

3.5 *Workpackage 5*

PRODUCTIVITY AND CAPABILITY IN THE TRANSITION COUNTRIES: A HISTORICAL AND COMPARATIVE PERSPECTIVE

Research in **workpackage 5**, conducted in a team around David Dyker, Katie Higginbottom, Leonardo Iacovone, Niels Kofoed, and Cordula Stolberg, is concerned with the social capability in transition economies with respect to technological development. transfer via FDI. The method of research included both deep-level interviewing techniques of some eleven foreign investment parent companies in the West, and a triangulation technique, cross-referencing results generated in other workpackages and the larger literature available on the subject with their own results. The aim of this workpackage is to pinpoint the gaps in capacities of firms in technology-intensive branches of selected new member states to absorb and diffuse 'hard' (process and product) and 'soft' (management, organisational) foreign technology transferred from abroad through various channels.

The failure of Soviet-type socialism, in particular its failure to catch up with the developed industrial countries in terms of basic GDP and standard of living indicators, was in essence a failure of productivity. To a degree, low levels of productivity under socialism reflected misallocations of resources. But even in the Soviet Union itself, allocative efficiency in the broad factorial sense was not so bad (Whitesell, 1990). Basic process productivity was not so bad either. What cut average plant-level productivity to a fraction of the levels reported in comparable plants in the developed countries was the inefficient (in terms of what would be rational in a market economy) organisation of ancillary functions. Thus in the Soviet engineering industry in the early 1980s, repair, tool-making and transport/warehouse work accounted for 38% of the total workforce, compared to just 11% in the USA (Kulagin, 1982). Of course, these functional patterns were perfectly rational in the context of the classic weaknesses of central planning. Central planning is incapable of providing efficient supply networks, so that lead factories have to make the bulk of their tools and components themselves. Once central planning is gone, however, the rational for this distorted kind of Fordism goes with it. In practice, old habits die hard, and Soviet-style industrial 'do-it-yourself' has survived into the transition period. This reflects more than just conservatism and the forces of inertia. It also reflects the fact that the building of supply networks is neither costless nor instantaneous. Effective supply networks, inter alia, are based on elements of social capability, and their development is constrained by considerations of technological congruence, just like other dimensions of organisational and motivational efficiency. In purely statistical terms, there is nothing unique about the productivity problem of the transition countries. Thus, for example, productivity in the British steel industry in 1967 was only some 35% of productivity in the US and EEC steel industries (Cockerill, 1974, p.32). After some muscular restructuring and radical downsizing, the British industry largely closed the gap. What is special about the productivity problem in the transition countries are the factors that make it difficult to close the gap, therefore still difficult to catch up with the developed industrial countries. In this report we seek to shed some light on these questions, firstly by establishing an analytical framework within which we can categorise the factors hindering catch-up, then bringing foreign direct investment (FDI) into the picture as a possible catalyst for catch-up breakthrough, and finally looking at some case-study material by way of illustration of the preceding analysis.

WP 5.1 Social capability and technological congruence

In the simple but incisive theory of catch-up put forward by Verspagen (1999) following Abramovitz (1979; 1994), the scope for catching up is defined in terms of the scope for diffusion of technology (in the broadest sense, including 'soft', organisational technology) from the advanced countries to the catch-up countries. Just as the level of GDP per head (*i.e.* the level of social productivity) in the former countries is determined by their human capital and knowledge stocks, and the efficiency with which they use such stocks, so the ultimate limits to economic growth in the latter countries are determined by their ability to assimilate those knowledge stocks and bring their own human capital stocks up to the same level. If economic development is universally dependent on the same productivity-enhancing mechanisms, and assuming no critical constraints on the supply of basic factors of production (land, raw labour and physical capital), what is to stop all countries ending up at the same level of development?

We have already identified the two main groups of factors which may inhibit catch-up through technological diffusion - technological congruence and social capability. Verspagen defines the first in terms of

"the match between the technologies in use in the advanced country and those most fit for introduction in the backward country. If there is a mismatch between the two, the opportunities for catch-up-driven growth are reduced. The sectoral distribution of economic activity is one important factor in congruence. For example, one may well imagine that most technologies developed in the industrialized market economies are not very relevant for the most backward economies, which are often still largely agricultural societies. But there are also other factors in congruence, as in the case where the technologically leading country applies very scale-intensive technologies, for which investment opportunities and/or domestic markets in the backward country are too small. In such a situation, technological incongruence would prevent successful catch-up." (Verspagen, 1999, p.31)

The second he defines in terms of

"institutional factors such as educational systems (which supply the human capital necessary for assimilating spillovers), the banking system (which supplies financial capital for catch-up related investment), the political system *etc.*" (Verspagen, 1999, pp.31-2).

The concept of social capability is clearly related to that of social capital. Thus Putnam (1993) argues that

"Stocks of social capital, such as trust, norms, and networks, tend to be self-reinforcing and cumulative. Virtuous circles result in social equilibria with high levels of cooperation, trust, reciprocity, civic engagement, and collective well-being... Defection, distrust, shirking, exploitation, isolation, disorder, and stagnation intensify one another in a suffocating miasma of vicious circles. This argument suggests that there may be at least two broad equilibria toward which all societies that face problems of collective action (that is all societies) tend to evolve and which, once attained tend to be self-reinforcing." (p.177)

In the present context, however, the notion of social capital presents two critical difficulties. Firstly, it focuses on inputs rather than outputs, and offers no explanation of how social capital interacts with other inputs - other forms of capital, and with other factors of production. Partly for that reason, it says little about productivity, or indeed about any other key economic development indicator.

