-skilled workers separately utilizing a large three-way country/industry panel for NMS (see Box 5).

Box 5

Assessing the skill bias of FDI

We define low-, medium- and high-skilled workers on the basis of occupational placement utilizing country and industry level data from the European Labour Force Survey. Following Berman et al. (1998) we then assess the impact of FDI on the skill composition of employment by estimating the following three way panel model for the employment share of high-, medium- and low-skilled workers respectively:

$$\begin{aligned}
 S_{ijt}^s &= \mathbf{a}_0 + \mathbf{b}_Y \ln Y_{ijt} + \mathbf{b}_C \ln C_{ijt} + \mathbf{b}_{FDI} \ln FDI_{ijt} \\
 &+ \mathbf{b}_{IMPF} \ln IMP_{ijt}^f + \mathbf{b}_{IMPM} \ln IMP_{ijt}^m \\
 &+ \mathbf{b}_{EXPF} \ln EXP_{ijt}^f + \mathbf{b}_{EXPM} \ln EXP_{ijt}^m \\
 &+ \mathbf{u}_{jt} + \mathbf{d}_t + \mathbf{l}_j + \mathbf{m}_i + \mathbf{e}_{ijt}
 \end{aligned}$$

where s indexes the skill level, i industry, j country and t time. Y and C denote output and capital and FDI represents the stock of foreign direct investment. Imports (Exports) of final and intermediate goods are denoted by IMP^f (EXP^f) and IMP^m (EXP^m). Furthermore we allow for country specific time effects \mathbf{u}_{jt} that capture country specific factors such as changing relative wages. The remaining error term is decomposed into a time specific component \mathbf{d}_t , a country specific component \mathbf{l}_j , an industry specific component \mathbf{m}_i and an idiosyncratic error term \mathbf{e}_{ijt} .

We estimate the model by dummy Ordinary Least Squares and TOBIT, the coefficients do, however, not differ significantly between the different estimators. Appendix Tables A7 and A8 report the estimation results for the dummy OLS regression.

Estimation results suggest a significant impact of inward FDI on the relative demand for medium-skilled workers. Low- and high-skilled workers appear to be positively affected by inward FDI, the effect is however not statistically significant. International outsourcing, proxied by imported intermediate inputs, also exerts a negative impact on the relative demand for medium skilled workers and increases the employment share of high-skilled workers. Accordingly we find evidence for an skill-upgrading effect of international outsourcing. A 1% increase in imported intermediate inputs results in a 0.04 percentage point increase in the share of high skilled workers and a 0.06 percentage point decline in the share of medium skilled workers.

The effects of FDI are somewhat more ambiguous. FDI lowers the employment share for medium-skilled workers. We can however not identify a significant positive effect of FDI on

the employment share of high-skilled workers, indicating that to some extent FDI also increases employment of low-skilled workers. This result is not consistent with an unequivocal technology spillover effect that is biased towards high-skilled workers but rather suggestive of an increased disparity of required skills at the workplace. The reason for this development might lie in a mismatch of workers' occupational skills acquired in the socialist system and the new skill requirements of multinational enterprises and their production network in NMS. Under changing production technology, former medium-skilled workers face a depreciation of their skills being downgraded to elementary occupations while at the same time demand for higher ranking occupations such as technicians and professionals is rising.

However, this result deserves some further qualification. While it is plausible to assume that on average skills acquired in the socialist system only poorly match the requirements of new production technologies that are fostered by multinational firms, an interesting question is how younger workers with more recent training are affected by FDI. We therefore re-estimate our model for a sub-sample of young workers (aged below 25 years). Contrasting the results for the whole sample, among younger workers FDI has no significant negative effect on the employment share of medium-skilled workers. Instead, we find a significant positive effect for the employment share of high-skilled workers. Our results strongly indicate a skill upgrading effect of FDI for younger workers.

