

Foreign Direct Investment and Technology Transfer in Russia

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Introduction: Foreign direct investment (FDI) as a vehicle of technology transfer

Today, it is universally recognized that FDI is one of the main instruments for the dissemination of new technology through the international economy. More specifically:

The transfer of technology and its efficient application and diffusion are...some of the most important benefits sought by developing countries from FDI. TNCs tend to be leading innovators. They are leading suppliers of technology to developing countries and economies in transition, through FDI and other (externalized) forms of transfer. They can also stimulate the development of innovatory capacities in host economies, thereby supplementing technology development that takes place through R&D in domestic firms and publicly funded institutions. (UNCTAD, 2000, p.172)

World Bank economists have perceived a fundamental change in the pattern of international economic activity in recent decades, with

...more and more multinational corporations (MNCs)...adopting integrated regional or even global strategies, using both subsidiaries and strategic allies to locate interdependent facilities in various countries so as to maximize their competitive edge worldwide. This is a change from the dominant behavior of 10 or 20 years ago, when MNC subsidiaries in foreign countries were operating more or less independently of each other and were located anywhere there was a market and without regard to whether the locale offered the conditions necessary for world-competitive price and quality production. (Bergsman et al., no date, p.3)

In more concrete terms, there has been a shift away from FDI focused purely on exploitation of natural resources, or of a large domestic market (often behind protective barriers which have since been lowered with the progress of world trade liberalization), towards FDI which seeks to harness human capital resources to the development of worldwide technology and supply networks. This has paralleled the emergence of intra-industry trade as one of the most dynamic categories of international exchange.¹ And it has been reflected, at the sectoral level, in the rapid globalization of the automotive and electronics industries, two of the sectors with the most ramified supply linkages.

FDI in Russia: the basic picture

Among the countries of the world, Russia has not been a leading recipient of FDI. More specifically, it is well

below the transition country average in terms of FDI inflows (see Table 1). In absolute terms, inflows into Russia have been comparable to those into Slovakia, a country with a population some 3% of the Russian population. Relative to GDP, FDI inflows into Russia have been well below those of the countries due to enter the EU in 2004, and even those of other CIS countries.

Table 1: Inflows of FDI to transition economies, 2000-01

	Inflows (\$m)		Inflows as % of GDP	
	2000	2001	2000	2001
Countries due to accede to the EU in 2004				
Czech Republic	4,595	4,500	9.1	8.0
Hungary	1,649	2,443	3.6	4.7
Poland	8,294	6,929	5.3	3.9
Slovakia	2,075	2,000	10.8	9.8
Slovenia	176	442	1.0	2.4
Estonia	387	600	7.7	11.0
Latvia	408	257	5.7	3.4
Lithuania	379	600	3.3	5.0
CIS countries				
Russian Federation	2,714	2,921	1.0	0.9
Ukraine	595	800	1.9	2.1
Asian CIS	1,804	3,050	3.7	5.7

Source: ECE, 2002, p.154

In terms of the World Bank taxonomy, the FDI that has gone into Russia seems, at first sight, to have been mainly of the 'old' variety. Investment has been predominantly in the hydrocarbons industries, and in projects aimed at serving the domestic market. Despite the importance of investment in hydrocarbons, Russian subsidiaries of MNCs export on average only 12% of their output. If subsidiaries that do not actually produce in Russia are factored out, this figure falls to 7% (Ahrend, 2000, p.28). The comparable figure for Hungary in 1999 was 88.8% (Hunya, 2001). The survey of 46 companies conducted by Ahrend in 2000 found that size of the Russian market, desire to enter the Russian market and the avoidance of trade barriers were the main motivations for direct investment in Russia (Ahrend, 2000, p.28).

Table 2: Cumulative foreign direct investment in Russia to mid-1999

	\$m	%
Total	11,692.5	100.0
Fuel	2,138.7	18.3
Communications	2,208.5	18.9
Food	2,317.7	19.8
Trade and public catering	1,153.0	9.9
Mechanical engineering	470.4	4.0
General commercial activities	375.3	3.2
Non-ferrous metallurgy	292.4	2.5
Wood and paper	465.4	4.0
Transport	341.5	2.9

Source: Foreign Investment Promotion Center (FIPC), Ministry of Economics, Russian Federation

¹ There is evidence to suggest that technology transfer between trading partners intensifies as intra-industry trade passes the benchmark of 70% of total trade. See Hakura & Jomotte, 1999.

