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Keskusteluaiheita – Discussion papers

No. 1114

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DOES FOREIGN PRESENCE STIMULATE CREATIVE DESTRUCTION IN LOCAL MARKETS?

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ABSTRACT: This paper studies the effect of foreign-owned companies (FOCs) in the region on establishment survival and growth in the Finnish business sector. We analyze whether the presence of the FOCs has asymmetric effects among the local businesses. Foreign presence in the region is measured in a novel way by using the regional links between establishments and their workers in the local labour markets. Evidence for small service establishments suggests that the presence of the FOCs contributes to aggregate productivity by cleansing inefficient units. The FOCs do not seem to stimulate productivity-enhancing restructuring among large, manufacturing or continuing establishments.

Keywords: Foreign ownership, local labour markets, survival, growth, company efficiency, selection, reallocation

JEL-code: F23, J23, R11, R23

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TIIVISTELMÄ: Tutkimme ulkomaalaisten yritysten vaikutusta alueen yrityssektorin kotimaisten toimipaikkojen hengissä säilymiseen ja kasvuun. Tarkastelemme sitä, onko ulkomaalaisilla yrityksillä epäsymmetrinen vaikutus paikallisiin yrityksiin. Ulkomaisten yritysten paikallisia vaikutuksia on tarkasteltu uudella tavalla lähestymistavalla. Siinä käytetään hyväksi toimipaikkojen ja niissä työskentelevien työntekijöiden kotipaikan välisiä alueellisia yhteyksiä. Palvelusektorin pieniä toimipaikkoja koskevat tulokset kertovat siitä, että ulkomaalaisten yritysten läsnäolo kohottaa aggregaattituottavuutta puhdistamalla markkinoilta pois tehottomia yksiköitä. Sen sijaan ulkomaalaiset yritykset eivät näytä stimuloivan tuottavuutta vahvistavaa rakennemuutosta suurien, teollisten tai jatkavien kotimaisten toimipaikkojen keskuudessa.

Keywords: Ulkomaalaisomistus, paikalliset työmarkkinat, henkiinjääminen, kasvu, yrityksen tehokkuus, valikoituminen, uudelleen kohdentuminen

JEL-koodi: F23, J23, R11, R23

1. Introduction

The wealth of a nation is built on productivity, which is an outcome of sustained evolution of production methods and structures. Competitive pressure is the driving force of this process. Arguably it affects innovation incentives, technology choices, implementation of new technologies and (in)efficiency in production in companies and establishments.

For fostering sustained development of prosperity, competition policy needs instruments that have dynamic effects. This is not to say that efforts to reduce price margins, for instance, are inessential. However, the highest gains are achieved by policies, which not only cut companies' profits or clean inefficient companies from the markets but also stimulate innovations, and entries and expansion of the productive companies and establishments. Put differently, what is needed is the means that contribute to the both sides of the "creative destruction" process. Growing incumbent companies and establishments account for a dominant share of investments and job creation. Consequently, they can be expected to have a particularly important role in the productivity-enhancing restructuring in the medium term as well (see e.g. Davis et al., 1996).

As a candidate of an effective competition treatment, a rapid and profound liberalization of inward foreign investments took place in Finland in the early 1990s. Thereafter, indeed, penetration of the foreign ownership exhibited strong and sustained growth. According to the calculations by Ilmakunnas and Maliranta (2004), the employment share of foreign-owned establishments in Finnish manufacturing increased from about 10 per cent to about 20 per cent in the period 1994–2001.

We maintain the insight that competition relates to the behavior of agents rather than to the state of current structures in the markets (Vickers, 1995). We examine whether the foreign-owned companies (hereafter the FOCs) change the behavior of the local companies, and in particular, is there asymmetry in the responses among heterogeneous establishments, which leads to productivity-enhancing restructuring? Does the exposure to foreign ownership constitute a double-edged sword leading to failures of less efficient units and to increases in market shares among more efficient establishments?

There is some earlier empirical analysis on the effects of foreign ownership on establishment survival and growth. However, the role and the measurement of foreign presence and the aims of these papers vary considerably. Özler and Taymaz (2004) study the impact of foreign ownership on growth and survival at the establishment and industry level. Görg and Strobl (2003) examine the impact of the foreign presence on the survival of establishments. They do not, however, consider spatial effects. In addition, they do not carefully control for some relevant establishment-specific aspects (e.g. efficiency). Bernard and Jensen (2002) study the differences in the survival rates between U.S. multinational and domestic companies. However, their analysis does not consider indirect effects that the presence of the foreign ownership (or multinational companies) may have on domestically-owned establishments in the same geographical region, although various regional effects are carefully controlled for. Nurmi (2004) is a second example of an analysis involving a comprehensive set of characteristics that may affect establishment survival in addition to an indicator for foreign ownership at the company level. The work by Haskel, Pereira and Slughter (2002) is an example of an analysis of intra-regional effects of the foreign presence. However, they focus on the productivity effects. Furthermore, the regions (the U.K. is divided into 11 regions) are too broad to deal with the effects of foreign presence in close proximity.

With respect to the earlier literature, one of the main contributions of this paper is the novel measurement of regional foreign presence. It is based on the observed spatial scopes of the local labor markets. In addition, the analysis of the effects of foreign penetration on establishment growth and survival is used to shed light on the discussion on the role of competition policy in regional economic development.