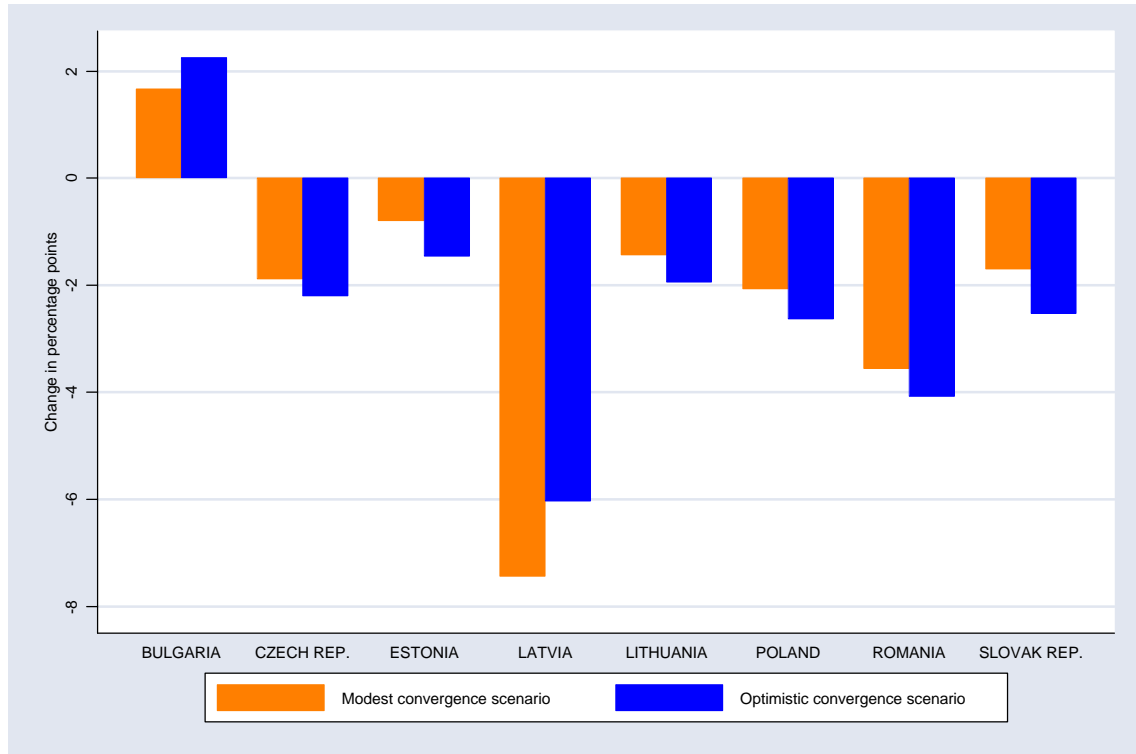
Based on the parameter estimates from the previous regressions we assess the magnitude of the effect of FDI on the skill composition of the labour force that is to be expected in the future. In order to do so, we combine predicted inward stocks of FDI in manufacturing from the gravity model estimated previously with the point estimates from the regression. Since our model controls for a wide range of observable industry-specific characteristics as well as country and industry unobserved characteristics we may interpret the coefficient of FDI as being representative of the average effect of FDI on the skill composition even for countries that initially were not included in our sample due to data constraints but for which we have estimates of future manufacturing FDI inward stocks (Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania and Slovakia).

Figure 5 depicts the cumulated marginal effect of FDI on the demand for medium-skilled workers under two different convergence scenarios holding all other determinants constant. From our estimations follows that a 1% increase in the inward stock of manufacturing FDI (log percentage) *ceteris paribus* lowers the demand for medium-skilled workers by 2 percentage points. With the exception of Bulgaria, manufacturing FDI is expected to rise significantly in all NMS. Accordingly our simulations indicate an expected increase in the relative demand for medium-skilled workers in Bulgaria and expected decreases for the Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania and Slovakia. In general the effects of FDI on the demand for medium-skilled workers are

moderate, cumulatively altering the share of medium-skilled workers by less than 3 percentage points over 16 years. Somewhat more pronounced effects are to be expected for Latvia and Romania, where under optimistic convergence assumptions the expected increase in manufacturing FDI until 2020 is particularly high so that the share of medium-skilled workers falls by 6 and 4 percentage points respectively.

