

**EXPORT PROPENSITY OF ESTONIAN AND SLOVENIAN
MANUFACTURING FIRMS:
DOES FOREIGN OWNERSHIP MATTER?**

**Matija Rojec
Jože P. Damijan
Boris Majcen**

WORKING PAPER No. 11, 2001

**EXPORT PROPENSITY OF ESTONIAN AND SLOVENIAN
MANUFACTURING FIRMS:
DOES FOREIGN OWNERSHIP MATTER?**

**Matija Rojec
Jože P. Damijan
Boris Majcen**

WORKING PAPER No. 11, 2001

E-mail address of the authors: matija.rojec@gov.si
joze.damijan@uni-lj.si
majcenb@ier.si

Editor of the WP series: Peter Stanovnik

© **2001** Institute for Economic Research

Ljubljana, May 2001

Abstract

This paper discusses the determinants of export propensity of foreign firms in Estonian and Slovenian manufacturing sectors relative to domestic firms. We show that differences in export propensity between foreign and domestic firms in Slovenia and Estonia, are significant and that they are due to structural differences between foreign and domestic firms which reflect in (i) different efficiency of factors utilisation and productivity level, and (ii) in differences in other operational characteristics determining productivity and export propensity. Superior export propensity of foreign firms is partly due to the factor of “foreign ownership”, embracing also the effect of multinationality.

Key words

Foreign direct investments, export propensity, Central and Eastern European countries

Acknowledgements:

This research was undertaken with support from the European Union’s Phare ACE Programme 1997 (Phare-ACE research project “Impact of foreign direct investment on the international competitiveness of CEEC manufacturing and EU enlargement”, Project number: P97-8112-R). The content of this publication is the sole responsibility of the authors and it in no way represents the views of the Commission or its services.

1. INTRODUCTION

One of the major changes brought about by economic transition has been the adoption of outward-looking, export-oriented development concept by the former socialist countries of Central and Eastern Europe (CEE), Estonia and Slovenia being two of them. Another, even more affirmative step in the same direction is the process of integration of CEE countries in the European Union (EU). The primary consequence of these processes for CEE economies and enterprises has been the need to increase their export competitiveness and to become viable and competitive participants in the internal market of the EU. Foreign direct investment (FDI), by bringing in assets which are crucial for export expansion, is an obvious vehicle for increasing CEE countries export competitiveness.

The paper has three objectives. Firstly, to explore export propensity of foreign versus domestic firms in Estonian and Slovenian manufacturing sectors. Secondly, to determine to what extent foreign subsidiaries' export propensity is superior, if yes, due to the factor of "foreign ownership" itself. Does foreign ownership as such, after normalising for all other differences between foreign and domestic firms, matter as far as export propensity is concerned? Thirdly, to define independent variables, i.e. operational characteristics (efficiency in utilisation of factors of production, factors encompassed in "total factor productivity" and some specific factors) of foreign and domestic firms in Estonian and Slovenian manufacturing sectors, to which their export propensity is systematically related.

The issue whether foreign ownership as such, after normalising for all other differences between foreign and domestic firms, matters as far export propensity is concerned, or to what extent foreign subsidiaries' export propensity is higher (or lower), compared to indigenous firms, due to the factor of "foreign ownership" itself has been tackled by many authors (Laal and Streeten, 1977; Dunning, 1993; UNCTAD, 1983; Kumar, 1990, etc.). They do not offer unanimous view on the subject. It seems that considerable part, if not most of the difference due to "foreign ownership" is actually due to multinationality element in multinational enterprises (MNEs) (Pfaffermayr and Bellak, 2000).

For Estonia and Slovenia, we expect that export propensity in manufacturing enterprises is positively correlated with the presence of strategic foreign investors. This expectation is based, firstly, on the fact that export to sales ratio in manufacturing foreign subsidiaries in Estonia is 50.9% as compared to 36.9% in domestic firms, while in Slovenia the ratio is 72.3% in foreign subsidiaries and 47.5% in domestic firms (1998 data); in most manufacturing industries export propensity of foreign is higher than that of domestic firms. Secondly, foreign firms in both countries have some substantive advantages over most domestic ones: (i) they have clear corporate governance, (ii) they have clear company strategy and resources for its realization; (iii) they have undergone major (post-acquisition) restructuring; (iv) they are part of a MNEs' network what gives them access to parent company ownership specific advantages, including access to foreign markets (Rojec, 1998; Varblane, 2000).

The paper is composed of four sections. First section discusses determinants of and factors related to export propensity of foreign subsidiaries, and establishes theoretical and empirical foundation of hypothesis. Second section formulates hypothesis, explains

methodology and data. Third section reports the results using the panel framework and the last section summarises main findings of the paper.

2. DETERMINANTS OF AND FACTORS RELATED TO EXPORT PROPENSITY OF FOREIGN SUBSIDIARIES

The aim of this section is to identify possible determinants of and factors related to export propensity of foreign subsidiaries (and domestic firms). In doing that we distinguish between two sets of factors. The first set relates to factors which determine productivity level of a firm. We consider the productivity level as the major determinant of export competitiveness of a firm, and define productivity as being determined by efficiency of utilisation of factors of production and by a number of factors which define the so called “total factor productivity”. The second set of factors relates to a number of specific factors which co-determine export propensity of foreign subsidiaries and whose influence on export propensity goes beyond their influence on productivity.

Productivity factors related to export propensity. If productivity level is the major determinant of a capability of a firm to export, than the concept of “productivity gap” between foreign subsidiaries and domestic firms is of crucial relevance for our exercise. Most of the studies dealing with the issue agree that the productivity gap in fact exists. In their survey of literature on theoretical arguments and empirical evidence on productivity gap, Pfaffermayr and Bellak (2000) put forward a number of factors leading to superior productivity of foreign subsidiaries. These factors are firm specific assets of MNEs and their transfer to and from affiliates, global network of activities or benefits of participation in multinational network, accounting reasons, corporate governance systems, different mix of activities, failure of domestic producers to adopt “best practice technology” or “frontier technology”, input intensity per worker and the tendency of foreign investors to acquire “the winners”. According to Davies and Lyons (1991), reasons for productivity gap should be decomposed into the “structural effect” and “ownership effect”. Our specific intention is to assess the “ownership effect” on export propensity. However, a number of studies suggest that most of the effect attributed to ownership is in fact due to multinationality (Pfaffermayr and Bellak, 2000).