The FOCs are expected to have various impacts on productivity in the regions. The FOCs may have some company-specific assets that enable them to use inputs more productively than an average local company and consequently may raise directly and immediately the aggregate productivity level of a region (Markusen, 1995). Some direct effects may turn up with a lag. The initial direct effect may be small due to the fact that entrants are small. However, their contribution to aggregate productivity level increases over time when the high-productivity FOCs capture market shares from the less productive local companies. The FOCs may also be more innovative and may have a higher productivity growth rate than the local companies, which also provides a direct contribution to the aggregate productivity level in the future.

Apart from having immediate and delayed direct effects, the FOCs are likely to have various important indirect effects among indigenous companies. Some of them are expected to appear immediately, and other with some lag. The appearance of the FOC in the close proximity may have a competition effect, which forces the local companies to improve their productivity level by increasing output with given inputs or by downsizing and fat-trimming. In addition, the FOCs may have technology spillover effects on the local companies, which presumably follow with some time lag needed to absorb and implement new technological knowledge. The presence of FOCs may also affect the behavior of the local companies. From the point of view of the regional development it is highly desirable that the competition effects are asymmetric in a way that favors efficient local companies.

This paper focuses on two hypotheses on the effect of foreign presence on company growth and survival. The first is *the selection effect* hypothesis. Vickers (1995) demonstrates different situations with a standard Cournot oligopoly model with constant unit production cost per company, and fixed entry costs. From the point of view of our study, an interesting situation is the one where the entrant is efficient (low-cost), which seems to hold true for the FOCs in Finland according to the results by Ilmakunnas and Maliranta (2004). Dispersion of efficiency among local companies is another important feature of the model, which has relevance to our study. In these circumstances, foreign penetration positively affects the aggregate productivity. Boone (2004) demonstrates that the switch from Cournot to Bertrand competition stimulates entries of efficient companies, and leads to exits of less efficient companies. So, again, the entry of efficient FOCs entails with exits of inefficient local companies, but the efficient local incumbents survive. In Vicker's (1995) model, an entry of an efficient (low-cost) company leads to an exit of one or more inefficient (high-cost) incumbents but the efficient incumbents survive. In this kind of situation, the foreign penetration that follows the deregulation of the foreign ownership should remove inefficient local companies but the efficient ones should not be negatively affected. In other words, increased competitive pressure associated with the penetration of foreign ownership should have the highest negative effect on the survival chances of the least efficient local establishments.

The second hypothesis of the paper is *the reallocation effect* hypothesis, which states that, among surviving local establishments, the presence of the FOCs negatively affects the growth of low-efficiency establishments but positively the growth of highly efficient local companies. So, there may also be creative aspects of the process stimulated by greater competition.

The first hypothesis is analyzed in an earlier paper by Maliranta and Nurmi (2004), which focuses on the effects of foreign presence in the region on the survival of entrepreneurs. For entrepreneurs, we found support for the crowding-out effect and for the selection effect suggesting that foreign presence leads to selection among local entrepreneurs eliminating especially less efficient entrepreneurs. However, the analysis provided evidence for “creative” elements of competition induced by the FOCs as well. It was found that amongst the most efficient entrepreneurs the FOCs had a positive effect on survival probability.

The rest of the paper is organized as follows: The second section describes empirical modeling. The third section reports the empirical results regarding the selection and reallocation effects of foreign presence. Finally, the fourth section concludes the paper.

2. Empirical modeling

2.1. Data

The data on establishments existing in 1994 is obtained from the Business Register (BR) of Statistics Finland, which is available until 2002. Only establishments with at least three employees are included in order to have as reliable longitudinal establishment links as possible. This data is extended by constructing company, industry and regional-level variables from various different sources of Statistics Finland, including the Financial Statements Statistics (FSS), Foreign Affiliates Statistics (FATS), Plant-level Employment Statistics Data on Average Characteristics (PESA, available until 2001) and the Finnish Longitudinal Employer-Employee Data (FLEED). The FLEED and the FATS are the main data sources for constructing the measures for the presence of foreign-owned companies in each region. The FATS data includes information on the ultimate beneficiary owner (UBO) of the company 1994–2002, whereas the FLEED data covers a rich set of information on working-age population, including the identity of the employer. These data sets allow analysing the effect of foreign ownership on the dynamics of business sector establishments over the years 1994–2001, if the employee characteristics are included in the estimation.

We are faced with a left-truncation problem in the analysis because of the structure of the sample, i.e., having a stock sample of existing establishments instead of a flow sample of new establishments. The problem arises because we exclude from our sample any establishment whose operation ended before 1994. However, this problem can be easily handled if the birth year of each establishment is known. This allows us to treat the subsequent survival time of the establishment as conditional on having already survived for a certain number of years. Information on establishment age is obtained by tracking the history of the establishments in the BR, which is available from 1976 biannually until 1986 and from 1988 annually. For establishments that appear in the BR data in 1976, we use as an approximation for establishment age information on company age, which is directly available from the Business Register. However, this age information classifies as births all the cases where a new company code emerges, which may also be due to some other reason than the actual start of operations. Moreover, the birth of different establishments of a multi-establishment company cannot be separated. To the extent that we cannot identify the actual start-up date of the establishment correctly, we are faced with left-censoring, which is not easy to deal with in the Cox regression framework. An establishment is defined as having exited if it is missing from the BR data for at least two consecutive

years. Observations in 2002 are subject to right-censoring since the ending of the spell cannot be observed.

