

German Mothers and Czech Daughters: Horizontal or Vertical Direct Investment?¹

DANIEL MÜNICH, MARTIN SRHOLEC

German firms are the second most important foreign direct investors in the Czech Republic, after the Netherlands. Moreover, the Czech economy ranks among top ten destinations of German foreign direct investment (FDI) outside of the Euro-zone, ahead of large countries like Japan, India and Russia, and finds itself as the most attractive destination in Central and Eastern Europe. Hence, the cross-border FDI has a non-negligible impact on labor markets and economic developments in both countries. It's no wonder that the effects surrounding FDI stimulate ongoing policy debates. Such debates highlight the hypothetical pros and cons of FDI for source and target countries, and consequently, the appropriate policies to stimulate an influx of FDI into the target country or limit the outflow of FDI from the source country. Such debates are important because they shape the adoption of national policies. Despite all that, empirical evidence supporting policy formation is still rare. Our study provides new and valuable insight.

Vertical FDI

One has to distinguish between vertical and horizontal FDI. The major motiva-

Since vertical investment involves production chains, this kind of investment is likely to decrease with increasing transport costs and other barriers of trade for inputs.

tion of vertical investors is to exploit differences in relative factor endowments, and hence relative factor costs across countries. Therefore, vertical investors locate different stages of the production chain at home and abroad. Since vertical investment involves production chains, this kind of investment is likely to decrease with increasing transport costs and other barriers of trade for inputs. In the "vertical model" of FDI, the investor and the affiliate specialize in widely different activities requiring different productive factors. A typical example is when the investor relocates low-skilled labor intensive production, such as assembling, from

the home base to a country with lower labor costs. Many examples² of this type of FDI can be seen in the Czech Republic, and there are also numerous cost cutting projects of smaller German firms.

Horizontal FDI

Horizontal investors engage in the same activities in different countries. Their main motivation is to reduce transportation costs or to access a market that, for whatever reason, is less profitable to supply from abroad. Hence, this kind of FDI increases with trade barriers. Another reason for horizontal FDI is to tap into foreign know-how. Horizontal investment is more likely to appear between locations with similar factor endowments. From this follows the rival "horizontal model", according to which the mother duplicates a similar portfolio of activities in daughter firms and creates similar types of jobs in home and host countries. The acquisition of Transgas by RWE Gas, the local T-Mobile subsidiary of Deutsche Telekom and the establishment of a DHL regional hub by Deutsche Post in Prague are prime examples³.

1 This Policy Brief is based on a research done thanks to EU COST project no. OC09017 within COST Action ISO701 „Comparative Analysis of Enterprise Data: Industry Dynamics, Firm Performance and Worker Outcomes“, co-funded by the Czech ministry of Schooling, Youth, and Sports (Ministerstvo školství, mládeže a tělovýchovy České republiky). A detailed description of background analysis and results can be found in an article published in CERGE-EI Working Paper no 467.

2 For example large local production facilities of Knauf, Osram, OTIS, Miele, Ravensburger.

3 Also the investment of Volkswagen in Škoda Auto generally fits this profile.

What is known

In the effort to inform policy, most of the existing studies rely on indirect classification criteria of FDI type. This leaves us in the dark with regards to the difference between the foreign investor, henceforth the “mother” company, and its local affiliate, henceforth the “daughter”, in terms of the portfolio of activities conducted in the source and target countries, respectively. More detailed evidence directly comparing technological, educational, skill and other qualities of mothers and their daughters remains extremely scarce.

Overall, there is evidence that the vertical type of FDI accounts for a much larger share of German investment in Central and Eastern Europe, including the Czech Republic, than in other major destinations, especially more developed countries. But firm level empirical evidence is still scant, limited to a handful of papers which employ hardly comparable methodologies. Most importantly, results with regard to the relative incidence of the vertical and horizontal FDI differ by a large margin, even if based on the same data. Hence, the existing literature remains ambiguous.

Our survey

Our unique study fills the gap by doing an empirical examination of the incidence of vertical versus horizontal FDI in a more direct way than has been done so far. We organized a large ReLoc survey⁴ which collected rich data on the activities of German daughters in the Czech Republic, their mothers in Germany and on control groups of other firms in the respective countries. To the best of our knowledge, this is the most extensive endeavor to date investigating the characteristics of Ger-

man-Czech cross-border investment. Our survey allows direct qualitative comparison of mother and daughter companies using methodology harmonized on both sides of the border.

