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The Extent, Characteristics and Impacts of FDI and Multinational Firm Activities A Firm Level Analysis

Martin Falk, Yvonne Wolfmayr

Abstract

The study examines the impact of Austrian outward foreign direct investments (FDI) on home based parent company employment. The analysis is based on the AMADEUS firm-level database and an improved methodology by applying matching methods and the difference in difference estimator. In this way we are able to overcome the major shortcomings of earlier studies on the home market effects of Austrian outward FDI, which included data on foreign direct investors only leading to biased estimates and preventing the deduction of causal relationships. Overall the results indicate that investing abroad strengthens the employment performance in the home country. This is also true for Austrian foreign direct investments in Eastern European locations. We also analyse the major factors determining the firms' decision to invest abroad as well as decisions on the degree of multinationality, which we measure by the number of foreign affiliates owned. Firm size, firm age, the capital intensity and the number of shareholders are significant determinants for the number of subsidiaries. The analysis also corroborates theoretical results establishing the fact that foreign direct investment activities are driven by firm specific advantages and a superior productivity performance in the pre-investment period. Thus, firms that start foreign activities are ex-ante different from non-investing purely domestic firms.

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1 Introduction

Since the early 1990s, the Austrian stock of outward direct investment has increased considerably. This surge in outward FDI and the activities of multinational enterprises have often been held responsible for the decrease in manufacturing employment. The aim of this study is to present new evidence on the effects of outward foreign direct investment on parent-company employment. In particular, we analyse whether investing in Eastern Europe has different employment effects as compared to Western Europe. In order to analyse the causal effect of investing in Eastern Europe, we use the propensity score matching estimator combined with the difference-in-difference method. This allows us to identify the control group of firms that share characteristics similar to those of firms that choose to invest abroad. In doing so, we are able to overcome the major shortcomings of earlier studies on the home market effects of Austrian outward FDI, which have only included data on foreign direct investors – leading to biased estimates and -preventing inference of causal relationships.

Furthermore, we investigate the characteristics of Austrian multinational firms as compared to domestic firms. Within the group of multinationals, we distinguish between Austrian multinational firms and foreign multinational firms. We extend the analysis by looking at the distribution of investing firms across destinations, firm sizes and industries. We also investigate the determinants and effects of the degree of multinationality, measured by the number of foreign affiliates. We base our calculations on a firm sample drawn from the AMADEUS database. For Austria, the data covers about 1,325 multinationals and around 4,000 of their subsidiaries for the year 2009.

The remainder of the paper is organised as follows. The next section reports on the evolution of Austrian multinational activity by foreign destination and industry. We distinguish between domestic and foreign multinational enterprises, differentiate by firm size, and also look at the locational choices of new (first-time) foreign direct investors. Section 3 presents descriptive results on the distinguishing characteristics of multinational firms in comparison to domestic firms, while in section 4 we present econometric results on the major firm-level factors influencing the decision to invest abroad, as well as the number of foreign subsidiaries firms choose to establish. In section 5, we apply matching methods and the difference-in-difference estimator to analyse the impact of Austrian outward foreign direct investment (FDI) on domestic parent-company employment. The last section concludes with a summary of the most important findings.

2 Evolution of the activities of multinational enterprises (MNEs)

The database is constructed from the various waves of the AMADEUS database from 2003 to 2009. We only include firms with unconsolidated accounts and information on the number and location of their subsidiaries. A foreign subsidiary is defined as a firm in which 10 per cent or more of the equity is directly or indirectly owned by the parent company. This is consistent with Dunning (1993), who defines multinational enterprises as firms that own or control facilities in more than one country.

Table 1: Percentage shares of multinational enterprises and domestic firms in all Austrian firms

	MNEs			Domestic firms		
	Total	Domestic MNEs	Foreign MNEs	Total	Domestic firms without domestic affiliates	Domestic firms with domestic affiliates
2003	2.1	2.0	0.2	97.9	88.7	9.2
2004	2.9	2.7	0.2	97.1	86.7	10.4
2005	3.3	3.0	0.3	96.7	83.8	13.0
2006	3.7	3.2	0.5	96.3	83.1	13.1
2007	3.2	2.8	0.3	96.8	83.2	13.7
2008	3.6	3.1	0.5	96.4	82.1	14.3
2009	4.2	3.6	0.6	95.8	77.8	18.0

Source: AMADEUS database, WIFO calculations. Note: Years refer to different waves of the AMADEUS database (2009 refers to information as of February 2009).

Only a few Austrian firms own foreign affiliates. For the year 2009, 1,325 firms (4.2 per cent) of the 31,373 firms in the sample have foreign subsidiaries and are multinationals according to our definition (Table 1). Note that the true share of multinational firms is even lower since very small firms are underrepresented in the AMADEUS database. The number of multinational firms increased from 712 in 2003 to 1,325 in 2009, indicating a large number of new investors. However, we cannot rule out the possibility that the increase in the number of multinational firms is actually the result of a change in the composition of the sample[1]). Indeed, there seems to be a slight structural break in the AMADEUS data between 2006 and 2007; explanations for this are hard to find, but our results are worth comparing to official direct investment statistics. OeNB (2009) reports that the number of multinational firms was 1,069 in 2007, and changed

[1]) To identify new or first-time investors and ownership change, we have to rely on different waves of the AMADEUS database since every new wave reports the ownership structure of the most recent year and replaces any information on earlier years. All other data points used in the analysis are taken from the same wave (2009).

only slightly between 2003 and 2007. However, little quantitative information is available on the characteristics of multinational firms.

Table 2: Number of MNEs and their foreign subsidiaries in Austria

	Number of MNEs		
	Total	Domestic MNEs	Foreign MNEs
2003	712	657	55
2004	815	746	69
2005	779	712	67
2006	909	793	116
2007	881	786	95
2008	1,007	858	149
2009	1,325	1,130	195
	Number of subsidiaries		
	Total	Subsidiaries of domestic MNEs	Subsidiaries of foreign MNEs
2003	1,904	1,763	141
2004	2,070	1,848	222
2005	2,339	2,133	206
2006	2,692	2,390	302
2007	2,738	2,498	240
2008	3,323	2,890	433
2009	4,426	3,876	550
	Number of subsidaries per multinational firm		
	Total	Subsidiaries of domestic MNEs	Subsidiaries of foreign MNEs
2003	2.7	2.7	2.6
2004	2.5	2.5	3.2
2005	3.0	3.0	3.1
2006	3.0	3.0	2.6
2007	3.1	3.2	2.5
2008	3.3	3.4	2.9
2009	3.3	3.4	2.8

Source: AMADEUS database, WIFO calculations. Note: Years refer to different waves of the AMADEUS database (2009 refers to information as of February 2009).

The multinational companies in our sample have about 4,426 foreign subsidiaries. Based on the foreign affiliate trade statistics (FATS) of Statistics Austria, the number of foreign affiliates was 4,297 in 2007. However, the FATS and our dataset are generally not comparable. Based on the AMADEUS database, we define multinational enterprises as corporations owning foreign affiliates with a minimum equity share of 10 per cent. The respective threshold in the FATS is an equity share of 50 per cent. There are also differences in coverage: While FATS covers all industries, our AMADEUS-based sample does not include firms in banking, insurance, or real estate. The main advantage of the AMADEUS database is its inclusion of information on parent

companies. In addition, the data allows us to distinguish between domestic multinational firms and foreign multinational enterprises (defined as Austrian foreign investors with headquarters abroad) and also track ownership changes (first-time investors).