2.2. Measurement of the intensity of foreign presence

The measurement of the intensity of foreign presence is described in more detail in Maliranta and Nurmi (2004). Let us consider municipality j , whose establishments employ N_{jt} persons in year t . Each of these persons inhabits in a municipality, which is denoted by k . Functional region of (or travel-to-work area around) municipality j consists of all municipalities ($k=1,2,\dots$) that are a residence for some persons employed by municipality j .

We assume that the contribution of municipality k to the intensity of foreign presence faced by an establishment, which operates in municipality j is dependent on the product of two factors: what is the labor share of the foreign-owned establishments in municipality k and how closely municipality k is related to municipality j through labor markets. The former, the foreign share, is defined by $FSH_{tk} = N_{tk,FOR} / N_{tk}$, where $N_{tk,FOR}$ and N_{tk} is the number of workers employed in municipality k by foreign-owned and by all establishments in year t , respectively. The latter, the functional closeness, is measured by $CLOSE_{tjk} = N_{tjk} / N_{tj}$, where N_{tjk} is the number of persons who work at municipality j but live at municipality k . Of course, N_{tjj} denotes the number of those workers that both work and live at municipality j and $\sum_k CLOSE_{tjk} = 1$ for any j and t . The intensity of foreign presence in municipality j is:¹

$$FOCPRES_{tj} = \sum_k FSH_{tk} \cdot CLOSE_{tjk} \quad (1)$$

Computation of this indicator requires access to linked employer-employee data which identifies the locations of both employers and employees. We have first computed the labor share of the foreign-owned companies for each municipality by using the comprehensive Business Register data and the FATS data. By using these figures, the FOCPRES indicator for each municipality is then computed as a weighted average of the foreign labor share in that municipality and its surrounding municipalities. Obviously, this new measure for foreign presence is useful when analyzing spillover effects prevailing within labor markets. Moreover, this indicator obtains support from those theoretical considerations that emphasize arm's-length relationships for technological diffusion between companies. Travel-to-work areas may be sometimes suitable for describing interactions between companies within product markets. This is likely to be the case in most service industries and also in some manufacturing industries. On the other hand, in those industries that are extensively exposed to global competition interrelationships between local companies through product market competition are much weaker. In these cases broader definitions of area might work relatively better.²

¹ These figures have been computed for each establishment so that the effect of the respective establishment on the indicator is eliminated. In other words, this measure is implemented so that it indicates the intensity of the presence of the FOCs among the other establishments in the municipality.

² Of course, linked user-producer data equipped with location information would be more ideal for analyzing the effects within product markets.

A great advantage of this indicator is that we do not need to assume that the competitive pressure on the establishments is similar in the different parts of the same broad region. The strength of this measure relative to other alternatives, varying with respect to the definition of weights and the scope of regions, was tested in the earlier paper by Maliranta and Nurmi (2004). It was found that the FOCPRES indicator was empirically superior to other alternatives.³

2.3. Estimation methods

In the survival analysis we use the Cox's (1972) semi-parametric proportional hazards model, which is a popular method in the analysis of company survival, because it is a reasonable compromise between the non-parametric Kaplan-Meier estimator and the highly-structured parametric models. It specifies a regression model with a specific functional form but no exact form of the distribution of event times, or the baseline hazard function. This is appropriate for our purposes, as our main interest is not in the estimation of the underlying baseline hazard but in the effect of the foreign presence on establishment survival. The Cox regression model can be formally expressed as follows:

$$h(t) = h_0(t) \exp(x' \beta)$$

where the hazard rate, $h(t)$, is the conditional probability that an establishment exits during the period $t + \Delta$ given that it has survived until time t , i.e., it measures the risk of failure for an establishment during the next year. $h_0(t)$ is the baseline hazard function at time t , which is estimated when all of the explanatory variables are set to zero, and β is a vector of regression parameters. The model can be estimated using the partial likelihood approach suggested by Cox. A negative (positive) coefficient indicates that the risk of failure at a moment in time is reduced (increased). In the presence of left-truncation, the Cox partial likelihood estimates based on a modified definition of risk sets are consistent if the left-truncation is conditionally independent of the failure process given the covariates.

In the growth analysis we use the Heckman (1976) selection model (Tobit type 2), which takes into account the possible sample selection bias due to the higher exit probability of less efficient establishments. The model can be formulated as:

$$\begin{aligned} y_i^* &= x_i' \beta + \varepsilon_i \\ d_i^* &= z_i' \gamma + v_i \end{aligned}$$

where the error terms are independently and jointly normally distributed with covariance $\rho\sigma_\varepsilon$, and v_i has a unit variance. The two latent variables y_i^* and d_i^* cannot be observed by the researcher, who only observes an indicator d_i , which takes the value 1, when the latent variable d_i^* is positive, i.e., the establishment continues. The value of the variable $y_i = y_i^*$, i.e., employment growth, is only observed if the indicator is 1. In other words, the second equation determines whether the observation is in the sample or not and the first equation explains establishment growth. These two equations can be jointly estimated using the maximum likelihood method.

