AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

HWWA HAMBURG

DISCUSSION PAPER

Why Foreign-Owned Firms are Different: A Conceptual Framework and Empirical Evidence for Austria

Michael Pfaffermayr
Christian Bellak

HWWA DISCUSSION PAPER

115

Hamburgisches Welt-Wirtschafts-Archiv (HWWA)
Hamburg Institute of International Economics
2000
ISSN 1616-4814

The HWWA is a member of:

- Wissenschaftsgemeinschaft Gottfried Wilhelm Leibniz (WGL)
- Arbeitsgemeinschaft deutscher wirtschaftswissenschaftlicher Forschungsinstitute (ARGE)
- Association d‘Instituts Européens de Conjoncture Economique (AIECE)

Why Foreign-Owned Firms are Different: A Conceptual Framework and Empirical Evidence for Austria[1]

Michael Pfaffermayr
Christian Bellak

[1] This Discussion Paper is part of the HWWA´s research programme "International mobility of firms". It was presented at the workshop on „Foreign-owned firms – are they different?" HWWA, 27 October 2000. The authors are grateful to the participants of the workshop for their comments.

HWWA DISCUSSION PAPER

Edited by the Department
EUROPEAN INTEGRATION
Head: Dr. Konrad Lammers

Hamburgisches Welt-Wirtschafts-Archiv (HWWA)
Hamburg Institute of International Economics
Öffentlichkeitsarbeit
Neuer Jungfernstieg 21 - 20347 Hamburg
Telefon: 040/428 34 355
Telefax: 040/428 34 451
e-mail: hwwa@hwwa.de
Internet: http://www.hwwa.de/

Michael Pfaffermayr
Austrian Institute for Economic Research
e-mail: michael.pfaffermayr@wifo.ac.at

Christian Bellak
University of Economics, Vienna
e-mail: christian.bellak@wu-wien.ac.at

CONTENTS

Abstract 6

Zusammenfassung 6

1. INTRODUCTION 7

2. THEORETICAL ARGUMENTS 9

3. METHODOLOGICAL CONSIDERATIONS: MEASUREMENT AND DATA PROBLEMS 13

4. A REVIEW OF EMPIRICAL RESULTS 16

5. EMPIRICAL ESTIMATES 26

6. SUMMARY AND CONCLUSIONS 31

REFERENCES 33

APPENDIX 37

Abstract

This study examines performance gaps among foreign-owned and domestically- owned Austrian firms. In line with earlier findings our results suggest that the positive effects of participating in a foreign multinational's network can mainly be found in productivity and profitability. A further distinction between purely national firms and multinational enterprises (MNEs) reveals that both gaps derive from gains of MNE networks rather than from ownership *per se*. Regardless of ownership, MNEs are more similar than MNEs and purely national firms. Gaps concerning the investment propensity and growth are primarily explained by firm characteristics rather than foreign ownership. There is no evidence of an additional bonus resulting from closer cultural proximity of German-owned firms.

Zusammenfassung

Diese Studie untersucht Unterschiede in der Performance auslandskontrollierter und heimischer Unternehmen in Österreich. Die Ergebnisse bestätigen insofern frühere Untersuchungen, als die wichtigsten Vorteile auslandskontrollierter Unternehmen in der überlegenen Produktivität und Rentabilität gesehen werden. Bei Unterscheidung der österreichischen Firmen in rein nationale und multinationale Firmen (MNE) zeigt sich, daß österreichische und ausländische MNE einander ähnlicher sind als die österreichischen MNE und rein nationale Firmen. Die aufgezeigten Performance-Unterschiede resultieren eher aus der Einbindung in MNE-Netzwerke als aus dem Auslandseigentum an sich. Unterschiedliche Investitionsneigung und Wachstumsverläufe lassen sich primär durch unternehmensspezifische Faktoren und weniger durch das Auslandseigentum erklären. Es ergeben sich keine Anhaltspunkte für einen zusätzlichen Performance-Vorsprung deutscher Investoren aus deren kultureller Nähe zu Österreich.

Keywords: Multinational Enterprises, Industry Studies, Organisation of Production

Labour Productivity

JEL Classification: F23, L6, L23, J24

1. INTRODUCTION

Empirical studies continuously reveal differences in the performance of foreign-owned companies (FOCs) and domestically-owned companies (DOCs) across countries, industries, over time and also on the plant level. Empirical evidence, however, is not conclusive. In some studies, FOCs perform better than domestic ones and vice versa. Despite this ambiguity, there is considerable agreement that these differences can be referred to a limited varying number of explaining factors, depending on the performance measure chosen (e.g. productivity, profitability, growth, skill, wage).

This paper is concerned with differences between FOCs and DOCs in four related respects: First, it seeks to provide arguments from economic theory for a superior performance of one over the other group of firms. Second, it discusses pitfalls in the comparison and the methodological problems related to measurement and data. Third, empirical results of earlier studies are reviewed and compared. Fourth, based on a sample of 524 Austrian manufacturing firms we analyse, whether and why differences between FOCs and DOCs exist and regression analysis is carried out in search of the determinants of performance gaps. Additionally, the possibility of a performance gap between German affiliates and those of other countries is explored pursuing the argument that especially for German firms the transfer of FSAs within the firms should be easier given the similarity in business culture between Austria and Germany. Therefore, overhead costs and other factors influencing performance (like market experience), accrue at the headquarter in Germany, while affiliates of other parent countries have to bear a higher amount of such costs. This could be an important source of performance differences of German affiliates not only vis-à-vis Austrian affiliates, but also vis-à-vis affiliates from other parent countries.

A number of empirical studies have been produced, which examine various performance gaps. All studies focus on the manufacturing sector, due to data availability, except Oulton (1989b), who studies the services sector. The empirical studies can be grouped into five groups: the first comprises financial performance measures; the second includes variables related to labour (skill, wage and labour relations); the third group refers to studies on post M&A performance (see section on "measurement problems"); the fourth group concerns growth and productivity gaps between firms, and the fifth group includes miscellaneous. Only few studies reveal superior performance of DOCs and only some report substantial gaps between DOCs

and FOCs related to ownership. Almost all studies reveal performance gaps between firms by different parent countries and those studies that examine domestic and foreign-owned Multinationals (MNEs) report negligible differences.

Several studies on the *profitability gap* (e.g. Mataloni 2000 and his review of earlier literature, Kumar 1990, Kumar 1984, Ylä-Anttila & Ali-Yrkkö 1997, Dickerson et al. 1997 with regard to acquisitions) have found substantial differences between FOCs and DOCs.

Several studies include labour-related variables. Howenstine and Zeile (1992), Blonigen and Slaughter (1999) and Doms and Jensen (1998) reveal a *skill* gap between FOCs and DOCs in the U.S. Of course, this is clearly related to capital-intensity and thus is a determinant of productivity gaps discussed in section 4 below. Here, one has to control for the difference in shares of production to non-production workers[1] in FOCs and DOCs in order to take into account the skill-mix of activities across industries. Howenstine and Zeile (1992) find that foreign affiliates in the United States are concentrated in manufacturing industries that require a higher level of employment skill. They examine, whether these characteristics differ significantly between FOCs and DOCs in the same industries and find that for one half of the industries, payroll per employee (as a broad measure for employee skill level) in FOCs exceeds that of DOCs by more than 10 per cent. Foreign ownership is, however not related to a factor that might explain such difference, namely average scale of plant operations. Blonigen and Slaughter (1999) find that inward foreign direct investment (FDI) does not contribute to skill upgrading within manufacturing industries. On the contrary, distinguishing by type of investment, they show that Japanese green-field FDI have a lower demand for skilled labour.

The *wage gap* is analysed *inter alia* by Blanchflower (1994), Globerman et al. (1997), Feliciano and Lipsey (1999) and Oulton (1998a). The wage gap is a possible sign of a skill gap, as relative wages for more skilled workers have been rising in general. Globerman et al. (1997) find that the wage gap vanishes, once they control for factors like size or capital-intensity. Feliciano and Lipsey (1999) find qualitatively identical results for U.S. manufacturing, with wage gaps related to industry composition. For other sectors, however, a gap of 8-9% remains even after controlling for size, industry and U.S. state. A paper by Oulton (1998a) found that foreign-owned establishments in

1 i.e. administrative and technical staff.

the UK are more human capital intensive than DO establishments, even within the same industry. Overall, the studies related to wage and skill gaps suggest that factor demand of DOCs and FOCs – even within the same industry – varies considerably, but only small part of the gap is attributed to foreignness, rather size is an important factor. *Labour relations* in domestic and FOCs are studied particularly in Canada (Carmichael, 1992; Cousineaou 1989; Creigh and Makeham 1978; Greer and Shearer 1981).

Among the miscellaneous indicators are mostly *R&D-related gaps* (see e.g. Allen and Frances, 1999; Howenstine and Zeile, 1992; Moden 1998) or the use of technology (e.g. Doms and Jensen, 1998). It goes without saying that these factors are closely related to productivity gaps.

The main findings for our sample of manufacturing firms in Austria can be summarised as follows: There exist marked differences between DOCs which are non-Multinationals and FOCs, while foreign and domestic Multinationals differ only marginally. Controlling for the most important determinants we find evidence that the productivity gap and the profitability gap are not explained by foreign ownership *per se*, but that belonging to or operating a MNE network in order to optimally exploit the FSAs is an important factor behind the gaps. There are no direct effects with regard to firm growth or investment propensity. In line with many studies there remain indirect effects originating from different firm characteristics. Contrary to expectations, German-owned firms largely exhibit the same characteristics as the other FOCs.

The remainder of the paper is organised as follows: Section 2 provides theoretical arguments. Section 3 defines the requirements for a proper comparison and the unit of analysis. Section 4 discusses and compares the results of earlier studies and section 5 provides new estimates on performance differences. There is a short concluding section (6).