Specific factors related to export propensity. Factors which co-determine export propensity of foreign subsidiaries and whose influence on exports go beyond their influence on productivity could be broadly divided into: (i) investing firm characteristics, (ii) industry characteristics, (iii) foreign subsidiary characteristics, (iv) home country characteristics, and (v) host country characteristics.

Investing firm characteristics. The most frequently quoted investing firm characteristics include investing firm internationalisation strategy and its degree of multinationality. Whether an investing firm applies horizontal or vertical internationalisation strategy will be the basic determinant of foreign subsidiary’s export performance (see Dunning, 1993; Lankes and Venables, 1996; Andersson and Fredriksson, 1996, etc.), being high in the case of vertical and low in the case of horizontal strategy¹. It is also commonly, but not unanimously (Andersson and Fredriksson 1996) argued that higher degree of multinationality leads to more trade, including exports of foreign subsidiaries.

Industry characteristics. Type of activity in which MNEs are engaged and the nature of activities being undertaken by the subsidiaries importantly codetermine export propensity of foreign subsidiaries. Higher export propensity of foreign subsidiaries is often importantly due to their concentration in (i) trade intensive industries, (ii) globalised industries characterised by high degree of intra-firm trade, and (iii) industries in which a host country has a comparative advantage (see Dunning, 1993; Makhija *et al*, 1997; Eltetö, 1998; Gatling, 1993).

Home country characteristics. There are likely to be variations in the extent and pattern of trade transactions associated with FDI according to home countries involved (Dunning, 1993). This is the very basis of Kojima's (1978) trade and anti-trade oriented FDI. Similarly, Reich (1998) argues that high intra-firm exports from parent companies are characteristic for German and especially Japanese but not for U.S. MNEs.

Host country characteristics. Influence of FDI on a host country trade depends crucially on its environment/system/policies (ESP) configuration (Dunning, 1993, pp. 270-271). Four host country characteristics which are especially relevant for export propensity of foreign subsidiaries:

- Large host country market is a major motivation for horizontal, market-seeking FDI. Can one expect *vice versa*, i.e. that FDI in small countries is more of the export-oriented type? Most of the evidence do suggest that host country market size is negatively correlated with export propensity of foreign subsidiaries².

- Higher host country development level is generally correlated with vertical rather than horizontal FDI (Helpman and Krugman, 1985; Andersson and Fredriksson, 1996; Papanastassiou and Pearce, 1992). However, in case of simple factor cost advantages-seeking (export platform type) FDI, foreign investors would tend to go to developing countries (Brouthers *et al*, 1996; Papanastassiou and Pearce, 1992).

- FDI projects in CEE countries that are in more advanced stage of transition reforms are more likely to be export oriented and integrated into foreign parents multinational production process (Lankes and Venables, 1996).

- Appropriate policy environment in a host country is more relevant for export oriented than market-seeking FDI. Export-oriented, outward-looking development concept with more liberal economic policy creates a more congenial environment for export oriented FDI (IMF, 1985; UNCTAD, 1996; Bhagwati, 1978; Islam, 1995). Liberalisation of FDI and trade regime, and economic integration (free access to foreign markets) have proved to be crucial stimulators of export oriented FDI (Dunning, 1993; WTO, 1996; Andersson and Fredriksson, 1996).

2.1. FOREIGN SUBSIDIARY CHARACTERISTICS

Apart from factors determining productivity level, foreign subsidiary characteristics are in the focus of our attention because they provide foundation for the formulation of hypothesis of our model. Theoretical and empirical evidence offer the following foreign subsidiary characteristics of relevance for their export propensity.

Higher degree of vertical integration inside MNE, resulted and reflected in multiplicity of linkages and higher intensity of intra-firm trade, is in principle considered characteristic of

efficiency-seeking/vertical FDI. Empirical evidence predominantly confirm a positive link between export propensity and vertical integration and/or intra-firm intensity (Andersson and Fredriksson, 1996; UNCTAD, 1983; Lankes and Venables, 1996; Eltetö and Sass, 1998).

Level of foreign ownership (equity share). It is widely accepted and empirically tested that foreign investors in export oriented FDI, in principle, insist more strictly on higher control, materialised in wholly or high majority ownership. The reason is that export supply FDI projects are an integral part of MNEs production network and, therefore, supply security is of great importance (Lall and Streeten 1977, Lankes and Venables 1996, Eltetö and Sass 1998).

Capital intensity versus low cost unskilled or semi-skilled labour versus skilled labour. Are export oriented foreign subsidiaries characterized by (i) capital intensity, in the context of economies of scale and scope leading to efficiency-seeking FDI, (ii) unskilled/semi-skilled labour intensity, in the context of factor costs differentials stimulating relocation of labour intensive production to low labour costs locations or (iii) by intensive use of skilled labour in the context of factor cost differences FDI and/or efficiency-seeking FDI (integrated international production)? Existing studies both confirm and deny positive correlation between each of the three characteristics and export propensity of foreign subsidiaries:

- UNCTAD (1983) for Brazil and Ozawa (1972) for Japanese outward FDI in early 1970s, motivated by restructuring away from pollution-prone industries, found positive correlation between capital intensity and export performance of foreign subsidiaries. On the contrary, Kumar (1990) could not explain export performance of foreign and domestic firms in India by capital intensity.

- Low cost unskilled or semi-skilled labour has traditionally been considered as the major motivating factor for export oriented FDI based on factor cost differences. Empirical evidence of a little bit older date (Hood and Young, 1979; Riedel, 1975; Ozawa, 1972) confirm this view, however, in more recent studies, the role of cheap labour is very much reduced (European Commission, 1994). Most studies on FDI in CEE countries play down the importance of cheap unskilled labour (see EBRD, 1994; Lankes and Venables, 1996; Eltetö and Sass, 1998).