Our unique study fills the gap by doing an empirical examination of the incidence of vertical versus horizontal FDI in a more direct way than has been done so far.

Besides data on the size, age and principal activity of the firms, the survey provides unique evidence on the underlying factor requirements. Firms were asked to identify whether R&D belongs to major business functions conducted by the company. Next, the firms evaluated the technological level of their equipment in comparison to other firms in the same industry — ranging from absolutely obsolete to state-of-the-art. They were further asked to divide their labor force into the three broad categories of low, medium and highly educated workers depending on the qualifications required by their jobs. And even better, the firms evaluated the skill requirements of the tasks actually performed, which gives us proportions of routine manual, non-routine manual, routine non-manual, interactive and analytical tasks. Finally, the firms identified their position in the value chain.

Technology and skills clusters

We identified four principal clusters.⁵ The main dividing line runs, on one hand, between principally manufactur-

ing and service firms, and on the other hand, between firms that score high/low in the variables of technological, educational and skill intensity:

- (1) High-tech manufacturers; conduct R&D activity, maintain more highly educated labor, require a higher share of employees performing interactive and analytical tasks and furnish themselves with technologically more advanced equipment, as compared to other manufacturing firms.
- (2) Low-tech manufacturers; do not engage in R&D, have a less educated workforce, specialize in manual work, especially the most rudimentary routine tasks, and use more technologically outdated equipment than firms in any of the other groups.
- (3) High-tech service providers; advanced service firms, which use by far the most educated labor, have the most advanced tasks portfolio and cutting-edge equipment; in these characteristics they even outclass high-tech manufacturers.
- (4) Low-tech service providers; are the opposite of the previous category, so that the “low-tech” label fits them rather well.

Our key findings

Table 1 reports the clustering results by ownership and location of the firms, which is at the heart of our interest. Not surprisingly, the mother companies are by far the most advanced. About half of them belong to the high-tech manufacturing cluster, while more than a fourth of them are concentrated in the high-tech services cluster and only about one in five is classified as low-tech. Of course, the technological superiority of

4 Our empirical analysis is based on original micro (firm) level data on the German mothers, their daughters in the Czech Republic and control groups of other firms not belonging to either of these categories. The survey was conducted from September 2010 to May 2011. The sampling frame was a census of the total population of mothers and daughters and a sample stratified by industry and number of employees of the control groups. And, the response rates were 14.9 % for the Czech daughters, 12.9 % for the Czech control group, 18.5 % for the German mothers and 19.1 % for the German control group. The data were collected by the “Research on Locational and Organizational Change” (ReLoc) survey. The survey in both countries was realized thanks to collaboration of research teams from CERGE-EI in the Czech Republic and the Institute for Employment Research (IAB) in Germany in the framework of the EU COST project no. OC09017 within COST Action ISO701 „Comparative Analysis of Enterprise Data: Industry Dynamics, Firm Performance and Worker Outcomes“, co-funded by the Czech ministry of Schooling, Youth, and Sports (Ministerstvo školství, mládeže a tělovýchovy České republiky).

5 To identify distinct groups of firms with regards to the underlying factor requirements, we partitioned the sample with the help of hierarchical cluster analysis.

Table 1: Percentage distribution of firms across clusters (by firm's location and type)

Firm type	Location	Number of firms	Cluster			
			#1 High-tech Manufacturing	#2 Low-tech Manufacturing	#3 High-tech Services	#4 Low-tech Services
Greenfield daughter	Czech Republic	264	11.7	44.3	26.5	17.4
M&A daughter	Czech Republic	86	19.8	51.2	15.1	14.0
Control group	Czech Republic	662	17.1	30.8	21.6	30.5
Mother	Germany	364	49.7	6.3	28.8	15.1
Control group	Germany	1,065	21.1	19.2	20.6	39.1

mothers is an important reason why they venture into investing abroad. It is more interesting however to compare this pattern to the cluster distribution of daughters. And it is here that the distinction between the manufacturing and service sectors comes out strong.

Daughters in manufacturing seem to be a reverse mirror image of their mothers, as they are most prevalent in the low-tech manufacturing cluster; with a slight difference between green-field and merge & acquisition (M&A) FDI projects. Therefore, the technological superiority of mothers does not translate into the operations of their daughters. Manufacturing daughters are even more concentrated in the low-tech segment than the Czech control group of firms. Our data thus document the fact that in manufacturing, there is a clear vertical specialization between mothers and daughters, where the former specialize in technologically demanding activities, while the latter operate on the low-tech end, probably driven by the cost saving motive.

