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Multinational Corporations, Country Characteristics, and Clustering in Foreign Direct Investment

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Abstract

Recent achievements in economic theory stress how technological spill-overs, accessibility to markets, and economies of scale, influence the location of firms and may induce clustering patterns in industrial production. By combining a unique data set on Swedish multinationals with industry data for 18 countries, it is shown how such agglomeration can be detected in the pattern of foreign direct investment. The clustering effect is statistically supported in more technologically advanced industries as engineering and chemicals, while it is insignificant in the basic industry.

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I. Introduction

During the 1980s foreign direct investment (FDI) increased to become a major force in the global economy, reaching an - as compared to other economic variables - unparalleled annual growth rate of approximately 30 percent. This increase in firms' foreign operations has finally begun to be incorporated in economic theory, particularly in growth theory and locational economics (Romer 1986; Sala-i-Martin 1990; Krugman 1991a,b; Venables 1993). In these models, agglomeration is spurred by the presence of externalities arising from firms' inability to fully appropriate the return to R&D investments, increased competition and interaction between firms, and enhanced access to specific skills and capabilities. If such factors gain in importance for firms' competitiveness, they will promote investments in regions with similar production, i.e. firms will act to exploit economies of agglomeration.

This paper focuses on the empirical underpinning of the alleged interaction between firm- and country-specific characteristics on the pattern of FDI. More precisely; are similarities between firm characteristics in home countries and industry characteristics in host countries promoting FDI, i.e. can we observe clustering, or agglomeration, patterns in FDI? The analysis focuses on differences across industries, in particular basic (iron & steel, paper & pulp) and more advanced, knowledge intensive industries (chemicals, engineering).

The OLI-theory, extended to account for clustering effects, constitutes the theoretical base for the model. The empirical analysis utilizes a unique IUI data set on Swedish multinational corporations (MNCs). Firm data will be combined with country data for most OECD countries as well as the most important Latin-American countries. Furthermore, our methodological approach is refined compared to previous work in this area, since countries where firms have no affiliate production are included into the analysis (Svensson 1993).

The paper is organized as follows. Section II reviews the theoretical framework of FDI as well as earlier empirical results. The data base is described in section III. In section IV, the econometric method and the hypotheses are presented. The results are provided in section V, and the final section concludes.

II. Foreign direct investment in economic analysis

II(i). Theoretical background

The theoretical framework - known as the eclectic approach (Dunning 1977) - stresses the interaction between firm specific factors and country variables as the main determinants of FDI. It is also referred to as the OLI-theory, where O stands for ownership advantages, i.e. firm specific assets, L denotes country specific factors, and I represents internalization of production within the firm through FDI. The lack of markets for firm-specific assets tends to make transaction costs - or the risk of being exposed to 'opportunistic behavior' (Williamson 1975) - excessively high for arm's length contracts and similar arrangements, which induce firms to internalize production. The theoretical platform builds on works by Coase (1937), Hymer (1960) and Williamson (1975, 1979). With regard to the locational factors, the eclectic approach maintain that in order to attract FDI the recipient country has to offer some particular, country-specific, advantage. Such advantages are for instance sizable markets, skills or costs of factors of production, policy designed incentives.

A recent explanation of factor accumulation not accounted for in the eclectic approach, is the possibility to capture 'spill-overs' from other firms, or industries, as suggested by the new growth theory (Romer 1986). It is argued that knowledge enhancing activities can only partly be appropriated by firms, implying that an externality is created and diffused to other firms, thereby reducing their costs (Griliches 1979). The spill-over literature is closely linked to the earlier research on public goods. Already Henderson (1974) argued that the rent firms derive from public goods - which enter their production functions as unpaid intermediate goods - induces entrance by firms. Regions where such spill-overs are abundant would therefore constitute a locational advantage.

The literature on economic geography also uses the concept of external effects. More precisely, the issue addressed in locational theory concerns why firms concentrate into certain geographically well-defined areas, despite the fact that costs tend to be higher in those areas. The rationale for such behavior is traditionally ascribed to advantages accruing to the pooling of factors with specific skills, the

possibility to support production of non-traded inputs, and information spill-overs.[1] The 'new' location theory, however, puts more emphasis on 'pecuniary' externalities, defined to be associated with demand and supply linkages rather than technological spill-over effects (Krugman 1991a,b). Economies characterized by high transportation costs, limited manufacturing production and weak economies of scale are shown to have a dispersed manufacturing sector. On the other hand, low transportation costs, coupled with a large manufacturing sector and economies of scale, foster concentration of production.[2] The analysis is frequently limited to the location of firms *within* countries although, and more appropriate for our purpose, the same line of reasoning can of course be applied to the location of firms *between* countries.