- With a shift towards advanced, flexible production systems and the need to assure quality and reliability, foreign investors in export oriented FDI attach growing importance to factors as skilled labour, infrastructure and educational standards (European Commission, 1994; Kravis and Lipsey, 1982). CEE countries are no exception in that (Lankes and Venables, 1996; Eltetö and Sass, 1998).

Three levers of export oriented FDI are to a certain extent alternative to each other and each of the three propositions could be tested in one or other direction, depending on other factors and on the type of export oriented FDI. While low costs of labour are more important for simple factor-cost oriented FDI, qualification is more important for efficiency-seeking FDI or integrated international production (see Papanastassiou and Pearce 1992).

The scope of value added. One of the differences between stand-alone subsidiaries in horizontal (market-seeking) integration and vertically integrated (export-oriented) subsidiaries is scope of activities/functions performed by subsidiaries. Stand-alone subsidiaries are, in general, active in all functions in the vertical chain, while subsidiaries in

vertical integration are confined to processing and assembling of imported components, which are then exported (UNCTAD, 1996). A subsidiary in vertical integration may, thus, have less scope for own value added activities than stand-alone ventures. This suggests a negative correlation between subsidiary's export propensity and its scope of value added.

Import propensity. A positive correlation between export and import propensity of foreign subsidiaries is somehow *a priori*. In a system of MNE integrated international production, a vertically integrated subsidiary produces and exports in what it is the most efficient and imports all it needs from subsidiaries which are more efficient in other segments. Vertical internationalisation with efficiency-seeking FDI strengthened international division of labour with increasing export and imports, in particularly intra-firm (UNCTAD, 1996; Reuber *et al*, 1973; Rojec, 1998; Eltetö and Sass, 1998; Lankes and Venables, 1996b).

Production cost considerations. Export oriented foreign subsidiaries attach greater importance to production cost considerations. According to Lankes and Venables (1996), the most striking difference between local supply and export supply type of foreign subsidiaries in CEE countries, as far as the motivation of foreign investors is concerned, is the importance attached to production costs by export suppliers.

3. HYPOTHESIS, DATA AND MODEL

Country specific characteristics of Estonia and Slovenia which define their ESP configuration (host country characteristics) - (i) small local market, (ii) advanced stage of transition (accelerated process of adopting EU *acquis communautaire*), (iii) liberal foreign trade regime (membership in WTO, European agreement with EU, full national treatment in FDI regime, numerous free trade agreements) and (iv) relatively high level of development in the case of Slovenia (GDP per capita near to that of Portugal and Greece) - speak in favour of export-oriented FDI in manufacturing sector of both economies.

3.1. HYPOTHESIS

In the framework of this host country specific situation, our intention is to test whether variation in export propensity (dependent variable) of foreign firms in Slovenian and Estonian manufacturing sector is systematically associated with a variation in various operational indicators of firms. To put it more precisely, we check:

(i) what is the impact of efficiency in utilisation of factors of production, of factors encompassed in total factor productivity and of some other specific factors on export propensity of firms,

(ii) whether differences in the above operational characteristics between domestic and foreign firms do have significantly different impact on their export propensity,

(iii) whether the progress of transition in Slovenia has had any impact on structural relation between operational characteristics and export propensity of foreign firms (are the changes in export propensity time invariant?).

The data set with which we dispose relates to income statements/balance sheets and foreign trade transactions of foreign and domestic firms. This database allows us to check

for correlation between differences in fundamental operational characteristics of the firms and the differences in their export propensity. The dependent variable in our model will be export propensity, measured by exports to sales ratio (**EX/S**). The fundamental independent variables, according to theoretical findings and empirical evidence presented in the first section, are listed below:

a/ **Foreign subsidiary/domestic firm variables:**

- (i) **type of ownership:** export propensity is positively correlated with (majority) foreign ownership, measured by foreign equity share (**FES**);
- (ii) **capital intensity:** export propensity is positively correlated with capital intensity, measured by fixed assets per employee (**ASS/Emp**);
- (iii) **skill intensity:** export propensity is positively correlated with skill intensity, measured by labour costs per employee (**LabC/Emp**);
- (iv) **labour intensity:** export propensity is negatively correlated with labour intensity, measured by the share of total labour costs in total costs (**LabC/C**);
- (v) **scope of value added:** export propensity is negatively correlated to the scope of value added, measured by the share of value added in sales (**VA/S**);
- (vi) **import propensity:** export propensity is positively correlated with import propensity, measured by the share of imports in sales (**IM/S**);
- (vii) **production costs considerations:** export propensity is negatively correlated with production costs, measured by the share of material, service and labour costs in sales (**C/S**).

b/ **Industry variables:**

- (i) **import protection** in industries: export propensity of firms is negatively correlated with import protection rates by industries, measured by the ratio of paid import duties to the value of imports by industries (**IPR**);
- (ii) **export orientation** of industries: export propensity of firms is positively correlated with overall export propensity of industries, measured by exports to output ratio by industries (**EX/OUT**);
- (iii) **international competitive position** of industries: export propensity of firms is positively correlated with RCA ratios by industries (**RCA**).

3.2. METHODOLOGY AND DATA

In order to check for correlation between differences in fundamental operational characteristics of firms and differences in their export propensity, growth accounting approach was used. Following Basu and Fernald (1995), we consider a firm's i production function having a following form:

$$(1) \quad Y_{it} = A_{it} K_{it}^{\alpha} L_{it}^{\beta} N_{it}^{\gamma}$$

where Y_{it} is gross output, K_{it} , L_{it} and N_{it} represent capital stock, labor input and materials, and A_{it} is total factor productivity (TFP) or Solow residual for firm i at time t . Firm's

production function is homogenous of degree r in K , L and N , so that $r = \alpha + \beta + \gamma \neq 1$. Decomposing gross output Y_{it} in (1) into exports (EXP_{it}) and domestic sales (DOM_{it}), and dividing both sides of equation with Y_{it} , we obtain:

$$(2) \quad EXP_{it}/Y_{it} = A_{it} K_{it}^{\alpha} L_{it}^{\beta} N_{it}^{\gamma} / Y_{it} - DOM_{it}/Y_{it}$$