³ Development of the presence of foreign ownership as well as variation across municipalities according to this indicator is described in Maliranta and Nurmi (2004).

Table 1. Sample description for domestic establishments

<i>Variable</i>	<i>Description</i>	<i>N</i>	<i>Mean</i>
<i>Characteristics of the establishment</i>			
Establishment size	Log of employment	337158	2.223
Multiunit company	Establishment belonging to a multi-establishment company = 1, otherwise 0	332244	0.403
Average education of the employees	Three educational categories, according to the 33th and 67th percentiles of average education of the employees (reference is the lowest group 1), available only until 2001	203956	11.951
Average age of the employees	Three age categories, according to the 33th and 67th percentiles of average age of the employees (reference is the lowest group 1), available only until 2001	203956	39.620
<i>Characteristics of the company</i>			
Ratio of operating margin to sales	Log(ratio of operating margin to sales), three categories according to the 33th and 67th percentiles	277191	-2.489
Return on total assets	Log((net income + financial expenses + taxes)/assets, %), three categories according to the 33th and 67th percentiles	262266	2.499
Labour productivity	Log(ratio of value added to the number of person engaged, in full-time equivalent units), three categories according to the 33th and 67th percentiles	308873	10.473
Total factor productivity	Log(value added) – (2/3)*log(employment) – (1/3)*log(fixed assets), three categories according to the 33th and 67th percentiles	306893	7.224
<i>Characteristics of the business environment</i>			
Foreign presence	Intensity of foreign presence, surrounding municipalities using person weights and the BR workers (the relevant establishment is excluded)	336552	0.092
Regional employee age	Average age in the region (NUTS 4)	332244	41.766
Regional education	Average number of schooling years in the region (NUTS 4)	332244	11.166
Regional unemployment	Regional unemployment rate, % (NUTS 3)	322210	12.489
Industry minimum efficient scale	Log of median size in the industry (3-digit SIC 1995)	331942	0.528
Industry concentration	Herfindahl index according to sales (3-digit SIC 1995)	290954	0.022
GDP growth	Annual change in the real gross domestic product	332244	0.039
Regional dummies	82 regions based on NUTS 4		
Industry dummies	31 industries		

Note: For the categorical variables the mean is based on the continuous variable. The percentiles for the categorical variables are calculated separately for each year and industry.

3. The effects of foreign penetration on establishment dynamics

3.1. Productivity-enhancing selection

The main results of our interest are presented in Table 2. Only establishments belonging to domestically-owned companies, defined as having a share of foreign ownership less than or equal to 20 per cent, are included in the estimations. In all estimations we have dropped one per cent of establishments with the highest and the lowest efficiency as potential influential outliers.

As it comes to the main interest of the paper, the results provide some empirical evidence in support of the hypothesis that the presence of the foreign ownership changes

the structures of domestic production in terms of efficiency, i.e., the effects of the foreign presence differ between the inefficient and efficient establishments. The (in)efficiency is measured with four alternative indicators, ratio of operating margin to sales (OPMARG), return on total assets (ROA), labor productivity (LP) and total factor productivity (TFP). The inefficient establishments are the reference point. The coefficient of the foreign presence variable for the inefficient establishments is 1.383 when the efficiency is measured by the return on total assets. To give an idea about the economic significance, an increase of foreign presence from 6.3% in 1994 to 14.9% in 2002 would imply an increase of hazard rate by a factor 1.13 ($\exp(1.383 \cdot (14.9\% - 6.3\%))$) among the inefficient establishments. The increase is substantially lower among the efficient establishments, the corresponding factor being 1.04 ($\exp((1.383 - 0.915) \cdot (14.9\% - 6.3\%))$).

Table 2. The effects of the foreign presence on hazard rate, the Cox regression results

Efficiency measured by ratio of operating margin to sales	... return on total assets	... labor productivity	... total factor productivity
Foreign presence	0.892 (0.514)*	1.383 (0.524)***	0.598 (0.422)	0.493 (0.436)
Among ...				
... inefficient establishments	Reference	Reference	Reference	Reference
... medium establishments	0.572 (0.510)	-0.672 (0.531)	0.633 (0.438)	0.790 (0.451)*
... efficient establishments	-0.620 (0.505)	-0.915 (0.516)*	0.511 (0.472)	-0.025 (0.456)
Intercept for ...				
... inefficient establishments	Reference	Reference	Reference	Reference
... medium establishments	-0.173 (0.055)***	-0.013 (0.057)	-0.582 (0.047)***	-0.396 (0.048)***
... efficient establishments	-0.106 (0.055)*	0.013 (0.057)	-0.673 (0.052)***	-0.441 (0.050)***
Log likelihood	-54377.0	-50453.5	-69587.7	-68843.2
Number of observations	161015	152871	179863	178817

Note: Other variables included in the models are described in Table 1.

