International Investment and Firm Performance:

Empirical Evidence from Small Open Economies

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Abstract

The global financial and economic crisis has severely affected foreign direct investment, particularly the cross-border mergers and acquisitions in advanced economies. This paper examines the effects of foreign mergers and acquisitions on labour productivity and employment growth over the period 2001-2009 in six small open economies in the European Union: Austria, Belgium, Denmark, Finland, the Netherlands and Sweden. We show that the severity of the crisis has been uneven across these six economies. Taken together, our estimates suggest that foreign direct investment had stronger effects on firm performance in services than in manufacturing.

1   Introduction

The global financial and economic crisis has severely affected foreign direct investment (FDI), particularly in developed economies. In 2008, FDI inflows to developed countries contracted by 29%, mainly due to a sharp decline in cross-border mergers and acquisitions (M&A) sales that fell by 39% in value in comparison to 2007 (UNCTAD, 2009).[1] In 2009, FDI inflows to developed economies declined further, by 44%, again mainly due to a severe contraction of 65% in the value of cross-border M&A sales, particularly in manufacturing (UNCTAD, 2010).[2] The sharp decline in cross-border M&A sales is linked to their higher sensitivity to financial conditions, given their shorter investment cycles, than those of greenfield investments. In addition, the turmoil in stock markets distorted the price signals upon which M&A sales rely. However, while depressed stock prices reduced the value of transactions, in combination with global restructuring, they also generated opportunities for multinationals that were still able to access finance (UNCTAD, 2010).

Given these developments in international investment activity during the recent global financial and economic crisis, it appears pertinent to analyse the impacts of cross-border M&A on firm performance. Foreign mergers and acquisitions imply a change of ownership and they thus provide a natural experiment which can help to identify the effects of foreign ownership on firm performance. While most existing analyses have focused on firms in manufacturing, the evidence for firms in services is scarce. To fill this evidence gap, we use two rich micro data sets[3] available for the period 2001-2009, and analyse the effects of foreign mergers and acquisitions on productivity and employment growth in service firms in six small open European Union (EU) countries.[4] Economic growth in small open economies is more dependent on FDI inflows and it is therefore more vulnerable to changes in international investment flows.

As documented in previous studies (Johne and Storey 1998; Miles 2005), services have a number of distinct characteristics, such as: (i) their intangibility; (ii) simultaneity of their production and consumption; and (iii) perishability. These specific characteristics together with the fact that services account for a growing share of economic activity in advanced economies, motivate the focus of this analysis on services. To identify service specific effects of foreign acquisition on productivity and employment growth, we compare these results with the corresponding evidence obtained for manufacturing firms.

Our data, described in detail below, spans the period 2001 to 2009, i.e., it includes the recent global financial and economic crisis. We show that the severity of the crisis has been uneven across these six economies. In particular, the decline in real GDP and employment growth in 2008 and 2009 was more severe in Denmark, Finland and Sweden than in the other three analysed small open economies, Austria, Belgium and the Netherlands. Productivity growth declined in all six economies, with the biggest decrease in Finland. Against this macroeconomic background, the annual average over 2008-2009 for cross-border M&A sales declined in Austria, Finland, the Netherlands and Denmark, while it was higher than their value in 2007 in Belgium and Sweden.

Our evidence indicates that, in both manufacturing and services sectors, foreign investors tend to acquire larger firms. Other characteristics of acquired firms differ across countries and between manufacturing and services. Taken together, our estimates suggest that foreign direct investment had stronger effects on firm

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[1] Cross-border M&A peaked in 2007 after a five-year worldwide boom.

[2] In comparison to 2008, in 2009 cross-border M&A sales in manufacturing were down by 77% , while in services, they declined by 57%.

[3] *Amadeus* and *Zephyr,* provided by Bureau van Dijk, http://www.bvdinfo.com.

[4] Austria, Belgium, Denmark, Finland, the Netherlands, and Sweden.

performance in services in comparison to manufacturing. Overall, we find that the effects of foreign direct investment on labour productivity and employment growth were country specific.

The rest of this paper is organised as follows. Section 2 reviews the relevant theoretical and empirical literature. Section 3 presents our data and summary statistics while our empirical methodology is outlined in Section 4. Section 5 discusses our empirical results. Finally, Section 5 concludes.

2   Theoretical and Empirical Framework

Firms' post-acquisition performance depends on the pre-acquisition performance and characteristics of both the acquired and acquirer firms. In relation to the pre-acquisition performance of the acquired firms, two hypotheses have been put forward in the existing literature. On the one hand, the *synergy-effects* hypothesis argues that 'cherries' (i.e. good performers) are more likely to be acquired. On the other hand, the *management's comparative advantage* (or managerial-discipline) hypothesis suggests that 'lemons' (i.e. bad performers) are more likely to be acquired. In both cases, the performance of the acquired firms is expected to improve after acquisition. These two hypotheses maintain that the aim of the acquisition is to maximise profits. Productivity is expected to rise when foreign investors transfer their superior firm-specific advantages to their foreign affiliates.[5]

Table 1 summarises the main empirical findings of these studies with respect to pre-acquisition performance.