Under assumption of competitive markets, marginal products of each input are equal to its factor price, hence, (1) can be rewritten:

$$(3) \quad ex_{it} = a_{it} + \alpha k_{it} + \beta l_{it} + \gamma n_{it} - \rho d_{it}$$

where $ex_{it} = \ln (EXP_{it}/Y_{it})$, $a_{it} = \ln A_{it}$, $k_{it} = \ln K_{it}$, $l_{it} = \ln L_{it}$, $n_{it} = \ln N_{it}$, and $d_{it} = \ln DOM_{it}$. Estimating (3) we seek to find whether differences in export propensity of firms are generated by their different efficiency use of the factors of production. This means that we are seeking for the existence of structural differences across firms that lead to different export propensities. One can argue that more export oriented firms are more competitive due to their greater efficiency of using of factor inputs. Greater export propensity of foreign firms relative to domestic ones should, hence be reflected in their more efficient production techniques, i.e. in better utilisation of factors of production and in greater technology stock (total factor productivity (TFP) reflected in a_{it} in (3)). We check for this by augmenting (3) with additional variables that may account for structural differences between FIE's and DE's:

$$(4) \quad ex_{it} = a_{it} + \sigma F_i + \alpha k_{it} + \beta l_{it} + \gamma n_{it} - \rho d_{it} + \chi F_i k_{it} + \phi F_i l_{it} + \varphi F_i n_{it} - \vartheta F_i d_{it} + \delta_k FD_{itk} + \nu IND_{itk} + \omega FM + \psi d_t + \lambda \text{lambda}_i + \varepsilon_{it}$$

where a_{it} is a log of a constant term, σ measures the difference in export propensity between domestic and foreign firms, α , β , γ , ρ , and χ , ϕ , φ , ϑ represent shares of factor inputs and domestic sales in domestic and foreign firms, respectively, δ_k represents the impact of different firm variables (FD_{itk} - type of ownership, size of investment, capital intensity, skill intensity, labour intensity, scope of value added, import propensity and production costs considerations), ν_k represents the impact of different industry variables (IND_{itk} - import protection, export orientation, and international competitive position), ω measures possible differences in export propensity between majority and minority owned foreign firms, ψ is a parameter of time dummies, while ε is the error term³.

Before we switch to the estimation results a problem of probable selection bias has to be addressed first. As seen in the next chapter firms with FDI in both samples perform better relative to domestic firms. This may be a consequence of the fact that foreign investment decisions are not randomly distributed but are subject to firms' characteristics and their initial performances. Foreign and domestic firms, hence, cannot be treated as homogenous units of observation due to possible endogeneity of foreign investment decisions. We correct for this problem using the generalized Heckman two-step procedure for correcting sample selection bias. According to Heckman (1979), in the first step we determine the probability of foreign investment choices using a probit model. We base foreign investment choices on initial firm size, firm's initial capital and skill intensity, initial productivity, firm's initial export propensity and sector dummies. In the second step we then follow generalized Heckman approach as developed by Amemiya (1984) and calculate inverse Mill's ratios (also called lambda) for all observations (for non-zero as well as zero observations regarding foreign investment choices). In doing so we obtain an additional independent

variable, *lambda*, in our estimated model, which we then use as an instrument for the unobserved impacts on foreign investment decisions.

We introduce additional variables representing fundamental operational characteristics of firms into the equation (3) as possible determinants of differences in their export propensity in order to explain the changes in export propensity which are not explained with differences in efficiency utilisation of factors used in production and changes in domestic sales.

Our estimations of (4) were performed on firm level data. While for Slovenia basically data on all manufacturing firms is available we constrained our sample to the firms that accounted for more than 10 employees. This is a very useful constraint since smaller firms do perform significantly different and it would lead us to biased results. Finally, we have a balanced panel of 1093 Slovenian firms for the period 1994-1998. In Slovenia the fraction of foreign firms is rather small (116 foreign firms, defined as firms with 10% or higher foreign equity share, out of total of 1093 firms), but in value terms their importance is much higher (Damijan and Majcen, 2001; Rojec 1998). The same is true for Estonia (Varblane, 2000), where, by using similar procedures and data sources, we constructed data bank of firms in Estonian manufacturing sector with a balanced panel of 363 firms for the period 1995-98 and a sub-sample of 106 firms with FDI.

This very comprehensive database allows us to use panel data techniques (random or fixed effects model – REM, FEM) that do explicitly take into account the firm specific effects. In our case a panel framework proved to be a superior econometric technique in comparison to cross-section analysis. First of all, panel provides us with a larger number of data points, it increases the degrees of freedom and reduces the co-linearity among explanatory variables and, hence, improves the efficiency of econometric estimates. Second, following (Hsiao 1986, and Egger 2000), panel data enable us to analyse a number of important economic questions that cannot be addressed using solely cross-section or time-series data. Panel framework allows us to capture the relationships between variables in the model over a longer period and, hence, to identify the impact of the business cycle phenomenon. Furthermore, panel framework enables us to disentangle the time invariant firm-specific effects that, without doubt, are very important when addressing the issue of relation between export propensity of firms and their individual operational characteristics. We thus perform estimations of (4) using both REM and FEM techniques.

4. ESTIMATION RESULTS

In the first subsection we analyse the structure of both data sets (checking for differences among different sub-samples) and in the second subsection we present the estimation results using panel data techniques.

4.1. STRUCTURAL ANALYSIS OF THE DATA SET

In the first step of our analysis both data sets were divided into two sub-samples: domestic firms and foreign firms. Tables 1 and 1a, showing mean values of the fundamental operational indicators of firms, reveals significant differences between domestic and foreign firms.

Tables 1a and 1b about here

On the average in both countries foreign firms are superior to domestic ones in almost all fundamental operational indicators for both economies⁴. Foreign firms are larger than domestic firms (in terms of assets), they export a significantly larger portion of their output and they buy significantly more inputs abroad. Foreign firms are more capital and skill intensive, they pay higher wages and they operate with higher profits. For Slovenia we also found that foreign firms are not attracted to more protected industries or to industries with traditionally higher international competition position⁵. More detailed insight into the data reveals that the observed operational differences between domestic and foreign firms become larger over time.