We find quite a different pattern in the segment of services, where the proportion of high-tech and low-tech operations comes out to be very similar in mothers and in their green-field daughters. M&A daughters somehow lag behind in this respect, but even in this category the high-tech cluster is more frequent than the low-tech one. This is in sharp contrast to the Czech

control group, where the low-tech cluster is significantly more populated. This finding suggests that the cross-border FDI in the service sector, particularly green-field projects, is predominantly horizontal, as the daughters engage in a similar portfolio of activities in terms of technology, education and skill intensity as their mothers.

Observed from the Czech point of view, our results suggest that the cross-border FDI in manufacturing generates jobs for low-skilled workers; possibly reducing unemployment in this segment of the labor market.

Our more detailed investigations⁶, which account for size, age and two-digit industry of the firm, confirm that in the service sector the factor requirements of daughters are similar to their mothers, which supports the conclusion that the dominant model of investment is horizontal. In contrast, for the manufacturing sector there is a profound difference with regard to factor requirements, and this is the hallmark of vertical investment.

Implications for industrial policies

Observed from the Czech point of view, our results suggest that the **cross-border FDI in manufacturing generates jobs for low-skilled workers; possibly reducing unemployment in this segment of the labor market.** But manufacturing FDI projects fall short of expectations as far as their contribution to technological upgrading is concerned, since they reinforce specialization of the local economy in low-tech manufacturing production. Somewhat surprisingly, however, cross-border FDI in the service sector appears much more promising for the upgrading process.

From the German perspective, our findings indicate that at least in the short-term horizon the cross-border FDI is likely to influence the relative wages of skilled and unskilled workers and hence disrupt the local market in manufacturing but not in the service sector. At the same time, however, fears of hollowing out local innovation systems do not seem to be justified in manufacturing, as the **technologically advanced activities remain concentrated in headquarters.** But there is the possibility of high-skill intensive jobs being transferred across the border in the service sector. Of course, the total impact also depends on whether the jobs are relocated from Germany or whether the investment projects generate new opportunities not undertaken before in Germany.

⁶ A detailed description of our analysis and results can be found in an article published in CERGE-EI Working Paper no. 467.

Admittedly, the ultimate welfare impact on both economies begs to be more closely scrutinized, but goes beyond the scope of our study. In addition, it would have been of interest to analyze the impact of these patterns on pro-

ductivity growth. This would require integrating our ReLoc survey data with information from other sources, most notably with balance sheet data and employment statistics, which exist, at least, for a subsample of the firms. This

is, therefore, a feasible next-step in this line of research. It may also be useful to analyze the dynamic aspects of the issues under consideration, something which may be possible were the ReLoc survey to be repeated in the coming years. ■

Acknowledgement: This project was financially supported by grant No. 402/08/P466, provided by the Grant Agency of the Czech Republic.

Daniel Münich is an Associate Professor at CERGE-EI (since 1998). He is a member of the National Economic Board of the Government (since 2010) and a Senior Expert of European Expert Network of Economists of Education (EENEE). In his research, he focuses on topics in labor economics (human capital, labor supply, tax and benefits schemes), economics of education and schooling (public vs. private schools, quality of education, efficiency and equity, selectivity). He is also an expert on evaluation and funding of R&D.

Martin Srholec is a Senior Researcher at the Economics Institute of the Academy of Sciences of the Czech Republic since 2010. He earned Ph.D. degrees in Economics from the University of Economics, Prague in 2003 and in Science, technology and innovation studies from the University of Oslo, Norway in 2005. His research focuses on economics of innovation, international economics and development economics.

Center for Economic Research and Graduate Education – Economics Institute (CERGE-EI) was founded in 1991 and is located in Prague, Czech Republic. A joint workplace of Charles University and the Economics Institute of the Academy of Sciences of the Czech Republic, CERGE-EI offers merit-based PhD and Masters programs in economics, taught in English, to students primarily from Central and Eastern Europe, the former Soviet Union, and other emerging-market economies. In addition to training the next generation of economic leadership, its scholars engage in research in both theoretical and empirical economics, especially in public-policy issues, experimental and behavioral economics, development, transition, and macroeconomics. CERGE-EI has been recognized as a Center of Excellence by both the European Union and the US government.



Politických vězňů 7, P. O. Box 882, 111 21 Prague 1, Czech Republic
phone (+420) 224 005 123, fax (+420) 224 005 333 • www.cerge-ei.cz • office@cerge-ei.cz