Looking at Table 2, it is interesting to note that the number of subsidiaries rose faster than the number of multinational firms. Between 2003 and 2009, the number of foreign subsidiaries increased from 1,904 to 4,426, while the number of multinational firms less than doubled. This is consistent with Hunya (2008). Another key indicator of Austrian multinational activity is the number of foreign affiliates per multinational. On average, the number of foreign subsidiaries per multinational was 3.3 in 2009. This is higher than the respective figures reported for the UK, which reached 2.6 in manufacturing and 2.3 in services (see Görg et al., 2008). As expected, we find that Austrian multinationals have a larger number of foreign subsidiaries than do foreign multinationals (3.4 vs. 2.8, Table 2).

Table 3 shows the shares of multinational enterprises with only one, as well as two or more foreign affiliates, while Table 4 provides the distribution of multinationals by number of foreign subsidiaries. The percentage of multinational firms with a single subsidiary is growing (Table 3), as are those with two or more foreign affiliates. It is interesting to note that the increase in the share of multinational enterprises with two or more subsidiaries is higher than the share of those with only one subsidiary. Consequently, the share of multinational enterprises with only one foreign subsidiary is falling, while the share of multinational enterprises with two, three, four, or more subsidiaries is rising (Table 4). The share of multinational enterprises with four or more subsidiaries shows the strongest increase over time (from 12 per cent in 2003 to 18 per cent in 2009).

Table 3: Percentage shares of MNEs by number of subsidiaries

	MNEs with one single subsidiary	MNEs with two and more subsidiaries
2003	1.4	0.7
2004	1.9	1.0
2005	2.0	1.3
2006	2.3	1.4
2007	2.0	1.2
2008	1.9	1.6
2009	2.2	2.0

Source: AMADEUS database, WIFO calculations. Note: Years refer to different waves of the AMADEUS database (2009 refers to information as of February 2009).

Table 4: Distribution of multinational enterprises by number of subsidiaries (percentages)

	Total	One single subsidiary	Two subsidiaries	Three subsidiaries	Four or more subsidiaries
2003	100	67	15	6	12
2004	100	65	16	7	11
2005	100	61	19	6	14
2006	100	62	17	7	14
2007	100	62	17	7	14
2008	100	54	21	9	16
2009	100	53	20	9	18

Source: AMADEUS database, WIFO calculations. Note: Years refer to different waves of the AMADEUS database (2009 refers to information as of February 2009).

Table 5 shows the contribution of multinational enterprises to various domestic activities, distinguishing between Austrian multinational and foreign multinational firms. Multinational firms account for a relatively large share of domestic economic activity. In particular, they account for 24.3 per cent of total sales, 20.4 per cent of total employment, 30.2 per cent of fixed assets, and 10.6 per cent of intangible assets. Austrian multinational enterprises account for the largest bulk of these activities, while foreign multinational enterprises account for a much smaller proportion.

Table 5: Contribution of multinational enterprises to domestic activities (percentages)

	Total MNEs	Domestic MNEs	Foreign MNEs
Employment 2007	20.4	17.3	3.1
Turnover 2006	24.3	17.4	6.9
Fixed assets 2007	30.2	18.7	11.5
Intanglible assets 2007	10.6	9.1	1.4

Source: AMADEUS database, WIFO calculations.

Table 6 displays the number of multinational enterprises by subsidiary location, and Table 7 shows the number of subsidiaries by their respective locations. Multinational enterprises with one foreign affiliate or more in Western Europe make up the most prevalent group, followed by those with one affiliate or more in Eastern Europe.

Table 6: Number of MNEs by location

	Total	Western Europe	Eastern Europe	North America	Asia	South America
			Number of MNEs by location of foreign affiliates			
2003	852	547	251	21	21	12
2004	966	636	280	20	20	10
2005	960	618	279	20	22	21
2006	1,121	697	343	30	25	26
2007	1,086	721	277	35	27	26
2008	1,338	811	382	86	30	29
2009	1,707	990	540	102	37	38
			Distribution of MNEs (percentages)			
2003	100	64	29	2	2	1
2004	100	66	29	2	2	1
2005	100	64	29	2	2	2
2006	100	62	31	3	2	2
2007	100	66	26	3	2	2
2008	100	61	29	6	2	2
2009	100	58	32	6	2	2

Source: AMADEUS database, WIFO calculations. Note: Years refer to different waves of the AMADEUS database (2009 refers to information as of February 2009).

Table 7: Number and distribution of foreign subsidiaries by location

	Western Europe	Eastern Europe	North America	Asia	South America	Not available
			Number of foreign subsidiaries by location			
2003	1,101	680	34	44	24	21
2004	1,235	726	27	37	24	21
2005	1,312	731	67	100	72	57
2006	1,492	865	86	103	78	68
2007	1,563	831	88	112	72	72
2008	1,783	1,205	130	86	65	54
2009	2,311	1,737	160	80	56	82
			Distribution of foreign subsidiaries (percentages)			
2003	58	36	2	2	1	.
2004	60	35	1	2	1	.
2005	57	32	3	4	3	.
2006	57	33	3	4	3	.
2007	59	31	3	4	3	.
2008	55	37	4	3	2	.
2009	53	40	4	2	1	.

Source: AMADEUS database, WIFO calculations. Note: Years refer to different waves of the AMADEUS database (2009 refers to information as of February 2009).

Table 8: Subsidiaries per MNE (unweighted means)

	Western Europe	Eastern Europe	North America	Asia	South America
2003	2.7	2.0	2.7	1.6	2.1
2004	2.5	1.9	2.6	1.4	2.1
2005	3.0	2.1	2.6	3.4	3.0
2006	3.0	2.1	2.5	2.9	2.7
2007	3.1	2.2	3.0	2.5	2.6
2008	3.3	2.2	3.2	1.5	2.4
2009	3.3	2.3	3.2	1.6	

Source: AMADEUS database, WIFO calculations. Note: Years refer to different waves of the AMADEUS database (2009 refers to information as of February 2009).

Table 8 indicates the number of subsidiaries per multinational enterprise across different regions. The number is highest in Western Europe and North America. More importantly, we find that the number of subsidiaries per multinational enterprise is growing over time in these regions. Note also that the variations in Asia and South America are due to problems of small cell size.

Table 9: Number of newly investing firms by geographical area

	All destinations	Western Europe	Eastern Europe	North America	Asia	South America
			Total			
2008/2009	183	122	100	19	11	8
2007/2008	165	127	118	49	8	6
			Manufacturing			
2008/2009	56	30	39	6	2	4
2007/2008	54	38	37	23	4	2
			Non-manufacturing			
2008/2009	127	92	61	13	9	4
2007/2008	111	89	81	26	4	4

Source: AMADEUS database, WIFO calculations. Note: Years refer to different waves of the AMADEUS database (2009 refers to information as of February 2009).