In the second step the data set of foreign firms was divided into majority and minority foreign owned firms. However, as shown in Tables 2 and 2a, there are apparently only slight and mostly insignificant differences between the two types of foreign firms. First observable difference is that majority owned foreign firms import significantly more inputs abroad. Majority owned foreign firms employ more workers, they are more skill intensive, and in Slovenia they also pay higher wages and they operate at lower profits, compared to minority foreign owned firms.

Tables 2a and 2b about here

4.2. ESTIMATION OF RESULTS USING PANEL FRAMEWORK

We use panel data techniques to test whether unexplained variation in export propensity of foreign firms in Estonian and Slovenian manufacturing sector (not explained with the differences in efficiency of utilisation of factors used in production) is systematically associated with the variation in various fundamental operational characteristics of firms. As already mentioned, in a panel framework it is crucial to decide which of the two estimators – fixed effects model (FEM) or random effects model (REM) - one will employ. Fixed effects are due to omitted variables that are specific to cross-sectional units or to time periods (Hsiao, 1986). In our case firm specific fixed effects may be related to specific qualification structures of employees, to specific intangible assets and to a plenty of other factors that are specific to individual firm and could not be accounted for in included variables in the model. As most of these effects are not random but deterministically associated with certain idiosyncratic factors, a FEM seems to be the right choice. On the other hand, Hausman specification test (Hausman, 1978) used in order to decide whether FEM or REM is the econometrically more appropriate approach, showed that FEM provides better specification of our model relative to REM. We report both estimation results.

We report the results obtained in the panel of all (domestic and foreign) firms. Both FEM

and REM have been performed. However, highly significant Hausman χ^2 statistics reveals systematic differences in coefficients between both models, hence indicating high importance of firm-specific effects and their correlation with the dependent variable. Therefore, we will comment only the results obtained with the FEM. Let us systematically comment on the results:

Tables 3 and 4 about here

a/ Positive and statistically highly significant parameter of variable F_i (a dummy variable denoting foreign firms) confirms significantly higher export propensity of foreign firms in both countries. One could conclude that results demonstrate relatively high positive impact of FDI on export propensity of recipient firms. This is partly due to enhanced technology transfer which increases productivity what, however, proved to be significant only after we have corrected for initial selection bias for foreign investment decisions⁶. On the other hand foreign equity share (FES) and the distinction between majority and minority owned foreign firms (DumM) do not have any significant impact on the export propensity.

b/ Time dummies reveal the fact that export propensity of Estonian firms increased over the observed period while this was not the case for the Slovenian firms.

c/ Regarding the factor intensity variables results point to the fact that for Slovenian firms capital intensity does not have any significant impact on export propensity (neither for domestic nor for foreign firms). Expected positive and significant parameter was found for skill intensity variable for foreign firms. One could see this variable as a proxy for human capital variable, internal technology determinant, that increases overall productivity of a firm and thus has a positive impact on export propensity. On the other hand labour intensity turned out to be significantly negatively correlated with export propensity for both domestic and foreign firms. It seems that cheap labour force is not a Slovenian comparative advantage any more. As expected from theoretical findings, in the case of Estonian firms we found positive and significant parameter only in the case of capital intensity variable for foreign owned firms. Significantly negative parameter for domestic firms on the other side seems to reveal an unfinished restructuring process of these firms.

d/ The variable for import propensity was used only for Slovenian manufacturing firms. Positive and statistically highly significant estimated parameter for this variable reveal another channel of technology transfer to the Slovenian firms and the fact that highly export oriented firms tend to import more. At first glance it seems contradictory that parameter for foreign firms is non-significantly different. This, however, could be explained by subcontracting activities (imports of foreign inputs for export processing) in which domestic firms are much more heavily engaged than the foreign ones⁷.

e/ For other firm and all industry variables we did not find any significant parameter. The only exemptions were two industry variables (export orientation and import protection variables) in the case of Slovenian firms and with used REM technique⁸.

5. CONCLUSIONS

The paper discusses the determinants of export propensity of foreign firms in Estonian and Slovenian manufacturing sector relative to domestic firms. Our main objective has been to explore to what extent foreign subsidiaries' export propensity is different, compared to domestic firms, due to differences between both categories of firms in efficiency of utilisation of factors of production, due to differences in some other operational characteristics and, finally, due to the factor of "foreign ownership" itself. Growth accounting approach within a panel framework was used in order to capture the relationships between export propensity of firms and their structural differences over a longer period and to disentangle the time invariant firm-specific effects (such as unobserved differences in qualification structures of employees between firms, differences in firm-specific intangible assets, etc.).

We show that differences in export propensity between foreign and domestic firms in Slovenia and Estonia. are significant and that they are due to the structural differences between foreign and domestic firms which reflect in (i) different efficiency of factors utilisation and productivity level, and (ii) in differences in other operational characteristics determining productivity and export propensity.

After controlling for firm specific effects and possible endogeneity problem due to sample selection bias, we were able to confirm our basic propositions that differences in export propensity are generated by structural differences among foreign and domestic firms. Therefore, the hypothesis that foreign ownership matters, as far as export propensity is concerned, is confirmed. More specifically, we found that differences in efficiency of factor utilisation do affect the level of export propensity, since more efficient firms are more competitive also on international markets. Secondly, our evidence suggests that the remaining (unexplained) part of differences in export propensity can be explained by other structural differences between foreign and domestic firms reflected in operational characteristics – capital, skill and labour intensities, and import propensity.

NOTES

1. "Horizontal" *versus* "vertical" co-determines a number of other specificities of local/regional market versus export-oriented FDI.

2. Findings of Andersson and Fredriksson (1996), Papanastassiou and Pearce (1992) and Eltetö (1998) support the negative correlation between host country market size and foreign subsidiaries' export propensity, but Kravis and Lipsey (1982) and Michalet (1997) are not of the same opinion.

3. It is not reasonable to expect for all firms to have identical production function in terms of identical input parameters. While it is assumed the same specification, parameters of determinants are expected to be different. The least one should do is to allow foreign and domestic firms to differ in terms of the efficiency of factor inputs and also in stated

operational characteristics. On the other hand, one also has to assume efficiency of firms in transition countries to improve over time as more productive capital and more skilled labor is employed. We control for this including the time variable d_t . In the absence of other good proxies, time variable is also intended to capture time specific aggregate shocks to the whole economy. These shocks are inherent to transition economies.