"Whilst (sic) much effort has gone into examining the indices of social capital in both qualitative and quantitative terms, much less attention has been devoted to the mechanisms by which such measures of social capital lead to discernible differences at

the economic level. Does more social capital, for example, lead to a higher growth rate or merely to a different growth path or the same growth rate on a higher base?" (Fine, 2001, p.92)

Because the notion of social capability focuses on outcomes, and because it subsumes the dimension of learning, it avoids these difficulties: it provides a supple framework within which issues of development and catch-up can be assessed. Vicious circles of poverty and virtuous circles of prosperity can be accommodated by the framework, but in social capability analysis no country or society is condemned to eternal backwardness. The productivity gap may be deep-seated and obdurate, but with time and appropriate policies it should be possible to remove it completely. None of this stands in contradiction to the social capital approach – it simply makes it more precise and focused.

The distinction between social capability and technological congruence is in theory clear enough. In the real world, shortfalls in social capability may constrain the establishment of technological congruence, and indeed incomplete technological congruence hamper the development of social capability, where governance is heavily technology-dependent (e.g. in relation to computer and software systems). The ability of a given group of workers to cope effectively with a flexible production system is clearly a dimension of technological congruence, yet it must surely also relate to elements of social capability within the society in which the group of workers is nested. So in the analysis that follows we use the concepts as heuristic devices, rather than strictly separate, independent variables

WP 5.2 Social capability, technological congruence and foreign direct investment

FDI is the *deus/diabolus ex machina* of international economic development. As the main vehicle for the globalisation of the activities of the multinational corporations (MNCs), it is alternately lauded as a key instrument of technology transfer, and more generally of economic modernisation, and condemned as a weapon of exploitation and socio-political subjugation. These are not, of course, mutually exclusive interpretations, and indeed some authors have integrated both elements into their analysis. Any definitive assessment of these issues is beyond the scope of this report. But we do start off with certain assumptions about MNCs as initiators of FDI which are either true by definition, or strongly supported by the standard literature. God or devil, MNCs are always exogenous. When they invest in a given country they always introduce new ideas, breaking the mould of existing patterns of business relationship and giving new impetus to dynamic entrepreneurial development. This is as true for EU countries, for the US or Japan as for any emerging or developing economy. The new ideas may not always be good ones, or the new entrepreneurial developments always profitable ones. International investment has had its failures as well as its successes, and it is only reasonable to assume that that will also be the case in the transition countries. But FDI is always a new broom, and this is particularly important in countries like the transition countries, where legacies from the past may hang heavier than in other emerging economies.

It would be wrong, however, to assume that, because MNCs always start with a clean page, that therefore their commercial and technological vistas are unlimited. On the contrary, all the literature on FDI in general stresses that MNCs are generally cautious in their assessment of socio-technological options for FDI. They usually look to invest in host industries/plants of more or less similar factor mix to the 'mother'

industries/plants (Ozawa, 1979; Wells, 1983). In our terminology, they are averse to technological incongruity. That is why, automotive MNCs, for example, tend to invest in medium-developed countries with (by international standards) relatively high wages, rather than in undeveloped countries with very low wages, even though car production is relatively labour-intensive. In more positive terms, MNCs generally place considerable stress on the importance of being able to impose their own technological culture on subsidiaries, and indeed on some categories of supplier, as a way of guaranteeing control over productivity (in this case, of course, plant productivity rather than social productivity), and thereby control over the crucial wage/productivity relationship (much more important than the level of wages as such). As far as subsidiaries are concerned, the point hardly needs elaboration. With respect to suppliers, its implications are more complex. Where the relationship is essentially a commodity one, delivery conditions are the only things that matters to the MNC. In the extreme form of outward processing, raw materials are supplied to the partner for processing and redelivery at a precontracted price. Neither wage nor productivity levels at the partner plant are of any interest to the MNC. Where there are hierarchies of supplier, as in the automotive and electronics industries, the same can be said of second- and third-tier suppliers, which generally supply components to higher-level suppliers, without any direct link to the MNC at all. In relation to first-tier suppliers, the situation may be rather different. Because first-tier suppliers are involved in the design as well as the production function, the lead firm may want to integrate the first-tier supplier into its own technological culture, in order better to integrate the latter's design function into its (the lead firm's) design function. We return to this question in our empirical section.

Finally, MNCs do not build, or maintain, schools. Indeed one of the factors that has inhibited brownfield FDI in the former Soviet Union is precisely the fact that most big formerly Soviet plants did take responsibility for most of the social functions affecting their workforce, and the expectation that a foreign buyer would in turn take over this commitment. But MNCs do build and maintain R&D units, and do spend a great deal of money on training. In terms of our jargon, they have policies on social capability, but policies that operate within constraints. Their policies are largely focused on plant- or firm-level productivity, and any impacts on social productivity are essentially side-effects. How strong those side-effects might be is one of our key research questions.

WP 5.3 What do MNC managers say about all this?

We interviewed eleven leading international companies engaged in large-scale investment in Eastern Europe. The firms interviewed did not represent a balanced group. Most of them come from West-Central Europe (Germany, Denmark etc), and most of them are located in the middle-tech, engineering-based industries which emerged in the earlier part of the twentieth century (the automotive industry and its supplier industries, manufacture of control mechanisms etc). These are the sectors in which 'tacit' knowledge is the main form of embedded technology – tacit in the sense that it is embodied in tightly-knit groups of people rather than patents, and is difficult to transfer outside those groups of people, and therefore outside the firm. In such a milieu, it is transfer of tacit knowledge rather than transfer of formal intellectual property rights (IPRs) that is the main vehicle for technological upgrading, and FDI is an indispensable condition of such transfer. As argued by Zysman and Schwartz (1997), there are others sectors, based on high technology and software engineering,

in which tacit knowledge may be less important than IPRs in terms of embodying the state of the art in a given sector. And it is these sectors – the electronics- and software-based sectors which are the fastest-growing at present. Clearly, in sectors in which FDI is not actually a necessary condition of effective technology transfer (as it must be wherever tacit knowledge is key), the whole picture of FDI and technology transfer could change.

WP 5.4 What questions did we ask the executives?