Figure 5

Cumulated effect of FDI on demand for medium-skilled workers, 2005-2020, *ceteris paribus*



In a further simulation we take account of changes in other important determinants of the skill composition. For the analysis we assume growth rates for manufacturing output that are consistent with modest and optimistic convergence respectively. Imported intermediate inputs are extrapolated using country level average growth rates between 1998 and 2002. Since we now also take into account changes of other variables our sample is constrained to the countries for which we have predicted manufacturing FDI stocks and at the same time data on manufacturing output (from the New Cronos enterprise data) are available. Figures 6 and 7 show the respective simulation results for the Czech Republic, Estonia, Latvia, Lithuania and the Slovak Republic.

Figure 6

**Cumulated marginal effects on demand for medium-skilled workers,
2005-2020, modest convergence**

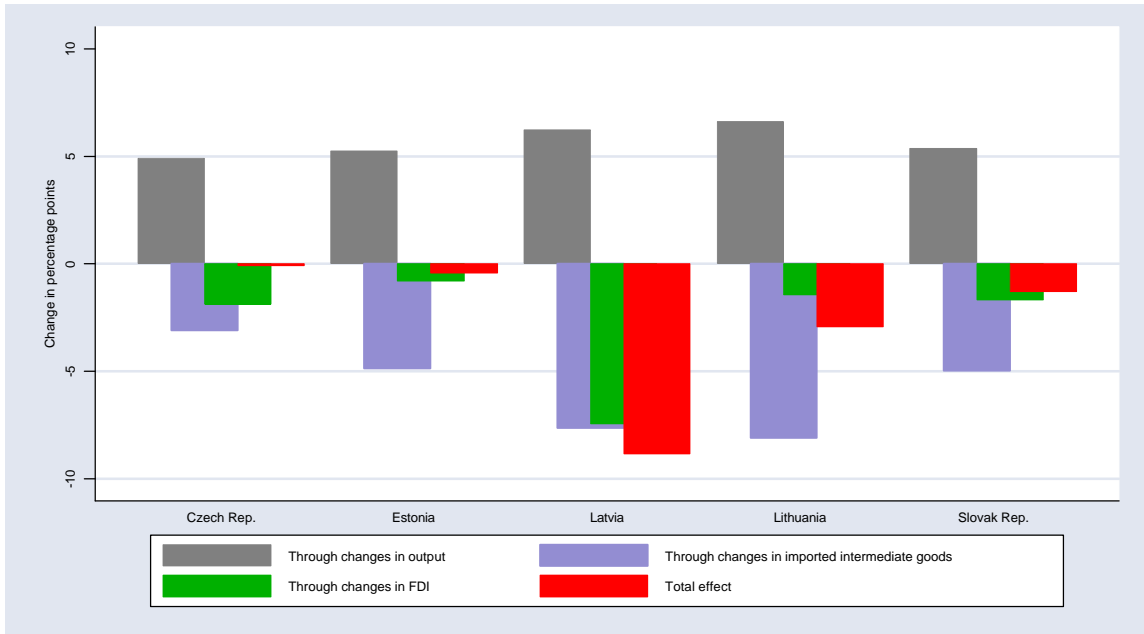
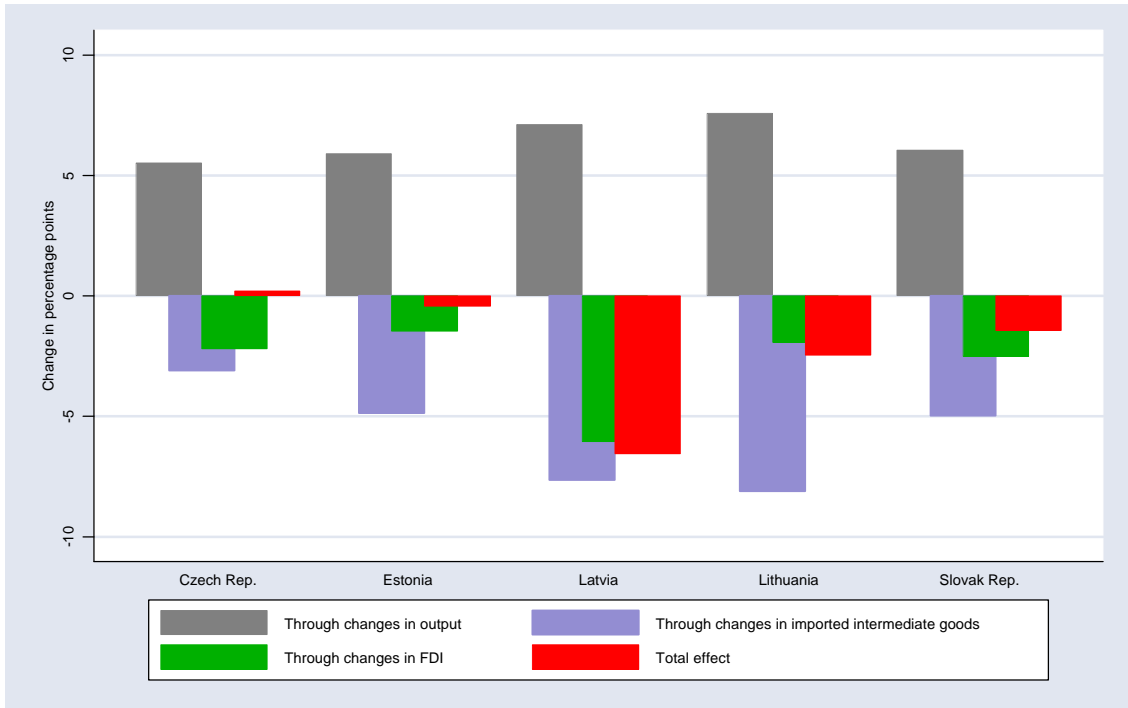


