

The innovative performance of foreign-owned enterprises in small open economies

Bernhard Dachs · Bernd Ebersberger · Hans Lööf

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Abstract This paper compares the innovative performance of foreign-owned and domestically owned enterprises in five European countries. We look at innovation inputs, outputs, and examine how strong foreign-owned enterprises are embedded in the innovations systems of their host countries. We find that foreign ownership is associated with similar levels of innovation input, but higher levels of innovation output and higher labour productivity compared to domestic ownership. In four of the five countries, affiliates of foreign multinationals show a similar or even a higher propensity to co-operate with domestic partners than domestically owned enterprises.

Keywords Austria · Denmark · Finland · Norway · Sweden · Innovation · Multinational enterprises · Foreign-owned enterprises · CIS

JEL Classification O310 · F230

1 Introduction

Issues related to multinational enterprises (MNEs) and the internationalization of economic activity have sparked both academic and policy attention in recent years. The current discussion about the sources and consequences of foreign direct investment (FDI) highlights the interrelatedness of technology, innovation and FDI. Large MNEs are identified as

B. Dachs (✉)
Department of Technology Policy, Austrian Research Centers – ARC, Vienna, Austria
e-mail: bernhard.dachs@arcs.ac.at

B. Ebersberger
MCI Management Center Innsbruck, Universitätsstr. 15, Innsbruck 6020, Austria

H. Lööf
Royal Institute of Technology, Stockholm, Sweden

the main drivers for the globalization of innovation and of research and development (R&D) activities in the literature. Serapio and Dalton (1999), for example, report that growing FDI investments are closely associated with growing multinational involvement in R&D via foreign affiliates. A recent study by the OECD shows that affiliates of MNEs already account for 15–20% of total manufacturing R&D in France, Germany and the United States; between 30% and 50% in Portugal, the Netherlands, Spain, Sweden and the United Kingdom; and between 50% and 70% in the Czech Republic, Hungary and Ireland (OECD 2004, p. 172).

This paper deals with one particular aspect of the relationship between MNEs and innovation. It investigates whether affiliates of foreign MNEs reveal a different pattern of innovation behaviour and performance than domestically owned enterprises. The relevance of this question is obvious: if foreign-owned enterprises show a significantly higher or lower propensity to innovate or spend, on average, more or less than their domestically owned counterparts on innovation, a high share of foreign ownership in the enterprise sector of a country could considerably influence its technological performance and competitiveness.

Our analysis compares the results of studies which examined the innovative behaviour of foreign-owned enterprises in Austria, Denmark, Finland, Norway and Sweden with a standardized dataset and a common methodology.¹ We examine the propensity to innovate, as well as innovative input and output of foreign-owned and domestically owned enterprises with a range of different indicators. Moreover, we focus on the external relations and co-operative behaviour of foreign-owned enterprises to reveal the intensity of knowledge flows between foreign-owned affiliates and the innovation system of their host countries.

The paper differs from previous studies in some respect. First, we do not focus on one single indicator such as the number of patents or innovation expenditure, but rather utilize a broad set of variables to describe the innovative performance of over 5.500 enterprises. Second, this exercise covers five different countries, which allows a comparative perspective on the effects of foreign ownership. A third distinct feature of this paper is its focus on small open European economies. All countries have a population between 4.5 and 9 Mio. inhabitants, a market size which is not larger than 1% of the total OECD market, and are highly integrated in the world economy. With the exception of Norway, import and export shares are higher than 25% of GDP in all countries, and inward FDI amounts to more than 2% of GDP (OECD 2005a, b; Eurostat 2005).

2 Theoretical background and research hypotheses

2.1 Firm-specific assets and innovation gaps

There is sound empirical evidence that foreign-owned enterprises differ from domestically owned enterprises in a number of economic indicators (see Bellak 2004 for a review). A first line of arguments to explain these differences relates to superior firm-specific assets possessed by the MNE and specific advantages that the enterprise derives from these assets (Dunning 1973; Caves 1996; Markusen 2002). These assets are, for example, superior technology, production processes, reputation, brands or management capabilities. The

¹ See Ebersberger and Lööf (2004), Ebersberger and Lööf (2005), Ebersberger et al. (2005) for detailed results for DK, FI, NO and SE, and Dachs and Ebersberger (2006) and Dachs (2006) for detailed Austrian results.