4. As data set for slovenian manufacturing firms was richer it was possible to calculate mean values for more indicators-the test for significant differences between two samples was prepared only for slovenian data.

5. This is basically because the highest RCA indexes are specific to labour intensive industries, to which, apparently, foreign firms are less attracted. We do not dispose with a comparable data for Estonia.

6. Better performance of foreign owned firms could be also the outcome of the improved efficiency of utilisation of the existent factor inputs. Despite the fact that the model used differentiates between factor inputs used by foreign and domestic firms this is still an indirect approach as we can not directly account for changes in efficiency of existent factor inputs. In the case of Slovenia we found significantly different parameters for material inputs.

7. Foreign trade data related to these activities heavily increase import propensity of firms involved because imported inputs for export processing are recorded in gross value, while export side includes only the value of processing services and not the value of exported goods.

8. We ran the similarly specified model also on the panel of foreign firms only. However as results show this model seems not to be an appropriate way to explain differences in the variation of export propensity between majority and minority owned foreign firms. The variation in various operational characteristics within the group of foreign firms seems to be too modest to allow for any significant relationships with the dependent variable. These results confirm our previous failure (see section 4.1.) to find any significant differences in operational characteristics between both groups of foreign firms.

REFERENCES

- Amemiya, Takeshi. 1984. Tobit models: A Survey. *Journal of Econometrics*, 24: 3-61.
- Andersson, Thomas & Torbjoern Fredriksson. 1996. International organization of production and variation in exports from affiliates. *Journal of International Business Studies*, 27(2): 249-63.
- Basu, S. & J. Farland. 1995. Aggregate Productivity and the Productivity of Aggregates. NBER Working Paper no. 5382.
- Bhagwati, Jagdish. 1978. *Foreign trade regimes and economic development: Anatomy and consequences of exchange control regimes*. Cambridge, Mass.: Ballinger.
- Brouthers, Lance Eliot, Steve Werner & Timothy J. Wilkinson. 1996. The aggregate impact of firms' FDI strategies on the trade balances of host countries. *Journal of International Business Studies*, 27(2): 359-73.

- Damijan, Jože P. & Boris Majcen. 2001. *Transfer of technology through FDI and trade, spillover effects and recovery of Slovenian manufacturing firms*. Ljubljana: Institute of Economic Research, Mimeo.
- Davies, S.W. & B.R. Lyons. 1991. Characterising Relative Performance: The productivity Advantage of Foreign Owned Firms in the UK. *Oxford Economic Papers*, (43): 584-595.
- Dunning, John.H. 1993. *Multinational enterprises and the global economy*. Wokingham: Addison-Wesley.
- EBRD. 1994. *Transition report*. London: European Bank for Reconstruction and Development.
- Egger, Peter. 2000. A note on the proper econometric specification of the gravity equation. *Economic Letters*, 66(1): 25-31.
- Eltető, Andrea. 1998. The impact of FDI on the foreign trade of four smaller CEE Countries. Working Paper No. 96, Institute for World Economics, Hungarian Academy of Sciences, Budapest.
- Eltető, Andrea & Magdolna Sass. 1998. *Motivations and behaviour by Hungary's foreign investors in relations to exports*. Working Paper No. 88, Institute for World Economics, Hungarian Academy of Sciences, Budapest.
- European Commission. 1994. *Trade and investment*. Discussion Paper (December), Directorate General for External Economic Relations, Brussels.
- Gatling, Rene. 1993. *Foreign investment in Eastern Europe*. London: The Economist Intelligence Unit.
- Helpman, Elhanan & Paul R. Krugman. 1985. *Market structure and foreign trade: Increasing returns, imperfect competition, and the international economy*. Cambridge, Mass.: MIT Press.
- Hood, Neil & Stephen Young. 1979. *The economics of multinational enterprise*. London: Longman.
- Hsiao, C. 1986. *Analysis of Panel Data*. Cambridge, MA: Cambridge University Press.
- IMF. 1985. Foreign private investment in developing countries. Occasional Paper No. 33, International Monetary Fund, Washington, D.C.
- Islam, Azizul. 1995. Collaboration with transnational corporations and manufactured exports from developing countries: Potentials and policy implications. *RIS (Research & Information System) Digest*, 11(3/4): 1-21.
- Hausman, A.J. 1978. Specification Tests in Econometrics. *Econometrica*, 46: 727-738.
- Heckman, James J. 1979. Sample selection bias as a specification error. *Econometrica*, 47(1): 153-161.
- Kojima, Kiyoshi. 1978. *Direct foreign investment*. London: Croom Helm.
- Kravis, Irving B. & Robert E. Lipsey. 1982. The location of overseas production and production for export by U.S. multinational firms. *Journal of International Economics*, 12: 201-23.
- D.B.A. Audretsch & C.P. Kindleberger, editors, *The multinational corporation in the 1980's*. Cambridge, MA: MIT Press.
- Kumar, Nagesh. 1990. *Multinational enterprises in India*. London: Routledge.
- Lall, Sanjaya & Paul Streeten. 1977. *Foreign investment, transnationals and developing countries*. London: Macmillan.