Figure 7

**Cumulated marginal effects on demand for medium-skilled workers,
2005-2020, optimistic convergence**



As becomes apparent, FDI and outsourcing work in the same direction, both significantly lowering the demand for medium-skilled workers. Changes in output, however, counteract these effects significantly, increasing the employment share of medium-skilled workers. As a result, the overall changes in medium-skilled workers employment shares are fairly modest, below 3 percentage points. An exception is Latvia, where significant predicted increases of outsourcing activity and FDI lower the employment share by up to 8 percentage points. To conclude, FDI is a significant determinant of the skill composition in Central and East European countries and is biased against medium-skilled workers.

10 Summary conclusions

- FDI into the NMS has been as high relative to GDP as in the EU-15, indicating that catching up in this respect was fast. But there is still room for foreign participation in public utilities to expand and even more scope for export-oriented FDI to increase.
- By the time of EU accession, all economic sectors had been opened to foreign investment, with the exception of some utilities. FDI has mainly gone into services – banking, telecommunications, retailing and real estate.
- FDI in services oriented towards the local market has usually had job-creating effects but more recently it has grown only in line with the expansion of the market. At the same time, export-oriented services have begun to appear through the development of off-shore activities.
- Manufacturing accounts for less than 40% of the overall stock of FDI but is responsible for the bulk of exports. In the future export-oriented FDI is likely to grow faster than that oriented towards the local market.
- FDI related to the privatization process resulted mostly in labour shedding, whereas FDI in greenfield sites resulted in job creation. Irrespective of the initial method of entry, FDI is now increasingly taking the form of reinvestment of profits. Large manufacturing FDI projects involve in many cases local suppliers and establish linkages with local businesses. Promoting such linkages as well as stimulating reinvestment of profits may be major factors in receiving more FDI and creating more jobs in the future.
- Over the past decade, domestically-owned manufacturing companies reduced the number of employed while foreign-owned enterprises expanded that number. However, job losses from FDI have resulted from the restructuring of privatized state-owned companies. A policy of delaying privatization or imposing employment requirements on the new owners is likely to mitigate the loss of jobs only temporarily and even then only under favourable circumstances. A reduction of employment has also resulted from foreign companies' cutting domestic linkages after taking over state-owned enterprises.