Key new developments in 2002-03 reflected a continuation of the same pattern, with Danone buying 4% of food producer Wimm-Bill-Dann, Heineken buying 100% of the Bravo International brewing concern and Scottish and Newcastle Breweries buying Hartwall, which has a 24.3% stake in the leading Russian brewery Baltika. (The other main shareholder is Carlsberg.) BP has acquired a 50% stake in the Russian oil firms Sidanco and TNK, and the Hungarian oil and gas company Mol has entered into a joint venture to develop the West Malonalykskoe oil field. Russian oil company Sibneft has expressed an interest in acquiring a foreign strategic investor.

While the pattern is clear enough, however, the interpretation of the pattern is a more complex matter. Hydrocarbon extraction is an area of comparative advantage for Russia, and Russia's enormous oil and gas reserves mean that the country can play a key role in the global policies for energy supply security of the oil multinationals, and indeed of the governments and supranational authorities of the developed industrial world. International oil companies have, furthermore, played an important role as disseminators of state-of-the-art oil technology to the Russian industry. While this enabled the Russian industry to do much to close the technological gap through the 1990s (Dyker, 2001a, pp.864-5), the continued interest of Russian oil companies in the possibility of foreign strategic investment suggests that the gap has still not been completely closed. The interest of foreign investors in the Russian domestic market is hardly surprising, given the size of that market as reflected in a population of nearly 150 million. Moreover, foreign investment in the Russian food industry has targeted a sector of the Russian economy that suffers from a range of historically conditioned structural and organizational problems which more than a decade of transition has done little to resolve. In that context, incoming food firms have, in practice, played an important role as technology disseminators, though the technology in this case has been largely the 'soft' technology of management, including financial management, procurement, distribution and marketing. In hydrocarbons, too, transfer of soft technology has been an important factor of upgrading, particularly in relation to the technology of organizing complex projects (Dyker, 2001a, *ibidem*). With a weighted average tariff on agricultural imports of 17%, tariff-hopping may have been an factor in the decisions of some of the international food firms which have invested in Russia. But it has not necessarily been the main one.

It is possible, therefore, to explain the pattern of FDI into Russia in Heckscher-Ohlin terms (as seeking to exploit Russia's factor endowments and compensate for Russia's factor deficiencies through a process of 'asset creation'²), or in terms of Dunning's OLI paradigm (Dunning, 1988) (as

seeking to exploit Russia's location-specific advantages and bring to Russia the ownership-specific advantages the companies concerned can offer). But Russia's factor endowments/location-specific advantages go beyond oil and gas. Russia has large concentrations of scientific and technological capability, and a literate workforce with good levels of basic training, available for hiring at wage rates a fraction of comparable wage rates in the developed industrial economies. In this respect, Russia is not very different from the transition countries of Central-East Europe. A number of those have seen a very substantial flow of FDI into manufacturing in recent years. Does this mean that Russia is missing out on something important, that Russian FDI flows really are sub-optimal, that Russia really is trapped in an 'old' pattern of FDI? To try to answer this question, we have to go beyond broad sectoral analysis, and look at some of the company-level research that has been done on the subject.