2. THEORETICAL ARGUMENTS

The reasons for performance differences between FOCs and domestic ones are nicely summarised by the OECD: In general, they are “due to the technological and organisational advantages of firms, which have the resources to operate internationally, the advanced industries in which they operate, and their larger average size.” (OECD

1996) These arguments are analysed in more detail below and they are grouped in four parts:

First, *firm-specific assets* (FSAs) and their transfer to and from affiliates seem to be an important source of difference. Caves (1996) argues that FSAs (like special know-how on production processes, reputation for high quality or simply a well known brand) are intangible and have public good characteristics within the firm. (See Box I for an illustration.) This has two consequences: First, FSAs are exploited within the firm (internalisation) since arms length trade via markets is inefficient (licensing it is not attractive). Secondly they can be transferred at low (zero) additional cost to foreign affiliates. Ceteris paribus, this would lead to superior performance of foreign owned affiliates vis-à-vis DOCs, if the latter do not have access to FSAs of comparable value. Conceptually, FSAs induce spillovers between parent and affiliates (Fors, 1997) or multi-plant economies of scale (Scherer, et.al., 1975; Markusen, 1984, 1995). Additionally, if the potential for exports is limited by rising marginal costs of production, transportation or market access, MNEs have an incentive to invest more in FSAs because of the multi-plant economies of scale (Pfaffermayr 1999). Note, this resembles the endogenous sunk cost mechanism of Sutton (1991). Empirically, it implies the hypothesis of additional benefits if a firm participates in a MNEs-network.

In the international business literature, the view is very similar. Competitive advantage is defined as a concept, which can be „usefully separated into those growing out of location (or nations) and those independent of location and arising from the firm's overall global network of activities." (Porter 1990, p. 60) The latter component brings „significant performance benefits to organisations (...), such as the ability to leverage scale economies, the potential to take advantage of arbitrage opportunities in factor cost differentials across multiple locations and the ability to hasten new product development and introduction." (Gomes and Ramaswamy 1999, p. 174). It is quite conceivable, „that the benefits of the initial stages of internationalisation will exceed the concomitant costs because of the advantages associated with market familiarity, leveraging home base skills and competencies, and utilising home base managerial and administrative resources more efficiently." (ibidem, p. 174) This suggests that the advantage for an affiliate of being part of a MNE network are high, if the affiliate is young and geographically or culturally close to the parent company. They may vary over time and develop into a two way relationship later on. Such considerations are

important e.g., with regard to German affiliates in Austria. It also implies that age and experience effects (Matalony 2000) are important.

Large MNEs are also more suited to fragment production stages internationally according to the location advantages of the host countries inducing further gains from specialisation of affiliates vis-à-vis smaller non fragmented firms. The specialisation of a foreign-owned firm in a more narrow spectrum of activities which are more suited to them could be another source of performance differences (see Egger et. al, 2000).

A third group of arguments refers to path dependency. Affiliates of FOCs have access to newer and superior technology, whereas domestic non-MNEs may operate older less efficient plants. Also, in a MNE, additional possibilities for learning may arise from the operation of affiliates in variegated economic environments in different nations.

These arguments suggest that it is not ownership *per se* which matters, rather ‘ benefits of participation in a multinational network’. Globerman et al. (1997, p. 154) make this differentiation. Note this has important implications for empirical research, especially for classifying firms according to foreign ownership.

Fourth, there are various accounting arguments, for example that investments in FSAs are counted as expenses of the headquarter, whereas affiliates participate at zero costs, thus raising their profitability. This is usually termed “auxiliary services” and comprises research and development, controlling etc. DOCs, although they operate affiliates themselves, have to bear that costs. So comparing a foreign affiliate with a domestic headquarter (or integrated firm) may create an artificial gap (see section 3).

A fifth issue is whether different corporate governance systems lead to performance differences. The source of a superior performance of one group over the other derives from better control. Since corporate governance structures are largely national (Buckley 2000, p. 289), it is quite conceivable that they are an important cause of performance gaps not only between FOCs and DOCs, but also between foreign affiliates by parent countries. Performance gaps between affiliates of different parent countries are reported in many empirical studies (see below section 4). Zeckhauser and Pound (1990) among others argue that the existence of a strong shareholder (i.e. strategic investor) who is able to monitor the management more efficiently than a dispersed group of shareholders, exhibits higher performance. This argument also applies in our case here.

Foreign-owned affiliates under the control of a headquarter form a prime example since direct investing firms usually hold a large share in the assets of their affiliates and must be viewed as strategic investors.

Box 1. Example of Wienerberger Bricks Company

An illustration of firm-specific advantages and the benefits of common governance within a MNE is an Austrian brick manufacturer (Bellak 2000). The company is 180 years old and has been continuously in the same business since it was founded in 1819. Being a purely domestic firm in 1985, it started an internationalisation process which made it the world's largest brick manufacturer of the world by 1996.

Brick production is a highly standardised process. Standardisation in this context refers to the fact that when an innovatory shift occurs in production technology, it can be introduced in new plants anywhere around the world and the product is highly standardised, too. This leads to two types of firm-specific advantages.

1. Substantial economies of scope are derived from the standardised process technology. The latest development has been submitted for patent protection in 1996. In the past, a multi-layered drying and burning process has been used, while the new technology introduces a drying and burning process on a brick-by-brick basis. This implies a significant reduction in the amount of facilities to be handled and easier control of the process. It resulted not only in an improved quality of the product but also in a reduction of operating costs by 20 percent. The cost reduction stems from a reduction of production time of up to four-fifth compared to the former technology, from lower energy consumption, lower maintenance costs and lower personnel expenses. The development of the new technology was only partly a response to the market (high quality standards), but also a response to tighter environmental standards.
2. The standardisation of the brick production yields on additional firm-specific advantage, as it enables each of the plants to benefit from substantial advantages of common governance. These are enjoyed by each of the more than one hundred affiliates around the globe and derive from the experience gained in acquiring, setting up and maintaining efficient brick producing plants. A modern brick production – as a thumb rule – costs EURO 6-11 mn plus an annual replacement investment. Break even is reached after seven to eight years in large sites (with an average service life of 20-25 years) and already after 3 to four years in smaller

plants. The criteria for efficiency are well known and therefore each plant, more or less independent of its location, is able to take measures when deviations from the benchmark become too large. The precondition and crucial success factor is a very tight controlling process, which is carried out by the headquarter.

Both types of firm-specific advantages, apply in many other industries as well. Most literature focuses on the former, whereas little is known about the latter, which might be due to measurement problems. (One very common type of firm-specific advantages arising with horizontal integration namely brand names, does not play an important role. Rather, acquired plants keep their local brand names.)

Summarising the main theoretical arguments, we expect in our empirical analysis that foreign ownership – in the sense of an affiliate being part of and having access to the FSAs of the MNE network – induces a productivity and profitability gap between FOCs and DOCs, and maybe also growth differentials in firm size and productivity. The argument that it is not foreign ownership *per se* which matters, should become clear when comparing FOCs with domestically based MNEs. We are not able to test for differences in skills composition of employment and wages due to a lack of data.

3. METHODOLOGICAL CONSIDERATIONS: MEASUREMENT AND DATA PROBLEMS

Concerning the methodology of a proper comparison between DOCs and FOCs we concentrate on three issues: First, we ask which set-up makes a proper comparison, secondly which is the proper unit of measurement, and thirdly which is the proper set-up to single out endogeneity problems and idiosyncratic short-run differences.

In a proper comparison "like is only like" if it is possible to control for those firm characteristics which are important determinants of performance (aside from ownership and control). Since not all performance differences can be attributed to ownership (see e.g. Globerman et al. 1997, p. 144), a simple comparison between the two groups of firms will certainly not do the job. Therefore, most descriptive statistics published may be actually misleading. One has to use an econometric set-up with the estimated specifications depending on the measure of performance (e.g. firm growth, productivity, profitability). These should include the most important control variables suggested by

theory in order to isolate the specific ownership effect. However, given the limited number of control variables available not all performance measures are well suited for comparisons based on econometric estimates. For example, labour productivity as a performance measure requires an estimate of the real stock of capital (or an appropriate proxy thereof), which is rarely available in samples of firms.

Secondly, the choice of the unit of comparison is essential. The usual comparison is between DOCs (including MNE headquarters and exporting firms) and local affiliates of foreign parents which is not satisfying for a number of reasons. Basically, four types of comparisons are possible: Affiliates vs. DOCs which could be either national, an exporter or a domestic MNE with a multi-layer organisation. Although the econometric exercise below controls to some extent for this by including indicators like size, export orientation or market share as explaining variables, the correct choice of the unit of measurement remains essential. Ideally, one would want to compare performance at a very disaggregated (enterprise) level to avoid the problem of dealing with fixed investment costs in FSAs, headquarter services or more general economies of scale at the firm level. For example, comparing foreign owned plants, which pursue only marginal corporate governance and control functions (management, controlling and accounting) and do not invest in R&D and reputation (R&D, marketing), with DOCs which perform all these tasks would be misleading. For this reason we analyse the data at the corporate level where it can be assumed that both types of firms perform a similar set of activities besides production. This suggests to exclude domestic corporate headquarters, and include the firms they control instead. However, a sharp distinction is not always possible as this depends on the degree of consolidation of the firm and its reporting behaviour.

Additionally, the group of DOCs is quite heterogeneous and in order to distinguish between the pure ownership effect and that of MNE-network membership, it is necessary to differentiate also between domestically-owned MNEs and non-MNEs (Doms and Jensen, 1998).

Thirdly, one has to look at systematic differences which persist in the long run and sort out idiosyncratic developments in particular periods. Empirically, this suggests to look at average performance over a period of time, rather than comparing a cross-section of firms at a particular point in time. To avoid endogeneity problems – e.g. successful firms may be attractive for take-over by or mergers with FOCs - the comparison seems

to be more robust when analysing ex-post performance in the period after the status of ownership has been measured.

Nevertheless difficulties in the 'proper comparison' remain which cannot be singled out easily: Differences in age between an established firm and a new establishment (choice of location, state of the art technology etc.) cannot easily be controlled for.[2] Accounting standards and practice may lead to artificial distortions in some of the performance measures. Additionally, transfer pricing may distort performance measures of foreign affiliates if they are based on nominal figures.

Given all the problems of comparison the proposed approach only makes a second-best comparison and there are alternatives. One alternative is to use event analysis and compare a domestic firm prior to and after a takeover by a foreign MNE (cf. e.g. Moden 1998; McGuckin and Nguyen, 1995 for the effects of ownership changes in general) or to compare internal and external growth (e.g. Dickerson et al. 1997). Here it is essential to have observations before and after the take-over for a sufficiently long-period since consolidation afterwards and the integration into a MNE's network usually take several years.

Yet another alternative would be to compare purely DOCs before and after they have become a MNE. However, this is a very rare case and other things have to be held constant.

