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THE IMPACT OF FOREIGN DIRECT INVESTMENTS ON STRUCTURAL CHANGES IN POLISH EXPORT

1. INTRODUCTION

Foreign direct investment (FDI) in Poland increased exponentially in the 1990s when this country, like other Central and Eastern European countries ($CEEC_S$), started its transition processes to democracy and a market economy. This field of economy has been studied intensively in recent years because of FDI flows' potential impact on the industrial restructuring processes of the host countries (Hunya 1997; Sheeky 1994; Meyer 1995).

Although there is a great deal of discussion about FDI flows in the transition countries, there have not been many studies dedicated to influence of FDI on foreign trade (i.e. Wysokinska, Witkowska 1997; Jensen 2001).

It is widely recognized that FDI is – as other measures for openness of the economy (trade) – positively associated with the process of economic growth. Openness between fosters linkages (interaction) between them, where the international technology transfer undertaken within multinational corporations (MNS_S) is one obvious and important vehicle for exchange of new knowledge about production (know-how) between nations.

There is, however, no clear evidence about the role played by the FDI in changes in foreign trade, especially in export.

This paper represents an attempt to assess the effects of FDI on structural changes in the Polish exports by providing an econometric analysis of the factors affecting exports at the sector level in Poland over the period 1999–2002.

The rest of the paper is organized as follows. Section 2 reviews the theoretical background of the economic effect from FDI in the host country perspective and a general overview of the sectoral structure of FDI and the foreign trade in Poland in the years 1994 to 2001. Section 3 and 4 focus on the econometric analysis and the discussion of the results. The final section provides some conclusions.

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2. FDI AND EXPORT

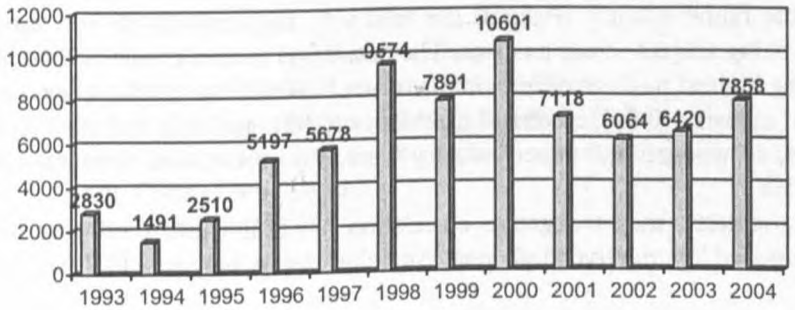
In the economic literature there is stressed the beneficial effects of FDI in the host country (Blomstrom 1991, Lall 1993 and 1995; Fagerberg 1994). A structural view on export specialization and FDI is forwarded by several authors on technological development in transition countries (Radosevic and Dyker 1996; Dyker 1997; Guerreri 1998, Barrel and Holland 2000, Jensen 2001).

In the transition countries most of the national firms and institutions carry a socialist heritage, especially technological capabilities of national firms can be viewed as underdeveloped in comparison with accumulated ownership advantages of firms in Western Europe. These historical factors continue to affect the international competitiveness of products from transition countries. (Jensen 2001, p. 237). At the same time these countries face particular structural problems and need FDI as an important catalyst to technological development. An important consideration for policy – makers when promoting development is to improve "export competitiveness". It may be observed by sustaining higher rates of export growth over time, upgrading the technological and skill content of export activity, and expanding the base of domestic firms able to compete internationally. The impact of differential functions and motives with FDI on the trade pattern of the host country are presented in the work of Dunning, 1994. One of the positive functions is concentrated around advantageous integration of the value added chain. The motive is here based on other localization advantages apart from local demand in the host country, such as access to cheap and for skilled labour and natural resources. This type of FDI is more likely to have an effect on the export pattern of the host country (Jensen 2001, pp. 238–239).

According to data of UNCTAD, value of global flows of foreign direct investment is estimated at the level of 612 billion USD in year 2004. It is more then 50% decrease in comparison with the year 2000. In the CEE region increasing interest of foreign investors is observed as the result of EU expansion. Among the CEE countries, Russia enjoyed most of interest of foreign investors. Poland was estimated on the second position among 19 CEE states.

In 2004 value of foreign capital inflow to Poland amounted to 7.86 billion USD. This is the highest value since the year 2000, when the country received a record high value of FDI inflow. For detailed information please see graph 1.

Accumulated value of foreign investments in Poland is 84.45 billion USD. The majority of capital was invested by French investors who allocated 16 billions USD, which constituted roughly 20% of total FDI inflow to Poland. The second most important group are Dutch investors (14%). They are followed by American and German investors (13% each). 74% of total FDI inflow comes from European Union countries, while 26% by other investors for example from USA and (MNCs) multinational corporations.



Graph 1. The inflow of foreign capital to Poland between years 1993–2004 (million USD)

Source: Polish Information&Foreign Investment Agency.

Analysis of the structure of FDI inflows plays a very important role. In last few years we can observe an increasing interest in Greenfield investment. In 2002 this kind of investment constituted 37% of all investments to the latest data the share of Greenfield investments stands at 58% of total inflow in 2004. About ¼ of FDI inflows are located in a process of privatisation. In 2004 foreign investors created in total 15 000 new jobs directly and also declared thay would make another 13 000 places in year 2005.

First approach of the empirical analysis is limited to investigating the relationship between exports of the host country – Poland and its incoming stock of FDI (the outgoing stock of FDI is currently very small).