[Table 1 about here]

Out of 42 studies reviewed in Table 1, 22 conclude that foreign firms "cherry picked" high productivity firms. On the other hand, two studies find evidence that foreign firms acquired local firms with below-average productivity,[6] while six studies do not analyse this question.[7] Overall, the bulk of the existing evidence suggests that foreign investors tend to acquire high productivity firms.

Cross-border M&A may involve either the most or the least efficient foreign investors. Nocke and Yeaple (2007) show that, in industries in which the source of firm heterogeneity is linked to internationally mobile capabilities, such as R&D-intensive industries, foreign investors are the most productive, while foreign acquirers in industries with low or non-mobile capabilities are the least productive. This evidence implies that potential productivity spillovers are expected to be the highest when the foreign acquirer is in a R&D-intensive industry and the lowest, or even negative, when the foreign investor operates in industries with low R&D intensity.

The productivity impact of foreign investment on the acquired firm may depend on its absorptive capacity, i.e. the level of education of its employees (see for example, Nelson and Phelps, 1966). Thus, it may be that only a firm with a higher productivity when acquired will be able to absorb the more advanced technology

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[5] See, for example, Gugler et al. (2003), Fukao et al. (2008) and Balsvik and Haller (2010).

[6] According to Gioia and Thomsen (2004), foreign buyers tend to buy poor performers in Denmark as measured by return on assets and factor productivity. They argue that this is because of information disadvantages leading to a double "lemons problem". Bertrand and Zitouna (2008) find evidence of lemons picking in French manufacturing industries. Similar evidence is found by Girma and Görg (2007) for the UK electronics and food industries, and Harris (2009) for UK service industries.

[7] 12 of the studies referred to in Table 1 use data from the UK. However, even these find different answers to the question about cherry-picking.

of the foreign-owned firm (Lapan and Bardhan, 1973). Consequently, an acquired exporting firm may receive greater benefits than an acquired domestic firm, as found by Bandick and Görg (2010). On the other hand, it has also been suggested that a large technological gap between the foreign-owned firm and the acquired firm may lead to a larger productivity boost in the latter (Findlay, 1978). This situation has been analysed, for example, by Girma (2005a).

Existing evidence suggests that while in the short term productivity and employment growth may be negatively correlated, in the long term productivity growth correlates positively with employment growth (Pissarides and Vallanti 2004; Landmann 2004). In the short term, restructuring and performance-boosting measures following acquisition may lead to lower employment and higher labour productivity.[8] Existing studies have typically analysed total factor productivity which also accounts for the efficiency of the capital stock use. Foreign-owned firms are often more capital-intensive than domestic firms.[9]

With respect to empirical methodologies, early analyses of effects of foreign acquisitions on firm performance have used Ordinary Least Square (OLS) estimators (Aitken and Harrison 1999; Conyon et al. 2002a; Gioia and Thomsen 2004; Piscitello and Rabbiosi 2005; Fukao and Murakami 2005; Hanley and Zervos 2007; Balsvik and Haller 2010) or system GMM (Harris and Robinson 2002; Gugler and Yurtoglu 2004; Harris 2009). To capture the causal link between foreign ownership and firm performance, more recent studies use propensity score matching combined with difference-in-differences estimators. These studies include Girma (2005a, 2005b); Bellak, Pfaffermayr and Wild (2006); Girma, Kneller and Pisu (2007); Karpaty (2007); Huttunen (2007); Salis (2008); Bertrand and Zitouna (2008); Arnold and Javorcik (2009); Bandick and Hansson (2009); Schiffbauer, Siedschlag and Ruane (2009); Lipsey, Sjöholm and Sun (2010).

In most cases, firms were analysed for at least two years before and after the acquisition. However, in some studies (for example, Chen 2011), acquisition effects are found only five years after the event, which suggests the need to extend the analysed period. Nevertheless, it is difficult to assess *a priori* how many years it takes for the possible effects of an ownership change to fully sink in.

Evidence from the reviewed literature indicates that foreign acquisitions tend to result in higher productivity growth and that the productivity level remains higher relative to the pre-acquisition period.[10] This productivity boost can be linked to restructuring of inefficient plants, which may involve labour shedding and new capital investments.

Most existing studies use data on manufacturing firms, with only a few including also service firms. Using data from the UK, Harris (2009) found TFP gains in the acquired service sector plants. However, it appears that these productivity gains decline over time. In contrast, Schiffbauer, Siedschlag and Ruane (2009) found no TFP effects of foreign acquisitions on service firms in the UK.

In comparison to the evidence on effects of foreign acquisitions on productivity, the evidence with respect to the employment effects of foreign acquisitions is less conclusive Faster employment growth after acqui-

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[8] For example Girma (2005b) found that foreign acquisitions in the UK led to an increase in labour-use efficiency. On the other hand, Piscitello and Rabbiosi (2005) as well as Arnold and Javorcik (2009) find that there has been a rise in both labour productivity and employment in foreign-acquired Italian and Indonesian firms, respectively.