Summing up, the short literature survey below and our empirical exercise based on Austrian manufacturing firms on performance gaps among firms originating from ownership effects is organised around the following questions. As will become clear, it deals with comparisons of firms in general, but it is also an issue of the comparison between purely domestic and multinational firms.

1. Is the gap an artefact?
2a. Is the existence of a gap related to ownership or to an "industry composition effect"?
2b. How is the gap explained?" and "Why does a gap remain between DOCs and FOCs even after controlling for industry and firm characteristics?
3. Does the gap differ by parent country? (mostly US vs. Non-US)
4. What is the appropriate level of analysis: firm, establishment, plant, enterprise level?

2 For example, in our empirical analysis of Austrian manufacturing firms age cannot be observed.

4. A REVIEW OF EMPIRICAL RESULTS

This subsection discusses in more detail studies examining a productivity gap, a growth gap, an investment gap or a profitability gap between DOCs and FOCs. It also draws on the scarce evidence for Austria. See Appendix Table 1 for a summary. The theoretical part discussed several arguments related to a *productivity gap.* Also, empirically, this has gained the most attention (e.g. Davies and Lyons 1991, Maliranta 1997, McGuckin and Nguyen 1995, Moden 1998, Howenstine and Zeile 1992, Oulton 1998a, Oulton 1998b, Ylä-Anttila & Ali-Yrkkö 1997, Doms and Jensen, 1998).

Davies and Lyons (1991) find a productivity gap of 20 percent, which is decomposed into a "structural" and an "ownership" effect. The gap is persistent on different levels of aggregation, i.e. on 2-digit and 3-digit level industries, the weight of both effects remains mainly unchanged. Therefore, within 2-digit level industries, contrary to expectations, FOCs do not cluster in the high-productivity 3-digit industries. The gap therefore is more a firm- or plant-specific phenomenon, where ownership becomes particularly important. Oulton (1998a, b) studies productivity gaps in the UK: in manufacturing (1998a), labour productivity is 38 percent higher in FOCs, which is mainly determined by their higher capital-intensity (physical and human). In service industries (1998b), where Oulton examined over 49,000 companies, a productivity gap of one third over DOCs' productivity remained after controlling for various structural differences (size, age, parent country). Again, a more skilled labour force and a higher capital-intensity in FOCs explains most of the variation.

A paper on U.S. establishments by Doms and Jensen (1998) examines the role of multinationality for productivity. They compare DOCs that are multinational to FOCs (which are by definition multinational), and domestic DOCs. The multinational DOCs and FOCs perform better than domestic DOCs, suggesting that foreign ownership is of less importance. Observed differences are considerably reduced by control variables (e.g. from 50% to 20% for labour productivity). Although their analysis is on the plant level, they include auxiliary plants, thus reducing the problem of undercounting non-production workers on the establishment level. This has implications for labour productivity and skill / wage levels.

Evidence by Howenstine and Zeile (1992) shows the tendency of FDI establishments to operate in industries characterised by higher capital intensity. While this evidence is

only descriptive, it gives an indication of higher labour productivity (depending on the type of underlying production function). Maliranta's study on more than 5,000 Finnish plants reveals a weak foreign ownership effect. Using a large number of control variables, *inter alia* multi-plant vs. single-plant firms, it is one of rare studies on total factor productivity (inputs are: labour, machinery, electricity, rents per hour). Maliranta also points to time effects (i.e. in the implementation of technology in a newly acquired plant).

A similar question related to productivity gaps is raised in the literature on acquisitions, namely are high-productivity properties more likely to be overtaken and how do they perform after acquisition. McGuckin and Nguyen (1995) show that high-productivity plants (in the U.S. food industry) are indeed more likely to be taken over and that their growth performance tends to be better compared to plants without ownership change. A clear drawback of this study is that it does not differentiate between domestic and foreign acquisitions.

Also Moden (1998) studies post-acquisition productivity focusing on foreign acquisitions in Sweden. He finds that while foreign acquisitions have increased labour productivity, the development of total factor productivity is more uncertain which he attributes to time effects. Such studies give some support to the "restricted matching hypothesis", namely that FOCs pick the *ex post* better performing firms, yet this seems to depend on firm size and on the initial productivity level.

Growth and *size* gaps are explicitly studied by Kumar (1984), Blonigen & Tomlin (1999) and Oulton (1998a). Howenstine and Zeile (1992) provide descriptive evidence on a plant-scale gap, maintaining that FO establishments tend to be larger, on average, than U.S.-owned establishments. This scale effect may be responsible for a large portion of the above described skill and capital intensity of FO establishments compared to U.S. establishments. From a sample of 1,752 establishments which survived over 1973-93 Oulton (1998a) concludes that the gap of the annual average growth rate of U.S. owned establishments in the UK was 1.82 percentage points compared to UK owned establishments during 1973-93. Also, value-added and capital per employee showed higher growth rates. Oulton reports considerable differences between U.S. owned and other foreign establishments in the UK.

An explicit study on plant growth is Blonigen and Tomlin (1999), who compare size and growth of Japanese plants in the U.S. They search for evidence on Gibrat's Law and ask whether size and growth of FO and DO establishments in the U.S. are similar. Since firm growth is related to firm age, they control (in addition to other variables) for age. Furthermore, since the type of entry of Japanese firms into the U.S. market may affect growth-rates of the affiliate via learning, they distinguish between acquisitions and green-field FDI. They clearly reject Gibrat's Law, since smaller plants grow faster than larger ones. Their findings also reveal substantial learning effects and effects of earlier investments on the likelihood of future investments.

Turning to profitability gaps, it should be emphasized that profitability is one plant level characteristic where FOCs usually perform worse than DOCs (reasons are provided in section 4 below). Using company-level data, Mataloni finds that only a small portion of the gap can be explained by an industry effect (12%), while market share and age effects (i.e. market power and newness) are significantly correlated with the profitability gap. A paper by Kumar (1990) examines the determinants of profit margins of affiliates of MNEs and local firms in 43 Indian manufacturing industries. Here, FOCs have higher profit margins than DOCs, which is explained by greater protection from entry-barriers of MNEs and a persistent knowledge advantage of MNEs (as a basis for FSAs). Contrary to such results, comparing purely domestic UK-firms and UK-firms with FDI, Kumar (1984) shows, that the degree of overseas operations has no strong influence on profitability or growth. Providing evidence on post-acquisition performance from a large panel of UK firms, Dickerson et al. (1997) report that acquisitions have a detrimental effect on company performance (pre-tax profits). Internal growth yields a higher rate of return than external growth.[3]

Empirical evidence on *Austria* is still limited (Glatz and Moser 1989, Gugler 1998, Hahn et al. 1996). The evidence is largely descriptive and is suggestive of a residual "ownership" effect on variables like profitability (Gugler 1998), productivity and value-added. The empirical part below aims at adding to this evidence on a firm-level basis.

By way of a summary, the questions posed at the end of the last subsection can now be answered as follows:

3 To our knowledge, no such evidence has been produced comparing FOCs and DOCs, i.e. whether inward FDI was made in the form of acquisition or green-field FDI and how this relates to profitability.

1. Is the gap an artefact?

Here, a *caveat* is in order: The possibility of a spurious relationship exists "between foreign-ownership levels and productivity levels. [...] Observations of higher average productivity levels among foreign affiliates may simply reflect the fact that foreign affiliates are clustered in industries enjoying above-average productivity levels for reasons unrelated to Foreign Direct Investment" (Globerman et al. 1997, p. 144; Howenstine and Zeile 1992, p. 53). In many cases, controlling for firm-specific variables reduces substantially the weight of an ownership variable, putting into question some of the gaps revealed by descriptive statistics.

2. How are the gaps explained?

and

Why does a gap remain between DOCs and FOCs even after controlling for various other variables?

Generally, the empirical evidence supports two arguments: First, when performance gaps "disappear" after controlling for firm and industry characteristics, they - but not foreign-ownership - account for most of the variation. When gaps do not exist on the industry level, but on the plant level, the intra-industry variation is larger than the inter-industry variation. This has been referred to as the "*structural effect*" or "*industry composition effect*" as isolated, for example, in Davies and Lyons (1991).

Second, when gaps are persistent even after controlling for firm and industry characteristics, the multinationality of the firms (i.e. the international multi-plant firm) (plants) and their FSAs are more important than foreign ownership. (see e.g. Doms and Jensen 1998, p. 251; Kumar, 1984) In this case, DOCs and FOCs which are multinational show a similar performance and this performance is superior to that of purely domestic DOCs. This suggests the possibility of intra-firm spillovers between plants as well as inter-firm spillovers between FOCs and DOCs and has been termed the "*ownership effect*".

Productivity gap

Globerman et al. (1997) address two sources to explain a productivity gap. The first source are differentials in the mix of activities undertaken by FOCs and DOCs. „Strategic demands frequently require that individual units be assigned differentiated roles" (Gomes and Ramaswamy 1999, p. 177) which give rise to performance gaps within foreign affiliates themselves and creates a problem for comparisons as discussed

in section 3. If FOCs undertake a set of activities, different from that pursued by domestic plants, they might perform better (in the case of a high degree of specialisation, e.g. in research units, which employ highly trained staff; or in highly-automated production facilities, which require highly qualified blue-collar workers and have above average productivity levels). The FO affiliates may also perform worse than DO plants (e.g., in the case of screw-driver factories, which employ low-skilled workers, pay below average wage levels). The lower skill-intensity of Japanese green-field investments in the U.S., as reported e.g. by Blonigen and Slaughter (1999), is a recent example for the latter case.

The second source of productivity gaps relates to differences in FSAs. Here, ownership matters. Yet, it is not the mere existence of FSAs that give rise to superior productivity, but the multinationality of the firms. These results are derived from comparisons of DO and FO Multinationals, instead of FOCs vs. all DOCs. This aspect is stressed by Doms and Jensen (1998), who find only very few performance gaps between U.S. DO and FO Multinationals in the U.S. (This might also be an indication for the well-known fact that FSAs across countries are more similar on the industry level than across firms in different industries in one country.) Globerman et al. (1997, p. 154) provide two types of advantages of being part of a global network within the MNEs: (a) FO affiliates enjoy better access to foreign markets through intra-firm trade and network economies, such that they can operate more profitable on a larger scale. Size and scale effects have been revealed in various studies. (b) FO affiliates can draw on their parent's managerial expertise to manage the complexity of larger scale. In addition, the importance of spillovers between plants within a multi-plant firm should not be underestimated.