Table 9 provides evidence on the geographical breakdown of new investors. Of the 183 new investors in 2009, 122 chose Western Europe, followed by Eastern Europe with 100 investing firms. Few firms open up their first affiliate in North America, Asia, or South America, indicating that distance is a primary factor in investing abroad in general, but for new foreign direct investors in particular. Similar evidence is reported based on Italian data (see Castellani et al., 2008).

Table 10: Location of subsidiaries of foreign direct investors in 2009 (percentages)

	Total	Manufacturing	Non-manufacturing
Western Europe only	52.9	55.4	51.9
Eastern Europe only	22.5	17.0	24.6
Western & Eastern Europe only	14.6	14.3	14.8
Other combinations	10.0	13.2	8.7
Total	100.0	100.0	100.0

Source: AMADEUS database, WIFO calculations. Note: Year refers to wave 2009 of the AMADEUS database.

Table 11: Percentage shares of MNEs in all Austrian firms, by firm size (2009)

Number of employees	Total	Manufacturing	Non-manufacturing
	MNEs (with at least one subsidiary)		
1-9	4.5	1.9	4.6
10-24	1.7	1.7	1.7
25-49	2.8	3.3	2.7
50-99	5.9	7.0	5.6
100-249	9.9	15.5	7.5
>250	23.4	38.4	15.2
	MNEs with one single subsidiary		
1-9	2.5	1.9	2.5
10-24	1.1	1.4	1.1
25-49	1.7	2.2	1.6
50-99	3.4	4.3	3.1
100-249	4.9	9.0	3.1
>250	8.5	13.2	5.8
	MNEs with two or more subsidiaries		
1-9	2.0	0.0	2.1
10-24	0.6	0.4	0.7
25-49	1.1	1.1	1.1
50-99	2.5	2.7	2.4
100-249	5.0	6.5	4.4
>250	14.9	25.2	9.3

Source: AMADEUS database, WIFO calculations. Note: Year refers to wave 2009 of the AMADEUS database.

About one half of the multinationals have at least one subsidiary located in Western Europe and no further subsidiaries in other locations (Table 10), while 22.5 per cent have a subsidiary in Eastern Europe only. The third most frequent form (14.6 per cent) is to choose destinations in both Western and Eastern Europe. Locations overseas are rarely chosen, suggesting that

Austrian firms select European locations when establishing their subsidiaries abroad. A comparison of the manufacturing and non-manufacturing sectors shows that the non-manufacturing sector has a higher preference for subsidiaries in Eastern Europe.

Table 11 reveals a strong relationship between multinationality and firm size. Except in the case of very small firms with nine or fewer employees, the share of multinational firms increases with firm size. This holds for both the manufacturing and non-manufacturing sectors. However, the difference in the prevalence of multinationality between manufacturing and non-manufacturing increases with firm size. In the largest firm size group (those with 250 employees or more), 38 per cent of the manufacturing firms are multinational, compared to 15.2 per cent in the non-manufacturing sector.

Table 12: Percentage shares of MNEs by firm size and number of subsidiaries

Number of employees	One single subsidiary	Two subsidiaries	Three subsidiaries	Four or more subsidiaries	Total
			Total		
1-24	58.8	17.6	7.1	16.5	100.0
25-49	60.5	19.8	10.5	9.3	100.0
50-99	57.8	24.4	11.1	6.7	100.0
100-249	49.2	21.8	12.4	16.6	100.0
>250	36.2	21.9	10.0	31.9	100.0
Total	52.4	20.5	9.7	17.4	100.0
			Manufacturing		
1-24	81.8	15.2	0.0	3.0	100.0
25-49	67.5	10.0	20.0	2.5	100.0
50-99	60.8	29.4	7.8	2.0	100.0
100-249	57.8	21.1	15.6	5.6	100.0
>250	34.4	25.2	9.3	31.1	100.0
Total	51.8	22.2	11.0	15.1	100.0
			Non-manufacturing		
1-24	56.7	17.8	7.8	17.8	100.0
25-49	58.3	22.7	7.6	11.4	100.0
50-99	56.6	22.5	12.4	8.5	100.0
100-249	41.8	22.3	9.7	26.2	100.0
>250	38.5	17.4	11.0	33.0	100.0
Total	52.7	19.8	9.1	18.4	100.0

Source: AMADEUS database, WIFO calculations. Note: Year refers to wave 2009 of the AMADEUS database.

Table 12 shows the percentage of multinational enterprises by number of subsidiaries and firm size. As expected, we find the share of MNEs with one single subsidiary to depend on firm size. The relatively high share of very small firms holding four or more foreign subsidiaries may be ascribed to some very small business-service firms. Generally, however, the smaller the firm,

the higher the share of multinationals with only one subsidiary abroad. Contrarily, the share of MNEs holding four or more subsidiaries is clearly higher for the largest firms in the sample. This is valid for both manufacturing and non-manufacturing firms, with the ranking more pronounced in the service sector.

Table 13 provides the distribution of the number of multinational enterprises and subsidiaries by location and firm size. As expected, we find that small multinational firms prefer to have affiliates close to their headquarters, while large multinational firms have a higher than average share in more distant locations.

Table 13:Number of MNEs and subsidiaries by location and firm size (2009)

Number of employees	Western Europe	Eastern Europe	North America	Asia	South America	Total
			Number of MNEs			
1-24	282	150	17	8	3	460
25-49	134	59	10	3	1	207
50-99	135	66	13	4	4	222
100-249	146	80	19	5	8	258
>250	208	129	39	15	15	406
			Distribution of MNEs (percentages)			
1-24	61	33	4	2	1	100
25-49	65	29	5	1	0	100
50-99	61	30	6	2	2	100
100-249	57	31	7	2	3	100
>250	51	32	10	4	4	100
			Number of subsidiaries			
1-24	683	504	22	18	3	1,230
25-49	379	256	15	17	1	668
50-99	224	121	19	7	8	379
100-249	273	242	26	7	17	565
>250	609	400	73	27	18	1,127
Total	2,168	1,523	155	76	47	3,969
			Distribution of subsidiaries (percentages)			
1-24	56	41	2	1	0	100
25-49	57	38	2	3	0	100
50-99	59	32	5	2	2	100
100-249	48	43	5	1	3	100
>250	54	35	6	2	2	100
Total	55	38	4	2	1	100

Source: AMADEUS database, WIFO calculations. Note: Year refer to wave 2009 of the AMADEUS database.

Breaking down the data across broad sector groups in Table 14, we find that the share of multinational firms is highest in business services (7.4 per cent) followed by manufacturing (7.1 per cent). Construction and hotels/restaurants are least globalised, with a share of 1.4 and 0.5 per cent, respectively. The share of multinational firms has increased steadily over time in all sectors considered: Between 2003 and 2006, it grew by 2.5 percentage points in manufacturing and 2.1 percentage points in business services. In the period from 2007 to 2009, the respective shares rose by about 1.3 percentage points in manufacturing and 0.6 percentage points in the business service sector.