The impact of FDI on the Russian economy: the microeconomic evidence

Research done on the basis of the Registry of Foreign-Owned Firms of the Russian Federation and the Russian Enterprise Registry Longitudinal Database (RERLD)³ has yielded a number of important general results. The regional pattern of FDI tends to be correlated with the educational levels of the regions concerned (i.e. with the quality of the labor force), but regional variations in labor costs are not a significant factor. The quality of institutions and the progress of reform in the given regions, presence of other firms from the same country in the region, international risk rating of regions, and regional climate are also important. In terms of the sectoral dimension, FDI is strongly correlated with the degree of concentration in the given industry, suggesting that the quest for market power has been an important motive of investing firms. Even more telling, tariff-jumping emerges as a major determining factor (Manaenkov, 2000). In terms of our earlier analysis the implications are clear; quality of Russian human capital is an important determinant of FDI patterns, but so is access to the domestic market. The evidence on tariff-hopping does, furthermore, suggest that in many cases, the market-access motive may have been relatively free of any asset-creating complications. Manaenkov did not test for raw-material location factors. If he had, he might have obtained inconclusive results, since there is clearly no need for a foreign oil company to locate its Russian office in the region of extraction. Overall, however, his results tend to confirm and fill out the more impressionistic findings of Ahrend cited earlier; to support the thesis that much of Russia's FDI is of the 'old' variety, while hinting that there may be some elements of 'new' FDI. To go further in the investigation, we have to look at what has been happening

² See Dyker & Kubiela, 2000

³ *The registries contain company-level information on output, number of employees, book value of capital, total costs, export and import, and some other variables. The Registry of Foreign-Owned Firms includes all fully or partially foreign-owned firms operating in Russia. The RERLD includes all Russian industrial firms with over 100 employees, all state-owned firms, and non-state firms with fewer than 100 employees that are up to 75% privately owned. It excludes firms with fewer than 100 employees that are more than 75% privately owned.* (Yudaeva et al., 2001, pp.7-8) The combined dataset covers 42,000 firms.

inside firms hosting foreign equity, and between those firms and domestic Russian firms.

FDI and the host firm: technology, capability and productivity

Let us again take Central-East Europe as a point of reference. Notably in the automotive and electronics industries, FDI has revolutionized process and product technology in the CEECs. Investing firms have taken concrete measures to raise levels of capability amongst the local workforce, and to reduce, progressively, the proportion of management workers coming from the home country. The result is that labor productivity has increased sharply. In Hungary, for instance, average productivity in firms hosting foreign ownership is nearly three times the level found in wholly Hungarian-owned firms (ECE, 2001, p.212). These patterns have not been repeated in Russia. There have been significant foreign investments in the Russian car industry - by Daewoo, Renault, Fiat, Iveco, Ford, GM, etc. But these investments have failed to revolutionize technology and productivity, or build social capability in line with the Hungarian model. Agreements with foreign companies have helped to transfer main production line technology, to introduce new models, and to develop particular parts of the automotive supply chain. GAZ (the Gorky Automobile Plant), probably the best managed of the Russian car firms, has taken a notably leading role in this from the Russian side. But the kinds of deals that have been signed have been insufficient to fill all the gaps that prevent the creation of an integrated system. It is not surprising that, in a number of cases, joint ventures merely involve the assembly of imported knocked-down kits, which is the lowest form of cooperation in terms of scope for technology transfer and network-building.

The reasons for these problems have been essentially two-fold. Firstly, foreign firms have found it difficult to impose their production culture on Russian workers, and it has accordingly been difficult to develop *technological congruence* with the home firm. It is noteworthy that the general pattern is for productivity gains from FDI in Russia to decrease with the size of companies (Melentyeva, 2000, p.15). Bigger companies in Russia tend to be inherited from the old Soviet Union, and the productivity pattern is consistent with the hypothesis that it is more difficult to crack the established production culture of such companies. Secondly, foreign firms have found it difficult to build supply networks in the Russian environment. Foreign suppliers have been far away, and reluctant to follow the lead investors into Russia.⁴ Significantly, there has been very little foreign investment in Russian small companies (Pripisnov, 1999), even though the impact of foreign investment on productivity levels in smaller Russian companies is large relative to that in large companies. Furthermore, domestically-owned suppliers have generally proven unable to guarantee the levels of quality and

specification required by global leaders in manufacturing. Thus, Ford's St. Petersburg plant, for example, imports 95% of its components. In response to the problem, the International Finance Corporation set up a project in 2002 to help Ford develop a supply chain in Russia (involving Russian and foreign companies). In the next section, we try to dig deeper into the underlying reasons for the difficulties in building supply chains in Russia.