Also, as a third source, failure of domestic producers to adopt ' best practice technology' or ' frontier technology" (Maliranta 1997, p. 2; Oulton 1998a, p. 50) may explain productivity gaps. Inferior access to technology by DOCs may have several explanations. Their geographical space of operation may be smaller, they may be absent from certain markets at all, lacking the possibility to tap into the local knowledge base or not profitting from regional agglomerations; the feedback from their affiliates may be less efficient or the activities of the affiliates do not allow technology sourcing; they might not have the necessary information; or they lack the capability to make efficient use of acquired technology (i.e. the absorptive capacity), which is related to learning processes and path dependence. Since most of these factors are related to multinationality, it remains an empirical question whether FOCs or DOCs show better

performance. Such issues have been termed “best practice model” vs. “random model” by Davies and Lyons (1991). The latter suggests that FSAs may be randomly distributed, i.e. they are not systematically related to industry factors.

The fourth source of productivity gaps is simply a higher input intensity per worker, which is related to capital or technology. Yet, as Globerman et al. (1997) show, the gap vanishes, once they control for size or capital intensity. Oulton (1998a) provides two reasons, why FOCs may be more capital intensive than DOCs, all of them are related to higher costs of capital: (a) DOCs face higher costs of capital than FOCs; and (b) DOCs are more exposed to the home market, while FOCs are better able to spread risk globally (but this applies to globalised DOCs as well and depends on the environment in a certain nation). Also, DOCs have to rely on credit markets whereas foreign owned ones have access the cheep sources of credit (e.g. the cash-flow of the MNE-network) without paying a risk premium. But this again relates to the question of national vs. multinational firms rather than to DOCs vs. FOCs.

A fifth source of productivity gaps that has been identified by the literature concerning acquisitions is that FOCs may be particularly good at “picking the winner” (Oulton 1998a, b). The “restricted matching hypothesis” (McGuckin and Nguyen 1995), i.e. that firms with above average productivity are more likely to be taken over, is supported by many studies, but it is difficult to establish cause and effect and also in most cases, it is not clear, whether DOCs or FOCs are involved in the acquisition. An exception is evidence provided by Moden (1998), who reports that in Sweden it is primarily high productivity firms which are acquired by FOCs. (There is also a size effect, in that lower productivity firms are acquired if they are larger firms (cf. Feliciano and Lipsey 1999, p. 11.)

Profitability gap

Profitability gaps between firms can be referred to accounting factors, to managerial explanations and to economic factors. Among the *accounting* factors, the motivation of MNEs to minimise their tax burden may be responsible for the low performance of FOCs. On the other hand, the *management* in a foreign-owned affiliate may be under higher pressure than a management of a DOC, especially after a takeover. Therefore, these managers “set their sights higher” (Ylä-Antilla and Ali-Yrkkö 1997) and normally they also seek to have a co-operative relationship with the workers in order to pursue the objectives set up by their foreign parent company. Among the *economic* factors, on

the one hand the higher capital intensity (see above), which is a primary force behind an increase in labour productivity, may lead to higher profit margins. Higher market power of firms in MNE-networks might be another source.

On the other hand, the higher capital intensity may make the firm accept lower profitability abroad, in case the FOCs have lower costs of capital at home. The more global the financial markets are and the lower the barriers to sourcing funds abroad, the smaller will be the interest differentials and the easier will be access to capital. Moreover, connected to firm size, market share has been identified to be a major explanatory variable of profitability (Matalony 2000).

The role of age (see also below) as a determinant of profitability is twofold. On the one hand, young affiliates of FOCs entering a new market may have to be cross-subsidised by their parent for some time. Such FOCs may have high start-up and restructuring costs. Blonigen and Tomlin (1999) maintain that newly acquired firms have a higher debt burden which is responsible for the low profitability. On the other hand, established affiliates which operate profitable, may motivate the firm to use transfer pricing to shift profits (see above). This depends very much on the maturity of the market, as profits are generally declining in mature industries.

The type of entry is important, since a green-field investment enjoys all the advantages of a newcomer, i.e. it has the advantage of the choice of the optimum location, the implementation of the state-of-the-art technology and the choice of the optimum plant size. Established firms, on the other hand, may be located in marginal locations etc. Thus, a performance gap may arise simply from the different age of FOCs and DOCs. This information is hardly available and only few studies are able to introduce age as a control variable. (see e.g. Blonigen and Tomlin, 1999).

Growth gaps

How is firm growth related to industry structure and ownership of FSAs? Empirical studies reveal that plant size and plant growth are not independent. Blonigen and Tomlin, (1999) reject Gibrat's law on the basis of evidence of FOCs in the U.S.

There are several reasons why FOCs may grow slower than DOCs. Blonigen and Tomlin provide an argument for slower growth rates of FOCs in the case of first entry into a market, because of uncertainties like (a) inefficiencies; (b) obtaining material

inputs. Such inefficiencies may arise from monitoring problems of workers (see below) or other factors. Another factor behind a slower growth of FOCs is their lower capital intensity in case they start as small plants. In this case the growth process may take long time. This argument is again not connected to ownership, but to optimum plant size in an industry. Blonigen and Tomlin also report that prior experience and learning are substantial for FOCs subsequent investment and growth-performance.

Because growth is related to learning, the type of FDI (green-field vs. M&A) is important. It makes a huge difference whether an investing firm acquires a certain stock of know-how instantaneously and has to adapt it or whether this has to be built from scratch, not reaping any benefits of path-dependence. Also Matalony (2000) studies the lower experience of green-field investors vs. acquirers in the case of FDI in the U.S.

Wage and Skill gap

Wage gaps between firm in general arise for a number of economic and institutional reasons. Possible sources of earnings-differentials in FOCs and DOCs are the following and some of them relate to ownership, but most relate to industry-specific and institutional factors:

The organisation of production by DOCs may lead to the fact, that FOCs employ more skill-intensive employees (Doms and Jensen 1998, p. 240f). While empirical results on wage gaps determined by skill are not unequivocal, they have been established in many studies (see below).

Also, higher wages may give rise to higher levels of effort by workers. The high capital intensity of FOCs that has been found in many empirical studies (see above), encourages firms to pay efficiency wages, since it is more costly for capital intensive firms to suffer employee shirking or absenteeism (Globerman et al. 1997, p. 153).

The main institutional argument relates to the role of labour unions. On the one hand, FOCs may pay a wage premium to deter unionization (Doms and Jensen 1998, p. 243). On the other hand, where DOCs enter an industry with a high level of unionisation, the higher degree of unionisation leads to higher wages. Such evidence is produced by Feliciano and Lipsey (1999), on the distribution of FOCs in the U.S. by states.

If there is resistance against a foreign management, e.g. in the case of a takeover, higher wages may provide an incentive of domestic workers to accept foreign management.

There is clearly another variable that has to be controlled for with regard to wages. Since larger firms pay higher wages, the size effect is important here. The size effect loses considerable importance once the comparison is shifted from DOCs vs. FOCs to $DOCs^{MNEs}$ vs. $FOCs^{MNEs}$.

An ownership-related argument builds on FSAs. In this view, the higher wage in FOCs is the outcome of a bargaining game, in which workers share the extra rents generated by the superior technologies (Head, 1998, p. 257).

An interesting argument is provided by Lipsey and Feliciano (1999, p. 9). They maintain that "workers are not the same." Even comparable DOCs in the same industry may pay lower wages than FOCs, if the latter consider themselves less capable of monitoring workers in a foreign environment.

The main source of skill gaps lies in the fact that FOCs through their FSAs use superior technology. Such technology may require fewer workers of higher skill. This argument is clearly related to ownership of FSAs and horizontal integration of production internationally.

Despite the conceptual separation of the effects here, it must be emphasised that they are, of course, inter-related. For example, a skill-gap may be related to higher capital-intensity, which reflects a newer technology, which consequently might lead to a growth-gap etc. etc.

3. *What is the appropriate level of analysis: firm, establishment, plant, enterprise level?*
Empirical evidence is still constrained by a lack of meaningful data[4], particularly on the firm level, and methodological problems. Therefore comparative studies are scarce. Most of the theoretical arguments refer to *firm* or company level, while empirical analysis is often on the *plant* level. Plant level analysis generally excludes spillovers between plants of the same company (an exception is e.g. Maliranta 1997). Plant level analysis also excludes the crucial point of multinationality and the creation and use of

4 Large *and* long-run databases (such as LRD, ARD) are often on the establishment (plant, location) level rather than on the firm level.

FSAs. Doms and Jensen (1998, p. 238) mention “auxiliary establishments” as an additional source of performance gaps. Such establishments like R&D-units, controlling departments etc. create overhead costs, which may reduce the comparability between plants.

Another related constraint is the aggregation level of industries. The heterogeneity across companies within industries is considerable (Doms and Jensen, p. 236), which is reflected by intra-industry variances which are sometimes larger than inter-industry variances. Also, there may be substantial variation across sectors in the within-industry changes in foreign-affiliate presence. (Blonigen and Slaughter, 1999, p. 3) Industry analysis therefore would hide important information. Moreover, the level of disaggregation is inversely related to the number of observations. Yet, a shift from firm to plant level analysis allows not only to use more observations[5], but also reveals the firm-level heterogeneity within the groups of DOCs and FOCs. For example, plants can be classified in more disaggregated industries compared to firms, where all plants are consolidated and classified in a single industry. It is therefore desirable to link plant level and company-level data, yet this is hardly possible.[6]

Also, a change of ownership of firms in long-run time series may result in a loss of usable data.

4. Is the gap correlated by parent country? (mostly US vs. Non-US)

Parent country distribution matters. Davies and Lyons (1997) point out that the firm productivity gap is correlated with international productivity differentials between parent country and host country. Also Oulton (1998a) emphasises an *additional* productivity advantage of US affiliates in the UK of 9-20%. In contrast, Globerman et al. (1997) find no significant difference between parent countries. These results may also derive from a different mix of activities of affiliates from adjacent or far-away parent countries. As has been pointed out above, geographical proximity is a driver of FDI, because it lowers the costs of establishment. Also, the level of economic integration of countries has an effect on the organisation of production (geographic centralisation or dispersion), so that integrated countries may be served via exports from larger plants, while production will be set up in outsider countries, where firms face entry-barriers like tariffs. Similar arguments apply in the case of high transport costs.