In the next chapter, we compare the characteristics of multinationals and non-multinationals. In particular, we investigate whether the location of foreign affiliates impacts the difference in their characteristics.

Table 14: Percentage shares of MNEs in all Austrian firms, by industry

	Manufacturing, electricity, gas, water supply	Construction	Wholesale & retail trade	Hotels & restaurants	Transport	Banking, real estate	Business services
			MNEs (irrespective of number of subsidiaries)				
2003	4.1	0.8	1.6	0.2	1.4	3.2	4.5
2004	5.3	1.2	2.2	0.5	2.1	4.0	5.8
2005	5.7	1.0	2.7	0.4	3.1	4.7	6.7
2006	6.6	1.5	3.1	0.4	2.9	6.0	6.6
2007	5.8	1.3	2.3	0.3	2.3	4.1	6.8
2008	6.3	1.2	2.6	0.3	2.4	5.8	7.6
2009	7.1	1.4	3.9	0.5	2.5	3.3	7.4
			MNEs with one single foreign subsidiary				
2003	1.4	0.2	0.4	0.0	0.5	1.0	2.1
2004	2.0	0.4	0.6	0.1	0.5	1.9	2.4
2005	2.4	0.4	0.9	0.1	0.9	2.3	2.7
2006	2.8	0.5	1.0	0.1	0.9	2.3	2.7
2007	2.4	0.4	0.7	0.1	0.9	1.5	2.9
2008	3.0	0.5	1.1	0.1	0.9	3.4	3.7
2009	3.4	0.6	1.7	0.1	0.8	2.0	3.6
			MNEs with two and more foreign subsidiaries				
2003	2.7	0.6	1.2	0.1	1.0	2.2	2.4
2004	3.3	0.9	1.5	0.3	1.6	2.1	3.4
2005	3.3	0.6	1.8	0.3	2.1	2.5	4.0
2006	3.8	1.0	2.1	0.2	2.0	3.7	3.9
2007	3.4	0.8	1.6	0.2	1.4	2.6	3.9
2008	3.3	0.7	1.5	0.2	1.5	2.5	3.9
2009	3.7	0.8	2.2	0.4	1.7	1.3	3.8

Source: AMADEUS database, WIFO calculations. Note: Years refer to different waves of the AMADEUS database (2009 refers to information as of February 2009).

3 Differences among domestic Austrian firms and Austrian/foreign multinationals

The economic literature on the determinants of firms' decisions to invest abroad highlights firm-specific advantages due to product differentiation, intangible assets such as technological know-how, investment in software, innovative property, and superior economic competencies in the form of organisational capital and firm-specific human capital (Markusen, 1995)[2]). In the most recent theoretical literature, the behaviour of international firms is explained by the "new new trade theories" based on the work of Melitz (2003) and Helpman et al. (2004), which point out that differences in firm productivity lead to a self-selection of firms into exporting or foreign direct investment. Thus, within an industry productivity sorting leads to a firm distribution in which not all firms export or become foreign direct investors. Helpman et al. (2004) present a theoretical model of heterogeneous firms with two modes of foreign market entry, namely exporting and (horizontal) FDI. The authors find that highly productive firms choose to invest abroad, while firms with an intermediate level of productivity choose to export and the least productive firms neither export nor invest abroad. This section contributes to the literature by looking at the differences in the level of labour productivity between domestic and multinational firms. In addition, we investigate the differences in other firm characteristics, such as firm size, capital intensity, and the ratio of intangible assets to total fixed assets. However, we cannot investigate the differences between exporters and non-exporters or the choice between different modes of internationalisation (exporting versus FDI) due to data availability (see Pöschl – Stehrer – Stöllinger, 2009 for a recent study based on Austrian data). As an extension to the previous literature, we are able to distinguish between Austrian multinationals and foreign multinational firms.

[2]) In the accounting literature intangible assets include computer software, patents, copyrights, motion picture films, licenses, franchises, models, design, prototypes etc (see Official Journal of the European Union 2004; Eckstein, 2004).

Table 15: Differences among domestic firms, domestic and foreign multinationals, median (number of observations in parentheses)

	Domestic firms	Domestic MNEs	Foreign MNEs
		Total	
Number of employees	20	50	100
	(16,512)	(400)	(57)
Sales (mn €)	2.4	11.7	40.3
	(13,912)	(313)	(39)
Sales (T€) per employee	151	219	315
	(10,342)	(260)	(28)
Fixed assets (T€) per employee	31	75	125
	(12,449)	(658)	(118)
Ratio of intanglible assets to total fixed assets (%)	(0)	(1)	(1)
	(18,826)	(916)	(162)
Annual labour costs (T€) per employee	47	56	62
	(1,260)	(217)	(60)
		Manufacturing	
Number of employees	29	135	355
	(2,702)	(142)	(16)
Sales (mn €)	4	17	199
	(2,028)	(107)	(10)
Sales (T€) per employee	130	184	338
	(1,654)	(99)	(10)
Fixed assets (T€) per employee	33	59	136
	(2,518)	(233)	(40)
Ratio of intanglible assets to total fixed assets (%)	0.7	0.9	1.9
	(3,088)	(264)	(45)
Annual labour costs (T€) per employee	47	52	50
	(324)	(87)	(22)
		Non-manufacturing	
Number of employees	20	35	65
	(13,810)	(258)	(41)
Sales (mn €)	2	8	23
	(11,884)	(206)	(29)
Sales (T€) per employee	160	281	265
	(8,688)	(161)	(18)
Fixed assets (T€) per employee	30	108	117
	(9,931)	(425)	(78)
Ratio of intanglible assets to total fixed assets (%)	0	0.2	0.2
	(15,738)	(652)	(117)
Annual labour costs (T€) per employee	48	64	70
	(936)	(130)	(38)

Source: AMADEUS database, WIFO calculations. The variables refer to the year 2006.

Table 15 provides the median value for selected indicators for Austrian MNEs versus non-MNEs. The former are distinguished further as Austrian or foreign multinational firms. We find that Austrian MNEs show a higher labour productivity than domestic non-MNEs (at a difference of 219 to 151 in terms of thousands of euros per employee). This also holds for foreign MNEs. Furthermore, we find that Austrian MNEs are, on average, larger in terms of both employment and sales than domestic non-MNEs – a finding that once again holds for foreign MNEs, as well. In addition, Austrian MNEs are more capital-intensive and pay higher wages (measured as labour costs per employee) than non-multinational firms. This also holds for foreign multinational firms. Compared with non-multinationals, MNEs' average wages are higher by 20 per cent. The latter fact may indicate that Austrian MNEs employ more skilled labour as compared to domestic firms. The ratio of intangible assets to total fixed assets – a variable that captures firms' activities concerning expertise and innovation – is much higher for multinationals than non-multinationals.

In order to test whether the differences in labour productivity, capital intensity, and share of intangible assets are statistically significant, we apply two nonparametric methods (i.e. the Kruskal-Wallis equality-of-populations rank test and the Kolmogorov-Smirnov (KS) equality-of-distributions test). The null hypothesis of the KS test is that the two distributions are equal.