MNE creates these advantages in the home country, but they are transferable and fully appropriable within the enterprise. In fact, firm-specific assets are the very reason why MNEs exist. International expansion is one way, besides exports or licensing, for MNEs to utilize these assets since they give them an advantage over incumbent competitors in other countries and therefore enable them to enter foreign markets.

The concentration of the creation of firm-specific assets in the MNE home country is favoured by a number of factors. A centralization of R&D implies scale advantages from a higher degree of division of labour and staff specialization, allows more secrecy and control over the results, and avoids co-ordination cost and principal-agent problems arising from dispersed R&D locations (von Zedtwitz and Gassmann 2002; Gersbach and Schmutzler 2006). Moreover, the creation of firm-specific assets is closely linked to the home country because of various complementarities between the knowledge base of the MNE and the technological competencies of the home innovation system (Patel and Pavitt 1991). There is strong evidence that MNEs still tend to concentrate R&D and other activities generating firm-specific assets at the headquarter location (Le Bas and Sierra 2002; Castellani and Zanfei 2004).

The assumption that MNEs are a means to exploit superior firm-specific assets at international markets has important implications for the overseas innovation activities of MNEs. It follows that innovation activities of foreign affiliates are to a higher degree based on existing knowledge and technology than in the case of domestically owned enterprises. Foreign-owned enterprises may be more engaged in adjusting existing technology to local habits, regulations and standards of the host country, a strategy known as “asset exploiting” innovation activity (Kuemmerle 1999).

We expect to observe the results of such a strategy in *innovative input*; foreign-owned enterprises may devote less money to innovative activity and may be less engaged in R&D as opposed to design, adoption and customization activities, because they can build on a vast internal stock of knowledge and technology. This may lead, on average, to a lower *innovative input* of foreign-owned enterprises compared to domestically owned enterprises.

Firm-specific assets may also affect *innovative output*. Knowledge and resources of the enterprise group enable a foreign-owned affiliate to create new products and services more easily and yield a higher turnover from these innovations than a domestically owned enterprise could. Foreign-owned affiliates can also learn from the experience the MNE has gained in other markets. As a result, we expect a higher *innovative output* of foreign-owned enterprises compared to their domestically owned counterparts. Both Frenz and Letto-Gillies (2004) and Castellani and Zanfei (2004) find support for a related hypothesis from an analysis of Italian and UK firms.

Another field where gaps may arise is *productivity*. Lichtenberg's (1992) matching theory of takeovers posits that some owners fit better to certain firms/establishments than others do. The fit is the major factor in determining the performance of the company or the establishment and productivity can be used as a proxy for the quality of the fit (Ali-Yrkkö and Ylä-Anttila 2001). Due to the fact that greenfield investment is comparably low, we can think of ownership change as mean to increase the productivity of a company. Therefore, foreign-owned enterprises should, on the average, yield a superior productivity compared to domestically owned enterprises. Such a gap has been found, for example, by Doms and Jensen (1998) for the US. Harris and Robinson (2002) find in the UK that selecting the high-productivity enterprises for acquisition results in a superior performance *ex post*. As previous innovative performance plays a role in the attractiveness of being acquired (Lehto and Lehtoranta 2002), the selection of high performing innovators for

foreign acquisition may be reflected in a superior *productivity* of foreign-owned enterprises.

The existence of internal firm-specific assets and intra-firm innovation networks may also affect *co-operation behaviour* and the *information sources* enterprises utilize for their innovative activities. The innovation systems literature shows that the innovative performance of enterprises depends on external relations and exchange with customers, suppliers, other enterprises, or universities (see Edquist 2005 for a survey). We speak of *embeddedness* (Frost 2001) to describe the strength of ties and intensity of exchange between an enterprise and its surrounding innovation system. An intensive exchange and spillovers between foreign-owned enterprises and domestic firms and universities can lead to considerable benefits for the hosting innovation systems (Blomström and Kokko 1998).