Our interviews, conducted in 2003 and 2004, were open-ended, but they were built around the following questions:

- i How do lead companies specify the kind of production/technological system they wish to install in a subsidiary. Is the basic model always the company's plants in the home country? How is the basic model adjusted for variables like wage rates in the putative host country?
- ii How do lead companies formulate their training programmes for management and line workers? How do they assess the existing levels of capability of actual and/or potential employees? Is there a training programme for everyone? What categories of worker are sent back to head office for training? To what extent are local training facilities used?
- iii Following on from 2., how do lead companies assess local training facilities? How do they evaluate professional qualifications of the host country?
- iv Do lead companies see in-house R&D activity as a crucial element in capability? If so, how do they rate different kinds of in-house R&D activity (basic research, adaptation, design, superficial/fundamental) as factors of capability-formation?
- v Do lead companies see extra-mural R&D activity in the host country as a crucial element of capability? If so, how do they rate different kinds of extra-mural R&D (research institutes, universities, consultancy companies, individual consultants) as factors of capability formation? Do they have strategic goals for extra-mural R&D?
- vi To what extent do lead companies extend their policies for capability development into their supply networks? Are there training programmes for management and workers of first-tier suppliers? Are there policies on R&D activity and cooperation for suppliers? To the extent that there are policies, are they short-run, opportunistic, or strategic? Do lead companies help suppliers to move up the supply hierarchy?
- vii Where lead firms give preference to suppliers from the home country, do they do so on general grounds of technological culture and capability, or specific, quantifiably grounds, in terms of price, quality etc? Do lead firms make strategic choices about the balance of home suppliers and host-country suppliers, or do they judge each firm on its merits?

WP 5.5 What kind of responses did we get?

Our respondents did not always answer our questions directly. Sometimes they did not answer them at all. But because the questions were open-ended, they also sometimes answered questions we did not ask. All of the executives interviewed were anxious to start off by defined what they saw as the central activity and field of operations of the company. So we always started off talking about strategy.

WP 5.5.1 *Business strategy*

One of the most striking features of the interviews was the emphasis on the global nature of the overarching strategy of the firm.

The basic point is that XXX is a world firm. If you look at how many countries we are active in, then we must be one of the top global players. And on the competitiveness side, we recognise that this world-wide network is a real advantage, to be at the coal face in every region. If we think of Eastern Europe in this connection, when the Iron Curtain came down, then it was clear from the point of view of the firm's philosophy the direction we had to take. We had to get in there. The markets were open, we had to engage with a similar or identical concept to the one which had been used in the rest of the world, and had proved successful.

If we had not gone into Eastern Europe we would have seen our share of the global market fall... But if you are not a world-class company to start off with, you will not become one in Eastern Europe.

This is the kind of reasoning we are used to hearing from international oil companies, for example in justifying their investments in the former Soviet Union – we are global players, we are in every region of the world, and that is part of our competitive advantage. So when a new region opens up, we have to get in there. But while the argument is transparent enough in relation to a natural-resource-based sector in which international prices are very volatile, it is less obvious, if not necessarily less compelling, in relation to engineering-based sectors. Here, the implicit argument is that, in Dunning's terms, you maximise your firm-specific advantages by being global – and therefore you maximise your scope for technology transfer by being global. Thus it is crucially important not to assume that a German firm investing in the Czech Republic is pursuing a purely regional strategy. If you do, you risk misunderstanding the nature of the technology transfer process involved, and therefore the pattern of productivity enhancement. Most seriously, you risk misunderstanding the pattern of supply networking that may flow from the initial investment, and therefore the pattern of productivity spillovers. It is not only lead firms that have global strategies. As we discovered in one of our other interviews, first-tier suppliers may also think of themselves as global players, seeking to build production complexes in particular regions (e.g. CEE), but with global objectives in view. As we found out, if you only ask such firms questions about their relations with local firms (including foreign-owned local firms), you may come away with the (completely mistaken) idea that they are not interested in network-building. Note, however, that within this global framework regional, specifically locational, factors may be of critical importance in terms of simple cost minimisation and managerial proximity.

We run a regular shuttle between Berlin and [town in the Czech Republic]. And it's great that it only takes us 3½-5 hours to get there, and that we don't lose 24-30 hours like an American travelling to his subsidiary in East Asia.

Cost considerations apart, these strictly geographical considerations may make it much easier for [in this case German] firms to transfer tacit knowledge on the regional dimension. To complicate the picture even further, some firms are global players in relation to some of their products, but only regional players in relation to others.

WP 5.5.2 *Is there a productivity gap or not?*

A quick reading of the transcripts might incline one to think that there is really no productivity gap at all as far as CEE is concerned, or a least none that cannot be

liquidated in two or three years through the injection of Western capital, technology and marketing.

We started with a level of productivity of 1.7 in comparison with that of the main factory, that is it took 1.7 times as long to make a given volume of value added as in the main factory. That was the initial position. And our goal is to get that down to 1 within 2-3 years.

We quite quickly achieved Western productivity levels. But we did not reinvent the bicycle. We took something that we knew we could do and was a safe bet, transferred it and trained the people in it, so that they were able to handle it just like the people in the West.

What was lacking was the business dimension.... But we took on the rest of the workforce one-for-one. From the point of view of qualifications, they were of the same standard as you meet in Western firms. Their education and their technical skills (Facharbeiterausbildungen) were on a par with ours.

In terms of productivity, the Polish workers have a productivity of around 80% [of the Danish level] I suppose. In Lithuania it is maybe 30-40 % of the Danish productivity, but it is a learning process. Here in Denmark we have people who have cut fish for 20-25 years. In Lithuania they have as a maximum one year of experience – maybe only half a year. So our experience is that they will come relatively close to the Danish productivity within a short period.