Locational aspects, however from a somewhat different angle, are also in focus in a model recently presented by Venables (1993). Within a traditional monopolistic competition framework, he argues that low trade costs will make firms highly sensitive to differences in production costs, thereby making them more internationally 'footloose'. Venables also shows that in the case of vertically linked industries, parametric changes may result in 'catastrophic' effects, implying that extensive relocation of firms may more or less wipe out the industrial base in regions or countries. Consequently, there are inherent instabilities in the system and several equilibria may prevail simultaneously in different countries.[3]

II(ii). Previous empirical results

To what extent have the hypotheses of agglomeration effects been confirmed in empirical research? Although evidence has been forwarded concerning the existence

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[1] The idea is not new, already Dahmén (1950) stressed the importance of clustering, or in Dahmén's terminology, development blocks, in creating competitive advantages, a tradition pursued at the macro-level by for instance Porter (1990).

[2] If factor mobility is low, such clustering could be halted by increases in factor rewards.

[3] See also Braunerhjelm (1991) where it is shown how sensitive Swedish upstream firms are to the location of downstream firms. Braunerhjelm (1993) argues that industrial characteristics, i.e. whether production is specialized towards basic industries or more high-tech industries, is an important explanatory variable of countries' vulnerability to such parametric changes.

of R&D externalities (Levin and Reiss 1988; Bernstein 1988; Bernstein and Mohen 1994), most empirical analyses of location still emanate from the traditional OLI-framework. For instance, Kravis and Lipsey (1982) and Veugelers (1991) conclude that size and geographical proximity exert a positive impact on the distribution of investments. With regard to openness, evidence is more scattered. Kravis and Lipsey (1982) and Culem (1988) find that it has a positive influence on FDI, supporting the 'new' locational theory, while Wheeler and Mody (1992) report opposite results and Veugelers (1991) fails to detect any significant impact. Factor costs seem to have very limited influence on FDI, at least among industrialized countries. In fact, Kravis and Lipsey (1982) report a pattern of 'opposite attract', i.e. firms in low wage industries invested in high wage markets, which was interpreted as high wages reflecting high productivity and not necessarily high costs. It could however also be hypothesized that firms invest in high wage, high cost, areas in order to exploit price differentials between countries, i.e. reflecting a first mover strategy.

From the above cited studies a number of variables can be distinguished that influence the locational choice of firms, although less light is shed on the tendencies towards clustering. By incorporating country agglomeration factors, defined as the quality of infrastructure, the degree of industrialization and the level of inward FDI into the respective market, Wheeler and Mody (1992) contended that US investors regard such agglomeration factors as the major determinant of FDI. Some further evidence of agglomeration is also found in pattern of Japanese FDIs which seem to have strengthen the specialization of countries and regions (Micossi and Viesti 1991).

Wheeler and Moody (1992) also raise the question how economies which lack such attracting factors could overcome this drawback, since agglomeration - after a certain stage has been reached - seems to be a self perpetuating process. As shown by Arthur (1986), a minor regional advantage could turn into a substantial clustering of a specialized industrial activity.

II(iii). Introducing agglomeration factors into the OLI-model

The OLI framework - extended to incorporate agglomeration factors - constitutes

the theoretical base for the empirical model in section IV. As shown above, theoretical models focus on R&D spill-overs as the main force in creating clusters. This is somewhat misleading since a number of other factors also influence the locational attractiveness of different regions, e.g. the industrial structure, the characteristics of local networks and suppliers, the skill level among employees, etc. Some of these factors have been emphasized in recent contributions to economic geography. Hence, in order to understand the distribution of production across countries such local forces, related to country- and industry-specific features, must be included in the empirical models.

In our view, the most relevant agglomeration variable is the industry's share of the manufacturing sector in the respective host country. The compelling feature of this variable - as we measure it - is that it captures the support systems within industries, without becoming too general to invalidate an economic interpretation. Earlier attempts to include agglomeration variables suffer from the weakness that they have been confined to aggregated country variables, hardly allowing any meaningful interpretation as far as industrial clustering is concerned. We include one such country variable that captures the relative abundance of skilled labor across countries. In this extended version of the OLI-model, both variables can be traced directly to recent contributions in economic theory.