5 Often, more information is collected on the plant level than on the firm level.
6 For a more detailed discussion, see e.g. Howenstine and Zeile, 1992, p. 45.

Overall, the survey has shown the importance of the theoretical arguments set out in section 2. We now turn to the empirical part which focuses on productivity and growth gaps.

5. EMPIRICAL ESTIMATES

The empirical investigation into the effects of foreign ownership for Austrian manufacturing firms is based on the Spring Investment Surveys of the years 1997 to 2000, which WIFO conducts annually in co-operation with the EU-DG II (see European Commission, 1997 for details on the design of these surveys). The Investment survey is not compulsory and includes about 700 respondents who regularly supply complete answers for most of the questions. It is not a random sample of firms, but rather follows the development of a fixed 'test group' of mainly large and mature firms over the course of years. Due to the small number of newly founded firms and new entries in the panel the test group is not representative for the whole population but only for the larger size classes. In addition, it was not always possible to attain a clear picture on mergers and acquisitions which may be partially hidden in the database and cannot be controlled for in all cases.

Formerly, the WIFO Investment Survey has defined the plant as basic unit of measurement. However, in recent years the majority of firms prefer to respond at the corporate level. So we have skipped all responses at the plant level and base our comparison at the corporate level. For enterprises with multilayer-organisations, the (incorporated) daughters active under the control of the headquarter and responsible for particular branches are included, rather than the whole consolidated enterprise. However, this is not possible for all firms and depends on the degree of integration and consolidation of the individual firm. In this sense our basis of comparison is also second best, although, as argued above, from a conceptual point of view the unit of comparison is the correct one. Additionally, we excluded all firms with less than 10 employees on average as well as those with less than two observations for the period 1996-1999.

The Survey provides information on employment, sales, investments[7], export propensity (EU and countries outside the EU), market shares in the EU, and cash-flow. The last four variables are evaluated on an ordinal scale, according to size classes. For example, the question on export propensity asks for the share of exports to EU-countries in sales from domestic production and is formulated as follows: „no exports, up to 10%, 10% to 20%, 20% to 30%, . . . , 90% to 100%." This form of questioning greatly increases the general acceptance of the questionnaire by firms, but on the other hand implies that some information is lost. With exception of the cash-flow variable, which has open intervals at tails of the distribution, we valued all stages at the middle of the interval. For all the figures we calculate averages over the period 1996-1999 and relate them to the status of ownership at the beginning of the estimation period 1996. The averages of the cash-flow variable - as it is not continuous - have been mapped into three size classes '<6%', '6-12%' and '>12%'.

The status of ownership has been inferred from various other sources and refers to the year 1996 (1997 if 1996 has been unavailable). First, we use information on the top 500 Austrian firms published by Trend. A second source is Dun & Bradstreet's ' Who owns Whom'. We classified a firm as foreign owned, if the ultimate owner holds a majority share and is based in a foreign country. Additionally, we classified only those firms as foreign owned if, according to the information at hand, the foreign owner is an operative headquarter which controls the affiliate and not just a shareholder. Despite having no exact definition what makes up a multinational enterprise (MNE), the foreign ownership dummy indicates whether an Austrian firm is part of an foreign MNEs-network. Additionally, we checked whether a firm belongs to a German MNE. As argued above, there are some arguments that the benefits of foreign ownership – if they exist at all – might be higher if the foreign owner operates in a similar business environment. Additionally, we have information from the investment survey whether the firms operate foreign affiliates. Thus, concerning the form of ownership, we are able to distinguish four types: domestically-owned non-MNEs ($DOCs^{non\text{-}MNEs)}$, domestically-owned MNEs ($DOCs^{MNEs}$), foreign-owned non-German companies ($FOCs^{non\text{-}German}$) and foreign-owned German companies ($FOCs^{German}$). These four groups of firms allow us to

7 The survey asks for both realised values of sales, employment and investment which are lagging two years after of the survey date as well as 4 planned figures in four consecutive bi-annual surveys (spring and autumn) afterwards. Missing values and those referring to the year 1999 where the realisations are not yet available the most recent available plan (4 th. plan in the terminology of these surveys, see European Commission, 1997) of the spring survey has been put to use.

compare DOCs^{MNEs} to FOCs and hence to discriminate between pure ownership effects and those arising from FSAs and the membership in a MNE-network.

At the descriptive level, the Kruskal-Wallis test (which is based on the comparison of ranks) in Table 1 indicates marked differences in firm characteristics of DOCs$^{non\text{-}MNEs}$ and FOCs. On average the latter are significantly larger both in terms of employment and sales, more productive (according to the nominal sales/employment ratio), more capital intensive (at least at 10%; measured in terms of average of the investment to employment ratio). They exhibit higher export orientation and, according to their subjective estimate, hold a higher share in the European market. Compared to DOCs^{MNEs}, the FOCs differ only marginally with exception of labour productivity, where the FOCs again show a superior performance.

In contrast, with respect to growth in size there are no significant differences between FOCs and both DOCs^{MNEs} and DOCs$^{non\text{-}MNEs}$. Rather growth seems to be mainly randomly determined in all groups of firms. The gap in the growth of productivity between FOCs and DOCs is not significant.

As a measure of profitability in Table 2 the average cash-flow over the period 1996 to 1999 is classified in three stages (<6%, 6-12% and >12%). The cross tabulation with the foreign ownership variable indicates, that the share of firms with medium and high cash-flows is somewhat higher for firms being member of a MNE-network. A simple chi-square test on independence of these two variables, which is admittedly a rather crude test, does not reject the null hypothesis of any differences (or association of this two variables). However, comparing domestically owned MNEs to FOCs shows that the share of firms in the low and medium cash-flow classes is lower for the former (however, again the null hypothesis of no association cannot be rejected). So we conclude that - if there is any descriptive evidence at all - the DOCs$^{non\text{-}MNEs}$ perform worse than FOCs, but not the DOCs^{MNEs}.

German-owned firms do not show any *additional* difference to the Austrian owned companies. The hypotheses of higher gaps arising from the cultural proximity does not find support. Rather German-owned firms largely exhibit the same characteristics as the other FOCs. Only firm size forms an exception, German-owned firms are on average larger than FOCs from other parent countries.

As is often the case with firm level data, the distributions of the performance variables, especially the growth rates exhibits long flat tails, included by a considerable number of extreme values which would have to be classified as outliers with OLS estimators. Hence, in the regressions below we use the LAD-estimators or median regressions. The LAD estimator is more robust with respect to outliers and minimises the sum over absolute errors and weights extreme values lower than the OLS-estimators do. It achieves almost the same efficiency as OLS in situations with independent, but non-normal errors (*Hamilton*, 1998). In order to account for possible heteroscedasticity which would lead to underestimated standard errors using the standard estimation approach (*Rogers*, 1992) the standard errors are calculated by bootstrap resampling with 100 replications.

Table 3 provides regression results for labour productivity, investment propensity and cash-flow as dependent variables. As mentioned above, the latter is coded in three size classes, so we estimate an ordered probit to predict the probability that a firm belongs to one of the three categories.

With respect to productivity, here measured as labour productivity in nominal terms (sales over employment), we follow the large literature on productivity and use a simple Cobb-Douglas framework (see e.g. Maliranta, 1997 among others for a detailed discussion of the proper econometric set-up). We regress the log of labour productivity on the log of employment, the average investment to sales ratio as a proxy of the stock of capital and 16 industry and 2 regional dummies as additional control variables. As a measure of the productivity gap, which can be directly associated with foreign ownership, we introduce our ownership dummies using $DOCs^{MNEs}$ as the baseline. The difference between the German ownership dummy and that of the non-German foreign ownership dummy measures the additional direct effect from cultural proximity. The estimation results indicate a productivity gap between $FOCs^{non\text{-}German}$ and $DOCs^{MNEs}$ of approximately 12 percentage points. The estimate is not significant, however, and due to the approximation of the stock of capital by the average investment to sales ratio, this is only a rough estimate. For $FOCs^{German}$, there is no additional ownership effect. Similar to other studies (Davies and Lyons, 1991, Maliranta, 1997, Oulton, 1998a, Pfaffermayr, 1999[8]) which, however, mostly do not control whether the domestic firms

8 Based on the same data-set as a panel, Pfaffermayr (1999) uses the foreign ownership dummy as a control variable to test for effects of foreign affiliates on domestic performance. Since there a capital stock has been constructed and an industry share of intermediates has been imputed, the effect of foreign ownership has turned out somewhat higher but likewise significant.

are MNEs or not, our results indicate that DOCs$^{non\text{-}MNEs}$ perform worse. Compared to FOCs$^{non\text{-}German}$ the gap is approximately 0.21% and significant ($F(1,496) = 5.73$ with $p= 0.017$). Note, the difference to FOCs^{German} is approximately 11%, but insignificant.

In the productivity growth equation (Table 4) the foreign-ownership dummies are insignificant suggesting no systematic difference to the baseline (DOCs^{MNEs}). The gap between FOCs and DOCs$^{non\text{-}MNEs}$ is likewise higher than that to the baseline but not significant. Therefore, with respect to the productivity gap there is some evidence, that not foreign ownership *per se* is important, but belonging to or operating a MNE network in order to optimally exploit the FSAs is one important factor behind the productivity gap.

To explain investment behaviour we use the investment to sales ratio as the dependent variable and transform it by the logit-transformation to secure that the prediction lies in the [0,1] interval. Following the huge literature on investment we introduce growth in sales, dummies on the two upper cash-flow size classes and the degree of export orientation as explanatory variables. With exception of the export ratio to non-EU countries, all variables are significant and, after controlling for a number of influences, the direct impact of foreign ownership vanishes. This is an indication that it is mainly firm performance and other characteristics like sales growth, export orientation and profitability (the access to high cash-flows as cheap source of finance) which determine investment behaviour.[9] The different form of ownership *per se* has no direct effect, although the DOCs$^{non\text{-}MNEs}$ exhibit a higher investment to sales ratio than the base, yet insignificant. However, since FOCs differ according to characteristics used to explain the profitability gap, we conclude that ownership effects are mainly indirect and more pronounced for FOCs$^{non\text{-}German}$.