In some cases these statements are qualified with respect to technology choice. So if a more labour-intensive technology is being used in the CEE plant because wages are lower in CEE, productivity will converge to the levels of productivity that would be achieved if you used a similar technology in the EU. Even so, the general picture is a striking one. In terms of general growth theory, we are saying that CEE is on the path to absolute convergence, not just conditional convergence¹ – as indeed we would expect, given that the basic endowment in human capital in the region is on a par with Western Europe. Whether the gap has been completely closed as of right now, the top firms in the FDI business aim to bring their CEE subsidiaries up to the productivity levels of Western Europe, or rather onto the dynamic path of those productivity levels, and foresee no serious difficulties in achieving that aim quite quickly. The vision of the managements of those firms with respect to future productivity trends in their subsidiaries in CEE is summed up in Figure WP 5.1.

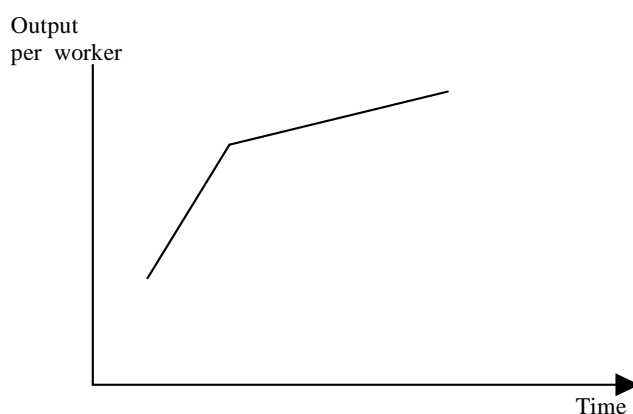


Figure WP 5.1 Productivity over time in a foreign investment enterprise

¹ The absolute convergence theorem posits that all economies will eventually reach the same steady state, where the rate of economic growth is given by the rate of technical progress and the rate of population growth. The conditional convergence theorem allows for different steady states, on the basis that human capital endowments may differ. See Jones, 2002.

The picture is very different when we turn to transition countries outside CEE. In Romania, for instance, in a low-tech, labour-intensive traditional sector,

there is a sort of catch-22 situation there. Because the labour is cheap but the factories are fairly primitive, the price of the raw materials is actually higher than in countries like, say, France.

This is the nightmare scenario for any foreign investor – where wages in the host country are low, but productivity is even lower. In this particular case, however, as we shall see later on, the problem did not prove to be insoluble.

The picture is also very different, even within CEE, when we start to talk about suppliers and supply networks, and here the problem turns out to be less tractable.

In some areas of supply, we simply cannot get the components to the quality and technical specifications that we require. So we have to bring these products largely from Western Europe. But not because we want to. We would like to get more involved in the local supply market.

What were the main reasons for getting rid of a local supplier – or for failing to take one on?

Oh, quality, productivity, things like that...

The supplier base is certainly one of the biggest problems in Eastern Europe. We are always trying to solve the problem, for it makes little sense to move things from Western Europe to here and then back again – it's a long way....

Nothing much has changed here, or very little, unfortunately. Suppliers are in any case international in our branch. I think we have taken on just one Czech supplier. I suppose we have neglected this a bit. But in the mechanical field, for instance making mechanical parts for the housings, which accounts for some 10-15% of our total costs – here it would make sense to get them from Czech firms.

Here the globalisation of supply networks theme is again clearly dominant, but it interacts with another theme, which we might tentatively dub the lack of entrepreneurial vision theme, with the aversion to technological incongruity syndrome, as discussed above, possibly lurking in the background. There are cases from more low-tech sectors where the experience with local supply network building has been more positive.

In terms of third party suppliers, we use many, such as local advertising and design agencies, market research suppliers, accountancy firms, PR advisers, recruitment agencies, office suppliers *etc.*

Regarding packing we use both local suppliers and foreign suppliers. It depends on costs – where can we get it most cheaply. Locals also do maintenance of the plants. We buy spare parts for the machines from two local companies. But in general we buy more and more in Poland and Lithuania because gradually they can produce as well as anyone else.

Even here, however, there are limits to the scope for local supply networking, and these limits are imposed less by lack of entrepreneurial vision as by the absence of the technological capability in the host countries to make a given key supply (in this latter case a type of packaging – low-tech, but with very stringent quality requirements).

That last point brings out the key importance of quality in relation to supply networks. Even in cases where investor-companies have persevered with local suppliers, they are resigned to the persistence of a significant productivity gap, if only because they have to impose (costly) quality inspections on their East European suppliers, whereas quality would be taken on trust in relation to West European suppliers. And

this sharp contrast between patterns of main activity productivity and those in ancillary production facilities is, indeed, what we would expect. Our case studies confirm the picture of CEE productivity patterns that we drew earlier on the basis of historical and a priori reasoning. The problem is not one of productivity or productivity potential in main industrial activities, it is a broader problem, a problem of social productivity rather than process productivity as such. We have seen what our leading companies can do about process productivity. Can they make any contribution to the solution of the broader problem?

WP 5.5.3 FDI and human capital formation

Do leading companies help to build social capability through a process of (asset) creation? Each one of our interview companies stressed the importance of training, of upgrading the quality of the human capital stock within their subsidiaries. And they admitted that that human capital stock, once upgraded, was free to move to other companies. But the system of upgrading differs widely between individual companies. In some cases, it takes the form of a highly formalised, in-house education system. One company has a special department at head office which deals with all matters relating to the transfer of know-how and production technology (the key elements of tacit knowledge). But all interviewees stressed the importance of on-the-job training and personnel exchanges (between the lead factory and the subsidiary), and some were scathing about the role of formal training and retraining.

We had 10,000 men to find work for. They had to make cars, cars that would sell. That's what you have to aim for – always better products, new markets, that is the thing. I tell you, you cannot send 10,000 men back to school. That is simply not possible. And anyway, they would not learn what they need to learn there – assimilating new functions, learning about markets etc....

We train locally and if there's anything that can't be trained locally, the staff will come over to the UK, We try and train people up locally because retailing is local business. And you have to understand your local customers - you're not going to be selling a Yorkshire pudding in Warsaw.

At the same time, the companies with more formal training systems stressed that these are available for all levels of personnel, and encompass the whole gamut of production operations.