III. The data base

The data on Swedish MNCs has been collected by the Industrial Institute for Economic and Social Research (IUI) in Stockholm at six different occasions since the mid-1960s. It contains detailed information about R&D, production, employment and the distribution between foreign and domestic units, as well as the extent and direction of external and internal trade flows. In the empirical analysis, only the last three surveys (1978, 1986 and 1990) are used since emphasis is on the location by Swedish MNCs in the 1980s. Only countries to which we have export statistics of the individual firms are included in the analysis, i.e. the OECD-

countries in Europe and North America, and the major countries in Latin America.[4] This is, however, not a cause of great concern since more than 95 percent of the foreign production of Swedish MNCs is undertaken in the countries included in the model.

(Table 1)

As mentioned above, countries which host no Swedish-owned manufacturing affiliates must be compared with countries that do, in order to adequately test for the determinants of localization. As illustrated in Table 1, firms frequently establish manufacturing affiliates in markets to which they have previously exported. This suggests that firms' export markets are strong candidates for FDI. Exceptions in this pattern relates to industries where different barriers to trade have made exports impossible, as in the gas (chemicals), concrete, food and textile (others) industries. In the empirical analysis one observation is, therefore, generated every time a firm has had previous exports to a foreign market. Note that this is irrespective of whether the firm has any affiliates in the particular country or not. Due to the export variable, only MNCs which are included in two succeeding surveys are tested in the model, i.e. observations for 1990 (1986, 1978) are only included when a firm appears in the 1986 (1978, 1974) survey as well.

IV. Econometric specification and hypotheses for empirical testing

The dependent variable is net sales of firm *i's* affiliates located in country *j* in period *t* (NS_{ijt}).[5] It is divided with total sales of the firm (TS_{it}), since one should expect foreign production to be increasing in firm size. This is also a way to avoid heteroscedasticity. NS/TS is characterized by a large share of zeroes (more than 60%), since we want to compare host countries where affiliates are established with

[4] EC-countries: Germany, the Netherlands, Belgium, France, Italy, Great Britain, Denmark, Spain and Portugal; EFTA-countries: Norway, Finland, Switzerland and Austria; North America: USA and Canada; Latin America: Argentina, Brazil and Mexico.

[5] Net sales = Gross sales - Imports from the parent.

ones where the firms have no affiliate production. The appropriate statistical method for estimating such a model is the Tobit method (Tobin 1958):

$$\frac{NS_{ijt}^{*}}{TS_{it}} = \beta_0 + \beta_1 CLUST_{kjt} + Z'\beta + \epsilon_{ijt}, \tag{1a}$$

$$\frac{NS_{ijt}}{TS_{it}} = \begin{cases} \dfrac{NS_{ijt}^{*}}{TS_{it}} & \text{if } \dfrac{NS_{ijt}^{*}}{TS_{it}} > 0 \\ 0 & \text{if } \dfrac{NS_{ijt}^{*}}{TS_{it}} \leq 0 \end{cases}. \tag{1b}$$

CLUST is the agglomeration variable and the Z corresponds to either attributes of the MNC or attributes of the host country. The latent variable $(NS/TS)^{*}$, can be interpreted as an index of the intensity to produce in a specific host country.[6] The parameter estimates, which are consistent, may, however, not be interpreted as marginal effects.[7] This specification contrasts with previous studies that have investigated the locational determinants of affiliate production. More precisely, earlier models have limited the analysis to host countries where each firm already has production. The weakness of such approach is that the location of production is given, and consequently one only tests whether the firm produces more or less in the existing affiliates in a host country.

The explanatory variables included in the model are primarily derived from the OLI-theory, extended to incorporate country-specific agglomeration factors. The focus is on the interaction between firm-specific and country-specific determinants of FDI. The principal, and most interesting determinant of FDI is the variable measuring country clustering effects ($CLUST_{kjt}$). It is defined as the share of employees in industry *k* of all employees in the manufacturing sector in host country *j* at time *t*. For two reasons, this variable is divided with a weighted mean of the

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[6] The residuals are assumed to have the desired properties $\epsilon \sim N(0, \sigma_\epsilon^2)$, $E(\epsilon_{hjt}\epsilon_{ijt})=0$ for $h \neq i$ and $E(\epsilon_{ijt}\epsilon_{ikt})=0$ for $j \neq k$. It should be noted that $E(\epsilon_{ijs}\epsilon_{ijt}) \neq 0$ for $s \neq t$, since a firm which has a high production in country *j* at time *s*, is also expected to have a high production at time *t*. This will, however, not yield inconsistent parameter estimates.