[9] For UK manufacturing, Schiffbauer, Siedschlag and Ruane (2009) found no effect of foreign M&A on total factor productivity (TFP). They found that labour productivity rose due to capital deepening. Furthermore, they found positive TFP effects when the acquirer was in R&D-intensive industries and negative effects when the acquirer was in marketing-intensive industries.

[10] Also negative productivity effects have been found, e.g. Hanley and Zervos (2007) for UK manufacturing.

sition is found by Piscitello and Rabbiosi (2005) for Italy; Gong, Görg and Maioli (2007) for privatised Chinese firms; Almeida (2007) for Portugal; Arnold and Javorcik (2009), and Lipsey, Sjöholm and Sun (2010) for Indonesia; Balsvik and Haller (2010) for Norway; and Bandick and Görg (2010), as well as Bandick and Karpaty (2011) for Sweden. Negative employment effects have been found by, among others, Conyon et al. (2002b) for the UK; Csengödi, Jungnickel and Urban (2008) for Hungary; and Chari, Chen and Dominguez (2009) for the United States.

In a number of studies, the employment effects have been found to depend on the sector, the size of the acquired firms, or the skill-level of the labour force. Girma (2005b) found negative employment effects in larger acquired British firms and positive effects in smaller ones. Using Swedish data, Bandick and Görg (2010) found that the increase in employment was larger in exporters and smaller in acquired multinational firms, but both effects occurred only if the takeover was vertical. There were no effects if the target was a purely domestic firm or if the acquisition was horizontal.

Huttunen (2007) as well as Lehto and Böckerman (2008) found negative employment effects of foreign acquisitions in Finland albeit with some variation depending on the skill groups and sectors. Huttunen's results indicate that the share of highly-skilled workers declined in the post-acquisition period. On the other hand, Bandick and Hansson (2009) found that in Sweden, the relative demand for skilled labour rose in foreign-acquired non-multinational firms (but not in acquired multinational firms). Also Bandick and Karpaty (2011) found an increase in skilled employment in Sweden following foreign acquisitions. Girma and Görg (2004) found slower employment growth in the electronics industry in the UK, in particular for unskilled labour, but no significant effects in the food sector. Lipsey, Sjöholm and Sun (2010) found that in foreign-acquired firms in Indonesia, blue-collar employment grew faster than white-collar employment.

Only few studies report evidence of employment effects of foreign acquisitions of service firms. Fukao et al. (2008) report a fall, albeit temporary, in non-manufacturing employment following a foreign takeover. Lehto and Böckerman (2008) found some evidence of negative employment effects in construction and other services in Finland, but no effects in trade, hotels and restaurants. Harris (2009) found that post-acquisition employment changed very little in service sectors in the UK.

The review of the literature discussed above suggests that foreign acquisition leads most frequently to productivity increases, while the employment performance of firms in the post-acquisition period appears to be more mixed, depending on firm and sector characteristics. While most of the previous evidence has been obtained for manufacturing firms, the evidence on the effects of foreign acquisitions on service firms is very limited.

3   Data and Descriptive Statistics

We use firm level data from the Bureau van Dijk's *Amadeus* and *Zephyr* datasets for firms in the six small and open economies we analyse in this paper. The period under examination covers the years 2001 to 2009. *Amadeus* is a large micro dataset including information on firm characteristics, financial performance and legal structure while *Zephyr* has detailed information on mergers and acquisitions, notably cross-border transactions. Using common identifiers we combine these two datasets for this study. Considering their legal form, companies are grouped into three broad categories: limited companies, limited liability companies, and other forms. We use data on unconsolidated accounts for only the first two categories to allow comparability across countries as these two categories correspond to public and private limited companies, respectively. Firms are classified according to their two-digit NACE code (Rev.1.1), which enables us

to separate service firms (NACE 50 – NACE 74) from manufacturing firms (NACE 15 – NACE 37) and explore heterogeneity between the two sectors.

We define a foreign acquisition as any change of ownership from domestic to foreign passing over a threshold of 10 per cent of total shareholding in line with officially recognised definitions of foreign direct investment.[11] Given data availability, we only consider medium-sized and large firms.[12] These are defined in the *Amadeus* data set as firms fulfilling at least one of the following conditions: the number of employees is greater than 15, operating revenue is greater than one million euros and/or total assets are greater than two million euros. Financial institutions and insurance companies are excluded from the *Amadeus* database due to compatibility issues with respect to the format of financial accounts.

Using available data, we construct the following firm variables: the age of the firm; employment; the ratio of debt to fixed assets; tangible fixed assets per employee (capital-labour ratio); turnover per employee[13] (labour productivity); employment growth rate; turnover per employee growth rate (labour productivity growth); a foreign acquisition dummy (binary variable equal to one in the year when the acquirer's stake passes 10 per cent); and industry, region and year dummies. We use industry producer price indices at the two digit level to deflate manufacturing firm monetary variables with 2005 as the base year and a GDP deflator with 2006 as the base year for service firms. Finally, our sample is restricted to non-negative observations for tangible fixed assets and the number of employees while debt is restricted to values equal to or greater than zero[14].