People from (the subsidiary in CEE) come and spend a period of time at the lead factory. And they don't just come to follow courses, - they actually work in the factory as well. That includes assembly-line work, so that it includes blue-collar workers as well, right up to the management level – of course with a different orientation.

First comes skills training, then the emphasis shifts to management development... During the set-up stage a team of specialists is sent over from the UK to set up the business and recruit the core team. This team will stay in the country for a number of months in order to transfer knowledge and directly support the local management team. Once the core team is in place and up to speed, the set-up team returns to the UK. The UK continue to support the countries both remotely and with regular trips to the country as and when appropriate.

Thus training programmes are comprehensive, focusing primarily on the transfer of tacit knowledge, on the transfer of 'things that you cannot buy on the free market'. In some cases, the learning is 'collective', in the sense that personnel from the investing firm and personnel from the subsidiary are learning together about something exogenous that they need to know about – for example EU food hygiene regulations. Even in a low-tech sector in low-wage Romania or low-wage Lithuania, you have to have a training programme, covering every job, even the humblest, because

otherwise you cannot control the crucial productivity/wages relationship. And even on that scenario, you have to have a vision of the future, and a strategy for preparing your workers to face new challenges as the company climbs the technological ladder. So training programmes must help to open up channels of asset creation which cannot be expected to develop spontaneously in the process of market-based transformation.

WP 5.5.4 FDI and local educational and R&D facilities

Foreign firms can create assets, not just directly, through measures to upgrade their own human capital stock, but also indirectly, by helping to redevelop local educational and R&D facilities within the CEECs themselves. Clearly these local facilities cannot play a role in the transfer of tacit, within-firm knowledge. Clearly their role in human capital formation must be essentially ancillary. But the interviewees did stress the importance of local facilities, particularly with regard to the teaching of foreign languages (English and German) and the development of bespoke software. The first point hardly needs further discussion, the second is more interesting. Again, it is confirmed that software development, even for the very particular purposes of a given firm, is not a matter of tacit knowledge. Local suppliers are much cheaper as well as being closer, and their competitive advantage is clear-cut. But deep R&D cooperation between head office and CEE subsidiary does not occur in any of the manufacturing companies we interviewed. One interviewee stated bluntly that the local people simply did not at present have enough know-how for that. But in five years, he went on, it might be different..... Interestingly, but inconclusively, the only unequivocal confirmation among our interviews of the existence of two-way technology transfer came from service sector companies.

In some cases, firms have developed on-going relationships with particular host-country institutions, often universities. And these relationships tend to have a dual significance. On the one hand, much of the sub-contracted software development work goes to university people. On the other hand, the companies use these on-going links as a basis for recruitment of local people into the organisation. There are key individuals who play a central role in this dual process. Thus in one case a head of development within the subsidiary was eventually recruited by the local university as a full-time professor, on the basis of special lectures he had given while still working for the company. Thus company involvement with local education and R&D organisations can lead to multiple forms of human capital enhancement. But these effects remain fundamentally peripheral to the main process of asset creation, which is within the firm. In a number of cases, given the kinds of technology involved, this pattern is perhaps inevitable. But one interviewee noted that his firm cooperated with local universities in the Far East on a large scale, but had not yet developed this in Eastern Europe. It would be dangerous to build too much on one interview, but one can speculate that Far Eastern universities might be seen as more effective partners than their East European counterparts.

WP 5.5.5 Does FDI ever help local suppliers to raise their game?

Although all of the companies we interviewed had serious problems with their local suppliers, and all were anxious to resolve these problems, none integrated those suppliers into their own, within-company training and technology transfer programmes. To a degree, the companies sought to solve local supply problems indirectly – by operating with a much smaller number of first-tier suppliers than would

be normal within Western Europe, and thus effectively devolving the problem of productivity and quality control to a limited number of first-tier suppliers. More directly, some of the interviewed companies followed an active policy of helping local suppliers to find foreign partners. This policy was obviously based on the supposition that it is not possible for local CEE suppliers to make it as first-tier suppliers in global terms on their own, a supposition that is supported by other research (Dyker *et al.*, 2003). More specifically, one of the interviewees had a clear vision of their buying department as playing a kind of educational role *vis-à-vis* local suppliers.

The subsidiary has its own buying department – relatively strong, with 25 people. The process always starts with the identification of suppliers, which are in general terms relevant for us, and which have the technological level we need for our products. So we have here in the buying department clear benchmarks on supplier qualifications, and we will continue to do this. We train people specially in this business of assessing suppliers....

So here is a case of the multinational company setting up a system of training the trainers, enhancing its own human capital stock with a view to helping other firms do the same for their human capital stock – though without taking on any corporate commitment to ensuring the success of the second stage of the process.

All of this is very positive, yet in the end perhaps a little inconsequential. The top firms in the FDI business do not have many ideas about raising the game of local suppliers beyond helping them to sell out to other foreign firms. So the whole cycle stays within the ambit of FDI. The key issue of linkages and spillovers outside the area of FDI remains unresolved. And it is that issue which is crucial in terms of considerations of overall social productivity.

WP 5.5.6 Is the picture any different in the electronics sector?

We interviewed only one 'high-tech' company – from a hardware rather a software sector. Here the limitations of our methodology are starkly revealed. We found no evidence whatsoever to support the Zysman thesis, as outlined above. Rather technology transfer in this case was implemented through 'close contact, and transfer of machines and production process documentation', suggesting that the underlying technology base was embodied primarily in tacit structures and in documentation which may well not have been IPR-protected. In that context, it is not surprising that cost-driven FDI in CEE has been an important strategic element for the firm in question. All that this proves is that the question remains open. And indeed we are unlikely to resolve it unless we interview some high-tech firms which have chosen not to engage in direct investment in the region.

WP 5.5.7 Is the picture any different in the services sector?