The use of other alternatives for measuring efficiency does not provide statistically significant results for the effects of foreign presence. However, higher efficiency as such seems to increase the chances of survival considerably. Thus, establishments most vulnerable to the presence of FOCs seem to be those having low return on total assets. This finding points to the importance of efficiency in the use of capital. It should be noted that efficiency is here measured with company-level indicators. An establishment-specific measure for labor productivity (sales per the number of persons) was also used (not reported here) but it gave results quite similar to those of the company-level measure. It should be noted that these models include a wide set of variables, listed in Table 1, for controlling various background factors. For example, the fixed regional effects are taken into account by using dummies for NUTS4 regions (82 dummies). When even more

detailed municipality dummies (445 dummies) were used instead, the results remained rather similar. For return on total assets, the magnitude of the coefficient for foreign presence did not change (1.389), but the statistical significance was clearly reduced. When the estimations were performed using one-year or two-year lags of the efficiency measures and the foreign presence variable, the effects of lagged foreign presence were still positive for inefficient establishments. However, the coefficients of other efficiency groups according to different efficiency measures were quite conflicting and uninformative.

In Table 3 we report results obtained by doing the estimations separately for different groups. In the reported estimations, the efficiency is measured with return on total assets.⁴ However, it should be noted that when the estimations were performed using total factor productivity as the measure for efficiency, the results were mostly statistically insignificant. We find that in the manufacturing sector the effect of the presence of the FOCs does not vary between the efficient and inefficient establishments significantly. In fact, a bit surprisingly, an increase in the presence of the FOCs appears to increase the hazard rate in the middle group more than in the lowest efficiency group. In the service sector, on the other hand, the results are in accordance with our hypothesis. It can be concluded from the coefficients that the FOCs destroy less efficient local companies in the service sector, but the efficient ones are not particularly threatened. Analysis made separately for small companies on one hand and for medium-sized and large companies on the other hand reveals that our hypothesis pertains to small companies. Another interesting result shown in Table 3 indicates that the productivity-enhancing selection seems to focus on those establishments that have young personnel. It is very likely that this is related to an earlier finding by Maliranta (2003) according to which productivity-enhancing restructuring is particularly intensive among young establishments. Asymmetry in the effects of the FOCs is also apparent when analysis focuses on the establishments where the educational level of the staff is relatively low.

We find some evidence that the role of the presence of the FOCs in the productivity-enhancing selection is not as large in manufacturing as in services. This may have something to do with the fact that a significant proportion of manufacturing establishments are exposed to global competition through international trade. In other words, international trade and foreign ownership may be substitutes. However, it is worth noting that not all manufacturing industries are alike in this respect. We have classified the manufacturing industries into three groups by the intensity of international trade. In fact, it can be seen that foreign presence has a statistically significant, positive effect on the hazard rates only in those manufacturing industries where openness is low. However, efficiency differences do not seem to play an important role here. It can be argued that technology intensity plays a role here as well (e.g. Görg & Strobl, 2003), because domestic companies in high-technology industries arguably are widely exposed to global markets through various channels even when the presence of FOCs in the vicinity is of minor importance. The results show that, again, foreign presence has the most detrimental effects especially for low-efficiency establishments situated in low-tech industries.

⁴ When municipality dummies were used instead of regional dummies, the findings were similar but statistical significance was reduced.

Table 3. The effects of the foreign presence on hazard rate in different groups, the Cox regression results

Group of establishments	NOBS	Foreign presence	Inefficient establishments	Medium establishments	Efficient establishments
Sector					
a. Manufacturing	46371	1.730 (1.000)*	Reference	0.733 (1.073)	-0.130 (1.058)
b. Services	105255	1.024 (0.637)	Reference	-1.146 (0.620)*	-1.192 (0.605)**
Size					
a. Less than 50 employees	140955	1.490 (0.531)***	Reference	-0.849 (0.539)	-1.016 (0.521)*
b. At least 50 employees	11944	-7.939 (3.667)**	Reference	8.334 (3.364)**	7.321 (3.853)*
Age of personnel					
a. Relatively low	52566	2.728 (0.904)***	Reference	-1.369 (0.910)	-1.633 (0.849)*
b. Medium	51329	0.903 (1.097)	Reference	-0.577 (1.119)	-0.389 (1.083)
c. High	48640	0.245 (0.818)	Reference	-0.150 (0.820)	-0.635 (0.849)
Educational level of personnel					
a. Relatively low	52783	2.462 (0.780)***	Reference	-1.697 (0.819)**	-2.313 (0.837)***
b. Medium	54083	0.862 (0.976)	Reference	-0.289 (0.988)	-1.118 (0.943)
c. High	45682	0.202 (1.063)	Reference	0.411 (1.010)	1.286 (0.956)
Openness of the manufacturing industry					
a. Low	27204	3.044 (1.312)**	Reference	0.471 (1.412)	-0.330 (1.429)
b. Medium	8775	-1.653 (2.710)	Reference	1.632 (2.946)	0.863 (2.759)
c. High	10394	1.211 (1.901)	Reference	0.902 (2.067)	-0.096 (2.038)
Technological level of manufacturing industry					
a. Low	35242	2.768 (1.124)**	Reference	0.273 (1.221)	-1.501 (1.234)
b. Medium	8774	-3.529 (2.595)	Reference	1.846 (2.903)	2.925 (2.619)
c. High	2351	-0.556 (0.000)	Reference	4.110 (5.883)	4.803 (5.826)

Note: Other variables included in the models are described in Table 1.