Table 16: Kwallis test on the difference between MNEs and non-MNEs (p-values)

	Domestic MNEs vs. domestic firms	Foreign MNEs vs. domestic firms	Domestic MNEs vs. foreign MNEs
	Kruskal-Wallis equality-of-populations rank test		
Number of employees	0.00	0.00	0.01
Sales (T€)	0.00	0.00	0.00
Sales (T€) per employee	0.00	0.00	0.32
Fixed assets (T€) per employee	0.00	0.00	0.11
Ratio of intanglible assets to total fixed assets (%)	0.00	0.00	0.34
Annual labour costs (T€) per employee	0.00	0.00	0.26
	Kolmogorov-Smirnov equality-of-distributions test		
Number of employees	0.00	0.00	0.04
Sales (T€)	0.00	0.00	0.00
Sales (T€) per employee	0.00	0.00	0.18
Fixed assets (T€) per employee	0.00	0.00	0.02
Ratio of intanglible assets to total fixed assets (%)	0.00	0.00	0.53
Annual labour costs (T€) per employee	0.00	0.00	0.24

Source: AMADEUS database, WIFO calculations. The variables refer to the year 2006.

The nonparametric tests show that the differences in labour productivity and other variables between Austria multinationals and domestic firms are significant at the 1-per-cent level (see Table 16). However, the difference in labour productivity between Austrian and foreign multinational firms is not significantly different from zero. In addition, the Kolmogorov-Smirnov test shows that the distribution of labour productivity of investing firms dominates that of domestic firms. Overall, the results are somewhat consistent with Girma et al. (2004), who find that multinationals in Ireland exhibit a higher level of labour productivity (measured as sales/employee and value added/employee) than both domestic non-exporters and domestic exporters. Similar evidence is reported for German firms (see Wagner, 2006 and Arnold – Hussinger, 2006) and euro-area firms (Geishecker – Görg – Taglioni, 2009).

Investigating whether there are differences in the characteristics across different locations is an interesting proposition. Table 17 shows that Austrian firms investing in Eastern Europe have a higher productivity of labour and capital than those investing in Western Europe. This holds for both the manufacturing and non-manufacturing sectors. There is also some evidence that in the non-manufacturing sector, human-capital-intensive firms tend to invest in Eastern rather than Western Europe.

Table 18 provides some evidence on the characteristics of investing firms at the beginning of the period as compared to domestic firms and firms that do not change their ownership status (control group). Firms that start foreign activities are ex-ante different from those that remain domestic firms; they are larger and have a higher labour productivity. Furthermore, we find that new investors also have a higher ratio of intangible assets to total fixed assets. They are also more capital-intensive. It is interesting to note that Austrian firms investing in Eastern Europe show the highest difference in labour productivity and capital intensity with respect to the control group of firms. Finally, we find that firms opening up a foreign affiliate experienced a higher rate of employment growth than non-investing firms in the last three years. This implies that past performance is an important factor in the decision to go abroad. Note that this holds for firms investing in both Western and Eastern Europe.

Table 17: Differences between multinationals across different locations, median (number of observations in parentheses)

	Western Europe only	Eastern Europe only	Both Western and Eastern Europe	Other combinations
		Total		
Number of employees	40	57	143	191
	(272)	(83)	(64)	(38)
Sales (mn €)	8	15	37	70
	(217)	(60)	(42)	(33)
Sales (T€) per employee	214	280	303	206
	(180)	(43)	(40)	(25)
Fixed assets (T€) per employee	64	104	114	99
	(419)	(151)	(125)	(81)
Ratio of intanglible assets to total fixed assets (%)	0.5	0.3	0.4	0.7
	(562)	(250)	(162)	(104)
Annual labour costs (T€) per employee	54	64	53	77
	(107)	(67)	(65)	(38)
		Manufacturing		
Number of employees	85	155	311	467
	(88)	(22)	(27)	(21)
Sales (mn €)	15	17	59	180
	(66)	(14)	(21)	(16)
Sales (T€) per employee	184	207	247	192
	(61)	(12)	(20)	(16)
Fixed assets (T€) per employee	55	68	80	83
	(152)	(42)	(44)	(35)
Ratio of intanglible assets to total fixed assets (%)	1.2	0.8	0.9	1.3
	(171)	(52)	(47)	(39)
Annual labour costs (T€) per employee	48	48	52	59
	(50)	(20)	(24)	(15)
		Non-manufacturing		
Number of employees	30	50	61	105
	(184)	(61)	(37)	(17)
Sales (mn €)	5	14	21	37
	(151)	(46)	(21)	(17)
Sales (T€) per employee	255	280	368	288
	(119)	(31)	(20)	(9)
Fixed assets (T€) per employee	81	161	221	108
	(267)	(109)	(81)	(46)
Ratio of intanglible assets to total fixed assets (%)	0.2	0.1	0.1	0.5
	(391)	(198)	(115)	(65)
Annual labour costs (T€) per employee	63	70	56	95
	(57)	(47)	(41)	(23)

Source: AMADEUS database, WIFO calculations. The variables refer to the year 2006.

Table 18: Differences between firms that became multinational in 2004 and firms that did not change their ownership status (median)

	Control group	Firms that opened a foreign subsidiary	Control group	Firms that opened a foreign subsidiary in Western Europe	Control group	Firms that opened a foreign subsidiary in Eastern Europe
Number of employees	20	50	20	50	20	77
Sales (T€)	2,500	12,356	2,500	11,711	2,500	22,350
Sales (T€) per employee	154	215	154	232	154	269
Fixed assets (T€) per employee	25.0	39.6	25.0	38.7	24.9	71.6
Ratio of intanglible assets to total fixed assets (%)	0.5	1.4	0.5	1.7	0.5	0.6
Average annual employment growth rate 2004-2007	0.0	3.1	0.0	3.2	0.0	2.2

Source: AMADEUS database, WIFO calculations. Firms that did not change their ownership status are treated as non-investors. Removing this group of firms from the control group does not change the results.

4 Determinants of the number of subsidiaries

In this section, we apply a model that distinguishes between two choices firms have to make. First, they choose between investing and not investing abroad. Then, those firms that opt for foreign direct investment have to decide on the number and location of their subsidiary (or subsidiaries). We apply the zero-inflated negative binomial (ZINB) model. Based on this model, we attempt to estimate the influence of firm-specific factors on the decisions determining both multinationality and the number of foreign affiliates to set up in specific locations. Accordingly, the model comprises two parts: the participation equation explaining the existence of subsidiaries and the count component explaining the number of subsidiaries. Table 19 shows the results and reveals coefficients for the count component and the logit part of the ZINB model. Furthermore, special attention is directed to the determinants of foreign direct investment decisions in Eastern Europe. The table thus reports the results of the ZINB model for all subsidiaries irrespective of destination, as well as for the number of subsidiaries in Eastern Europe. In the lower panel of Table 19, we also report the marginal effects of the independent variables and the corresponding z-values for the count component. We find that capital intensity, firm size, and number of shareholders are significant factors influencing the number of subsidiaries. However, the magnitude of these effects is quite small, as indicated by the elasticities. An increase in a firm's capital intensity by 1 percent increases its expected number of subsidiaries by 0.06 percent. Similarly, an increase in firm size by 1 percent raises the expected number of subsidiaries by 0.07 percent. The elasticity of the expected number of foreign affiliates in Eastern Europe with respect to the number of shareholders is 0.01. Turning to the determinants of the expected number of foreign affiliates, we find that firm size and capital intensity are significant, but the impact is much lower than for the number of subsidiaries in Western Europe. The other difference is that firm age does influence the number of subsidiaries, whereas the number of shareholders is not significant. Other variables prove not to be significant and are not included in the final model. For instance, the ratio of intangible assets to total fixed assets is not a significant determinant of the number of subsidiaries. This stands in contrast to the literature, which suggests that multinational expansion is due to the presence of intangible assets (see e.g. Morck - Yeung, 1992).