With only two service-sector companies in the interview set, we must again be very cautious about generalisation on that sector. It is nevertheless striking that both those companies laid particular stress on the long term in their strategic thinking. This is interesting, not only because they are in sectors which interface directly with the mass consumer, but also because both companies are British. Where systematic comparisons have been made between British firms investing in Eastern Europe and, say, German firms, a strong contrast between British short-termism and Rhenish long-termism has often been remarked (see Barz, 1999). We have certainly not disproved the proposition in the present project, but we have found no evidence to reinforce it.

In relation to training, the two service-sector companies show no significant divergences from the general picture – their commitment to training seems to be at least as strong as that of any of the manufacturing companies. But on local supply networking, the contrast is stark. Where manufacturing firms struggle to procure adequate supplies from local firms, one of our service-sector firms (a retailer) manages to procure over 90% of food supplies for its Polish subsidiary from Polish producers. This may simply be a sectoral peculiarity of the food sector, but in a part of the world where you are never far from an international border, food stores are not compelled to source everything from local producers. In the given case, the company is clearly perfectly happy with the quality of Polish supplies – in a sector where the kinds of technological congruence problems that bedevil manufacturing sectors simply do not arise.

Finally in this section, as noted above, the two service-sector companies are the only ones that explicitly confirm the presence of two-way technology transfer. With one firm in retail and distribution and the other in financial services, there can be no argument that this reflects low levels of competence or know-how on the part of the lead firms. Rather it seems to reflect a high level of fluidity and dynamism in relation to the organisation of these businesses. The two-way technology transfer is almost certainly strictly in the realm of soft technology, which is of overwhelming importance in service sectors. There is, nevertheless, a suspicion that manufacturing companies might learn something from the service sector in relation to cumulative technology transfer (see also Dyker, 1996).

WP 5.5.8 The issue of country specificity

As noted in the last section, the interviews did not always confirm conventional views about the peculiarities of particular countries. More generally, however, country specificity did come through very strongly in our interviews as a factor affecting productivity trends, although we did not explicitly ask about it. As already noted, nearly half our interviewee firms were German. And the subsidiaries involved were mainly in Poland, the Czech Republic and Hungary, with a few also in Romania, Slovakia and the Baltic countries. A number of our interviewees expressed very strong views about differences between different transition countries. ‘Since we set up in Poland and the Czech Republic we have been able to refine our new country entry model enormously, although it is a continuous learning curve as no two countries are ever the same.’ One interviewee said quite emphatically that the process of unconditional convergence was clear-cut in the case of the Czech Republic alone. Another made the same point in relation to supply networks.

In relation to the supplier problem, you have to differentiate clearly between countries. In the Czech Republic they are making good progress here. There also we started off with mainly German suppliers, to make the transition as fast and smooth as possible. Since then, however, we have been able to bring in a number of Czech suppliers. The situation is much more problematic in Hungary. The Hungarian supplier industry is not so well developed. Our clients have very stringent requirements, and we still have difficulty in finding Hungarian suppliers who can come up to those requirements.

This statement is clear enough, yet it raises as many questions as it answers. While Hungary has a somewhat lower level of GDP per head than the Czech republic, it has a well-developed engineering industry, and the emergence of Hungary as a major exporter of specialist supplier goods (admittedly largely on the basis of foreign capital) has been one of the notable achievements of transition. So there is little basis at the aggregate level for putting the Czech Republic in a higher league than

Hungary. Is the problem that the Hungarian economy is more dualistic than the Czech, so that the difference between the foreign- and domestically-owned sectors is greater? Or is it more of a cultural issue? Should we be looking, not just at country-specific factors, but also at country-pair-specific patterns? Is there something special, perhaps historically conditioned, about the relationship between Germany and the Czech lands, which impinges on the issues we are studying? Can it be argued that cultural congruence is an important element in technological congruence? And if there is, why is that German-Czech technological congruence seems to be so much stronger on main production lines than in component supply? And when one of our (German) interviewees says (à propos the Czechs) that 'it's still a planned economy: the managers are still different from over here', is he saying something specific about that ethnic/cultural group, or could that statement be applied to any transition country? These are questions which we cannot answer categorically. One general point is, however, worth making. Investing companies are aware of country differences, and adjust their strategic plans accordingly. That may mean slower convergence in the given economic activities for some countries. But it does not affect the basic trend towards convergence (see Figure WP 5.2).

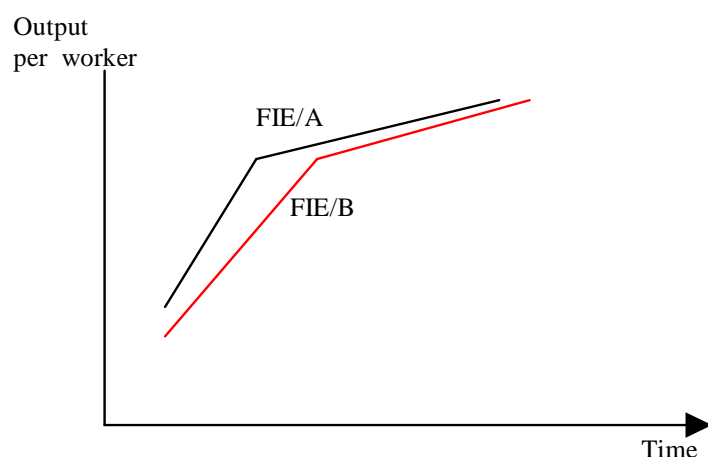


Figure WP 5.2 Productivity over time with foreign investment and inter-country differences

Note: FIE/A = Foreign investment enterprise, Country A
FIE/B = Foreign investment enterprise, Country B

In domestically-owned firms we must presume that there are similar, or even greater inter-country differences in productivity levels. And here there is no mechanism for ironing out those differences. The pattern that is likely to result from this is presented in Figure WP 5.3. Under the impact of FDI, there is a strong tendency to convergence between East and West, and between CEE countries in sectors dominated by FIEs. In the domestically owned sector, by contrast, the productivity gaps between East and West, and between individual CEE countries, persist into the medium-to-long term. Because underlying social capability gaps are bound to narrow over time, and with progressive integration into the EU market, irrespective of the incidence of FDI, convergence in domestically-owned sectors is also ultimately inevitable. But the prospect is banished to the very long run, well beyond the time horizons of business managers, politicians and citizens alike.