A gap between foreign-owned and domestically owned enterprises with respect to embeddedness may occur because foreign-owned enterprises are highly integrated in intra-firm networks and can freely access internal know-how and resources of the MNE. This may reduce incentives to co-operate with domestic partners in the host country. If there is a rich pool of technological knowledge and expertise within the MNE, incentives of foreign affiliates to co-operate with external partners in their host country may be lower than in the case of domestically owned enterprises. We therefore expect foreign-owned enterprises to be less engaged in domestic co-operation than their domestically owned counterparts.

2.2 Home country effects

Despite internationalization, many authors argue that the business environment of the home country still determines MNE activities abroad (e.g. Porter 1990; Ruigrok and van Tulder 1995; Benito et al. 2002). Differences in innovative behaviour between foreign-owned and domestically owned enterprises may therefore be also related to “corporate nationality” and the country of origin of the parent company. Such effects may be caused by differences or similarities in the legal systems, accounting standards and codes of corporate governance between the MNE’s parent and host countries (Buckley 2000, p 297). A common distinction is between the market-based system of corporate governance found in Great Britain and the US and the bank-based system of Germany and other European countries (Dimsdale and Prevezer 1994). The differences in the governance style can best be exemplified by looking at control and corporate goals. Typically, the German and European style of corporate governance is characterized by concentrated ownership of listed companies, characterized by weak minority protection. Also, companies tend to follow a strategy to maximize the stakeholder value, whereas the Anglo-Saxon system is thought to follow a shareholder value maximizing approach. The Anglo-Saxon system is also characterized by a strong minority protection and dispersed ownership.

Effects from corporate nationality, however, go beyond legal issues and shareholder expectations. If two countries are close in cultural aspects, enterprises may have less need for product adaptations. Products and methods which worked in the MNE home country may also be successful in the host country, and it may also be easier for a foreign-owned enterprise to get access to localized knowledge. This assumption is supported by empirical evidence on co-patenting which shows that geographical proximity and a common language of two countries significantly explains mutual patenting activities at the national level (Guellec and van Pottelsberghe de la Potterie 2001).

We therefore expect that foreign-owned enterprises from neighbouring countries with a similar culture, legal tradition and business environment may perform better than

enterprises influenced by a different corporate governance style and cultural background. In particular, we expect that enterprises from neighbouring countries may find it easier to link to the domestic knowledge base of their home countries.

2.3 Research hypotheses

We sum up the hypotheses about the potential gaps between foreign-owned and domestically owned enterprises in innovative behaviour:

Hypothesis IIG Foreign-owned enterprises show a lower innovative input than domestically owned enterprises (innovation input gap).

Hypothesis IOG Foreign-owned enterprises show a higher innovation output than domestically owned enterprises (innovation output gap).

Hypothesis PG Foreign-owned enterprises show a higher productivity than domestically owned enterprises (productivity gap).

Hypothesis LEG The embeddedness of foreign-owned enterprises in the national innovation system is weaker than in the case of domestically owned enterprises (embeddedness gap).

Hypothesis HCG Foreign-owned enterprises from neighbouring countries perform better than foreign-owned enterprises from other countries (home country gap).

3 Data set

The empirical analysis draws on data from the Third European Community Innovation Survey (CIS 3), a survey on innovative behaviour of enterprises carried out in the EU member states and some non-member states such as Norway. The data relates to the period from 1998 to 2000. The CIS methodology follows the Oslo Manual (OECD 1997) and incorporates previous experience with innovation surveys, including the Yale survey and the SPRU innovation database (Klevorick et al. 1995; Pavitt et al. 1987). Although cross country comparison is hampered by the fact that the country sample may not be pooled, CIS results nevertheless provide a high degree of comparability due to a standardized questionnaire. Table 1 summarizes the details of the CIS 3 methodology for each of the selected countries.

Table 1 Methodology of CIS for the countries in the analysis

Country	Survey method	Participation	Sampling frame
Austria	Postal	Voluntary	National business register. Statistics Austria
Denmark	Postal + Telephone	Voluntary	Private business register 'NewBiz'
Finland	Postal	Voluntary	Finnish business register
Norway	Postal	Mandatory	Statistics Norway's central register of establishments and enterprises
Sweden	Postal	Voluntary	Swedish business register

Source: Götzfried (2003)