The ordered-probit equation explains the probability that a firm belongs to one of the three cash-flow classes (low, medium and high). It is based on the standard specification used in industrial economics which introduces market share and capital intensity (which is to some extent endogenous and should be interpreted with care) as the main explanatory variables (Martin, 1993). Both are highly significant. The dummy for DOCs$^{non\text{-}MNEs}$ is significantly negative, while the two foreign ownership dummies are not, implying that their profitability does not systematically deviate from the base line (domestically owned MNEs). Setting the foreign ownership dummy counterfactually to

9 On contrary results see Oulton 1998a, who analyses capital intensity.

1 holding all else equal results in 33.4% chance to be in the highest profitability class as compared to the actual prediction of 21.6%. This result again emphasises that foreign ownership *per se* does not explain the gap.

Table 4 refers to average firm growth measured both in terms of sales and employment growth. The econometric specification is based on the traditional approaches which test Gibrat's law of proportionate growth and introduces initial size, export and investment propensity as well as industry dummies and two dummies for the western and the southern region as explanatory variables (see e.g. Bloningen and Tomlin, 1999). Consistent with the descriptive evidence we do not find any impact of foreign ownership (neither in general nor in case of German ownership) after controlling for these growth determinants. Rather, firm growth is mainly randomly determined and idiosyncratic with systematic influences being of minor importance.

6. SUMMARY AND CONCLUSIONS

The empirical evidence for a sample of Austrian manufacturing firms suggests that the direct positive effect of participating in a foreign MNE's network can mainly be found in productivity and profitability. This is in line with the hypothesis that these firms can draw on ownership-specific advantages and receive spillovers from the network which DOCs could not or only to a lower extent. Distinguishing between $DOCs^{MNEs}$ and $DOCs^{non\text{-}MNEs}$ proves important in this respect in order to discriminate between the effects of foreign ownership *per se* and the gains of MNE-networks. The productivity and profitability gaps refer to the former but not to the latter. Concerning investment propensity and firm growth there seem to be no direct effects (gaps) after controlling for the most important determinants. However, as FOCs are significantly different with respect to several important characteristics like size, capital intensity, export propensity and market share there may be important indirect effects which could explain the gap. For example, an increase of the cash-flow may be mainly due to a firm's growing market share; or the productivity gap can be partly explained by the higher capital intensity. We find no additional effect of cultural proximity as it would materialise for German owned companies. In contrast, there is weak evidence that other foreign firms perform better, although effects could not be estimated precisely. Future research should look at the channels and size of spillovers in more detail to find more evidence on the advantage of operating in a MNE's network.

Several empirical studies distinguishing the type of FDI (horizontal vs. vertical integration) or the market entry strategy (green-field vs. acquisition) revealed different impacts on the gaps examined. Affiliates reap variegated advantages from being part of a MNE's network such as access to firm-specific human capital, information exchange, technology transfer, transfer pricing etc. Little is known so far on the role of the affiliates within MNE's networks and the economic nature of the interactions and exchanges between affiliates.

On the basis of the evidence presented, three aspects are of interest for economic policy. First, economic should enforce inter- and intra company spillovers to improve the performance of the manufacturing sector and the structure of ownership is important in this respect. Based on the evidence of significant spillovers within MNEs one option is to support *foreign entry* by take-overs or by greenfield investment (i.e. to promote the direct effects of foreign ownership.). However, due to the rather small direct ownership effects this may not very efficient and to many governments it is also not attractive, as public concern over foreign ownership is widespread. Also, the danger that locational competition may bid away most of the benefits after subtracting the costs of local incentive packages cannot be denied. (Head 1998, p. 256) A more efficient approach would focus on *DOCs* and seek to increase their degree of internationalisation (e.g. by providing information about foreign markets, through state insurance packages etc.). This should induce more investments in FSAs, a catching-up and a reduction or even closing of the gap. Still another option is to stimulate indirect effects, most prominently the industry composition, through structural policies and the encouragement of inter firm spillovers. The second important aspect focuses on rents accruing to the host country from successful FOCs. Since these companies usually engage in transfer pricing to avoid this, the ability of rent extraction by the host country is often limited. A third concern for economic policy is the effect of FOCs on competition, especially if FOCs enter the domestic market by a take-over. This is an important aspect of competition policy, which has not been subject of the present paper.

REFERENCES

Allan, K. and Frances, R. (1999)
The tangible contribution of R&D spending foreign-owned plants to a host region: a plant level study of the Irish Manufacturing sector (1980-1996), *Trinity Economic Papers*, No. 99/7, Dublin, Ireland.

Bellak, C. (2000)
Large Multinationals from Small Countries. The case of „Wienerberger" Brick Company (Austria), in: T. Almor and Hashai, N. (eds.), Festschrift for Seev Hirsch, forthcoming October, Tel Aviv University.

Blanchflower, D. (1984)
Comparative Pay Levels in Domestically-owned and foreign-owned Manufacturing Plants: A Comment, *British Journal of Industrial Relations*, Vol. 22, pp. 265-267.

Blonigen, Bruce A. and KaSaundra Tomlin (1999)
Size and Growth of Japanese Plants in the United States, NBER Working Paper 7275, Cambridge.

Blonigen, Bruce A. and Matthew J. Slaughter (1999)
Foreign-Affiliate Activity and U.S. Skill Upgrading, NBER Working Paper 7040, Cambridge.

Brainard, R. (1993)
Globalisation and Corporate Nationality, *STI Review*, No. 13, December, pp. 163-190.

Carmichael, F. (1992)
Multinational Enterprise and Strikes: Theory and Evidence, *Scottish Journal of Political Economy*, Vol. 39, No. 1, February, pp. 52-68.

Caves, R. (1996)
Multinational enterprise and economic analysis, Cambridge UP.

Cohen, B.I. (1973)
Comparative Behavior of Foreign and Domestic Export Firms in a Developing Economy, *Review of Economics and Statistics*, Vol. 55, pp. 190-197.

Cousineau, J.-M., R. Lacroix, and D. Vachon (1989)
Foreign Ownership and Strike Activity in Canada, Working Paper Nr. 8927, Department of Economics, University of Montreal.

Creigh, S.W. and P. Makeham (1978)
Foreign Ownership and Strike-Proneness: A Research Note, *British Journal of Industrial Relations*, Vol. 16, pp. 369-372.

Davies, S.W. and B.R. Lyons (199?)
The Industrial Organisation of Multinational Enterprise, Blackwell.

Davies, S.W. and B.R. Lyons (1991)
Characterising Relative Performance: The Productivity Advantage of Foreign Owned Firms in the UK, *Oxford Economic Papers*, Vol. 43, pp. 584-595.

Dickerson, A.P., Gibson, H.D. and Tsakalotos, E. (1997)
The Impact of Acquisitions on Company Performance: Evidence from a Large Panel of UK Firms, *Oxford Economic Papers*, No. 49, pp. 344-361.

Doms, M.E. and J.B. Jensen (1998)
Comparing Wages, Skills, and Productivity between Domestically and Foreign-Owned Manufacturing Establishments in the United States in: Baldwin, R.E., R.E.

Lipsey, and J.D. Richardson (eds) *Geography and Ownership as Bases for Economic Accounting*, Studies in Income and Wealth, Vol. 59, pp. 235-255.

Dunning, J.H. (1999)
Globalization and the Theory of MNE Activitiy, Discussion Papers in International Investment and Management, University of Reading, No. 264, Series B, Vol. XI.

Egger,P., Pfaffermayr, M. and Wolfmayr-Schnitzer, Y. (2000)
The International Fragmentation of the Value Added Chain: The Effects of Outsourcing to Eastern Europe on Productivity, Employment and Wages in Austrian Manufacturing, WIFO.

European Commission (1997)
The Joint Harmonized EU Programme of Business and Consumer Surveys, *European Economy*, Reports and Studies 6.

Feliciano, Z. and R. E. Lipsey (1999)
Foreign Ownership and Wages in the United States, 1987-1992, NBER Working Paper 6932, Cambridge.

Fors, G. (1997)
Utilization of R&D Results in the Home and Foreign Plants of Multinationals, *The Journal of Industrial Economics*, June, Vol. XLV, No. 2, pp. 341-358.

Glatz, H. und Moser, H. (1989)
Ausländische Direktinvestitionen in Österreich, Campus, Frankfurt.

Globerman, Steven, John C. Ries and Ilan Vertinsky (1997)
The economic performance of foreign affiliates in Canada, *Canadian Journal of Economics*, Vol. XXVII, No. 1, pp. 143-156.

Gomes, L. and Ramaswamy, K. (1999)
An Empirical Examination of the Form of Relationship Between Multinationality and Performance, *Journal of International Business Studies*, Vol. 30, No. 1, First Quarter, pp. 173-188.

Greer, C.R. and J.C. Shearer (1981)
Do Foreign-Owned Firms Practice Unconventional Labor Relations? *Monthly Labor Review*, Jg. 104, S. 44-48.

Gugler, K. (1998)
Corporate Ownership Structure in Austria, *Empirica*, Vol. 25, No. 3, pp. 285-307.

Hahn, F. R., Mooslechner, P., Michael Pfaffermayr (1996)
Globalisierungstendenzen in der österreichischen Wirtschaft, WIFO, Vienna.
Head (1998) fehlt noch??

Howenstine, N.G. and W.J. Zeile (1992)
Foreign Direct Investment in the United Stages: Establishment Data for 1987, *Survey of Current Business*, October, pp. 44-58.

Kumar, M.S. (1984)
Comparative Analysis of UK Domestic and International Firms, *Journal of Economic Studies*, Vol. 11, No. 3, pp. 26-42.

Kumar, N. (1990)
Mobility Barriers and Profitability of Multinational and Local Enterprises in Indian Manufacturing, *The Journal of Industrial Economics,* Vol. XXXVIII, No. 4, pp. 449-463.

LaPorta, R., Lopez-de-Silanes, F. and A. Shleifer (1999)
Corporate Ownership Around the World, *The Journal of Finance*, Vol. LIV, No. 2, pp. 471-517.??nicht zitiert??