The analysis above suggested that the role of the FOCs in the productivity-enhancing selection is concentrated to small establishments and the service sector. In the following, we focus on this subgroup. Sensitivity analysis is performed in Table 4. In Models (1) – (7) efficiency is measured with return on total assets. Models (2) – (7) are estimated with Probit where ‘0’ denotes exit in the dependent variable. Although not

directly comparable, it should be noted that signs of the variables in these estimations are basically as expected on the basis of Cox estimations (reversed). For instance, it can be inferred from the coefficients that an increase in the presence of the FOCs does not increase the probability of exit for the efficient establishments. In Models (2) – (4) regional effects are controlled with an increasingly detailed classification scheme, NUTS 3, NUTS 4 and municipality level, respectively. The main findings are robust. In Models (5) – (7) we have excluded controls for the characteristics of the personnel, i.e., the variables measuring the average age and schooling level of the employees. Qualitatively the results are similar. However, it should be noted that for example in Model (7) the coefficient of the foreign presence variables is substantially higher than in Model (4). This finding indicates that the effect of the foreign presence may be overrated if the characteristics of local establishments are not carefully controlled for.

In Models (8) – (14) the efficiency is measured with the total factor productivity indicator. Again, we find robust evidence that the foreign presence increases the probability of exit among the inefficient local small service sector establishments. According to Models (8) – (11) the effect is smaller in the efficient establishments, but the difference is statistically insignificant. Exclusion of the controls for the characteristics of employees has a substantial impact turning, unexpectedly, the signs of the coefficients positive and, in addition, statistically significant.

Next, the role of efficiency and the presence of FOCs is illustrated with a statistical simulation technique using the CLARIFY computer program (King et al., 2000; Tomz et al., 2003). This approach is particularly useful in computing and presenting quantities that are of direct substantive interest when the model includes nonlinearities and interaction effects. Of course, the assessment has some uncertainty because the estimates of the model are imperfect measures for true parameters, so there is estimation uncertainty. Statistical simulation provides us with measures of such uncertainty.

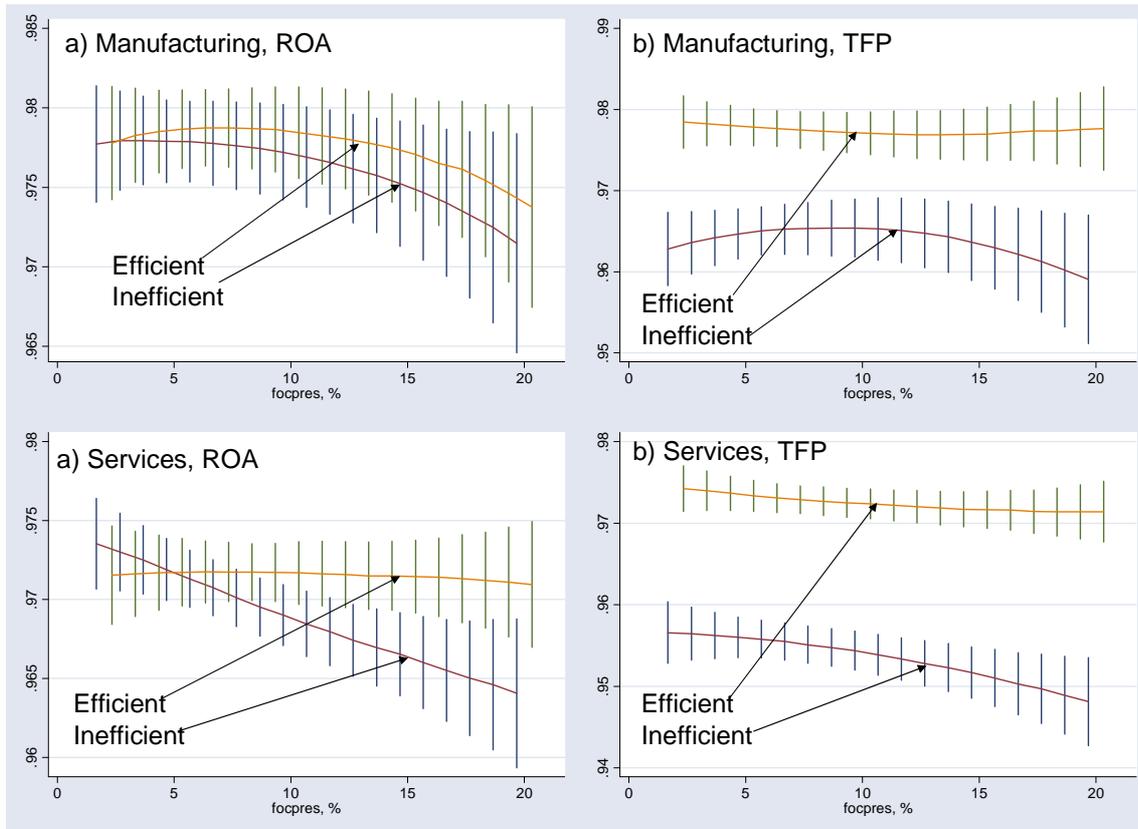
Analysis is made with a probit model, which aims to predict the survival of an establishment. We use specifications that are rather similar to those used above. The main difference here is that we include squared terms for the FOCPRES variable and that we allow the coefficients of these variables to vary between three efficiency groups. In order to get estimation results, we were forced to control for the regional effects by using a rougher NUTS 3 classification. The following analysis focuses on small establishments in the manufacturing and the service sector using return on total assets (ROA) and total factor productivity (TFP) as efficiency measures. Figure 1 shows the relationships in the different situations. In the manufacturing sector, we do not find a clear negative relationship neither for inefficient nor for efficient establishments, whose curves are quite similar. However, the results for the service sector appear to be different. With the return on assets measure, a clear negative relationship can be found for the inefficient small service sector establishments but for the efficient ones the relationship is flat. Furthermore, we find that establishments that have a low total factor productivity level have significantly lower survival probability than those having high total factor productivity, and, moreover, the gap increases with the increase in the presence of the FOCs.