- Foreign penetration of the domestic economy is highest in manufacturing in Hungary, with 45% of the workforce employed in foreign subsidiaries in 2001; in the Czech Republic, Slovakia and Poland, the respective figure amounts to around 35%. Foreign affiliates are characterized by higher labour productivity and better capital endowment and use more up-to-date technology than domestic companies; as a result, they tend to increase all of these in the host economy as a whole.
- Ownership-specific differences in productivity are clearly reflected in relative wages. Young skilled workers employed by foreign enterprises have higher wages relative to both their unskilled and skilled older colleagues and also relative to their counterparts in domestic firms. The more efficient matching of new technologies and new skills in foreign as compared to domestic enterprises has benefited younger generations.
- Foreign penetration is highest in the medium-to-high-technology industries and these tend to have a higher skilled workforce than domestically owned companies. They also provide more training to workers.
- Following EU accession, some factors affecting FDI locational decisions are likely to become more favourable to investment in the new member states, while in other cases the effect of entry is less clear. In particular, lower transaction costs and increasing perceived stability can make NMS more attractive destinations, while the cost of compliance with EU norms may offset some of the cost advantages.
- FDI-related jobs are expected to shift between the new member states as foreign subsidiaries become more specialized and concentrate in particular places. Some production capacity is likely to be closed down, other units are likely to be enlarged and begin to supply more than one country. The dismantling of border controls will open up more opportunities for smaller countries such as Slovenia and the Baltic States.
- A major question for the future is whether the present high regional concentration of FDI within the countries is likely to diminish. Agglomeration effects work against this happening, while improvements in transport and telecommunications make it more feasible. Thus, for instance, larger towns in peripheral regions have started receiving more FDI after becoming accessible by motorway.
- Labour cost advantages relative to the EU-15 will remain for some time and stimulate export-oriented FDI in the NMS. The greater geographical dispersion of production in order to take advantage of lower costs may strengthen the competitive position of the multinationals concerned and thus help to make jobs more secure in headquarters and subsidiaries alike.
- Empirical results from a gravity model suggest that FDI in non-manufacturing sectors tends to be of a horizontal type while this is less the case in manufacturing. As a result, a different growth path for FDI in manufacturing and non-manufacturing may be expected in the longer term. With the exception of Bulgaria, the model predicts strong increases in manufacturing FDI in the coming years. The picture, however, is more

mixed for non-manufacturing FDI. With a modest pace of convergence towards the level of GDP per head in the EU-15, non-manufacturing FDI is likely to remain constant or even decline, except in the Czech Republic where non-manufacturing FDI would grow at a similar rate as in manufacturing. With stronger convergence, FDI in non-manufacturing is likely to show more robust growth.

- Further econometric analysis suggests that FDI is a significant determinant of the skill composition in the NMS and is biased against skilled manual workers (i.e. FDI results in more employment of high-skill non-manual workers and low-skill workers). The magnitude of this effect is, however, modest and partly offset by other factors (the share of skilled manual workers is predicted to decline by less than 3 percentage points between 2005 and 2020).

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Appendix

Table A1

Foreign direct investment inflow

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Czech Republic	559	734	1982	1140	1152	3317	5933	5404	6296	9012	2289
Hungary	2039	966	3751	1886	1973	1857	1913	2998	4391	3026	2182
Poland	1468	1581	2831	3592	4343	5676	6824	10334	6372	4371	3935
Slovakia	153	231	200	285	195	609	366	2089	1763	4260	600
Slovenia	96	98	117	138	295	194	99	149	412	1707	160
New EU-Members-5	4315	3610	8882	7041	7957	11654	15135	20973	19234	22376	9167
Estonia	139	184	156	120	236	511	284	425	603	307	699
Latvia	38	180	138	305	462	317	325	445	182	407	311
Lithuania	27	26	56	122	313	824	457	412	499	772	437
Baltic countries	203	390	350	547	1011	1653	1066	1282	1284	1486	1447
New EU-Members-8	4518	3999	9232	7589	8968	13306	16201	22255	20518	23862	10614

Remarks:

Czech Republic: equity capital cash + in kind + reinvested earnings from 1998 + loans from 1998.