Little, J.S. (1981)
The Financial Health of U.S. Manufacturing Firms Acquired by Foreigners, *New England Economic Review*, Vol. ?, No. ?, pp. 5-18.
Maliranta, M. (1997)
Plant Productivity in Finnish Manufacturing, *ETLA Discussion Papers*, No. 612, Helsinki.
Markusen J. R. (1995)
The Boundaries of Multinational Enterprises and the Theory of International Trade, *Journal of Economic Perspectives*, Vol. 9, No. 2, Spring, pp. 169-189.
Martin, St. (1993)
Advanced Industrial Economics, Blackwell, Oxford and Cambridge MA.
Matalony, R.J. (2000)
An Examination of the Low Rates of Return of Foreign-Owned U.S. Companies, *Survey of Current Business*, March, pp. 55-73.
McGuckin, R.H. and S.V. Nguyen (1995)
On productivity and plant ownership change: new evidence from the Longitudinal Research Database, *RAND Journal of Economics*, Vol. 26, No. 2, Summer, pp. 257-276.
Moden, K.-M. (1998)
Foreign acquisitions of Swedish companies: Effects on R&D and Productivity. IUI, Stockholm, mimeographed 1998.
Nelson, R. Nelson, R.R. (1991)
Why Do Firms Differ, and How Does It Matter?, *Strategic Management Journal*, Vol. 14, pp. 61-74.
Neudorfer, P. (1995)
Indikatoren zu den Direktinvestitionen, Berichte und Studien der OeNB, No. 4, Vienna, pp. 69-84.
OECD (1994)
The Performance of Foreign Affiliates in OECD Countries, Paris.
OECD (1996)
Globalisation of Industry, Paris.
Oulton, N. (1998a)
Investment, Capital and Foreign Ownership in UK Manufacturing, *NIESR Discussion Paper*, No. 141, August.
Oulton, N. (1998b)
Labour Productivity and Foreign Ownership, *NIESR Discussion Paper*, No. 143, September.
Pfaffermayr, M. (1999)
Ownership Advantages, Foreign Production and Productivity - Evidence from Austrian Manufacturing, *The Review of Industrial Organisation 15(4)*, pp. 379-396.
Porter, M.E. (1990)
The Competitive Advantage of Nations, Harvard UP.
Scherer, F.M., Bechstein, A., Murphy, Kaufer, E., Murphy, R.D. (1975)
The Economics of Multi-Plant Operation: An International Comparison Study, Harvard University Press, Cambridge MA.

Sutton, J. (1991)
Sunk Cost and Market Structure: Price Competition, Advertising and the Evolution of Concentration, MIT-Press, Cambridge MA.
Ylä-Anttila, P. und Ali-Yrkkö, J. (1997)
Foreign owners set their sights higher than local ones, Unitas 2, pp. 14-19.
Zeckhauser , R.J. and Pound, J. (1990)
Are Large Shareholders Effective Monitors? An Investigation of Share Ownership and Corporate Performance, in: Hubbard, G. (Ed.) Asymmetric Information, Corporate Finance and Investment: Chicago.

8. Appendix

Table 1: The Effects of ownership - Some descriptive evidence for Austrain manufacturing firms

Median	(A) Domestic, Non-MNE	(B) Domestic, MNE	(C) Foreign, Non-German	(D) German	overall	Kruskal-Wallis Test		
						(A),(B) vs. (C),(D),	(A),(B) vs. (D)	(B) vs. (C),(D)
Employment	88,8	274,8	196,2	391,8	173,0	**	**	-
Sales in Millions ATS	129,4	527,3	411,6	801,9	327,9	**	**	-
Log labour productivity	7,3	7,5	7,6	7,6	7,5	**	**	**
Investment/Sales ratio in percent	4,2	4,7	4,6	4,9	4,5	-	-	-
Investment/Employment ratio in 1000 ATS	70,6	83,5	85,1	82,7	80,8	*	**	-
Exports to the EU in % of Sales	22,5	35,0	35,0	37,5	30,0	**	**	-
Exports to countries outside of the EU in % of sales	5	15,0	15,0	15,0	10,0	**	**	-
Market share in the EU (subjective estimate by firms)	0,5	1,5	1,5	2,5	1,5	**	**	-
Average growth in employment in % p.a.	0	0,2	0,0	0,1	0,0	-	-	-
Average growth in sales in % p.a.	1,5	3,0	2,0	2,3	2,1	-	-	-
Average growth in labour productivity in % p.a.	2,3	2,2	3,1	3,0	2,4	-	-	-

Source: WIFO-Investment Surveys

1) Based on difference in rank sum, $Chi^2(1)$

** significant at 5%

** significant at 10%

- insignificant

Table 2A: Cash-flow by type of ownership

Cash-flow	DOCs	FOCs	Total
<6%	111	50	161
	32,0	*26,5*	*30,0*
6-12%	103	61	164
	29,7	*32,3*	*30,6*
>12%	133	78	211
	38,3	*41,3*	*39,4*
Total	347	189	536
	100	*100*	*100*

Pearson $chi^2(2) = 1.78$, $p = 0.41$

Table 2B: Cash-flow: $DOCs^{MNEs}$ vs. FOCs

Cash-flow	FOCs	$DOCs^{MNEs}$	Total
<6%	50	33	161
	26,5	*23,8*	*25,3*
6-12%	61	39	100
	32,2	*28,6*	*30,4*
>12%	78	67	145
	41,3	*48,2*	*44,2*
Total	189	139	328
	100	*100*	*100*

Pearson $chi^2(2) = 6.59$, $p = 0.0.04$

Table 3: Regression Results on Levels

	Labour Productivity[1)]		Investment Propensity[2)]		Cash-flow[3)]	
	ß	t	ß	t	ß	t
Foreign non-German ownership	0,12	1,6	0,04	0,3	0,03	0,2
German ownership	0,02	0,2	-0,04	0,0	-0,07	-0,3
Domestic non-MNE	-0,09	-1,4	0,16	1,4	-0,36	-2,2 **
Log employment	0,07	2,2 **	-	-	-	-
Log investment/employment (in 1000)	0,19	6,1 **	-	-	1,42	3,1 **
Sales Growth (log differences)	-	-	0,01	2,6 **	-	-
Cash-flow: medium	-	-	0,23	1,5	-	-
Cash-Flow: high	-	-	0,34	3,0 **	-	-
Export share (EU)*100	-	-	0,83	4,1 **	-0,04	-0,2
Export share (non-EU)*100	-	-	-0,03	-0,1	-0,05	-0,2
Market share (EU)	-	-	-	-		
Observations	521		491		409	
Pseudo-R^2	0,25		0,18		0,11	
Test on						
Non-German FOCs vs. $DOCs^{Non-MNEs}$, F-test	5,7 **		0,6		6,6 **	
German FOCs vs. $DOCs^{Non-MNEs}$, F-test	1,7		1,4		1,7	
Industry effects, $Chi^2(16)$	4,5 **		4,2 **		43,5 **	
Regional effects, $Chi^2(2)$	0,0		0,3		2,1	

Note: Extreme values of the lowest and highest percentile have been skipped
1) Dependent variable: log(sales/employment), median regression
2) Dependent variable: log[(investment/employment)/(1-investment/employment)], median regression
3) Dependent variable: Cash-flow in three size classes (see Table 2), ordered probit
**) significant at 5%
*) significant at 10%

Table 4: Regression Results on Growth

	Employment growth 1)		Sales Growth[2)]		Productivity growth[3)]	
	ß	t	ß	t	ß	t
Foreign non-German ownership	0,03	0,0	-0,64	-0,6	0,55	0,6
German Ownership	0,01	0,0	-0,98	-0,9	-0,36	-0,4
Domestic non-MNE	-0,86	-1,2	-0,69	-0,8	-0,28	-0,4
Log initial employment	-0,52	-2,7 *	-	-		
Log initial sales	-	-	0,10	0,4	-	-
investment/sales	0,30	4,6 **	0,20	1,8 *	-	-
Export share in % (EU)*100	0,21	1,9 *	0,30	1,8 *	-	-
Export share in % (non-EU)*100	0,31	1,9 *	0,31	1,4	-	-
log difference employment	-	- -	-		-0,23	-3,6 **
log (investment/employment)	-	- -	-		0,69	2,1 **
Observations	497		495		521	
Pseudo-R^2	0,1		0,1		0,1	
Test on						
Non-German FOCs vs. $DOCs^{MNEs}$, F-test	1,4		0,0		1,1	
German FOCs vs. $DOCs^{Non\text{-}MNEs}$, F-test	0,9		0,0		0,0	
Industry effects, $Chi^2(16)$	0,9		1,5 *		2,7 **	
Regional effects, $Chi^2(2)$	2,2		2,0		0,6	

Note: Extreme values of the lowest and highest percentile have been skipped
1) Dependent variable: log difference of log(employment), median regression
2) Dependent variable: log difference of log(sales), median regression
3) Dependent variable: log difference of log(sales/employment), median regression
**) significant at 5%
*) significant at 10%

Table A-1. **Earlier Studies on Performance Gaps between DOCs and FOCs**

Country Author (Year)	Research Problem	Performance Indicator viz. Dependent Variable	Explanatory Variables for Gap	Sample	Main Results	Superior Group of Firms
[1] UK Davies and Lyons (1991) PR	To decompose a productivity gap into a structural and an ownership effect.	Productivity	Structural effect Ownership effect	UK firms 1971-1987	Structural effect more important than ownership effect Productivity differential of 20% Random advantage model vs. “best practice” Catching-up possible (management)	FO
[2] UK Oulton (1998a) IN, WA, PR, GR, Capital Intensity	Studies physical investment in UK manufacturing from the viewpoint of the individual establishment. Studies reasons for differences between businesses in the levels of labour productivity.	Gross output (and net output, value added)	Wages (for skill levels); administra-tive, technical and clerical employees; operative wages; intermediate inputs	N = 1,752 *) 1973-93 Plant Level! Manufactu-ring Sector *) there of: 176 US-owned and 235 other foreign owned	FO establishments are more capital intensive, more human-capital intensive, value added per worker (LP) is 38% higher (Table 8, p. 38) Human and physical capital intensity differences are a significant determinant of productivity gaps. US-owned plants have additional productivity advantages over other FO plants. 3 explanations for the higher capital intensity of FO are provided (p. 45, 50)	FO

[3] UK Oulton (1998b) PR	Do foreign-owned companies have a productivity lead over domestically-owned ones? (gap, because (a) some companies use more inputs per worker; and (b) some companies may have access to superior technology etc.	Productivity Input intensity (K/L, w L, V/L)	Physical capital intensity, human capital intensity and size; Size, age, US, Non-US, UK-subsidiary	N = 49,009 companies Non-Manufacturing	After controlling for industrial composition and other factors, FO was found to raise productivity by about a third in non-manufacturing Explained by higher capital intensity and more skilled labour force (FO generally positively correlated with input intensity)	FO