Table 2 Composition of the national samples

Ownership	AT	DK	FI	NO	SE
Domestically owned	396	621	634	1601	814
Foreign-owned	232	223	184	685	383
NC (in %)	52.2	37.2	39.1	33.4	36.0
AS (in %)	23.3	22.9	29.3	16.6	27.4
EU (in %)	24.6	39.9	31.5	50.0	36.6
Total	628	844	818	2286	1197
% Foreign-owned	36.9	26.4	22.5	30.0	32.0

Note: NC denote groups of neighbouring countries - DE, LI and CH for Austria and the other Nordic countries for DK, FI, NO and SE. AS denote Anglo-Saxon owned companies, EU denotes ownership from all European countries not included in NC and AS

The CIS provides information on innovation activities at the enterprise level such as innovation inputs, innovation output, innovation collaboration with various partners and information sources utilized in the innovation process. Ownership is coded in the CIS data by a dummy variable which indicates if companies are part of a corporate group. All foreign-owned enterprises are by definition part of a corporate group. The analysis below includes only enterprises which are a member in a corporate group.²

In the case of foreign ownership, a second variable identifies the home country of the parent company. We have divided the group of foreign-owned enterprises into three subgroups (Table 2). These groups should capture cultural similarities with the host country as well as differences in corporate governance style.

The first subgroup, NC, denotes enterprises from neighbouring countries with a certain cultural proximity. For Denmark, Finland, Norway and Sweden, this group includes foreign-owned companies from another Nordic country. In the case of Austria, NC denotes enterprises with parent companies from Austria's German-speaking neighbouring countries Germany, Switzerland and Liechtenstein.

The two other subgroups are Anglo-Saxon owned enterprises (AS), and affiliates of a parent company located in a European country not yet considered (EU). The shares of these groups on the observations of each country are given below.

4 Methodology

The econometric analysis employs a two-equation sample selection model to test the assumptions stated above. This type of model is appropriate because data is truncated due to the questionnaire design; we observe explanatory variables such as enterprise size, export intensity or sectoral affiliation for all enterprises. A number of dependent variables such as innovative expenditure, however, can only be observed for innovative enterprises.

The setup of the empirical analysis corrects for this fact. Company characteristics which influence the companies' likelihood to carry out innovation activity have to be controlled

² In the analysis of the Nordic countries domestic multinational companies could be identified (see Ebersberger and Löff 2005). The results for this category are not reported here.

for. Ebersberger and Lööf (2005), Ebersberger et al. (2005), and Dachs (2006) use sample selection models (Heckman 1979):³

$$y_{0i} = \begin{cases} 1 & \text{if } y_{0i}^* = X_{0i}\beta_0 + \varepsilon_{0i} > 0 \\ 0 & \text{if } y_{0i}^* = X_{0i}\beta_0 + \varepsilon_{0i} \leq 0 \end{cases} \quad (1)$$

$$y_{1i} = y_{1i}^* = X_{1i}\beta_1 + \varepsilon_{1i} \quad \text{if } y_{0i} = 1 \quad (2)$$

where Eq. 1 depicts the companies’ decision to carry out innovation activities, and equation (2) determines the innovation behaviour of companies with a positive decision to carry out innovation activities. Hence, y_{0i}^* is a latent innovation decision variable measuring the propensity to carry out innovation activities, y_{0i} is the corresponding observed binary variable being 1 for innovation active enterprises. y_{1i} , describes innovation behaviour. These are the variables of interest in the analysis. X_{0i} , X_{1i} , are the exogenous variables.

To check the results of the Heckman selection model, Ebersberger and Lööf (2005) also employ a Crepon et al. (1998) model which extends the model (1) and (2) by Eqs. 3 and 4

$$y_{2i} = \alpha_{21}y_{1i} + \alpha_{23}y_{3i} + X_{2i}\beta_2 + \varepsilon_{2i} \quad \text{if } y_{0i} = 1 \quad (3)$$

$$y_{3i} = \alpha_{32}y_{2i} + X_{3i}\beta_3 + \varepsilon_{3i} \quad \text{if } y_{0i} = 1 \quad (4)$$

where y_{1i} , is the innovation input, y_{2i} , is the innovation output and y_{3i} , is the productivity. The inverse Mills’ ratio (Heckman 1979) is included in the vector of exogenous variables X_{1i} , X_{2i} and X_{3i} to correct for possible selection bias. The α and β are the unknown parameter vectors. ε , are i.i.d. drawings from a multivariate normal distribution with zero mean.