The logit model explains the presence of zero subsidiaries. The coefficients are interpreted relative to the observation of a zero count. Thus, the negative firm size coefficient implies that large firms are less likely to exhibit zero subsidiaries. Parameter estimates of the ZINB model reveal that firm age, capital intensity, number of shareholders, and sector affiliation significantly determine the probability of having no subsidiaries. Finally, the estimates show that the

dispersion parameter α is significantly different from zero in all cases. In addition, the likelihood ratio (LR) test of α = 0 is rejected, indicating the significance of over-dispersion and that the zero-inflated negative binomial model is more appropriate than the zero-inflated Poisson model. Therefore, we do not report the results of the zero-inflated Poisson model.

Table 19: ZINB estimates of the number of subsidiaries

	All destinations			Western Europe			Eastern Europe		
	Coeff.		z-value	Coeff.		z-value	Coeff.		z-value
	Count data component of model								
log employment	0.53	***	5.47	0.46	***	6.13	0.32	***	2.67
log total assets per employee	0.62	***	6.65	0.48	***	6.97	0.34	**	2.03
log number of shareholders	0.47	***	5.15	0.56	***	5.87	0.66	***	3.82
log age in years	0.24		1.26	0.28	*	1.85	0.45	***	2.68
Industry dummies	yes			yes		0.32	yes		
Constant	-7.75	***	-6.64	-7.10	***	-8.20	-6.38	***	-3.81
	Logit model component explaining zero subsidiaries								
log employment	-0.93		-3.03	-1.15	***	-5.42	-1.19	***	-7.49
log total assets per employee	-0.47		-1.46	-0.52	**	-1.97	-1.43	***	-4.3
log number of shareholders	0.40		1.04	0.43	**	2.12	0.83	***	2.50
log age in years	0.13		0.27	0.48		1.05	0.11		0.35
Industry dummies	yes			yes		0.32	yes		
Constant	5.41	***	3.5	5.56	***	3.34	13.38	***	8.33
log alpha	1.33	***	4.26	1.30	***	12.52	1.75	***	7.35
	Marginal effects								
log employment	0.071	**	2.24	0.063	***	6.42	0.014	***	6.26
log total assets per employee	0.058	**	2.07	0.048	***	5.25	0.016	***	5.99
log number of shareholders	0.013	*	1.83	0.029	**	2.09	-0.001		-0.46
log age in years	0.010		1.53	0.008		0.89	0.003	*	1.92
Industry dummies	yes			yes		0.32	yes		

Source: AMADEUS database, WIFO calculation. Note: z-values are based on robust standard errors. ***p<0.01, **p<0.05 *p<0.1. Dummy variables for sector affiliation are included, but not reported. The number of observations is 8,852, with 608 nonzero cases for all destinations and 491 and 231 nonzero cases for Western and Eastern Europe, respectively.

5 Employment growth and Austrian multinationals

To provide initial evidence on the relationship between foreign direct investment and firm performance in our first step, we simply compare the employment performance of MNEs holding subsidiaries either in Western or Eastern Europe to that of purely domestic firms.

Table 20: Robust regression estimates for the determinants of employment growth (2004-2007)

	Coeff.		t-value	Coeff.		t-value	Coeff.		t-value
Foreign affiliate in Eastern Europe	-0.004		-0.56	-0.006		-0.76	-0.009		-1.18
Foreign affiliate in Western Europe	0.008	*	1.85	0.007		1.45	0.000		0.03
Ratio of intanglible assets to fixed assets (%)				0.021	***	3.32	0.018	***	2.58
log fixed assets per employee							0.006	***	5.25
log firm age	-0.006	***	-6.68	-0.006	***	-5.49	-0.007	***	-5.53
log employment	-0.005	***	-6.52	-0.006	***	-6.87	-0.005	***	-5.52
Industry affiliation	0.053		9.9	0.055		8.66	0.027	***	3.24
Number of observations	7,209			5,392			4,472		

Source: AMADEUS database, WIFO calculations. ***p<0.01, **p<0.05 *p<0.1.

Table 20 shows the results of the robust regression model on the determinants of average annual employment growth between 2004 and 2007. The key variables of interest are a dummy variable expressing whether or not firms had foreign affiliates in Western or Eastern Europe in 2004. At this stage, we do not restrict the analysis to new (first-time) investors, but rather include all investors. In addition, we include a number of control variables. All variables are measured at their initial values at the beginning of the period (2004). The main result is that having a foreign affiliate in Eastern Europe does not have a significant impact on the employment growth rate in the following three years. Firms with foreign affiliates in Western Europe have a higher employment growth rate, but the effect is only weakly significant and disappears once control variables are introduced in the growth equation. More importantly, we find that the (logarithmic) capital intensity and the ratio of intangible assets have a significant impact ($p<0.05$) on employment growth in the subsequent three years. The importance of intangible assets for firm growth is consistent with previous studies (see Morck – Yeung, 1992). The results are also consistent with Corrado et al. (2006) and Morrano - Haskel (2006), who find that intangible assets lead to higher productivity growth and improved firm performance. Furthermore, the estimated coefficient of firm size is negative and statistically significant ($p<0.05$) in almost all specifications. This suggests that Gibrat's law, which states that a firm's size and growth rate are independent, does not hold for firms in our estimation sample. Finally, firm age is also a significant factor of firm growth, with older firms showing lower employment growth rates.

6 Employment effects of investing abroad – results of the matching analysis

After offering a first glimpse of the impact of multinationality on firm (employment) growth in section 5, we improve the analysis in this section by applying the propensity score matching estimator combined with the difference-in-difference estimator. Doing so enables us to compare the change in employment growth rate between the pre- and post-investment period with a control group of firms that choose not to invest abroad in a given period, but do share similar characteristics (Debaere et el., 2006; Barba Navaretti et al., 2004, 2006, 2009)[3]). This is especially important because the decision to invest is itself driven by firm-specific advantages and ex-ante differences to other firms (higher productivity, high share of intangible assets, etc).

In order to identify the statistical comparison group, we model the probability of participation in the treatment and subsequently calculate the propensity scores. Each firm that opened up a subsidiary in 2005 is then matched with the domestic firm with the closest propensity score. The number of Austrian firms that became multinational in 2005 is 66, of which 34 invested in Eastern Europe.