Table 4. Sensitivity analysis for small establishments in the service sector

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Efficiency measure	ROA	ROA	ROA	ROA	ROA	ROA	ROA
Labor characteristics	Yes	Yes	Yes	Yes	No	No	No
Regional classification	NUTS 4	NUTS 3	NUTS 4	Municipal level	NUTS3	NUTS4	Municipal level
Estimation method	Cox	Probit	Probit	Probit	Probit	Probit	Probit
Foreign presence	1.090 (0.639)*	-0.742 (0.285)***	-0.705 (0.314)**	-0.863 (0.451)*	-0.571 (0.158)***	-1.261 (0.180)***	-2.350 (0.261)***
Among inefficient establishments	reference	reference	reference	reference	reference	reference	reference
... medium establishments	-1.283 (0.626)**	0.686 (0.305)**	0.708 (0.306)**	0.709 (0.310)**	-0.220 (0.177)	-0.141 (0.183)	-0.108 (0.185)
... efficient establishments	-1.199 (0.607)**	0.707 (0.299)**	0.721 (0.300)**	0.714 (0.304)**	0.307 (0.174)*	0.393 (0.180)**	0.409 (0.181)**
Intercept for ... inefficient establishments	reference	reference	reference	reference	reference	reference	reference
... medium establishments	-1.283 (0.626)**	0.686 (0.305)**	0.708 (0.306)**	0.709 (0.310)**	-0.220 (0.177)	-0.141 (0.183)	-0.108 (0.185)
... efficient establishments	-1.199 (0.607)**	0.707 (0.299)**	0.721 (0.300)**	0.714 (0.304)**	0.307 (0.174)*	0.393 (0.180)**	0.409 (0.181)**
NOBS	101388	101388	101388	100189	146300	146300	146289
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Efficiency measure	TFP	TFP	TFP	TFP	TFP	TFP	TFP
Labor characteristics	Yes	Yes	Yes	Yes	No	No	No
Regional classification	NUTS 4	NUTS 3	NUTS 4	Municipal level	NUTS3	NUTS4	Municipal level
Company size	Small	Small	Small	Small	Small	Small	Small
Estimation method	Cox	probit	probit	probit	probit	probit	Probit
Foreign presence	0.463 (0.527)	-0.493 (0.245)**	-0.423 (0.270)	-0.724 (0.395)*	-0.279 (0.141)**	-0.843 (0.161)***	-2.058 (0.237)***
Among inefficient establishments	reference	reference	reference	reference	reference	reference	reference
... medium establishments	0.510 (0.530)	-0.118 (0.267)	-0.139 (0.267)	-0.156 (0.271)	-1.056 (0.160)***	-1.076 (0.165)***	-1.073 (0.167)***
... efficient establishments	-0.171 (0.536)	0.239 (0.270)	-0.223 (0.270)	-0.215 (0.275)	-0.484 (0.163)***	-0.548 (0.168)***	-0.549 (0.170)***
NOBS	118277	118277	118277	117481	169197	169197	169194

Note: Other variables correspond to Tables 2 and 3.

Figure 1. Relationship between survival and the FOCPRES variable among small domestic companies by sector and efficiency group (measured by ROA and TFP)



Note: Monte Carlo simulations based on probit models.

3.2. Productivity-enhancing restructuring among survivors

The analysis above provides some evidence that the exits of inefficient domestic establishments increase with the greater presence of the FOCs in the region. This seems to be the case especially among small establishments in the service sector. Next we examine the possible positive side of the creative destruction of local establishments. As a demonstration by Vickers (1995) indicates, the entry of efficient FOCs might entail the increasing market shares of the efficient local companies.

We have used the Heckman selection model (ML) to analyze whether the presence of the FOCs contributes to productivity-enhancing restructuring among surviving local companies. Table 5 reports the results regarding the effects of foreign presence on survival and growth, measured as a logarithmic difference of employment between two consecutive years, in different efficiency groups. The findings show that, as expected, establishments with higher efficiency have higher growth rates, both using ROA and TFP as an efficiency measure. However, the effects of foreign presence on the growth of establishments are statistically not very significant and in contradiction to our hypothesis suggesting that the effects of foreign presence on growth would be more negative to the efficient establishments. The results of the selection model (Tobit 2) are very similar to the OLS results, so the sample selection effect does not seem to play a large role here, although the correlation coefficient for the disturbances of the two equations ρ is statistically different from zero in both estimations. The results of the probit model deviate somewhat from the earlier results, but are mostly statistically insignificant. Estimations using other efficiency measures or including municipality dummies did not result in any further evidence. In Table 6 we concentrate on the small service sector establishments, but the results regarding

the effects of foreign presence remain insignificant. The results of the probit model correspond a little better to the earlier results. Subsequently, it can be concluded that we cannot find evidence on the reallocative power of foreign ownership in the regions.