FDI and the host firm: building supply networks

Yudaeva et al. (2001) find that intra-industry, i.e. horizontal, spillovers from FDI are substantial, and are an increasing function of levels of educational attainment in the region of the host enterprise (see also Ponomareva, 2000). This is consistent with a pattern of sectoral upgrading which proceeds primarily through the mechanisms of competition and imitation, and which is the stronger, the higher the existing regional endowment in social capability. But vertical spillovers are found to be negative, both upstream and downstream. The interpretation of this result is obvious - *'that foreign-owned firms in Russia rarely have Russian partners, and therefore their entry leads to break-up of production chains.'* (Yudaeva, 2001, p.5) This kind of reasoning has led, in the case of the Russian ship-building industry, to the promulgation of a government program for the development of 240 complex components, to be developed and produced in Russian-owned companies (von Hirschhausen & Bitzer, 2000, p.153). A slightly different angle on the same set of facts produces the conclusion that traditional, Soviet-type production chains hold back rather than facilitate the emergence of networks in the Western/Far Eastern sense (Harter, 1998). Bringing in the supply network dimension also helps to explain why FDI has less impact on productivity in big companies in Russia. Ahrend, in his survey, found that bigger companies tend to have bigger problems with local suppliers (Ahrend, 2000, p.32)

All of this would seem to confirm a general pattern of FDI under transition conditions, whereby Russian companies seem unable fully to exploit the potential effects of FDI, whether direct or indirect, in direct contrast to her Central-East European neighbors. In fact, the contrast between Russia and the CEECs in relation to supply network-building is not nearly so stark as it is in relation to lead foreign-owned enterprises. The integration of domestically-owned companies into supply networks in CEE has been at best patchy. Many foreign-owned companies in that region prefer to obtain their supplies from the home country (which is, of course, very close, if it happens to be Germany, Austria or Italy). Even when they use local suppliers, those suppliers turn out, in many cases, to be wholly or partly foreign-owned themselves. Thus, Soreide reports that while foreign-owned firms in Hungary buy 43% of their industrial supply from firms located in

⁴ Exceptions within the automotive industry include Bosch, whose joint venture in Saratov supplies 82% of the Russian ignition plug market; Lear, which has a car seat production facility located inside the GAZ plant at Nizhnii Novgorod; Ingersoll Rand, which makes steering columns in a factory near Nizhnii Novgorod; and Delphi, which manufactures wiring harnesses at its plant in Samara.

Hungary, one-third of these actually come from foreign-owned firms (Soreide, 2001). Within the framework of the kind of *supply hierarchies* which dominate industries like the automotive and electronic, it is possible to sort suppliers into three types:

first-tier suppliers, supplying complex parts like engines or gear boxes involving a significant level of design inputs;

second-tier suppliers, providing advanced single components to first-tier suppliers;

third-tier suppliers, making simple components for second-tier suppliers.

In those terms, local suppliers in CEECs are largely relegated to the status of second- and third-tier suppliers. In the automotive industry, at least, *'it is not feasible to "raise" - or keep alive - "national" first-tier suppliers.'* (Havas, 1999, p.37) In Russia the situation is the same, but simply more starkly delineated. Thus, despite the program for the development of local first-tier suppliers as discussed above, domestically-owned Russian shipyards do, in fact, obtain 70% of their complex components from foreign sources (von Hirschhausen & Bitzer, 2000, p.154). What this implies, in terms of our initial taxonomy of FDI, is that the scope of the 'new' FDI, as a drive to absorb and then develop local resources with a view to the implementation of global objectives, does come up against limits, certainly in the transition region.⁵ Investing companies do not generally extend their upgrading mission to suppliers, whether in CEEC or the former Soviet Union, and it would be naive to believe, in the Russian case, that multinational behavior vis-à-vis suppliers would change dramatically as a result of substantial changes in the business environment. If the benchmark is Central-East Europe, then the best Russian suppliers can hope to do in the medium term is to creep into the global networking business at the lowest rung, i.e. as third-tier suppliers.