[7] The β's can be decomposed into two parts: changes in the probability of being above the limit and changes in the value of the dependent variable if it is already above the limit (McDonald and Moffitt 1980).

share of employees in industry *k* for all countries; First, some industries may be large in almost all countries and, secondly, some industries are more labor-intensive than others. Such industries would then receive a lower value if we instead had chosen the share of output. Thus, if the coefficient of CLUST turns out to be significantly positive, it suggests a presence of clustering effects.[8] Insignificant or negative parameter estimates imply that firms primarily invest in countries which have limited production of similar products, indicating that other reasons to invest abroad are more important.

The other country variables included in the model are the following. Large markets, measured by GDP_{jt}, are supposed to capture demand and scale effects, and have received support in previous empirical studies. GDP is expected to have a positive influence on host country production. Furthermore, a variable measuring the relative factor endowment of skilled labor in the host country is included. This is defined as the number of research scientists, engineers and technicians per 1000s of the population ($RSET_{jt}$) based on UN (1992) statistics. Host countries with a high RSET value are expected to promote FDI, especially by R&D intensive firms. A modified version of the Wheeler and Mody (1992) index measuring trade policy has also been included ($OPEN_j$).[9] This index takes a higher value the more open the host country economy is. Here we apply the traditional tariff jumping argument and hypothesize that low openness encourages MNCs to locate production in the host country. Finally, the historical trade pattern of the firm is represented by the exports of finished goods by firm *i* to country *j* in period *t-1* ($XF_{ij,t-1}$). It is assumed that exports increase with firm size. XF_{t-1} is therefore weighted with the inverse total sales of the firm in period *t-1*. By using the lagged value of exports, we avoid simultaneity problems. Exports at an earlier stage are expected to have a positive

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[8] One may argue that there should be a simultaneous relationship between NS/TS and CLUST, e.g. if firms in transports allocate more FDIs to Germany, then this industry will get a larger share of total manufacturing employees in Germany. This is, however, not a problem of great concern, since our model analyzes location of affiliate production for individual firms. It is quite farfetched to believe that an individual firm would affect a characteristic aggregated on industry and country level.

[9] This index includes (1), limits on foreign ownership and, (2), government requirements that a certain percentage of a specific type of local components must be used when setting up manufacturing operations. This variable takes on values from 1 to 10, where 1 means high tariffs and 10 high openness. The Wheeler-Mody index was constructed for the US and it has been modified to conform better with the Swedish situation by utilizing the data on trade barriers in Leamer (1990).

influence on the location of production, as predicted by Aharoni (1966) and Johansson and Vahlne (1977).[10]

Firm-specific advantages are expected to create absolute advantages vis-à-vis competitors. We use R&D intensity (RD_{it}) - defined as total R&D expenditures divided by total sales of the firm - and the average wage (LS_{it}) in the home country part of the MNC, to capture such firm-specific advantages. The former is argued to capture the technological intensity of the firm, while the latter should be correlated with the human capital within the company. In accordance with the OLI-theory, both RD and LS should exert a positive impact on the intensity to produce abroad.

By including additive dummy variables, we examine whether any shifts in the level of the dependent variable occur over time or across regions.[11] The analysis also considers whether there are any industry- or firm-specific fixed effects to explain the variation in foreign production. This is done by alternatively assigning additive dummies for different industries or firms.[12]

Since we want to examine if the variables - especially the clustering variable - exert different impacts on the localization of production across industries, two main versions of the model are estimated.

Restricted model: All parameters to the explanatory variables are restricted, i.e. β_1, β_2, etc., are assumed to have the same value for all industries. Two variants of this model are estimated, one with industry (I) and one with firm-specific (II) additive dummies.

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[10] In Svensson (1993) it is discussed and shown how foreign production and exports are simultaneously related to each other.

[11] When using time dummies, 1990 will always be the reference period. The regions are the EC, EFTA, North America (Nam) and Latin America (Lam). The EC is always the reference region.

[12] The industries, which are assigned dummies are: food, textiles, basic, chemicals, metal products, machinery, electronics and transports. The metal industry will always be the reference industry. When controlling for firm-specific effects, MNCs included in at least two of the three surveys are given an additive dummy. This means that we control for 27 different firms, which cover more than 75 percent of the observations. There is no use to assign dummies to MNCs which only appear in one survey, since then there is little variation left between firms.