Hungary: equity capital cash + loans from 1995 + reinvested earning from 2000.

Poland: equity capital cash + in kind + reinvested earnings + loans - on a transaction basis.

Slovak Republic: equity capital cash + reinvested earnings from 1997 + loans from 1997.

Slovenia: equity capital + reinvested earnings from 1994 + loans from 2001.

Estonia: equity capital + reinvested earnings + loans.

Latvia: equity capital cash + reinvested earnings from 1996 + loans from 1996.

Lithuania: equity capital cash + reinvested earnings from 1995 + loans from 1997.

Sources: National banks of respective countries according to balance of payments statistics.

Table A2

Foreign direct investment inward stock

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Czech Republic	3054	3732	5741	6910	8367	12255	17479	23323	30717	37576	41000
Hungary	5002	5785	10108	12216	14807	16125	19439	21659	26503	29526	28000
Poland	2058	3105	6122	9229	13206	19247	25946	36792	46686	45739	48000
Slovak Republic	.	737	1013	1660	1888	2464	3174	5112	6327	8185	9000
Slovenia	851	1081	1376	1612	2000	2369	2675	3110	2952	3918	4000
New EU-Members-5	10965	14440	24359	31626	40268	52460	68712	89996	113185	124945	130000
Estonia	214	404	574	664	1040	1560	2454	2843	3573	4035	5400
Latvia	67	252	480	754	1140	1325	1782	2241	2652	2679	2800
Lithuania	136	255	274	564	942	1384	2050	2509	3023	3818	4000
Baltic countries	417	911	1328	1983	3123	4269	6285	7593	9248	10532	12200
New EU-Members-8	11382	15351	25688	33609	43391	56729	74997	97590	122433	135476	142200

Remarks

Czech Republic: equity capital + reinvested earnings from 1997 + loans from 1997. Excluding privatization revenues.

Hungary: equity capital + loans from 1995.

Poland: equity capital + reinvested earnings + loans.

Slovak Republic: equity capital + reinvested earnings + loans.

Slovenia: equity capital + reinvested earnings + loans.

Estonia: equity capital + reinvested earnings + loans.

Latvia: equity capital + reinvested earnings + loans.

Lithuania: equity capital + reinvested earnings + loans.

Source: National banks of respective countries according to international investment position (IIP).

Table A3

FDI inward stock by main activities, per cent

Code		Czech R.		Hungary		Poland		Slovak R.		Slovenia	
		1998	2002	1998	2002	1998	2002	1998	2003	1998	2002
A,B	Agriculture, forestry, fishing	0.2	0.1	0.9	1.3	0.1	0.4	0.1	0.2	0	0
C	Mining and quarrying	0.9	1.4	0.5	0.3	0.3	0.3	1.2	0.8	0	0
D	Manufacturing	45.8	35.5	38.4	45.8	38.9	35.8	49.1	37.5	53.0	43.3
E	Electricity, gas, water supply	4.5	6.9	14.8	4.6	0.1	2.6	0.5	11.7	0.5	1
F	Construction	1.0	1.9	1.9	1.1	1.4	2.6	2.0	0.7	0.2	0.1
G	Trade, repair of motor vehicles, etc.	17.3	11.9	12.3	11.1	12.3	17.1	16.9	11.2	15.8	14.5
H	Hotels and restaurants	0	1.2	1.8	1.1	0.2	0.6	1.0	0.5	0.7	0.4
I	Transport, storage, communications	9.2	13.6	7.1	10.1	1.2	10.4	3.2	10	1.8	4.4
J	Financial intermediation	14.7	15.9	10.9	10.3	13.6	21.3	21.5	23.5	16.2	18.8
K	Real estate, renting & business act.	5.5	9.3	9.8	11.7	3.0	7.5	4.0	3.2	10.6	15.2
	Other not classified activities	0.9	2.6	1.6	1.0	28.7	2.9	0.5	0	1.2	2.3
	FDI total (100%) EUR million	12255	36884	9245	29653	19246	45738	1815	8409	2369	3918

Remarks:

Czech Republic: equity capital, reinvested earnings, loans.