The available data are limited by missing values. Assuming that missing data are randomly missing, we generate these data using a weighted hotdeck imputing methodology. This is a multiple imputation process whereby five datasets are generated using a stochastic process and combined using the Rubin's Rule.[15] A detailed description of the imputation method is given in Appendix B.

Summary statistics are presented in Tables B1 – B6 in Appendix B. Relative to manufacturing, firms in services are smaller, younger, more productive, more capital-intensive and have a higher debt burden. Further, relative to manufacturing, foreign-acquired firms in services are smaller, older, more productive (with the exception of Belgium and the Netherlands), more capital-intensive (with the exception of the Netherlands), and with higher debt burden.

Comparing foreign acquired firms in services across countries, the average size is the largest in Austria and the smallest in Sweden; the average age is the highest in Belgium and the lowest in Finland; average productivity – the highest in the Netherlands and the lowest in Sweden and Finland; average capital intensity – the highest in Austria and the lowest in Finland; the average debt burden – the highest in the Netherlands and the lowest in Austria.

To put the results of our analysis in the context of the global financial and economic crisis, we provide a brief overview of descriptive statistics of macroeconomic performance and cross border M&A activity in 2008 and 2009.

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[11] For a definition of FDI see International Monetary Fund (1993).

[12] Data is more frequently missing in the case of small firms.

[13] The choice of labour productivity measure based on turnover is motivated by concerns over measurement errors given the lack of prices for intermediates if value added were chosen as output measure.

[14] These choices are motivated by using in the analysis logarithmic transformations of these variables.

[15] See Andridge and Little (2010).

The severity of the global economic and financial crisis has been uneven across the six small open economies we analyse in this paper: Austria, Belgium, Denmark, Finland, the Netherlands and Sweden.

Figures 1 and 2 indicate that the decline in real GDP and employment growth in 2008 and 2009 was more severe in the three Nordic countries, Denmark, Finland, and Sweden than in the other three small open economies, Austria, Belgium and the Netherlands.

[Figure 1 about here]

[Figure 2 about here]

Figure 3 shows that the economic and financial crisis also resulted in a decline in productivity growth in all six economies. Among these countries, Finland experienced the biggest decrease.

[Figure 3 about here]

Against this macroeconomic background, the annual average over 2008 – 2009 for cross-border M&A sales declined in Austria, Finland, the Netherlands and Denmark, while in Belgium and Sweden it was higher than their value in 2007.

[Figure 4 here]

4 Empirical Methodology

We use propensity score matching combined with difference-in-differences estimators (Heckman et al. 1997) to examine the causal effect of foreign acquisition on firm productivity and employment growth. To this purpose, we first estimate the propensity of foreign acquisition (the treatment, D) conditioned by the observed firm characteristics, X. We then use the propensity score to match foreign-acquired firms and domestic non-acquired firms assuming conditional independence, i.e. that foreign acquisitions are only determined by observables X and not by any unobservable characteristics. In combination with this assumption, a substantial overlap between the propensity score of the treated and untreated firms, also referred to as the common support assumption, allows matching non-acquired (control) firms to acquired (treated) firms such that:

$$(Y_1, Y_0) \perp D \mid p(X) \text{ and } 0 < p(X) < 1. \tag{1}$$

Y_1 is the firm outcome following foreign acquisition and Y_0 is the firm outcome under non-acquisition. $p(X)$ is the propensity score estimated using a set of observed characteristics X. $D \in \{0, 1\}$ is the treatment indicator where 0 indicates non-acquired control firms and 1 indicates foreign-acquired firms. Thus, assuming conditional independence, outcomes for foreign-acquired and non-acquired firms are independent of treatment when matched on the propensity score with common support.

To predict the foreign acquisition propensity, we use the following firm characteristics: the number of employees and its square term; the debt-to-fixed-assets ratio; the firm's age and its square term; the capital-to-labour ratio; and industry (3 digit NACE Rev. 1 classification), region and year fixed effects. These variables are lagged where possible by one year except for age and its square term. The sample is also

weighted by size classes[16] which divide firms according to the number of employees working at the firm as follows: 10-19 employees; 20-49 employees; 50-249 employees and firms with more than 250 employees.

Following the estimated probability of foreign acquisition, foreign-acquired firms are matched to domestic non-acquired firms on the common support. We employ the one-to-one nearest neighbour matching with replacement using a 0.005 caliper to reduce the likelihood of poor matches.[17] We impose the common support assumption, which implies that foreign-acquired firms having a propensity score higher than the maximum or less than the minimum of the propensity score of the domestic non-acquired firms are dropped. In addition, we perform balancing tests after matching to test the null hypothesis that sufficient overlap exists on the common support between foreign-acquired firms and the control group. The balancing tests are similar to Arnold and Javorcik (2009) including t-tests of the equality of means based on a regression of the variable on the treatment indicator, as well as a F-test of the quartic function of the propensity score and its interactions with the treatment dummy.