FDI in sectors where Russian technology is at the leading edge

The Soviet Union was generally, and increasingly, obsolescent from a technological point of view. But there were exceptions to that generalization, mainly in military-related sectors. One such exception is lasers (Bzhilianskaya, 1999). Another is aerospace and space-launching. The latter sectors have featured the following types of inward FDI:

Joint ventures aimed at remedying a specific weakness in the capabilities of the Russian industry, e.g. the agreement between GE Aviation and Rybinsk Motors to produce the CE Aviation CT7 aero engine at the Rybinsk plant, for use in the new Sukhoi-80 executive jet, and also for export (Ivanova, 1998, p.15). A similar agreement has been concluded between Pratt and

Whitney and Perm Motors in relation to the PS-90A engine (Ivanova, 2000, pp.15-16)

Alliances designed to transfer specific pieces of Russian hard technology to the Western partner, such as the agreement between Pratt & Whitney and Energomash whereby the latter will initially make the 'low-cost and robust' RD-180M engine for the Lockheed Martin Atlas III space-launch vehicle, with production (under license) gradually moving to the USA over an eight-year period (Ivanova, 2000, pp.6-7).⁶

Joint ventures designed to market a particular piece of Russian technology worldwide, e.g. the LKEI (Lockheed-Khrunichev-Energiya International) joint venture, which has sole rights in relation to the use of the Proton booster rocket, designed by Khrunichev (Bzhilianskaya, 1999).

Joint ventures designed to develop a particular piece of peculiarly Russian/Soviet technology for the Western market, like the SL (Sea Launch) joint venture, involving Energiya, Yuzhnoe from Ukraine, Kvaerner of Norway (building the rig) and Boeing (doing the finance and marketing), dedicated to the launching of satellites from platforms floating in the Pacific Ocean;⁷ and Sea Launch Services (SLS), a joint venture between the Russian association RAMCON and the US Sea Launch Investors, with a booster rocket specially adapted for sea launches, the Priboi, being expressly designed by the Russian side. (Bzhilianskaya, 1999)

Technological alliances like that between Boeing, DASA and Airbus and the Zhukovskii Central Aerohydrodynamics Institute relating to specific research projects being carried out by Zhukovskii for its Western partners.

A central theme in this varied picture is the recognized value of Russian hard technology. A less obvious but no less central theme is the essential role of Western soft technology in bringing Russian technology to the global market (Ivanova, 2000). That transfer of soft technology is essentially a learning process is highlighted by reports that Khrunichev may now be considering ending its partnership with Lockheed, on the grounds that it has now learned enough to 'go it alone' (Ivanova, 2000, p.5). Only time will tell how accurate this assessment may be. The evidence on the westwards transfer of elements of the Soviet technological legacy confirms the operational importance of this kind of technology transfer, but also confirms that, even here, technologies cannot simply be taken off the shelf - they have to be redeployed, and in some cases specific elements may have to be newly developed from scratch. There are elements of the 'Bangalore' system⁸ in some of the case studies from the space and aerospace sectors,

⁵ Magyar Suzuki presents an interesting exception, partly driven by EU local-content rules. See Havas, 1997

⁶ The first commercial launch of an Atlas III launch vehicle powered by an RD-180M engine was successfully completed in May 2000. An improved Atlas IIIb vehicle was successfully launched for the first time in February 2002.

⁷ SL ran into serious problems in March 2000 with a failed launch. The problem was almost certainly a software one. Since then, five successful launches have been carried out.

⁸ Whereby companies from the leading industrial countries hire highly skilled specialists from poorer countries to work on a sub-contracting basis; the specialists stay in their own country, and receive wages comparable to the general level of wages in those countries.

notably in relation to the Boeing-Zhukovskii partnership, but these elements do not seem to be dominant.

Foreign investment in leading-edge Russian technology is generally a matter of putting to commercial use technologies originally developed for military or space research purposes. There are, however, also some cases where 'new' leading edge technology has emerged from an East-West joint venture. An example is the US-Russian joint venture Polar Lights, the leading firm in the world in the field of environmentally sensitive ice pad drilling technology for the hydrocarbons industries (*Financial Times*, 1999; *Petroleum Economist*, 1999). Here, the technology transfer is bilateral - without the joint venture, the world at large would simply not dispose of this category of innovations.