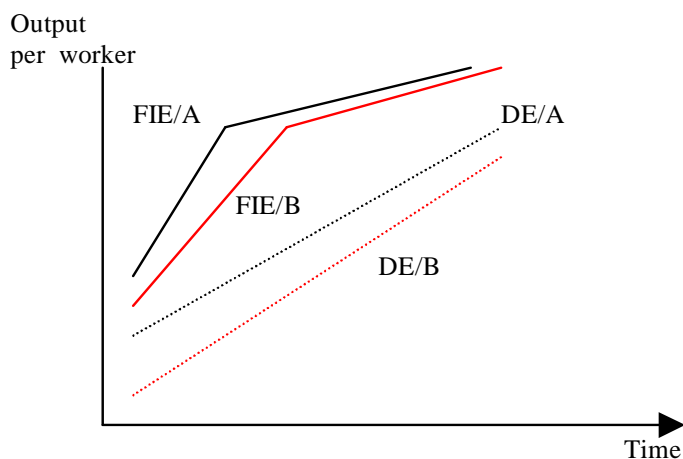


Figure WP 5.3 Productivity over time, with and without foreign investment, with inter-country differences

FIE/A = Foreign investment enterprise, Country A

FIE/B = Foreign investment enterprise, Country B

DE/A = Domestic enterprise, Country A

DE/B = Domestic enterprise, Country B

The diagram portrays the case where initial levels of productivity are higher for FIEs than DEs. This corresponds to the reality for most transition countries and most sectors. If we assume, however, that initial levels of productivity are the same in both sectors, or even higher in DEs, the basic analysis is not affected.

WP 5.6 *How did we check our results?*

In distinction to the other work packages within the project, we have not used formal sampling techniques. The general justification for our essentially inductive approach lies not just in the inherent interest of the anecdotal dimension of case studies, but also in the scope for building theory from the anecdotes.

While systematic data create the foundation for our theories, it is the anecdotal data that enable us to do the building. Theory building seems to require rich description, the richness that comes from anecdote. We uncover all kinds of relationships in our hard data, but it is only through the use of this soft data that we are able to explain them. (Mintzberg, 1979, p.587)

In a nutshell, 'the explanation of quantitative findings and the construction of theory based on those findings will ultimately have to be based on qualitative understanding.' (Meredith, 1998, section 7.3)

At the more specific level, the justification for our approach lies in the experience and outcomes of research on international technology spillovers and linkages.

Existing estimation techniques simply do not provide sufficient potential for detecting the fundamental relations (that is, whether foreign firms learn from domestic firms, whether domestic firms learn from foreign firms or whether there are mutual advantages from interaction), and should be supplemented with case studies which focus on imitation of technologies, engagement of workers trained by MNEs, the extent of innovation networks and co-operation projects between foreign and local firms, as well as spin-offs in the form of new domestic firms. (Kvinge, 2004, pp.3 & 59).

The results of the interviews have been analysed on the basis of replicative logic, *i.e.* 'the logic of treating a series of cases as a series of experiments with each case serving to confirm or disconfirm the hypothesis' (Eisenhardt, 1989, p.542). The case-study firms cannot be taken to be strictly representative of any larger group, but they can be taken as benchmark firms. Every one is at the leading edge of the

technologies used in its sector, and every one is heavily committed, in human and financial terms, to investment in CEE. By studying what they do, we can obtain an understanding of what is possible, an understanding of what might be termed the state of the art in technology transfer through FDI to transition countries. We should add that a number of these firms are very large firms. In those cases, even if ultimately they are only representative of themselves, that in itself carries a good deal of significance.

While case-studies are, in the first instance, by their very nature, stand-alone studies, there are strong arguments for seeking to establish points of comparison with other methodologies and other bodies of empirical evidence. The case-study approach has great merits, but is also prone to serious pitfalls. On the one hand,

The results of case research can have very high impact. Unconstrained by the rigid limits of questionnaires and models, it can lead to new and creative insights, development of new theory, and have high validity with practitioners – the ultimate user of research. (Voss *et al.*, 2002, p.195)

On the other hand,

People are notoriously poor processors of information. They leap to conclusions based on limited data, they are overly influenced by the vividness or by more elite respondents, or they sometimes inadvertently drop disconfirming evidence. (Eisenhardt, 1989, p.540).

The best way to handle these problems is through a process of triangulation, i.e 'the use and combination of different methods to study the same phenomenon. Such methods can include interviews, questionnaires, direct observations, content analysis of documents, and archival research.' (Voss *et al.*, 2002, p.206). Triangulation is essentially an extension of the primary principle of replication. The most basic form of triangulation is to check case-study insights against quantitative material and analysis which 'can indicate relationships which may not be salient to the researcher. It also can keep researchers from being carried away by vivid, but false, impressions in qualitative data, and it can bolster findings when it corroborates those findings from qualitative evidence.' (Eisenhardt, 1989, p.538) In the present context, the obvious way to pursue that form of triangulation was to check our findings against that of other work packages within the project that used standard quantitative approaches. Another key method of triangulation is literature survey. Where case-study findings conflict with those of the established literature, the explanation may be that the findings are incorrect, or simply idiosyncratic. Either way, the new information generated by the triangulation process is vital. Where case-study findings are in harmony with those of the established literature, the new information is equally vital, because 'it ties together underlying similarities in phenomena normally not associated with each other. The result is often a theory with stronger internal validity, wider generalizability, and higher conceptual level.' (Eisenhardt, 1989, p.544) We have pursued this form of triangulation through a survey of global literature on FDI and technology transfer, including some material from one or two key case-studies from non-transition countries. (See full report for a detailed exegesis of the triangulation exercise.)