Finally, we use a difference-in-differences approach to determine the causal effect of foreign acquisition on firm performance. This is achieved by calculating the difference between outcomes of foreign-acquired and domestic non-acquired firms but also the difference over time within outcomes for foreign-acquired and domestic non-acquired firms. This empirical approach gives the growth rate of firm outcomes as a result of foreign acquisition. Calculating the difference over time allows us to control for unobserved time-invariant characteristics having already controlled for observed heterogeneity in the propensity score stage described above. The difference-in-differences equation is given by:

$$D_{t,t-1}(X) = E(Y_{1t} - Y_{0,t-1} \mid X, D = 1) - E(Y_{0t} - Y_{0,t-1} \mid X, D = 0) \text{ for } X \in S, \tag{2}$$

where S is the common support between the treated and control groups. Equation (2) gives the average treatment effect on the treated (ATT) or the causal effect of foreign acquisition.

5 Empirical Results

Propensity Score Equation

We first consider the estimates of the propensity score equation.[18] These estimates indicate that foreign investors tend to acquire larger firms in Belgium, Denmark, Finland, and Sweden, in manufacturing as well as in services. However, in contrast to services, it appears that larger firms in manufacturing are acquired at a decreasing rate. These results are in line with Gioia and Thomsen (2004) for Denmark and with findings of Bandick and Görg (2010) and Bandick and Karpaty (2011) for Sweden. We find that foreign investors "cherry picked" higher productivity service firms in Belgium and Denmark, while in Austria lower productivity services firms were more likely to be acquired by foreign investors (in contrast to findings by Bellak, Pfaffermayr and Wild, 2006). In manufacturing, we find that in Finland foreign investors "cherry picked" high productivity firms (these results are in line with Ilmakunnas and Maliranta 2004; and Huttunen 2007) while in the Netherlands, lower productivity firms were more likely to be acquired by foreign investors.

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[16] Weights are calculated on the basis of information provided by the Eurostat.
[17] Using the nearest neighbour matching leads to less bias as this method only uses the control observation closest in distance to match the treated observation.
[18] Results are available on request from the authors.

Also, we find that in Belgium and Denmark, foreign investors in manufacturing were more likely to acquire firms with higher debt-to-fixed-assets ratios. In addition, older service firms were more likely to be acquired in Denmark and Finland, although at a decreasing rate, while foreign acquisition of manufacturing firms was more likely for younger firms. The evidence also suggests that in Belgium and Finland foreign investors in manufacturing tended to acquire more capital-intensive firms.

Matching

We discuss next the matching results using the nearest neighbour matching method. It should be noted that, while the number of foreign acquired firms in the acquisition year and the first two years following acquisition are approximately comparable in the number of matched firms, these numbers decline rapidly thereafter reducing the comparability of the group of firms under examination. The results of the balancing tests show few statistically significant differences, thus validating the common support assumption discussed above.[19]

Labour productivity is measured as turnover per employee as in Conyon et al. (2002a) and Chen (2011).[20] In other studies, labour productivity has been measured as value added per employee (Piscitello and Rabbiosi 2005; Mattes 2010; Csengödi, Jungnickel and Urban 2008). However, data on value added is not available for Denmark in the *Amadeus* data set. Previous studies using both measures of labour productivity found that foreign acquisition had a positive impact on both the level and the growth of productivity. On the other hand, Mattes (2010), using propensity score matching found no significant effect. However, these studies focus only on manufacturing firms whereas our results show some instances where results differ between manufacturing and service firms within countries, in addition to heterogeneity between countries.

The Effects of Foreign Acquisitions on Labour Productivity and Employment Growth

The estimates of the effects of foreign acquisitions on labour productivity growth in service firms are shown in Table 2.

[Table 2 about here]

Overall, the estimates suggest no general pattern across the analysed countries. In the acquisition year, foreign acquisition led to significantly higher labour productivity growth in Denmark, significantly lower labour productivity growth in Belgium and the Netherlands and had no significant effect on labour productivity growth in Austria, Finland and Sweden. Three years after acquisition, the positive and significant effect of foreign acquisition on labour productivity growth persisted in Denmark, while its negative and significant effect was still present in Belgium. Foreign acquisitions had no significant effect on labour productivity growth in the other countries. Five years after acquisition, labour productivity growth was significantly higher in Austria, Denmark and Sweden while in Belgium and the Netherlands labour productivity growth was significantly lower. There were no significant effects in Finland. Taken together, country-specific estimates suggest that foreign acquisitions led to significantly higher labour productivity growth in Denmark (in the acquisition year, and one, three and five years after acquisition), as well as in Austria and Sweden (five years after acquisition). Labour productivity growth was significantly lower in Belgium (in the acquisition year as well as in the analysed post-acquisition period) and the Netherlands (in the acquisition

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[19] Results available on request from the authors.

[20] Conyon et al. (2002a) explore both growth and level effects while Chen (2011) examines growth effects only.

year, two and five years after the acquisition). In Finland, foreign acquisitions in services had no significant effect on labour productivity growth.