Table 21: Probit estimates for the probability of opening a subsidiary

	Probability of becoming a MNE (2004-2005)					
	All destinations			Eastern Europe		
	Coeff.		z-value	Coeff.		z-value
Newly founded firm 2000-2004	-0.153		-0.74	-0.445		-1.29
Number of shareholders in 2004	0.224	***	2.83	0.064		0.62
log employment in 2004	0.191	***	4.91	0.254	***	5.39
Food & beverages 2009	0.16		0.5	0.048		0.11
Textile, leather, clothing 2009	0.471		1.4	0.589		1.62
Wood, paper, publishing 2009	0.272		1.16	0.088		0.27
Chemicals 2009	0.481	**	2.34	0.391		1.52
Energy, water, construction 2009	-0.758	**	-2.28	-0.353		-1.22
Wholesale & retail trade, hotels, transp., real estate 2009	0.222		1.38	0.071		0.35
Business services 2009	0.302		1.47	0.313		1.26
Constant	-3.322	***	-13.77	-3.663	***	-12.2

Source: AMADEUS database, WIFO calculations. Note: The reference category for the industry dummies is the machinery, electrical, and transport sector. *** p<0.01, ** p<0.05 * p<0.1.

Table 21 shows the estimation results of the probit model on the factors that influence the decision to invest abroad (see Oberhofer - Pfaffermayr, 2008, for a previous analysis on the

[3]) The control group also includes firms that did not undergo a change in ownership structure in a given geographical area.

characteristics of multinationality). We distinguish between investing irrespective of destination and investing in Eastern Europe. The probability of investing abroad depends significantly on firm size (measured as the log of employment), number of shareholders, and sector affiliation. The probability of investing abroad significantly increases with firm size. However, investing in Eastern Europe is not dependent upon firm size. Number of shareholders has a positive and significant impact on investment decisions. Based on these results, we calculate propensity scores for each firm and accordingly match foreign direct investors with non-investing firms.

Table 22: Descriptive statistics

		All destinations				Eastern Europe			
		Treated	Control group	t-value	p-value	Treated	Control group	t-value	p-value
Newly founded firm 2000-2004	Unmatched	0.17	0.09	3.53	0.00	0.10	0.09	0.24	0.81
	Matched	0.07	0.05	0.47	0.64	0.03	0.02	0.15	0.88
Number of shareholders 2004	Unmatched	0.96	0.62	7.58	0.00	0.80	0.62	2.95	0.00
	Matched	0.88	0.83	0.42	0.67	0.83	0.87	-0.23	0.82
log employment 2004	Unmatched	4.60	3.65	9.98	0.00	4.97	3.65	9.72	0.00
	Matched	4.58	4.70	-0.46	0.65	5.10	5.19	-0.26	0.80
Food & beverages 2009	Unmatched	0.01	0.03	-1.30	0.19	0.01	0.03	-0.94	0.35
	Matched	0.03	0.05	-0.45	0.65	0.03	0.05	-0.37	0.71
Textile, leather, clothing 2009	Unmatched	0.03	0.01	1.79	0.07	0.02	0.01	0.77	0.44
	Matched	0.03	0.02	0.33	0.74	0.06	0.05	0.21	0.83
Wood, paper, publishing 2009	Unmatched	0.04	0.03	0.23	0.82	0.03	0.03	-0.15	0.88
	Matched	0.08	0.07	0.27	0.79	0.06	0.05	0.10	0.92
Chemicals 2009	Unmatched	0.09	0.03	5.89	0.00	0.10	0.03	4.64	0.00
	Matched	0.13	0.15	-0.26	0.80	0.15	0.11	0.51	0.62
Mach., elect., transport equip. 2009	Unmatched	0.13	0.07	3.56	0.00	0.15	0.07	3.36	0.00
	Matched	0.11	0.12	-0.17	0.87	0.15	0.15	0.07	0.95
Energy, water, construction 2009	Unmatched	0.03	0.15	-4.67	0.00	0.05	0.15	-2.84	0.01
	Matched	0.02	0.03	-0.48	0.63	0.06	0.08	-0.37	0.71
Wholesale & retail trade, hotels,	Unmatched	0.39	0.39	0.05	0.96	0.41	0.39	0.43	0.67
transp., real estate 2009	Matched	0.44	0.46	-0.14	0.89	0.33	0.35	-0.15	0.88
Business services 2009	Unmatched	0.24	0.12	5.09	0.00	0.17	0.12	1.53	0.13
	Matched	0.13	0.10	0.50	0.62	0.15	0.15	0.00	1.00

Source: AMADEUS database, WIFO calculations. Note: The reference category for the industry dummies is the machinery, electrical, and transport sector.

In order to test whether the matching has been successful, we conduct t–tests on the mean differences of all relevant variables. The findings indicate that there are no statistically significant differences in the exogenous firm characteristics after matching (Table 22). This indicates that the exogenous variables are well balanced across the treatment and control groups.

Table 23 shows the average employment growth rates for the pre-investment period (2002-2004) and post-investment period (2005-2007) for MNEs as well as the control group (untreated). Generally, the post-investment employment growth rate of firms that went multinational in 2005 is higher than their pre-investment employment growth rate. However, firms that decided not to invest abroad or did not undergo a change in ownership status also experienced an increase in employment growth. That said, the change in the employment growth rate between the pre- and post-investment period is not significantly different from zero in any of the groups. The employment growth rate of firms investing in Eastern Europe also increased after they invested abroad. Again, the change in the growth rate is not significant, as indicated by the test performed.

Table 23: Employment growth before and after investment abroad

	Average annual percentage employment growth		Change of average annual employment growth in percentage points	T-test	Kwallis test	T-test based on robust regression method
	2002/2004	2005/2007	2002/2004 vs. 2005/2007		p-value	
Untreated	2.3	3.0	0.7	0.34	0.37	0.26
Becoming a multinational in 2005	3.4	5.1	1.7			
Untreated	2.4	3.1	0.7	0.27	0.67	0.69
Becoming a multinational in Eastern Europe in 2005	0.8	3.7	2.9			

Source: AMADEUS database, WIFO calculations.

As recommended by Smith - Todd (2005), all matching algorithms are implemented only for those firms with "common support". This is achieved by omitting the observations that have propensity scores above the maximum propensity scores or below the minimum scores of the controls. Imposing this "common support" restriction leads to a loss of one or two observations. For the remaining observations in the group of treated firms, we find appropriate twins.

Table 24 shows the results of the propensity score matching estimates of the mean difference in the average annual post-investment employment growth rate between the matched treatment group and the control group. This table includes the t-values associated with the null hypothesis that the means are equal. Table 25 provides the results of the difference-in-difference matching estimator, where the employment growth rates refer to the difference between the pre- and post-

investment period. In all cases, we apply the nearest-neighbor matching method without replacement. Again, we use the propensity score matching method to identify the control group. In the next step, we run an OLS and a robust regression model – with the dummy variable indicating whether or not a firm invests abroad – on the difference in employment growth rate between the pre- and post-investment period. The sample consists of the matched sample, i.e. the treated cases and the matched controls. For both results, we distinguish between the effects of becoming a multinational in Eastern Europe and in all destinations.