- Lankes, Hans-Peter & A.J. Venables. 1996. Foreign direct investment in economic transition: the changing pattern of investments. *Economics of Transition*, 4(2): 331-47.
- Makhija, Mona V., Kwangsoo Kim & Sandra D. Williamson. 1997. Measuring globalization of industries using a national industry approach: Empirical evidence across five countries and over time. *Journal of International Business Studies*, 28(4): 679-711.
- Meyer, Klaus. 1998. *Direct investment in economies in transition*. Cheltenham: Edward Elgar.
- Michalet, Charles-Albert. 1997. Strategies of multinationals and competition for foreign direct investment. Foreign Investment Advisory Service Occasional Paper 10, Foreign Investment Advisory Service, The World Bank, Washington, D.C.
- Ozawa, Terutomo. 1972. Multinationalism - Japanese style. *Columbia Journal of World Business*, 7(6): 33-42.
- Ozawa, Terutomo. 1992. Foreign direct investment and economic development. *Transnational Corporations*, 1(1): 27-54.
- Papanastassiou, Marina & Robert Pearce. 1992. Motivation and market strategies of US foreign direct investments: An analysis of host country determinants. In Proceedings of the 18th Annual Conference of European International Business Association, The University of Reading, Reading.
- Pfaffermayr, Michael & Christian Bellak. 2000. Why Foreign-Owned Firms are Different: A Conceptual Framework and Empirical Evidence for Austria. HWWA Discussion Paper 115, Hamburgisches Welt-Wirtschafts-Archiv, Hambur Institute of International Economics.
- Reich, Simon. 1998. Globalisation and changing patterns of foreign direct investment: The lessons for Central and Eastern Europe. *Journal of International Relations and Development*, 1(1-2): 106-19.
- Reuber, G.L. et al. 1973. *Private foreign investment in development*. Oxford: Clarendon Press.
- Riedel, James. 1975. The nature and determinants of export oriented direct foreign investment in a developing country: A case study of Taiwan. *Weltwirtschaftliches Archiv*, Band 111, Heft 3: 505-28.
- Rojec, Matija. 1998. Foreign Direct Investment's Effects on Restructuring and Efficiency Upgrading in Slovenia's Manufacturing Sector. *Journal of International Relations and Development*, 1(1-2): 46-64.
- UNCTAD. 1983. *The role of transnational enterprises in Latin American integration efforts: Who integrates for whom and for what benefits*. TO/B/C/7/38. Geneva: United Nations.
- UNCTAD. 1996. *World investment report 1996*. New York and Geneva: United Nations.
- Varblane, Urmas. 2000. *Foreign Direct Investments in Estonia: Major characteristics, trends and developments in 1993-1999*. Tartu: University of Tartu, School of Economics and Business Administration. Mimeo.
- Vernon, Raymond. 1966. International investment and international trade in the product life cycle. *Quarterly Journal of Economics*, 80(2): 190-207.
- WTO. 1996. *Annual report 1996*. Geneva: World Trade Organization.

TABLE 1a:
GROUP STATISTICS FOR DOMESTIC AND FOREIGN FIRMS (PERIOD 1994-1998) –
SLOVENIA

Variable	FDI ¹	N	Mean	Std. Deviation	Std. Error Mean
EX/S	0	2445	41,6	28,7	0,58
	1	432	56,7	30,8	1,48
IM/S	0	1547	23,9	20,8	0,53
	1	259	49,9	48,4	3,01
FES	0	2720	0,0	0,4	0,01
	1	455	50,9	34,5	1,62
ASS²	0	2671	1.024.526,7	2.080.159,5	40.249,43
	1	440	1.376.161,5	2.616.456,5	124.734,67
ASS/Emp²	0	2671	5.194,6	8.519,9	164,85
	1	440	7.146,5	8.453,6	403,01
WAGE/Emp²	0	2720	1.394,1	559,4	10,73
	1	455	1.589,3	733,4	34,38
LabC/Emp²	0	2717	1.972,1	861,3	16,52
	1	455	2.238,8	1.023,3	47,97
LABC/VA	0	2717	76,5	14,2	0,27
	1	455	65,5	17,3	0,81
LABC/C	0	2717	29,2	13,5	0,26
	1	455	21,7	13,5	0,63
VA/S	0	2648	36,9	16,7	0,32
	1	435	30,7	14,4	0,69
PF/REV	0	2648	-1,6	17,4	0,34
	1	435	1,4	10,1	0,49
C/S	0	2651	101,5	29,1	0,57
	1	435	98,9	11,4	0,55
Emp	0	2720	254,3	423,1	8,1
	1	455	236,6	379,6	17,8
IPR	0	2720	6,3	6,3	0,1
	1	455	5,9	6,2	0,3
RCA	0	2720	269,7	1.970,0	37,8
	1	455	146,6	174,6	8,2
EX/OUT	0	2720	48,5	114,8	2,2
	1	455	59,6	57,9	2,7

¹ FDI=0: domestic firms; FDI=1: foreign firms.

All variables in %, except ² (in 000 SIT).

* Bold variable indicates significant differences (at 5 %) between the two samples.

**TABLE 1b:
GROUP STATISTICS FOR DOMESTIC AND FOREIGN FIRMS (PERIOD 1995-1998) -
ESTONIA**

Variable ¹	FDI ¹	N	Mean
EX/S	0	1088	40.1
	1	404	58.2
FES	0	1088	0.0
	1	404	78.9
ASS²	0	1088	9850.2
	1	404	16287.8
ASS/Emp²	0	1088	78.6
	1	404	240.2
WAGES²	0	1088	6451.9
	1	404	7945.7
LabC/Emp²	0	1088	48.2
	1	404	68.2
LABC/VA	0	1088	81.8
	1	404	70.3
LABC/C	0	1088	47.9
	1	404	43.3
VA/S	0	1088	32.0
	1	404	120.1
C/S	0	1088	76.3
	1	404	132.1