These results are consistent with the findings of a previous study by Gioia and Thomsen (2004) which finds that foreign acquisitions had a positive effect on the productivity of Danish firms although they do not distinguish between the effect on service and manufacturing firms.[21]

The estimates of the effect of foreign acquisition on labour productivity growth for manufacturing firms are shown in Table 3.

[Table 3 about here]

In contrast to service firms, these results suggest that in most cases foreign acquisitions had no significant effect on labour productivity growth across the six analysed small open economies. Foreign acquisitions led to significantly higher labour productivity growth in Finland one year after acquisition. On the other hand, labour productivity growth was significantly lower in Belgium (in the acquisition year and one year after acquisition), in Denmark (three years after acquisition), in Finland (four years after acquisition) and in Sweden (five years after acquisition).

Karpaty (2007) and Bandick (2011) found positive effects on firm productivity in manufacturing in Sweden for the level of Törnqvist TFP and TFP growth (estimated following Levinsohn and Petrin 2003). In the case of Denmark, Gioia and Thomsen (2004) found that foreign acquisitions had a positive effect on the labour productivity of Danish firms. However, they do not distinguish between service and manufacturing firms. Finally, Ilmakunnas and Maliranta (2004) found that foreign acquisition increased the TFP level in Finnish manufacturing firms.

The estimates of the effects of foreign acquisitions on employment growth in service firms are shown in Table 4.

[Table 4 about here]

Overall, these estimates indicate that, in the six analysed small open economies, foreign acquisitions led to significantly higher employment growth particularly in the first post-acquisition year. The impact was significant in the acquisition year in Austria and Belgium, one year after the acquisition in all six countries with the exceptions of Austria and Sweden, two years after acquisition in Denmark and Finland and four years after acquisition in Belgium and Denmark. Five years after acquisition employment growth was significantly higher in the Netherlands and significantly lower in Austria and Sweden. Lehto and Böckerman (2008) examined service industries and found mixed evidence for the level effect of foreign acquisition on service firms in Finland with declines in construction and other services, but no effect in trade, hotels and restaurants.

Table 5 shows the estimates of the effects of foreign acquisition on employment growth in manufacturing.

[Table 5 about here]

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[21] Gioia and Thomsen (2004) use a selection adjustment (inverse Mill's ratio) from a probit model and control for this in the OLS regression to test the level of productivity measured by the Cobb Douglas measure of TFP.

These estimates suggest that in many cases, albeit in fewer than in service firms, foreign acquisitions led to significantly higher employment growth in Belgium (in the acquisition year and four years after acquisition) and in Denmark (two, three and four years after acquisition). On the other hand, foreign acquisitions led to lower employment growth in Finland (in the acquisition year and one year after acquisition) and in Sweden (three and five years after acquisition). In Austria and the Netherlands, foreign acquisition of manufacturing firms had no significant effects on employment growth. These results are in line with the findings of Bellak, Pfaffermayr and Wild (2006). The estimates for Finland are in line with the findings of Lehto and Böckerman (2008). In the case of Sweden, Bandick and Hansson (2009) find that skilled employment increased following acquisition for non-Swedish MNEs with no statistically significant effect for Swedish MNEs. Furthermore, Bandick and Görg (2010) find positive employment growth in exporting firms and Swedish MNEs in vertical acquisitions only, while Bandick and Karpaty (2011) find positive employment growth in non-MNEs with no growth effect for Swedish MNEs.

Given the significant implications of the global economic and financial crisis on international investment patterns discussed in the Introduction, it would be desirable to analyse the effects of foreign M&As on firm performance in the pre- and post-crisis periods. However, at the time this analysis has been conducted the available data was insufficient to analyse separately the post-crisis period and contrast the results with those for the pre-crisis period.

6 Conclusions

We analysed the causal link between foreign investment and firm performance in six small open economies in the European Union. Specifically, we used micro data from Austria, Belgium, Denmark, Finland, the Netherlands and Sweden over the period 2001–2009 to identify the causal effect of foreign investment on labour productivity and employment growth. While much of the previous literature considers foreign investment in manufacturing firms, we examine both service and manufacturing firms. To disentangle causality from correlation effects, we analyse the effects of foreign mergers and acquisitions on firm performance.

Our evidence indicates that foreign investors tend to acquire larger firms in manufacturing as well as in services. Other characteristics of acquired firms differ across countries and between manufacturing and services.

Taken together, our results suggest that foreign acquisitions had stronger effects on firm performance in services than in manufacturing. Overall, no general pattern emerges with respect to the effects of foreign investment on firm performance across the analysed six economies. Foreign acquisitions in services led to higher labour productivity and higher employment growth in Denmark, but lower productivity growth and higher employment growth in Belgium and the Netherlands. Foreign acquisitions in services in Finland had no significant effect on labour productivity growth but they led to higher employment growth two and three years after acquisitions. In Austria and Sweden, foreign acquisitions led to higher productivity growth and lower employment growth five years after acquisition.