These elements of FDI in Russia involving two-way technology transfer are important for the sectors concerned, and provide striking confirmation of the technological potential of Russian manufacturing. But they form a very small proportion of total FDI and involve virtually no linkages with other sectors of the Russian economy. In the transition period, as in the Soviet period, Russian prowess in space research represents a small island in a sea of obsolescence, making virtually no impact on the wider environment of Russian manufacturing. They are, quite simply, the exception that proves the rule.

How is EU enlargement likely to affect future trends?

It is inherently difficult to estimate the likely impact of EU enlargement on investment flows into Russia, simply because investment is one of the biggest unknowns in relation to the impact of enlargement on the new member states⁹ themselves. In their seminal work on the effect of enlargement on the GDP of the CEECs, Baldwin et al. (1997) simply assumed that joining the EU would produce a sharp fall in risk premiums on investments in CEEC. It is that assumption which lifts their (calibrated general equilibrium model) estimate of the enlargement-induced growth bonus in those countries from 1.5% to 18.8% of GDP. Other authors, including the present one (Dyker, 2001b), have argued that reductions in risk premiums are not automatic, and that institutional weaknesses in the CEECs, notably in the banking system, may conspire to keep risk premiums significantly higher than they are in western Europe. The whole issue is complicated by the question of anticipation. Thus, Bevan and Estrin (2001, p.26) suggest that announcements about accession may have a big effect on FDI flows, but that the effect may be limited to '*the psychically close nations which were frontrunners in the accession process at the time.*' It is certainly the case that the great bulk of transition region

FDI has gone to the Visegrad countries, the first group of transition countries to begin formal negotiations for accession to the EU. But in terms of political stability, technological congruence and social capability, the Visegrad countries are arguably significantly more attractive to international investment than the other transition economies, including Russia, irrespective of the issue of EU accession. Of course, these same factors make them more attractive from the point of view of EU accession as well. On balance, it is probably prudent to assume that accession will help to sustain the secular upward trend in FDI in CEEC and the Baltic countries, rather than producing a dramatic upward shift in the trend line.¹⁰

Similar arguments can be applied to the case of the countries that will not be joining the EU in 2004, including Russia. As we saw at the beginning of this article, Russia has a much lower level of FDI per capita than the countries due to join the EU in 2004. But, again, those levels of investment have more to do with perceptions of political stability, social capability and technological congruence than with the absence of EU-candidate status. In relation to technological congruence, experience with the automotive industry, as discussed above, is particularly noteworthy. Here, international companies have found it as difficult to establish their firm-specific production line and supply network 'cultures' in Russia (a country with a strong engineering tradition) as they have found it easy in the Visegrad countries and Slovenia. There is, therefore, a simple and plausible argument to the effect that EU enlargement will not affect the general perception of investment possibilities in Russia in any way.

There is, of course, a difference between investment *possibilities* and investment *decisions*. EU enlargement will certainly improve the perception of the investment possibilities of the countries joining in 2004, although to what exact extent is unclear. Thus the *relative* perception of investment possibilities in Russia and the other non-acceding countries will, other things being equal, worsen. That is only a problem for Russia if the total international investment 'budget' for the transition countries is in some way constrained. In that case, there would be a real danger of Russia being 'crowded out'. But it is not clear that there is any good reason to believe that such constraints exist, at least in a hard form. Total investment expenditures, whether globally or within particular countries, vary sharply between different time periods and between firms, depending on a whole range of variables, including current profitability, the stage in the business cycle, the state of business confidence, the rate of interest, etc. In the case of Russia, the international price of oil, and likely future trends in that price, are of particular importance in relation

⁹ Of the transition countries, Estonia, Latvia, Lithuania, Poland, the Czech Republic, Slovakia, Hungary and Slovenia are due to accede to the EU in May 2004.