Unrestricted model: The parameters are unrestricted across the main industries.[13] This is accomplished by assigning interaction dummies for different industries. In model (III), only β_1 is allowed to vary across industries, but in model (IV), all parameters of the explanatory variables are specific for each industry. Furthermore, firm-specific additive dummies are always used in the unrestricted model.

V. Results of the estimations

As seen in Table 2, the log-likelihood ratios are satisfactorily high in both runs in the restricted model. The parameter to our main variable, CLUST, is always significant at the 5%-level. The more important the industry of the firm is in the host country, the more production in the affiliates in that country, and the higher is the probability that the firm has established any affiliate there. This result supports the view that clustering, or agglomeration, partly determines the location of manufacturing affiliates. The previous trade patterns of firms, XF/TS, have an even stronger influence on the location of production. The parameter is significant at the 1%-level in both runs.

Considering the other host country variables, both market size, GDP, and the endowment of skilled labor, RSET, exert a positive and clearly significant impact on affiliate production. This is in accordance with the hypotheses above. The openness of the host country, OPEN, has the expected negative impact on affiliate production, but the parameter is never significant. This indicates that other factors than tariffs and trade barriers, in the first place, affect the distribution of Swedish FDI.

(Table 2)

Turning to the firm-specific variables, the R&D intensity, RD, exerts a confusing, negative impact, while the labor skill variable, LS, displays the expected, positive connection to foreign production in model (I). Not surprisingly, the

[13] The main industry groups are the basic, chemical, engineering and 'other' industries. The last group includes food, textiles, wood products etc., but is not shown in the result part of this paper due to the great heterogenity.

coefficients of the firm variables are strongly affected by the inclusion of firm-specific effects in model (II). RD then exerts a positive impact on FDI, which means that the influence of RD on the whole is uncertain. The coefficient of LS is not significant, but is still positive. Thus, there is some evidence that firms with skilled labor are more inclined to undertake FDIs. Human capital seems to be important both in the receiver country and in the investing firm when explaining the distribution of FDIs.

Table 3 shows the results of the unrestricted model, where the parameters are allowed to shift across industries In model (III), the clustering variable, CLUST, has a positive, and significant influence on foreign production at the 5%-level in engineering and chemicals, but not in the basic industry. When all parameters are industry-specific (model IV), the effect is significant at the 10%-level only in engineering. More interesting is, however, that the parameter estimates for the clustering variable are almost identical in models (III) and (IV). Only the standard errors increase, which can be explained by the inclusion of 18 more variables in model (IV), and that some sort of multicollinearity arises. Thus, we conclude that agglomeration effects are strongly prevalent in engineering, has some influence in chemicals, but is absent in the basic industry.

In model (III), the results for the other explanatory variables are analogous to those in model (II). In model (IV), however, the previous trade pattern of the firm is the main determinant of FDI in the basic industry. In chemicals, it seems obvious that previous exports, market size and skilled labor are the main host country variables that attract MNCs to establish affiliate production. Finally, in addition to the clustering effect, previous exports and market size seem to be the major determinants of foreign production in engineering.

(Table 3)

VI. Concluding remarks

The statistical analysis clearly supports that agglomeration, or clustering, governs Swedish MNCs as they locate production abroad. The clustering variable - the relative size of the respective industry in each country - captures the support system of an industry, i.e. a larger share indicates relative abundance of suppliers of

components and other complementary production. Furthermore, a larger size of the industry should improve the possibilities to profit from knowledge spill-overs. Disaggregated to the industry level, the clustering variable displays strong significance for engineering and some significance for chemicals, while it is insignificant for the basic industry.

Among the host country variables, market size and the quality of the labor force attract MNCs to establish manufacturing affiliates. Openness fails to show any significance. It is also verified that the previous trade pattern of the firm exerts a significant influence on the localization of production. Firms endowed with human capital seem to be more inclined to undertake foreign operations, while the influence of the technology level within the firm is uncertain.

The policy implications are obvious. If externalities, or economies of agglomeration, turn out to be increasingly important in firms' investment decisions, this could set off 'locational tournaments' among countries (David 1984; Oxelheim 1993). Particularly if the conclusions of the 'new' growth theory hold, i.e. if macro-economic growth is predominantly related to investment in knowledge.