¹ FDI=0: domestic firms; FDI=1: foreign firms.
All variables in %, except ²

TABLE 2a:
GROUP STATISTICS FOR FIRMS WITH FOREIGN MAJORITY AND MINORITY
SHARE (PERIODS 1994-1998) - SLOVENIA

Variable [*]	DumM ¹	N	Mean	Std. Deviation	Std. Error Mean
EX/S	0	186	54,0	29,7	2,18
	1	246	58,8	31,5	2,01
IM/S	0	93	41,3	38,0	3,94
	1	166	54,7	52,9	4,10
FES	0	195	17,5	16,5	1,18
	1	260	75,9	20,5	1,27
ASS ²	0	193	1.160.656,5	1.695.648,5	122.055,45
	1	247	1.544.552,1	3.147.663,8	200.281,05
ASS/Emp ²	0	193	6.829,9	8.819,9	634,87
	1	247	7.393,9	8.165,6	519,56
WAGE/Emp ²	0	195	1.467,0	563,0	40,32
	1	260	1.681,1	828,1	51,36
LabC/Emp ²	0	195	2.062,6	753,2	53,93
	1	260	2.370,9	1.170,4	72,58
LabC/VA	0	195	67,3	18,7	1,34
	1	260	64,2	16,1	1,00
LabC/C	0	195	22,1	13,9	0,99
	1	260	21,4	13,2	0,82
VA/S	0	188	30,1	13,4	0,98
	1	247	31,2	15,2	0,97
PF/REV	0	188	2,7	7,4	0,54
	1	247	0,4	11,7	0,74
C/S	0	188	98,1	10,7	0,78
	1	247	99,5	11,9	0,76
EMP	0	195	184,1	222,0	15,9
	1	260	276,0	460,5	28,6
IPR	0	195	6,4	5,1	0,4
	1	260	5,6	6,9	0,4
RCA	0	195	157,7	175,4	12,6
	1	260	138,2	173,9	10,8
EX/OUT	0	195	59,5	57,6	4,1
	1	260	59,7	58,1	3,6

¹ DumM=0: minority foreign share; DumM=1: majority foreign share.

All variables in %, except ² (in 000 SIT).

* Bold variable indicates significant differences (at 5 %) between the two samples.

TABLE 2b:
GROUP STATISTICS FOR FIRMS WITH FOREIGN MAJORITY AND MINORITY
SHARE (PERIOD 1995-1998) - ESTONIA

Variable ¹	FDI ¹	N	Mean
EX/S	0	73	52.2
	1	331	59.6
FES	0	73	34.0
	1	331	88.8
ASS²	0	73	9431.4
	1	331	17799.9
ASS/Emp²	0	73	130.0
	1	331	264.5
WAGES²	0	73	5275.3
	1	331	8534.6
LabC/Emp²	0	73	55.2
	1	331	71.1
LABC/VA	0	73	73.1
	1	331	69.7
LABC/C	0	73	47.1
	1	331	42.5
VA/S	0	73	46.5
	1	331	136.3
C/S	0	73	83.1
	1	331	142.9

¹ DumM=0: minority foreign share; DumM=1: majority foreign share.
 All variables in %, except ² (in 000 SIT).

TABLE 3:
ESTIMATION RESULTS FOR THE PANEL OF DOMESTIC AND FOREIGN FIRMS – SLOVENIA

Model Variable	Random effects		Fixed effects	
	Coeff.	t-Stat.	Coeff.	t-Stat.
Constant	-2.066749	-1.253	-7.631137	-3.332
Factor inputs	yes		Yes	
DumF	12.44727	4.352	13.61085	3.664
DumM	0.085841	0.180	0.169075	0.328
Y2	0.011390	0.129	-0.001982	0.140
Y3	0.132479	1.474	0.110429	1.229
Y4	0.178498	1.964	0.131275	1.429
Y5	0.094618	1.028	0.035687	0.382
FES	0.002468	0.336	0.001102	0.140
<i>ASS/Emp</i>	<i>-0.000008</i>	<i>-1.651</i>	<i>-0.000008</i>	<i>-1.570</i>
ASS/EmpF	-0.000018	-0.830	-0.000009	-0.369
LabC/Emp	-0.000184	-2.350	-0.000300	-0.340
LabC/EmpF	0.000405	3.308	0.000256	1.970
LabC/C	-0.017892	-1.689	-0.024137	-2.003
LabC/CF	-0.014204	-0.425	-0.000055	-0.002
VA/S	0.009059	1.337	<i>0.012894</i>	<i>1.784</i>
VA/SF	0.003086	0.122	-0.003246	-0.121
C/S	-0.001396	-1.079	-0.000825	-0.632
C/SF	-0.003024	-0.538	-0.003380	-0.530
IPR	0.001418	0.155	-0.019902	-2.348
IMS	0.023912	5.944	0.015965	2.876
IMSF	-0.020744	-3.047	-0.012856	-1.346
EX/OUT	0.002341	2.070	-0.000240	-0.210
RCA	0.000003	0.183	-0.000005	-0.027
lambda	-6.642144	-4.796	-6.642144	-4.796

Dependent variable: ln(EXP/S).

Adj. R sq.	0.3479	0.1124
W/F	638.05	9.43
N	2926	2926
Hausman specification test:		
Chi sq.	119.98	
Prob.	0.000	

Bold variable indicates significance at 5% confidence level;
italic variable indicates significance at 10% confidence level

TABLE 4:
ESTIMATION RESULTS FOR THE PANEL OF DOMESTIC AND FOREIGN FIRMS –
ESTONIA

Model Variable	Random effects		Fixed effects	
	Coeff.	t-Stat.	Coeff.	t-Stat.
Constant	-.3558383	-0.678	.4599252	0.716
Factor inputs	yes		Yes	
DumF	6.866533	8.440	4.606515	5.075
DumM	.0216626	0.091	-.0178917	-0.017
Y2				
Y3	.4052782	2.364	.2018607	1.154
Y4	.6349302	3.569	.3715607	2.009
Y5	.7036289	3.789	.4058304	2.083
FES	-.0010344	-0.389	-.0011123	-0.387
ASS/Emp	-.0009709	-2.675	-.0011000	-2.949
ASS/EmpF	.0011212	2.415	.0014349	2.882
LabC/Emp	-.0106128	-4.004	-.0035414	-1.217
LabC/EmpF	-.0012028	-0.451	-.0039258	-1.406
LabC/C	.0000346	0.028	-.0003572	-0.289
LabC/CF	-.0002741	-2.055	-.0001609	-1.216
VA/S	.0003283	0.217	.0006264	0.417
VA/SF	-.0003565	-0.186	-.0002498	-0.131
C/S	-.0012484	-0.759	-.0012597	-0.768
C/SF	.0023142	1.472	.0022058	1.393
EX/OUT				
RCA				
lambda	-4.175023	-9.757	-2.732674	-5.941

Dependent variable: ln(EXP/S).

Adj. R sq.	0.3264		0.0838
W/F	224.69		3.24
N	1293		1293
Hausman specification test:			
Chi sq.	186.42		
Prob.	0.000		

Bold variable indicates significance at 5% confidence level;
italic variable indicates significance at 10% confidence level