WP 5.7 Conclusions

- The experience of FDI in Eastern Europe, as documented through our interviews, provides strong evidence that the East-West productivity gap on main production lines is relatively small, and can be closed quite quickly. That means that, as long

as wages in the host countries remain well below West European levels there should be ample scope for further, profitable investments. The triangulation process has thrown up nothing to contradict this conclusion.

- The implication is that social capability and technological congruence have not been critical problems on these main production lines.
- It should be stressed that these strong conclusions emerge from a set of interviews involving exclusively West-Central European investor-firms and largely East-Central European host countries. It would be dangerous to extend them to the whole transition region. Our global triangulation exercise reinforces this caveat.
- Investor companies have invested massive resources in training programmes, ranging from full-time secondments to on-the-job training, sometimes on site in the host country, sometimes back at headquarters. These programmes have covered blue-collar as well as white-collar workers. This suggests that one of the reasons why social capability has not been a critical problem is simply that it has been seriously addressed by the companies involved. This conclusion is generally confirmed by intra-project triangulation, though other WPs do raise doubts as to whether training is a factor which significantly differentiates one firm from another.
- The positive experience with main-production-line productivity is not matched by performance in relation to ancillary sectors. Investor-firms have generally struggled to build adequate supply networks in the host countries. Where they have persevered, they have done so in the face of a stubborn productivity deficit. Given that lead-company programmes for building social capability have been largely restricted to the in-house dimension this is, perhaps, hardly surprising. There is also a hint that technological congruence problems may be much more stubborn once we move beyond the sphere of Fordist and post-Fordist production lines. Whether that is primarily an effect of fear of technological incongruity on the part of investing firms, or of more objective technological factors, remains unclear. The global literature suggests that the latter factor may be the most important, with the impact of FDI on growth in developing countries strongly and inversely correlated with the size of the 'objective' technology gap between home and host country. Comparison with other work packages within the project confirms our overall conclusion here, but urges caution in relation to its generality. Individual country studies reveal wide differences in precise patterns of linkage, possibly related to differences in underlying resource endowments and related differences in corporate strategy.
- Investor companies have been eager to exploit local training and R&D facilities, but have done so on an essentially casual basis. Teaching of foreign languages and software development are the only two areas where local educational/research expertise is brought in systematically. The implication is that local human capital formation organisations are not playing the role they ought to be playing in the solution of social capability problems in CEE. This is confirmed by intra-project triangulation.
- While investor companies have shown great willingness to help local suppliers to raise their game, they have been short of ideas as to how to actually do it. In practice, help often reduces to simply helping the local supplier to be taken over

by another foreign company. This pattern is strongly confirmed by the global literature.

- With strong FDI impacts on productivity trends in FIEs and weak impacts elsewhere, the overall effect of FDI on productivity convergence is likely to be mixed. In FDI target sectors, the tendency to convergence, East-West and inter-country, will be strong. Elsewhere, convergence to West European levels will be slow and difficult, and significant differences between individual East European countries will survive into the long term. This mirrors the global experience.
- The pattern of supply hierarchy in CEE whereby local companies are largely relegated to the status of second- and third-tier suppliers, with first-tier suppliers usually wholly or partly foreign-owned, is not universally reflected in global experience. Indeed, in China the problem is exactly the opposite – domestically owned first-tier suppliers (in this case to the auto industry) are strong, but second- and third-tier suppliers are weak. This in no way invalidates our conclusion on CEE, which is strongly supported by other research on CEE. But it does suggest that patterns of strength and weakness in supply hierarchies may be as much a function of specificities in development paths as of any universal developmental tendency. It is noteworthy that the pattern in Portugal has been more like the East European than the Chinese experience.
- The global experience strongly confirms the case-study results on the importance of two-way technology transfer, or rather on the reverse technology transfer element within that. It does, however, raise serious questions as to whether reverse technology transfer is a positive factor of host country development.

These conclusions are, in a sense, not surprising. It is not surprising that Czech and Hungarian production-line workers can quite easily be brought up to the standards of German workers, and it is not surprising that companies with shareholders to keep happy are not prepared to take on the job of retraining whole nations. There are, nevertheless, critical problems and gaps in the FDI-driven process of catch-up in Eastern Europe. These problems are as much a function of weaknesses in local infrastructure (especially R&D) as of any shortcomings in the management of major foreign investments. The fact remains that, in the outcome, the countries of Eastern Europe may experience uneven, dualistic development, rather than the smooth convergence to West European levels of development which catch-up theory (in principle) predicts. It is now common in Eastern Europe for levels of productivity and real wages in related sectors to vary by a factor of 2:1 and above, depending on whether the companies in question are foreign- or domestically-owned. This is clearly sub-optimal for the host countries themselves. To the extent that it generates social tensions and ultimately impacts on political stability, it could also significantly change the outlook for further foreign direct investment in this critically important area of the 'new' Europe in ways wholly beyond the control of the firms concerned.

Finally, let us return to the main 'unexpected' result of our interviews. The strategies of the companies we talked to are predominantly global strategies. This does not prove that global strategies are generally dominant among firms investing in CEE, but it does suggest that the global outlook is significantly represented among them. Intra-project triangulation strongly confirms that conclusion.

How is this likely to affect the impact of EU accession on the CEECs? To the extent that multinational investments in the region are cost-driven, and to the extent that enlargement tends to increase real wages in CEE, it will tend to mean a higher

degree of onward mobility of investment, which means less FDI in the region. To the extent that the investments are network-building (if, in principle, on a global scale), the removal of frontier barriers and the (putative) improvement of infrastructure, particularly transport, in the new member-states may swing the balance of effectiveness towards pan-European strategies. To the extent that eastwards enlargement unleashes rapid growth in GDP and a boom in consumption in CEE, and to the extent that the new member-states retain significant peculiarities of taste, specifically CEE strategies may emerge – for the first time – in the case of some consumer-oriented companies. In a word, the net impact on levels of FDI could go either way. In that context, we should be that much more cautious about our assessments of the likely overall impact of FDI on productivity in the new member states.