5 Empirical analysis

The presentation of the results below focuses on singling out robust patterns across the analyzed countries. A first indication of common patterns and differences is provided by the descriptive statistics of Table 3 which shows three indicators of innovation activities and the share of foreign-owned and domestically owned enterprises engaged in these activities. We find significant differences between the two groups in only seven out of fifteen pairs. The data suggests that differences are larger *between countries* than *between foreign-owned and domestically owned enterprises of one country* in a number of cases. In Norway and Denmark, for example, enterprises are considerably less often engaged in permanent R&D activities than in any other country regardless of their ownership status. Another example is the propensity of foreign-owned and domestically owned enterprises in Austria to co-operate, which is considerably lower than in any other country regardless of ownership status.

³ Dachs and Ebersberger (2006) use a non-parametric approach for their analysis following Czarnitzki (2005).

Table 3 Shares of foreign-owned and domestically owned enterprises that report innovation, permanent R&D activities and co-operation with national partners, 1998–2000

	Innovation activities		Permanent R&D activities		Co-operation with national partners outside the enterprise group	
	DOM (%)	FOR (%)	DOM (%)	FOR (%)	DOM (%)	FOR (%)
AT	62.9	47.8***	71.7	66.7	24.9	21.6
DK	55.7	56.1	26.6	27.2	37.5	29.6*
FI	62.5	64.7	69.4	71.4	68.4	65.5
NO	49.6	44.7*	36.3	42.4***	41.1	36.6*
SE	54.8	64.8***	53.5	61.2*	41.2	45.5

Note: Table shows the share of enterprises with innovation activities, with permanent R&D activities and with innovation cooperation with national partners outside the enterprise group. AT-Austria, DK-Denmark, FI-Finland, NO-Norway, SE-Sweden; *, **, *** indicate significant differences at the 10%, 5% and 1% level

Source: Ebersberger and Lööf (2004), Ebersberger and Lööf (2005), Ebersberger et al. (2005), Dachs (2006), and Dachs and Ebersberger (2006)

Descriptive statistics give hints to the question addressed in this paper, but cannot tell the whole story. The effects of foreign ownership can be distorted by other enterprise characteristics that influence innovative behaviour such as size, sectoral affiliation or export orientation. We therefore proceed with a multivariate analysis that corrects for these factors. We only report the signs of the parameter estimates for the dummy variables indicating foreign ownership which are significant at the 5% level. Readers interested in the complete results may find the references in the footnotes of the tables.

The analysis controls for the size, industry, orientation towards national or international markets, product or process innovation orientation, R&D strategy and public funding and, where applicable, for the innovation input.

5.1 Innovation input

We first analyze the propensity to innovate where we only distinguish between foreign-owned and domestically owned enterprises. In three of the five countries, foreign ownership, on average, does not exert a significant influence on the decision of enterprises to innovate (Table 4, first row). In Austria and Norway, we find that foreign ownership significantly reduces the propensity for innovative activity after correcting for size, sector and other independent variables.

Once a company decides to take up innovative activity, however, ownership status does not explain innovation expenditure (including R&D expenditure) per employee (Table 4, second row). This pattern is fairly consistent across the countries. The only exception is Norway, where we find significant negative deviation for NC-owned enterprises and a positive effect of Anglo-Saxon ownership. This finding does not support our hypothesis of a lower innovative input of foreign-owned innovating enterprises; rather, we can reject this hypothesis based on the sample of countries in the analysis.

Table 4 Effects of foreign ownership on innovative input, output and productivity

Category	Indicators	AT	DK	FI	NO	SE
Innovative Input	Innovation activity	-FOR			-FOR	
	Innovation expenditure per employee				-NC +AS	
Innovative Output	Likelihood to generate innovations which are new to the market		+AS	+NC		+AS +EU
	Share of sales generated by new products		+NC +AS	+AS	+NC +AS +EU	+NC +AS +EU
Productivity	Labour productivity	+AS	+EU	+NC +AS	+NC +AS +EU	+AS

Note: - (+) Indicate a positive sign of the foreign ownership dummy

Coefficients are significant at the level of 5% or better. For AT the base category is all domestically owned firms; for DK, FI, NO and SE the base category is domestically owned firms of national corporate groups. Ebersberger and Lööf (2005) control multinationality and provide additional results for domestic multinational firms