Our results suggest that one important factor in attracting investments of knowledge intensive firms is the amount of skilled labor in the economy. The crucial factor seems, however, to be the relative size of knowledge intensive industries, implying that larger industries tend to attract more investment to that particular industry. As discussed by Venables (1993), low trade costs, paired with high economies of scale, facilitates substantial relocation of firms which may threaten the entire industrial base of a country. Hence, the empirical analysis suggest that a multiple equilibrium situation is possible, where countries, or regions, are trapped in either virtuous or vicious growth cycles. Although the results are based on Swedish MNCs, we believe they have a general application to the investment pattern of other MNCs.

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Table 1. ***Comparison between establishment of manufacturing affiliates and earlier trade pattern of firms across industries for 1978, 1986 and 1990.***

Industry	No. of establishments	No. of obs. to which the firms had previous exports	Percent
Paper & pulp	44	43	99
Chemicals	73	62	85
Iron & steel	15	15	100
Metal products	35	31	89
Machinery	77	76	99
Electronics	108	107	99
Transports	16	16	100
Others [a]	86	78	84
All industries	418	392	94

Note: Every time a firm has established an affiliate in a host country, one observations is generated. Only firms which are included in two succeeding surveys are analyzed in the table, i.e. observations for 1990 (1986, 1978) are only included when a firm appears in the 1986 (1978, 1974) survey as well.
[a] 'Other' industries include the food, textile, paper products, wood products and concrete industries.

Table 2. ***Estimation results of the restricted model.***

Method = Tobit	Dependent variable = NS/TS	
Explanatory variables	Model (I)	Model (II)
CLUST	0.0195 ** (0.0087)	0.022 ** (8.66 E-3)
$(XF/TS)_{t-1}$	0.755 *** (0.116)	1.057 *** (0.120)
GDP	2.87 E-6 *** (7.42 E-7)	2.69 E-6 *** (7.36 E-7)
RSET	8.19 E-3 *** (2.89 E-3)	8.34 E-3 *** (2.89 E-3)
OPEN	-2.27 E-4 (3.44 E-3)	-9.06 E-4 (3.42 E-3)
RD	-0.396 *** (0.113)	0.575 ** (0.282)
LS	3.55 E-4 *** (1.15 E-4)	8.11 E-5 (1.49 E-4)
Log likelihood ratio	1068.9	1187.4
No. of observations	1278	1278
Left censored obs.	736	736

Note: Standard errors in parentheses. ***, ** and * indicate significance at 1, 5 and 10 percent respectively. Intercepts, dummies for time and regions in both models, for industries in model (I) and for firms in model (II) are not shown, but are available from the authors on request.

Table 3. ***Estimation results for different industries in the unrestricted model.***

Method = Tobit	Dependent variable = NS/TS					
Explanatory variables	Model (III)			Model (IV)		
	Basic	Chemicals	Engineering	Basic	Chemicals	Engineering
CLUST	0.0122 (0.0114)	0.0318 ** (0.0154)	0.0219 ** (0.0101)	0.0127 (0.0151)	0.0343 (0.0249)	0.0233 * (0.0132)
$(XF/TS)_{t-1}$	1.048 *** (0.120)			1.068 *** (0.240)	0.947 *** (0.341)	1.059 *** (0.173)
GDP	2.71 E-6 *** (7.35 E-7)			1.14 E-6 (1.32E-6)	3.42 E-6 *** (1.15 E-6)	2.94 E-6 *** (8.44 E-7)
RSET	8.58 E-3 *** (2.87 E-3)			9.36 E-3 (5.92 E-3)	0.023 *** (6.12 E-3)	3.25 E-3 (3.51 E-3)
OPEN	-8.71 E-4 (3.42 E-3)			2.19 E-3 (5.26 E-3)	-4.31 E-3 (4.85 E-3)	7.27 E-4 (3.69 E-3)
RD	0.587 ** (0.299)			0.780 (0.770)	0.274 (0.436)	0.536 (0.462)
LS	1.05 E-4 (1.49 E-4)			7.04 E-5 (2.30 E-4)	1.10 E-6 (2.17 E-4)	1.12 E-4 (1.18 E-4)
Log likelihood ratio	1192.8			1234.8		
No. of observations	1278			1278		
Left censored obs.	736			736		

Note: Standard errors in parentheses. ***, ** and * indicate significance at 1, 5 and 10 percent respectively. Intercepts and dummies for time, regions and firms, as well as estimates for the group of 'other industries' are not shown, but are available from the authors on request.