Hungary: equity capital and reinvested earnings; 1998: subscribed capital

Poland: equity capital, reinvested earnings, loans.

Slovak Republic: equity capital, reinvested earnings - in the corporate sector.

Slovenia: equity capital, reinvested earnings, loans.

Source: National banks of respective countries according to international investment position (IIP).

Table A4

Inward FDI stock in the manufacturing industry, EUR million

NACE code		Czech R.	Hungary	Poland	Slovak R.	Slovenia
		2002	2002	2002	2003	2002
DA	Food products; beverages and tobacco	1557.1	2187.5	3577.6	376.1	74.1
DB	Textiles and textile products	399.1	253.2	231.1	36.6	39.8
DC	Leather and leather products	100.9	80.3	.	25.5	35.8
DD	Wood and wood products	170.4	144.9	1904.8	30.1	8.3
DE	Pulp, paper & paper products, publishing & printing	791.8	467.1	.	138.0	258.9
DF	Coke, refined petroleum products & nuclear fuel	253.2	217.9	41.4	351.1	.
DG	Chemicals, chemical products and man-made fibres	948.2	1698.6	2025.1	283.2	544.2
DH	Rubber and plastic products	839.9	511.8	1069.2	94.4	200.9
DI	Other non-metallic mineral products	1675.2	601.9	.	161.0	85.7
DJ	Basic metals and fabricated metal products	1191.7	644.2	874.8	1108.2	105.0
DK	Machinery and equipment n.e.c.	725.9	752.3	495.8	158.5	159.4
DL	Electrical and optical equipment	1857.5	2704.1	539.0	182.8	125.8
DM	Transport equipment	2272.3	3230.0	2280.3	160.4	53.5
DN	Manufacturing n.e.c.	303.3	91.7	.	47.3	4.8
	Other non-classified industries	.	.	3339.6	.	.
D	Manufacturing	13086.5	13585.5	16378.7	3153.2	1696.2
	FDI total	36883.8	29653.1	45738.4	8409.0	3918.1

Remarks:

Czech Republic: equity capital, reinvested earnings, loans.

Hungary: equity capital and reinvested earnings.

Poland: equity capital, reinvested earnings, loans.

Slovak Republic: equity capital, reinvested earnings - in the corporate sector.

Slovenia: equity capital, reinvested earnings, loans.

Source: National Banks of the respective countries according to international investment position (IIP).

Table A5

Share of foreign affiliates in employment by industry in 2001, per cent

	Czech Rep.	Hungary	Poland	Romania, 2002
15 Food products, beverages	22	38	30	27
16 Tobacco	97	95	79	25
17 Textiles	24	33	20	40
18 Wearing apparel, dressing	21	36	33	38
19 Tanning and dressing of leather	17	52	26	45
20 Wood	25	22	34	28
21 Paper and paper products	45	44	53	35
22 Publishing, printing	33	20	45	20
23 Coke and petroleum	31	100	41	56
24 Chemicals	27	58	29	20
25 Rubber and plastic	47	49	47	59
26 Other non-metallic minerals	37	37	40	27
27 Basic metals	28	42	10	54
28 Fabricated metals	30	25	20	20
29 Machinery and equipment n.e.c.	21	41	18	15
30 Office machinery	86	33	25	31
31 Electrical machinery and app	58	76	54	53
32 Radio, TV sets	66	83	58	54
33 Medical, precision, opt. ins	38	41	26	18
34 Motor vehicles, trailers	70	69	68	36
35 Other transport equipment	8	22	14	31
36 Furniture, manufacturing n.e.c.	23	26	47	17
37 Recycling	18	37	26	24
D Manufacturing	34	45	33	33

Source: wiiw Database on foreign investment enterprises.