FOR-Denotes all foreign-owned enterprises and is only used in the regression analysis of innovation activity

NC-Denotes foreign-owned enterprises from neighbouring countries (DE, LI and CH for Austria and the other Nordic countries for DK, FI, NO and SE). AS-denotes Anglo-Saxon owned companies, EU-denotes ownership from all European countries not included in NC and AS

Source: Ebersberger and Lööf (2004), Ebersberger and Lööf (2005), Ebersberger et al. (2005), Dachs (2006), and Dachs and Ebersberger (2006)

5.2 Innovation output

The analysis of the innovation output is based on two different variables. The first one indicates if the enterprise has introduced a product or service which is new to the market. The second variable captures the economic relevance of innovative activity in terms of sales generated by new products as a percentage of total sales of the enterprise.

Here, our results reveal significant differences between foreign-owned and domestically owned enterprises in three of the five countries (Table 4, third and fourth row). We find that foreign ownership increases innovative output. This difference occurs in most of the Nordic countries, but not in Austria, and is more pronounced in sales generated by new products than in market novelties. The persistence of the result over countries is surprising, given the fact that the outcome (and success) of innovation activity is inherently uncertain, unevenly distributed between enterprises and dependent on a number of external factors a company cannot influence (Marsili and Salter 2005). The over-performance of foreign-owned enterprises may be explained by the superior financial, management and technological capabilities available to MNEs, and by experience they have gained in other markets with their products. The results therefore support our research hypothesis.

5.3 Productivity

The only feasible performance measure offered by CIS data is labour productivity since the data set does not supply reliable information on the enterprises' capital stock. Hence, although preferable, total factor productivity measures cannot be computed.

We find in all countries that foreign-owned enterprises exhibit a significantly higher labour productivity than do domestically owned enterprises (Table 4, last row). In particular, Anglo–Saxon ownership corresponds to a significantly increased labour productivity in four of the five countries. Thus, we find support for the productivity gap hypothesis.

5.4 Embeddedness in national innovation systems versus intra-firm networks

A gap between foreign-owned and domestically owned enterprises with respect to embeddedness in the national innovation system may occur because foreign-owned enterprises are highly integrated in intra-firm networks and can freely access internal know how and resources of the MNE. This may reduce incentives to co-operate with domestic partners in the host country.

We measure embeddedness by two indicators: (a) the valuation the enterprise gives to information sources from within their enterprise group which reflects the embeddedness in intra-firm networks, and (b) whether the enterprise co-operates with different external partners in the host country. Based on the type of partner, we differentiate between domestic horizontal embeddedness (co-operation with competitors), domestic vertical embeddedness (suppliers and clients) and embeddedness in the domestic science system (universities and research centres).

Our results show a significantly stronger integration of foreign-owned enterprises in intra-firm networks compared to domestically owned enterprises which are part of a national corporate group (Table 5, first row). Foreign-owned enterprises value information sources from within their own enterprise group significantly higher than domestically owned enterprises do. This pattern can be observed in all countries included in this paper. It is the most robust result of our exercise in terms of uniformity between the countries. This

Table 5 Effects of foreign ownership on embeddedness and information sources

Indicator	AT	DK	FI	NO	SE
Valuation of information sources form within the enterprise group	+NC	+NC	+NC	+NC	+NC
	+AS	+AS		+AS	+AS
	+EU			+EU	+EU
Embeddedness in the domestic innovation system	–AS		+NC		
Vertical embeddedness in the domestic innovation system	–AS		+NC		
Horizontal embeddedness in the domestic innovation system	–AS				
Embeddedness in the domestic science system	–AS				+AS +EU

Note: – (+) Indicate a negative (positive) effect of foreign ownership

Coefficients are significant at the level of 5% or better. For AT the base category is all domestically owned firms; for DK, FI, NO and SE the base category is domestically owned firms of national corporate groups. Ebersberger and Lööf (2005) control multinationality and provide additional results for domestic multinational firms

NC-Denotes neighbouring countries (DE, LI and CH for Austria and the other Nordic countries for DK, FI, NO and SE). AS-denotes Anglo–Saxon owned companies, EU-denotes ownership from all European countries not included in NC and AS

Source: Ebersberger and Lööf (2004), Ebersberger and Lööf (2005), Ebersberger et al. (2005), and Dachs and Ebersberger (2006)

finding suggests that multinationality of a corporate network matters for companies' knowledge sourcing activities.