[4] US Howenstine and Zeile (1992) SK, CI, RD, Plant scale	Examines the characteristics of Manufacturing Industries with substantial foreign investment intensity	Capital intensity, skill level and plant scale (R&D-activity)	only descriptive	N = 66,878 FO establish-ments Establishment vs. enterprise data (levels of disaggre-gation)	FO account for 1 percent of all U.S. businesses and 4 percent of employment and tend to be larger on average FO are more active in industries characterised by higher capital intensity FO are more concentrated in manufacturing industries that require a higher level of employment skill No significant relationship between foreign ownership activity and the average scale of plant operations. On a more aggregate level: significant tendency for FO establishments to operate in industries with the most R&D-activity Compare 2-digit to 4-digit levels in order to examine the structural effect Explanations for wage gap: FO tend to be located in high-wage areas; or labour market shortage for specific skills demanded by the FO.	FO

[5] US Doms and Jensen (1998) PR, WA, SK	How do foreign plants compare to domestically-owned plants in terms of wages and productivity? Differentiate by national ownership, firm size, and whether U.S.-owned plants belong to firms that have significant assets outside the U.S., i.e. compare plants of foreign MNEs to plants of U.S. MNEs. Hypothesis is that no gap exists between these plants.	Labour productivity (Capital / Employ-ment; Value-added / employ-ment); production and non-production workers; and their wages. Number of technologies	Control for: Plant size, industry, plant age, plant location and capital / labour ratio	N= 4,463 FO N= 110,676 DO establish-ments	Control variables reduce the observed differences, but they persist (inclusion of the capital/labour ration further reduces the gap, but remains statistically significant). FO MNEs vs. U.S.-owned MNEs: are the most similar → firm-specific advantages By parent country: no country compares favourably with plants owned by U.S. MNEs Use of technology (hyp: might produce spillovers, p. 248ff): negligible gap	DO: U.S. MNEs as a group by PR, SI, CI; FO follow closely in terms of WA, PR, followed by large dom-estically-oriented plants

[6] UK Kumar, M.S. (1984) GR, PF	Do firms with overseas production differ significantly from those with only domestic operations? Effect of overseas activities on growth and profitability			N = 700 UK firms	International firms have slightly higher growth. But have a lower profit rate and lower investment than DO firms. Degree of overseas operations has no strong influence on profitability or growth.	FO DO

[7] Canada Globerman et al. (1997) WA, VA	Performance comparisons of Canadian and non-Canadian firms, as well as between non-Canadian firms.	Value-added, labour-productivity, wages	Cost of fuel and electricity (proxy for capital costs); Production workforce; Share of male workers; Scale economies, ownership dummies, industry dummies	All establish-ments in 21 sample industries Plant level data	FO have higher value-added per worker; pay higher wages FDI improves efficiency and pay levels in Canada Gap vanishes, if controlling for size or capital intensity	FO
[8] SF Maliranta (1997) PR	Explain the differences in productivity levels among plants	TFP	Dummy variable for FO, plus 20 other explanatory variables (p. 27)	N=5,379 plants (208 FO, 4,668 DO) Plant Level!	FO firms appear to be capable of using resources more productively. It is not clear to what extent good performance leads to foreign ownership and vice versa (p. 41).	FO

[9] JAP Blonigen and Tomlin (1999) SI, GR	Gibrat's Law and FO firms Is the relationship between firm growth and firm size for these foreign owned affiliates similar to that found for domestic plants? Sample: Japenese affiliates are large plants with high growth rates	Employee growth (1987-1990)	Plant size 1987, industry dummy, Plant age*; Dummy variable for joint venture with US firm. *) distinguishes age of acquired plant vs. age of greenfield plant	N = 688 Plant Level! (subsample on automobile firms)	Reject Gibrat's Law: smaller plants grow faster than larger ones (doubling of plant size reduces growth by one-third). Plant size and plant growth are not independent. Learning effects are substantial for foreign-owned affiliates, because of uncertainties like (a) inefficiencies; (b) obtaining material inputs. More recent plants grow much quicker (indicates learning effects) Learning through prior investments existing investments increase the likelihood of future investments (only new plants are examined): prior investments do not affect plant growth	
[10] US Blonigen and Slaughter (1999) SK	Whether inward FDI flows contribute to within-industry shifts in U.S. relative labour demand toward more-skilled labour. (wage inequality)	Skill upgrading (level-change in the skilled-labour share of the total wage bill)	Relative unskilled wage; capital; value-added output; Dummy variables (industry ...)	U.S. firm data 1977-94; 56 SIC industries	inward FDI does not contribute to skill-upgrading within manufacturing industries distinction between acquired plants (similar factor demand as DO) and greenfield investments Japanese greenfield FDI: lower demand for skilled labour	(--)

[11] US Feliciano and Lipsey (1999) WA	-- Whether presence of more foreign firms is associated with higher wages in an industry and to higher wages within domestically-owned operations? -- Whether, if the foreign firms pay more, the difference can be explained by measurable characteristics of the foreign-owned establishments or whether there is some remaining differential associated with foreign ownership?	Wage gap (annual wage per worker)	Ownership of plant; degree of unionisation; size; skill; gender. Industry and state dummies.	Establishment basis 2 digit SIC and state 1987-1992	Manufacturing Sector Wage gaps related to industry composition (FO in high-wage industries) Differences within industries: 5-7 percent without control variables gap disappears with control variables (size, industry, state) extent of FO had no impact in 1987, but positive impact in 1992. Other industries: wage gap remains even after controlling for other factors (8- 9%)	FO DO

[12] SF Ylä-Antilla and Ali-Yrkkö (1997) PR, PF	Performance of FO firms after strong increase of inward investment in Finland	Productivity Profitability And key balance sheet data	Only descriptive; analysis of balance sheet data	N = 288 Finnish-owned firms and N = 104 Foreign-owned firms Industry, Services and Commerce	Yield on capital invested: 13% (DO) : 23% (FO) Value Added per Employee (FIM 1000): 366 (DO) : 423 (FO) FO are more capital intensive Managerial explanations: Mostly takeovers → new managers bring in new know-how → new owners are more demanding	Equal, except profitability and pro-ductivity, where FO > DO

[13] US Matalony (2000) PF	Explain the profitability gap	Rate of Return (ROA)	Market Share, Age, Industry, Intra-firm imports	N = 2,133 firms 1992 Industry level and company level (US firms)	Only a small portion of the gap can be explained by the industry effect, i.e. FO to be concentrated in low-profit industries. (12% of gap) Market share: the larger the market share of FO, the lower the gap between profitability of FO and U.S.- owned firms Profit transfer explanation for unexplained profitability gap: only weak and inconsistent evidence Age effects: some evidence; e.g., the ROA narrows over time, which seems to be related to age effects. Acquiring or establishing a new business can add costs, that disappear over time; experience can yield benefits, that accumulate over time. All four effects combined: market share and newness are significantly correlated; intrafirm-import content not correlated;	DO

[14] India Kumar N. (1990) PF	Examine determinants of profit margin gap (sustained differences in inter-group profitability)	Profit margins	Entry barriers (advertising, technology-intensity, skill intensity), VA-Sales ratio, average capital requirements, CR4, Growth, Size, effective rate of protection, capital-output ratio	N = 43 Indian manufacturing industries	MNEs enjoy greater protection from entry-barriers MNEs have persistent advantage over local firms, especially in knowledge.	FO
[15] Austria Glatz & Moser (1989) GR, PR, RD	Comparison of subsidised inward investments to manufacturing sector total in Austria	Employment growth Investment / turnover ratio Value-added per employee etc.	-	N = 36 largest inward FDI since 1970	employment growth: -1.9% (DO) vs. +7.7% (FO) investment /turnover ratio: 6.0% (DO) vs. 10.9% (FO) labour productivity: 25% higher in FO than manufacturing sector average R&D-ratio of FO: more than twice as high as manufacturing sector average	FO
[16] Austria Gugler (1998) PF, RD	Analysis of the ownership structure of Austrian firms			N = 600 largest non-financial corporations 1996	foreign control increases profitability: FO's rate of return = 10.4% (compared to overall median = 8.4%) FO's R&D ratio = 2.6% (compared to overall mean of 1.7%)	FO

[17] Austria Hahn et al. (1996) GR, IN, Equity, PR, labor costs	Examine the concentration of ownership and ist effects on performance	Investment-sales ratio; Equity ratio Labour productivity Etc.	Cash-flow ratio Investment-sales ratio Fixed effects (Time)	1980-94	no significant difference between FO and DO FO have higher labour productivity, higher value-added per employee and higher wage costs per employee DO have higher Personalaufwandsquote??	No difference FO DO

[18] UK Dickerson et al. (1997) PR, MA	Investigates the impact of acquisitions on company performance.	Pre-tax profits as a proportion of net assets	Size Debt ratio Growth of net assets	N = 2,941 UK firms, of which 613 made at least one acquisition	acquisitions have a detrimental effect on company performance lower rate of return than growth through internal investment	

[19] USA McGuckin and Nguyen (1995) MA, PR	What type of property experiences ownership change?` How do transferred properties perform after acquisition?	relative labour productivity, TFP for subsample	Capital, labour, materials	N = 28,407 plants, SIC 20 (food industry) 1977-87	Plants with high productivity are most likely to be taken over (“restricted matching hypothesis”, p. 265) (C.B.: not clear whether by DO or FO) (For larger plants, firms tend to acquire plants with low productivity.) Initial productivity and plant size have inverse relationship with ownership change Post-merger productivity performance: plants experiencing ownership change had higher productivity growth rates than plants that had no ownership changes	--

[20] Sweden Moden (1998) PR, RD	Examine, whether a firm, or plant, that changes ownership has had a poor productivity performance before the ownership change, and whether it shows an improvement afterwards	Labour productivity (Deviation from average labour productivity)	Firm Sales, Ownership Dummy	1980-94	Foreign acquisitions have increased the labour productivity, while the development of TFP is more uncertain. (maybe it takes longer) Foreign MNEs are not particularly attracted to R&D Results are broadly in line with the predictions of the matching theory	--

Note:					
SI	... Size	PR	... Productivity	VA	... Value-added
GR	... Growth	MA	... Mergers and Acquisitions	PF	... Profitability
SK	... Skill	FI	... Finance	RD	... Research and Development
		LR	... Labour relations		