Table 24: Standard propensity score matching estimates on post-investment employment growth (average annual percentage change, 2005/2007)

	Treated	Control group	Difference	t-value
		All destinations		
Unmatched	5.0	3.0	2.0	1.1
Average treatment effect on the treated	5.1	1.4	3.8	1.8
		Eastern Europe		
Unmatched	7.1	3.0	4.1	1.6
Average treatment effect on the treated	7.1	0.3	6.8	1.5

Source: AMADEUS database, WIFO calculations.

Table 25: Difference-in-difference estimates based on matched sample

	Dependent variable: differences in average annual employment growth rates between the pre- and post-investment period (2002/2004 vs. 2005/2007)			
	OLS regression		Robust regression method	
	Coeff.	t-value	Coeff.	t-value
Explanatory variable:				
Becoming a multinational 2005 vs. previous period	0.023	0.82	0.011	0.82
Opening a foreign affiliate in Eastern Europe 2005 vs. previous period	0.034	0.091	0.008	0.4

Source: AMADEUS database, WIFO calculations.

The results based on the standard matching method in Table 24 show that investing abroad (irrespective of destination) does not have a significant impact (at the 5-per cent level) on the employment growth rates of parent companies in the post-investment period (i.e. between 2005 and 2007). However, the coefficient for all destinations is positive and marginally significant (at the 10-percent level), indicating that the growth rates of parent companies are higher than they would have been if the frims had not invested abroad. Results based on the difference-in-

difference estimator again exhibit a positive coefficient, but one that is not significant at any conventional level. With regard to the employment effects of becoming a multinational in Eastern Europe, the results are quite similar. For the standard matching estimators that compare the differences in post-investment employment growth rate between the investing firm and the its non-investing twin, we find that the employment effects of becoming a multinational in Eastern Europe are not significant at conventional levels. The positive coefficient implies that the employment growth rate of Austrian multinationals that decided to invest in Eastern Europe (in 2005) is higher than what it would have been had they decided not to invest. Overall, the results are consistent with Navaretti - Castellani (2004), who find that investing abroad does not replace, but strengthens home activities.

7 Conclusions

The paper uses firm-level data based on the AMADEUS database to analyse the major factors determining firms' decisions to invest abroad and degree of multinationality, which we measure by the number of foreign affiliates owned. We concentrate on Austria and compare MNEs with purely domestic firms, but also distinguish between Austrian multinationals and foreign multinationals. The data covers about 1,325 multinationals and around 4,000 of their foreign subsidiaries. We find that few Austrian firms have subsidiaries abroad, and those that do have operate in just a few geographical areas (i.e. Western and Eastern Europe). The analysis also reveals that the number of subsidiaries rose faster than the number of multinationals in the period observed, indicating that the number of foreign affiliates per multinational is increasing and higher than in other European countries. The number of subsidiaries per multinational enterprise is highest in Western European destinations and North America, at an average of 3.3. These results are an indication that the dynamic development of Austrian FDI since the nineties has mainly been driven by an expansion and intensification of activities on the intensive margin rather than the entry of new foreign investors (extensive margin). New investors prefer closer locations in Western and Eastern Europe. The Austrian services sector has a higher preference for subsidiaries in Eastern Europe. Furthermore, the analysis reveals a strong relationship between multinationality and firm size. Larger firms own a higher number of subsidiaries and also invest in more distant and exotic locations. Besides firm size, firm age, capital intensity, and number of shareholders are significant determinants of the number of subsidiaries. This is also true for locations in Eastern Europe, but the impact of firm size and capital intensity is much lower than on the number of subsidiaries in Western Europe.

The analysis also corroborates theoretical results establishing the fact that foreign direct investment activities are driven by firm-specific advantages and superior performance in the pre-investment period. Comparing purely domestic firms with investing firms at the beginning of the investment period, we find that they are larger and more productive, have a higher share of intangible assets, and are more capital-intensive. Firms that start foreign activities are ex-ante different from non-investing, purely domestic firms and past-performance is an important factor in the decision to go abroad. Furthermore, Austrian firms investing in Eastern Europe exhibit higher productivity than those investing in Western Europe. This difference could possibly be explained by additional costs related to investing in low-cost, less developed countries, which only the most productive firms are able to cover.

We apply the propensity score matching estimator combined with the difference-in-difference method to examine the impact of Austrian outward foreign direct investment (FDI) on domestic

parent-company employment. With this improved methodology, we are able to overcome the major shortcomings of earlier studies on the home-market effects of Austrian outward FDI, which only included data on foreign direct investors – leading to biased estimates and preventing inference of causal relationships.

The standard matching analysis finds a positive and marginally significant impact of outward foreign direct investment on parent-company employment growth in the post-investment period. This is a clear indication that employment in parent companies has risen faster than it would have if they had not invested abroad. In applying the difference-in-difference estimator, we find that the impact on the difference in employment growth rate between the pre- and post-investment period is positive, but not significant. The employment effects of becoming a multinational in Eastern Europe are similar. The FDI coefficient is clearly positive, but not significant in both the standard matching approach and the difference-in-difference method. Overall, however, the results may be taken as an indication that investing abroad strengthens employment performance in firms' home countries.

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9 Appendix

Table 26: Definition of locations

Western Europe	Eastern Europe	North America	Asia	South America
Andorra	Albania	USA	Afghanistan	Anguilla
Austria	Belarus	Canada	Armenia	Antigua and Barbuda
Belgium	Bosnia-Herzegovina		Azerbaijan	Argentina
Cyprus	Bulgaria		Bangladesh	Aruba
Denmark	Croatia		Bhutan	Bahamas
Finland	Czech Republic		Brunei Darussalam	Barbados
France	Estonia		Cambodia	Belize
Germany	Hungary		China	Bermuda
Gibraltar	Latvia		Georgia	Bolivia
Greece	Lithuania		Hong Kong	Brazil
Iceland	Macedonia		India	Cayman Islands
Ireland	Moldova		Indonesia	Chile
Italy	Montenegro		Japan	Colombia
Liechtenstein	Poland		Kazakhstan	Costa Rica
Luxembourg	Romania		Korea, Dem. People's Rep.	Cuba
Malta	Russia		Korea, Rep.	Dominica
Monaco	Serbia		Kyrgyzstan	Dominican Republic
Netherlands	Slovak Republic		Lao, Dem. People's Rep.	Ecuador
Norway	Slovenia		Macau	El Salvador
Portugal	Ukraine		Malaysia	Grenada
San Marino			Maldives	Guatemala
Spain			Mongolia	Guyana
Sweden			Myanmar	Haiti
Switzerland			Nepal	Honduras
United Kingdom			Pakistan	Jamaica
			Philippines	Mexico
			Singapore	Netherlands Antilles
			Sri Lanka	Nicaragua
			Taiwan	Panama
			Tajikistan	Paraguay
			Thailand	Peru
			Turkmenistan	Saint Kitts and Nevis
			Uzbekistan	Saint Lucia
			Vietnam	St. Vincent and the Grenadines
				Suriname
				Trinidad and Tobago
				Uruguay
				Venezuela
				Virgin Islands