¹⁰ Buch and Piazzolo find, on the basis of gravity model analysis, that Poland, the Czech Republic and Hungary are already close to predicted levels of capital flow assuming EU membership, so that actual accession would not be expected to produce a dramatic increase. For the other seven accession countries they find a much bigger gap between actual and predicted levels of capital flow, and Buch and Piazzolo therefore forecast a much bigger increase in capital flow for these countries when accession actually happens. See Buch & Piazzolo, 2001, p.211.

to investment decisions, by foreign and domestic firms alike. It is not clear that any of this is likely to be significantly affected by enlargement. While, therefore, it would be dangerous to ignore the possibility of crowding out investment in transition countries not joining the EU in 2004, there are no strong *a priori* reasons for placing special stress on this issue. Finally, it must be noted that, in the case of Russia, WTO accession could do a great deal to improve the perception of investment risk because of the implications of accession to that body in terms of investment regulation, IPR regulation, technical standards, etc.¹¹ It is not clear that the combination of WTO accession and EU non-accession would necessarily worsen the relative perception of investment possibilities in Russia.

The transition countries due to join the EU in 2004 are all committed to joining EMU at some undefined point in the future. If there is a significant crowding-out effect in relation to investment, it will certainly be reinforced by EMU, and the impact on capital flows to the non-applicant countries will surely be substantially negative. It must be repeated, however, that there are no compelling reasons for assuming that there will be such an effect. More speculative, but possibly more important, is the idea proposed by Buch and Piazzolo (2001, p.211), namely that EMU, by flattening out the range of risks and interest rates within Western and Central-East Europe, may drive risk-loving investors out to other regions, including the 'outer' transition region. On that basis, monetary enlargement could actually *increase* capital flows to Russia. It must be said that in a perfect financial market, a lowering of the interest rate/risk premium baseline would not stop risk-loving investors finding high-risk/high-return investments at the top end of the investment spectrum within that market. The EU reality, however, is that financial markets are far from perfect, and the investment spectrum is not complete. In particular, venture capital institutions are weakly developed. Thus, consideration of the institutional structure of EU financial markets would tend to reinforce the Buch/Piazzolo argument. But while the Buch/Piazzolo factor might increase *aggregate* investment into Russia, it would not necessarily increase 'new' direct investment into that country. International oil companies invest in Russia because they are security-loving, not because they are risk-loving. In any case, CEEC is not an alternative theatre of investment for them, for resource endowment reasons. Thus, changes in the regional pattern of risk premiums would probably not affect the pattern of their investments in Russia at all. The kinds of engineering- and electronics-based companies that do most to transfer technology are concentrated in sectors which rarely offer high, short-term profits. To the extent that eastwards enlargement of EMU strengthens the incentive for investors to 'fish in troubled waters' in Russia, therefore, the effect is unlikely to be an underpinning of the drive to transfer technology; rather, it is likely to nudge FDI in Russia back towards investment oriented to overcoming trade barriers and conquering domestic markets, with minimal technology transfer. But eastwards enlargement of EMU is a medium- rather than

short-term prospect, and it is unlikely that any of these issues will become pressing before 2010.

Conclusions

Despite the richness of the Russian resource base, natural and human, and the size of the Russian market, levels of FDI in Russia are comparatively low. In addition, within the modest totals for inflow, only a small proportion could be categorized as 'new' FDI. Thus, the scope for technology transfer through FDI has been, *ipso facto*, restricted. But the pattern of causation here has been two-way, for one of the reasons why there has been so little 'new' FDI is precisely the operation of a number of factors in the Russian economic system which are inimical to effective technology transfer. Of these, the factors hindering the building of modern supply networks are among the most important. The importance of this issue has been recognized by the Russian government, as well as by foreign companies, and concrete plans to address it have been set in motion. The experience of Central-East Europe suggests, however, that we should not be too sanguine about the outcome of these plans. EU eastwards enlargement is unlikely to generate a critical 'crowding-out' problem in relation to investment in Russia. Eastwards enlargement of EMU could produce a significant change in the structure of foreign investment going into Russia, in such a way as to reduce the proportion of 'new' investment. This, however, will be a problem for the decade 2010-20, not for the present decade.

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¹¹ Russia is expected to join the WTO around 2007.

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