Table 5. Domestic establishments in the business sector

	OLS, weighted, ROA	Tobit 2, continuous part, weighted, ROA	Tobit 2, probit part, weighted, ROA	OLS, weighted, TFP	Tobit 2, continuous part, weighted, TFP	Tobit 2, probit part, weighted, TFP
Foreign presence	0.093 (0.073)	0.093 (0.073)	0.299 (0.498)	0.052 (0.065)	0.049 (0.065)	0.379 (0.458)
Among ... Inefficient	Reference	Reference	Reference	Reference	Reference	Reference
middle	-0.116 (0.075)	-0.117 (0.075)	-1.354 (0.547)**	-0.021 (0.068)	-0.005 (0.069)	-1.990 (0.497)***
efficient	-0.342 (0.134)**	-0.342 (0.134)**	-0.167 (0.668)	-0.203 (0.098)**	-0.199 (0.097)**	-0.502 (0.619)
Intercept for... inefficient	Reference	Reference	Reference	Reference	Reference	Reference
middle	0.035 (0.010)***	0.035 (0.010)***	0.165 (0.062)***	0.022 (0.008)***	0.020 (0.009)**	0.246 (0.051)***
efficient	0.047 (0.013)***	0.047 (0.013)***	-0.069 (0.082)	0.051 (0.010)***	0.050 (0.010)***	0.115 (0.071)
R-squared	146780	152871	152871	170659	178817	178817
Number of observations	0.03			0.02		

Notes: In addition to the explanatory variables used earlier, we have added establishment age groups as covariates. Employment-weights are used in all the estimations.

Table 6. Small service sector establishments

	OLS, weighted, ROA	Tobit 2, continuous part, weighted, ROA	Tobit 2, probit part, weighted, ROA	OLS, weighted, TFP	Tobit 2, continuous part, weighted, TFP	Tobit 2, probit part, weighted, TFP
Foreign presence	-0.040 (0.046)	-0.042 (0.046)	-0.791 (0.455)*	0.006 (0.043)	0.004 (0.043)	-0.479 (0.363)
Among ... Inefficient	Reference	Reference	Reference	Reference	Reference	Reference
middle	-0.007 (0.047)	-0.007 (0.047)	0.375 (0.425)	-0.073 (0.044)*	-0.074 (0.044)*	-0.125 (0.360)
efficient	-0.014 (0.045)	-0.013 (0.045)	0.574 (0.425)	-0.045 (0.043)	-0.046 (0.043)	-0.180 (0.390)
Intercept for... inefficient	Reference	Reference	Reference	Reference	Reference	Reference
middle	0.015 (0.005)***	0.015 (0.005)***	0.003 (0.044)	0.020 (0.005)***	0.021 (0.005)***	0.171 (0.038)***
efficient	0.009 (0.005)	0.008 (0.005)	-0.035 (0.045)	0.036 (0.005)***	0.037 (0.005)***	0.244 (0.040)***
R-squared	0.02			0.02		
Number of observations	96866	96866	101388	112216	112216	118277

Notes: In addition to the explanatory variables used earlier, we have added establishment age groups as covariates. Employment-weights are used in all the estimations.

4. Conclusions and discussion

In the absence of competitive pressure there is a danger of sclerosis of micro structures, which damages productivity and competitiveness of industries and living standards of regions in the long run. This risk is lurking especially in the regions where the economic geography is unfavorable, e.g. the density of economic activity is low. Exposure to global competition through international trade may make the interactions less lethargic between establishments and companies when goods are easily transportable across borders.

For some businesses, however, other tools may be needed in order to maintain productivity-enhancing selection and restructuring. This paper provides some empirical evidence that FDI is one such instrument. On the other hand, our results suggest that it is effective mainly to small businesses in service sectors. This finding seems to be intuitively appealing while these businesses can be expected to be least exposed to the competitive pressure arising from exports and imports. Further, our evidence suggests that the effect is limited to the selection effect whereas the productivity-enhancing reallocation among continuing businesses seems to be unaffected by the presence of the foreign-ownership in the close proximity. Thus, when considering the implications for creative destruction, we can find some evidence supporting the destructive power of foreign ownership in terms of establishment survival. However, there are no clear signs of the creative side of foreign ownership, neither for the survival of more efficient establishments nor for the growth of the surviving units.

In this analysis we have not taken into account the industry of the FOCs. Distinction by industry should be relevant when one wants to interpret our empirical findings from the point of view of the product market competition. We have made some experimentation that yielded imprecise and unrobust results. One possible explanation for this may be that the industry classification (2-digit industries) applied here was not quite appropriate for the current purpose. Presumably in some cases it should have been more aggregate and in some other cases more detailed. Certainly product market regions of many industries are broader than local labor market regions defined here, even if in some industries the equivalence of labor and product market regions should be quite close. More analysis is needed to disentangle various mechanisms (e.g. labor markets vs. product markets) by which the presence of the FOCs may affect industry dynamics. The focus on some selected industries might be useful. For instance, retail industry has been traditionally highly concentrated in Finland. Penetration of foreign-ownership at the turn of the century may have had exceptionally strong impact on micro-structures and productive efficiency in this particular industry. This is a research question which deserves an in-depth analysis in the future research.

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