Table 1. Correlation between FDI and exports by industries in Poland

Industry	Value of r-coefficient	t-value
Total industry	0.94	7.18*
Food processing	0.76	3.10*
Electrical machinery	0.93	6.57*
Mining and quarrying	0.81	3.68*
Chemicals	0.83	3.94*
Wooden and paper	–0.03	–0.21
Light industry	0.44	1.29
Petroleum and gas	–0.46	1.37
Iron and steel	0.88	4.86*
Other industries	0.62	2.08
Agriculture	–0.83	–3.83*

Source: D. Starzyńska (2004).

Empirical results presented in table 1 demonstrate that FDI and exports form the home country (Poland) are relatively high correlated in 6 for all 10 sector being subject of our analysis. The data come from the years 1994 to 2001.

The highest positive correlation between FDI and exports has been observed in total industry (0.94), electrical machinery (0.93), and iron and steel (0.88). In the area of wooden and paper industry there is no correlation between analysed variables.

Agriculture shows negative correlation (–0.83), while food processing is characterised by relative high positive relationship between FDI and exports (0.76).

3. THE ECONOMETRIC MODEL FOR PANEL DATA

The aim of this section is to briefly outline a simple theoretical model of exports, which will be used as a benchmark for the empirical exercise performed in section 4.

The structure of the model will try to stress the role played by FDI and other variables when determining exports. General from of the model estimated on basis of panel data is as following:

$$Y_{i_t} = \beta_{1ik} + \sum_{k=2}^{K} \beta_{k_{it}} Y_{k_{i_t}} + e_{i_t}, \qquad (1)$$

where:
i=1, ..., N denotes economic activity sectors (N=12),
t = 1, ..., T denotes time periods (T=4),
k = 2, ..., K denotes number of explanatory variable
with assumptions: $E[e_{i_t}] = 0$; $E[e_{i_t}^2] = \sigma_e^2$.

Using different assumption about changes in the intercepts due to objects (sectors) and over time several models for panel data may be used (Kuch 1959; Folloch 1961; Dańska 1995).

In empirical investigations there are used:
- one way fixed and random effects models,
- two factor fixed and random effects models,
- random coefficients model.

The basis for our empirical analysis will equation (1), which have been modified in order to estimate differences between sectors at same time period or

differences between periods for the same sector. Calculations have been made by means of softwear *limdep.*

In the models following variables were used:

Q – value of the sold production (in million PLN),

FDI – foreign direct investment inflows (in million PLN),

A – specialization index of type of Balassa,

E – exports share of production,

X – exports (in million PLN).

4. RESULTS OF ESTIMATION

The FDI data are available from the Polish Investment Agency (PAIZ), that continuously publishes over the Internet a list of all mayor investors in Poland (including all investments above US $ 1 billion). The data used in models are cumulated inflows of FDI in current US $ billion, in the period 1999–2002 by branches. The FDI data are much less accurate than the trade data. Above calculations must thus be viewed as a rough approximation to the distribution of FDI across branches.

We first try to establish a well – specified one way fixed model in which exports is determined by FDI and the Balassa specialisation index (A).

Results of estimation of this kind of model are presented in Table 2.

Table 2. Estimations of one way fixed model of exports (x) – version I

Explanatory Variables	b_i	t (b_i)	Probability
FDI	6.86	6.70	closed to 0
A	4497.58	2.51	0.158
R^2		0.9491	

S o u r c e: Own calculations.

FDI become statistically significant and positively correlated with dependent variable. The Balassa specialisation index A, however less significant, has a positive influence on exports. Strongly specialised firms obtain particular benefits from the foreign trade.

Because changes over time are not statistically significant we do not present here the two factor fixed model estimations.

A statistically significant positive association is also found between exports and production (Q) and exports and FDI (see Table 3).

Table 3. Estimations of one way fixed model of exports (x) – version II

Explanatory variables	b_i	$t(b_i)$	Probability
FDI	7.8895	7.561	closed to 0
Q	0.1287	3.442	0.0012
R^2		0.9553	

S o u r c e: As same as Table 2.

In next approach the export share of sector production (E) is positively related to FDI, while the Balassa specialisation index (A) is not significantly associated with dependent variable (E). The results of a such approach are presented in the Table 4.

Table 4. Estimations of two factor fixed model of export intensity (E)

Explanatory variables	b_i	$T(b_i)$	Probability
FDI	0.00014	1.775	0.0826
A	–0.17230	–1.516	0.1365
Constant	0.41340	2.012	0.0503
R^2		0. 9385	

S o u r c e: As same as Table 2.

5. FINAL REMARKS

We have examined throughout this paper the empirical relevance of hypothesis of FDI importance for exports using panel data for 12 industry sectors in Poland in the years 1999–2002.

High positive correlation between FDI and exports in majority of analysed sectors may be proved that FDI has served to promote exports from Poland. Negative influence of the Balassa index specialisation may suggest that FDI are going to labour intensive sectors (an alternative model of export intensity).

The FDI can contribute to the modernisation process of the transition economies and may accelerate the international technology transfer undertaken within multinational corporations.

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WPŁYW BEZPOŚREDNICH INWESTYCJI ZAGRANICZNYCH NA ZMIANY STRUKTURALNE POLSKIEGO EKSPORTU

Problematyka napływu bezpośrednich inwestycji zagranicznych w ostatnich latach jest często poruszana w wielu publikacjach naukowych, ponieważ jest to zjawisko mające istotny wpływ na rozwój gospodarki kraju przyjmującego. W artykule zaprezentowano wyniki badania wpływu bezpośrednich inwestycji zagranicznych na zmiany w poziomie i strukturze polskiego eksportu. Głównym celem artykułu jest analiza wielkości napływu bezpośrednich inwestycji zagranicznych i ich porównanie z eksportem oraz prezentacja empirycznej weryfikacji modelu eksportu na poziomie danych czasowo-przekrojowych. W badaniu wykorzystano informacje sektorowe dla lat 1999–2002.