Table A6

Estimation of Gravity Model

	Total	Non-Manufacturing	Manufacturing
GDPsum	0.043 [12.92]***	0.033 [11.52]***	0.009 [11.32]***
GDPdiff	-0.034 [9.90]***	-0.027 [8.79]***	-0.007 [8.78]***
ENDOWdiff	-540312 [2.81]***	-562664 [3.32]***	22351 [0.47]
ENDOWdiff \times GDPdiff	-0.208 [6.43]***	-0.175 [6.15]***	-0.033 [4.13]***
IMPT	6834320000 [2.01]**	5829200000 [1.94]*	1005120000 [1.21]
EXPT	3556340000 [1.64]	2920990000 [1.53]	635352000 [1.20]
ENDOWdiff ² \times EXPT	-0.8166 [0.54]	-0.512 [0.38]	-0.305 [0.82]
Constant	-26158800000 [4.56]***	-19743800000 [3.90]***	-6414970000 [4.56]***
Observations	1561	1561	1561
R ²	0.35	0.31	0.27

Notes: t-statistics in parentheses; regressions include full set of time, pair fixed effects.
Coefficient on interaction term (ENDOWdiff *GDPdiff)*1000000}

Table A7

OLS regression of employment shares

	Low-skilled	Medium-skilled	High-skilled
ln Y	-0.02322 [1.41]	0.06001 [2.69]***	-0.03815 [1.74]*
ln C	-0.00593 [0.52]	-0.00081 [0.05]	0.00796 [0.52]
ln FDI	0.00975 [1.34]	-0.02023 [2.05]**	0.01042 [1.08]
ln IMP ^m	0.02327 [1.64]	-0.05973 [3.11]***	0.03655 [1.94]*
ln IMP ^f	0.00405 [0.60]	-0.01243 [1.36]	0.00842 [0.94]
ln EXP ^m	-0.00039 [0.05]	0.00016 [0.02]	0.00043 [0.04]
ln EXP ^f	-0.00164 [0.30]	0.00075 [0.10]	0.00108 [0.15]
Year 1999	0.08477 [1.50]	-0.1505 [1.97]*	0.06137 [0.82]
Year 2000	-0.00919 [0.32]	0.00145 [0.04]	0.00783 [0.21]
Year 2001	-0.00478 [0.17]	-0.02211 [0.60]	0.0269 [0.74]
Constant	0.09986 [1.08]	0.86657 [6.92]***	0.03726 [0.30]
Observations	225	225	225
R ²	0.41	0.66	0.60

Table A8

OLS regression of employment and shares for young workers

	Low-skilled	Medium-skilled	High-skilled
ln Y	0.01415 [0.30]	0.03856 [0.69]	-0.05286 [1.33]
ln C	-0.00408 [0.12]	-0.01613 [0.41]	0.02005 [0.71]
ln FDI	-0.02785 [1.32]	-0.01505 [0.60]	0.04304 [2.42]**
ln IMP ^m	0.03688 [0.89]	-0.12639 [2.56]**	0.08952 [2.54]**
ln IMP ^f	0.00821 [0.44]	-0.01954 [0.88]	0.01127 [0.71]
ln EXP ^m	0.02688 [1.29]	0.01781 [0.72]	-0.04479 [2.54]**
ln EXP ^f	0.02071 [1.34]	-0.02108 [1.15]	0.00040 [0.03]
Year 1999	0.04868 [0.63]	-0.10934 [1.19]	0.06064 [0.93]
Year 2000	0.02343 [0.30]	-0.03507 [0.38]	0.01165 [0.18]
Year 2001	0.06396 [0.54]	-0.09864 [0.71]	0.03619 [0.36]
Constant	0.86162 [1.72]*	-0.42191 [0.71]	0.56038 [1.32]
Observations	210	210	210
R ²	0.30	0.32	0.33

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