A strong integration of foreign-owned enterprises in intra-firm networks, however, does not mean that these enterprises neglect exchange with partners in their host countries. In general, foreign-owned enterprises tend to be embedded in the innovation system of their host country at least to the same extent as their domestically-owned counterparts are. (Table 5, second to last row). The only country where foreign-owned enterprises appear to be reluctant to domestic co-operation is Austria. This result can be traced back to one particular group, Anglo–Saxon owned enterprises.

Austria, however, is an exception. In Denmark and Norway, the effect of foreign ownership on domestic co-operation is neutral. In Finland, foreign-owned enterprises have a *higher* propensity to co-operate with national partners than domestically owned enterprises. A similar result can be found in Sweden, where enterprises affiliated to an Anglo–Saxon or EU-based MNE co-operate more actively with domestic universities than Swedish-owned enterprises do. Foreign-owned enterprises in these two countries pursue strategies which rather enhance than just exploit the stock of knowledge of the MNE (Cantwell 1995; Dunning and Narula 1995). This strategy has been labelled as “asset-augmenting” in the literature (Kuemmerle 1999). An asset augmenting strategy may offer advantages, given that mastering an increasing number of technologies becomes vital for successful innovation. Here, multinational companies rely on a broader range of partners and locally specific sources. Asset-augmenting-strategies, however, make also higher demands on the firm's capabilities to manage, connect and utilize heterogeneous sources of knowledge (Narula and Zanfei 2005; Furu 2001; Hedlund 1986; Kogut 1989).

In the light of our results, a strong embeddedness in intra-firm networks does not necessarily mean that domestic co-operation is neglected by foreign-owned enterprises. Therefore, with the exception of Austria, the embeddedness gap hypothesis cannot be supported.

5.5 Home country effects

The results show some differences in the innovative behaviour between foreign-owned enterprises of different home countries. However, these differences cannot be generalized and some groups perform significantly better in one country, but do not in another. We don't find a general advantage of enterprises from neighbouring countries, either. The most uniform effect is found in productivity and innovative output. Anglo–Saxon enterprises significantly perform better than domestically owned enterprises in four of five countries. We therefore reject the hypothesis that these enterprises have an advantage in their innovative activities due to a common language and cultural similarities.

6 Foreign ownership – is there a common story across countries?

This paper compares the innovative behaviour of foreign-owned enterprises in five European countries. Our results give only little indication that foreign-owned companies in small open economies are less innovative than their domestically owned counterparts.

We observe similar effects for most variables in the majority of countries included in this paper. Therefore, we conclude that there is a common pattern of innovative behaviour among foreign-owned enterprises in small European countries: Foreign-owned companies

reveal a lower propensity to engage in innovation activities in two countries. Yet, foreign ownership is not related to robust differences in innovation input of innovating companies, but strongly correlated with higher innovation output and higher labour productivity. We cannot observe a weaker embeddedness of foreign-owned enterprises in the national innovation systems of their host countries. In contrast, foreign-owned affiliates in Sweden and Finland co-operate even more actively with domestic partners than domestically-owned enterprises. These co-operations may be a major source of spillovers for the host country as companies which are part of a multinational corporate group also tend to be strongly embedded in international knowledge flows within the corporate network. The conclusion that there is a common story across small countries is also supported by the fact that descriptive statistics show larger differences *between countries* than *between foreign-owned and domestically owned enterprises of one particular country*.

From a policy perspective, there is little reason to fear that a strong presence of foreign-owned enterprises may affect innovativeness and, in the long run, endanger the technological performance of a small open economy. The governments of the analyzed countries should encourage initiatives that attract this type of companies rather than scare them away. To unleash the full innovative potential and to generate most local value from international corporate networks policy intervention could target the foreign-owned companies' lower propensity to carry out innovative activities. Technological advance and competence building are characterized by constant interplay and mutual learning between different types of knowledge and actors, including enterprises, contract research institutes, universities, sources of funding, relevant public agencies and more.

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