In the case of manufacturing, it appears that foreign acquisitions led to lower labour productivity growth and higher employment growth in Belgium and Denmark. In Finland and Sweden, in most cases, foreign acquisitions led to lower productivity growth and lower employment growth, while in Austria and the

Netherlands, there were no significant changes in labour productivity and employment growth in the post-acquisition period.

Our analysis suggests that the effects of foreign investment on firm performance are likely to be conditioned by economic, social and institutional country-specific characteristics. Further research linking these results to relevant country characteristics would contribute to a better understanding of the effects of foreign investment on firm performance.

The global economic and financial crisis has been more severe in the three Nordic countries, Denmark, Finland and Sweden than in the other three countries analysed, Austria, Belgium, and the Netherlands. To the extent that additional data become available, it would be worthwhile to undertake further analysis and compare the effects of international investment on firm performance in the pre- and post-crisis periods.

Acknowledgements

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Table 1:   **Empirical Evidence on Pre-Acquisition Performance and Foreign Acquisitions in Manufacturing and Services**

Authors	Country	Manufacturing	Services	"Cherry Picking"
Aitken and Harrison (1999)	Venezuela	Yes	No	Yes
Conyon *et al.* (2002a)	UK	Yes	No	No
Harris and Robinson (2002)	UK	Yes	No	Yes
Girma and Görg (2004)	UK	Yes	No	Yes
Gioia and Thomsen (2004)	Denmark	Yes	No	No
Gugler and Yurtoglu (2004)	US, UK, Europe	Yes	No	
Ilmakunnas and Maliranta (2004)	Finland	Yes	No	Yes
Fukao, Ito and Kwon (2005)	Japan	Yes	No	Yes
Fukao and Murakami (2005)	Japan	Yes	No	
Girma (2005b)	UK	Yes	No	Yes
Piscitello and Rabbiosi (2005)	Italy	Yes	No	No
Bellak, Pfaffermayr and Wild (2006)	Austria	Yes	No	Yes
Benfratello and Sembenelli (2006)	Italy	Yes	No	Yes
Girma and Görg (2007)	UK	Yes	No	No
Girma, Kneller and Pisu (2007)	UK	Yes	No	
Almeida (2007)	Portugal	Yes	No	Yes
Hanley and Zervos (2007)	UK	Yes	No	Yes
Gong, Görg and Maioli (2007)	China	Yes	No	
Huttunen (2007)	Finland	Yes	No	Yes
Karpaty (2007)	Sweden	Yes	No	No
Bertrand and Zitouna (2008)	France	Yes	No	No
Csengödi, Jungnickel and Urban (2008)	Hungary	Yes	No	No
Fukao *et al.* (2008)	Japan	Yes	Yes	Yes
Lehto and Böckerman (2008)	Finland	Yes	Yes	Yes
Girma, Görg and Pisu (2008)	UK	Yes	No	
Salis (2008)	Slovenia	Yes	No	Yes
Arnold and Javorcik (2009)	Indonesia	Yes	No	Yes
Criscuolo and Martin (2009)	UK	Yes	No	Yes
Bandick and Hansson (2009)	Sweden	Yes	No	
Chari, Chen and Dominguez (2009)	USA	Yes	No	No
Harris (2009)	UK	Yes	Yes	No
Schiffbauer, Siedschlag and Ruane (2009)	UK	Yes	Yes	No
Arndt and Mattes (2010)	Germany	Yes	No	No
Balsvick and Haller (2010)	Norway	Yes	No	Yes
Lipsey, Sjöholm and Sun (2010)	Indonesia	Yes	No	Yes
Bandick and Görg (2010)	Sweden	Yes	No	Yes
Mattes (2010)	Germany	Yes	No	Yes
Bandick (2011)	Sweden	Yes	No	Yes
Bandick and Karpaty (2011)	Sweden	Yes	No	Yes
Chen (2011)	USA	Yes	No	
Vahter (2011)	Estonia	Yes	No	
Greenaway, Guaraglia and Yu (2012)	China	Yes	No	No

Table 2: The Effect of Foreign Mergers and Acquisitions on Labour Productivity Growth – Service Firms

Country	Austria	Belgium	Netherlands	Denmark	Finland	Sweden
Year 0	-0.123	-0.186***	-0.164*	0.212**	-0.011	-0.047
	(0.134)	(0.057)	(0.085)	(0.089)	(0.072)	(0.044)
	N=191	N=731	N=643	N=500	N=325	N=767
Year 1	0.005	-0.234***	0.090	0.271***	-0.108	-0.032
	(0.120)	(0.062)	(0.097)	(0.086)	(0.070)	(0.053)
	N=186	N=651	N=552	N=481	N=287	N=703
Year 2	0.195	-0.151**	-0.224**	0.155	-0.128	-0.040
	(0.155)	(0.065)	(0.107)	(0.102)	(0.089)	(0.053)
	N=139	N=523	N=449	N=380	N=222	N=572
Year 3	0.085	-0.201**	-0.084	0.295***	0.033	0.085
	(0.212)	(0.087)	(0.133)	(0.111)	(0.136)	(0.060)
	N=83	N=378	N=300	N=275	N=149	N=451
Year 4	0.122	-0.278**	-0.229	0.218	0.217	0.056
	(0.287)	(0.110)	(0.180)	(0.197)	(0.143)	(0.073)
	N=60	N=275	N=228	N=209	N=114	N=341
Year 5	0.504**	-0.220*	-0.339*	0.439**	0.015	0.155*
	(0.247)	(0.127)	(0.177)	(0.189)	(0.193)	(0.087)
	N=34	N=163	N=170	N=119	N=74	N=220

Notes: Bootstrapped standard errors in parentheses.

* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

Table 3: The Effect of Foreign Mergers and Acquisition on Labour Productivity Growth –
Manufacturing Firms

Country	Austria	Belgium	Netherlands	Denmark	Finland	Sweden
Year 0	0.098	-0.275**	0.110	-0.141	0.094	0.047
	(0.254)	(0.111)	(0.151)	(0.130)	(0.089)	(0.053)
	N=81	N=178	N=250	N=247	N=159	N=349
Year 1	0.002	-0.440***	-0.098	0.036	0.235**	0.046
	(0.212)	(0.121)	(0.156)	(0.136)	(0.095)	(0.060)
	N=68	N=161	N=229	N=221	N=144	N=321
Year 2	-0.032	-0.092	0.043	-0.225	-0.080	-0.086
	(0.323)	(0.161)	(0.183)	(0.141)	(0.106)	(0.072)
	N=50	N=125	N=182	N=158	N=118	N=258
Year 3	0.008	-0.228	0.062	-0.313**	-0.007	-0.102
	(0.383)	(0.147)	(0.216)	(0.142)	(0.158)	(0.068)
	N=37	N=106	N=142	N=128	N=76	N=197
Year 4	0.432	-0.104	0.183	-0.088	-0.431***	-0.023
	(0.399)	(0.214)	(0.318)	(0.232)	(0.163)	(0.103)
	N=15	N=75	N=82	N=82	N=54	N=106
Year 5	0.060	-0.624	-0.534	-0.283	-0.266	-0.243**
	(0.499)	(0.457)	(0.391)	(0.231)	(0.207)	(0.111)
	N=5	N=23	N=62	N=62	N=38	N=79

Notes: Bootstrapped standard errors in parentheses.

* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

Table 4: The Effect of Foreign Mergers and Acquisitions on Employment Growth – Service Firms

Country	Austria	Belgium	Netherlands	Denmark	Finland	Sweden
Year 0	0.275*	0.148**	0.073	0.125	0.125	-0.015
	(0.162)	(0.060)	(0.090)	(0.108)	(0.078)	(0.050)
	N=191	N=731	N=643	N=500	N=325	N=767
Year 1	0.175	0.178***	0.213**	0.245**	0.412***	-0.053
	(0.146)	(0.067)	(0.103)	(0.101)	(0.097)	(0.054)
	N=186	N=651	N=552	N=481	N=287	N=703
Year 2	0.046	0.011	0.132	0.402***	0.299***	0.060
	(0.182)	(0.077)	(0.096)	(0.122)	(0.111)	(0.059)
	N=139	N=523	N=449	N=380	N=222	N=572
Year 3	-0.094	0.059	0.214	0.022	0.149	-0.043
	(0.257)	(0.098)	(0.146)	(0.163)	(0.107)	(0.079)
	N=83	N=378	N=300	N=275	N=149	N=451
Year 4	-0.361	0.368***	0.290	0.551***	0.126	0.025
	(0.332)	(0.121)	(0.183)	(0.184)	(0.146)	(0.094)
	N=60	N=275	N=228	N=209	N=114	N=341
Year 5	-0.731*	0.171	0.311*	0.465	-0.141	-0.257**
	(0.376)	(0.173)	(0.169)	(0.294)	(0.185)	(0.105)
	N=34	N=163	N=170	N=119	N=74	N=220

Notes: Bootstrapped standard errors in parentheses.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

Table 5: The Effect of Foreign Mergers and Acquisitions on Employment Growth – Manufacturing Firms

Country	Austria	Belgium	Netherlands	Denmark	Finland	Sweden
Year 0	0.191	0.211*	0.126	0.031	-0.245**	-0.065
	(0.318)	(0.112)	(0.169)	(0.161)	(0.121)	(0.073)
	N=81	N=178	N=250	N=247	N=159	N=349
Year 1	-0.020	0.139	0.111	0.210	-0.256*	0.063
	(0.232)	(0.125)	(0.168)	(0.179)	(0.136)	(0.074)
	N=68	N=161	N=229	N=221	N=144	N=321
Year 2	0.413	0.240	0.034	0.378*	-0.075	-0.134
	(0.345)	(0.161)	(0.176)	(0.210)	(0.157)	(0.090)
	N=50	N=125	N=182	N=158	N=118	N=258
Year 3	0.387	0.109	0.138	0.572**	0.046	-0.190*
	(0.370)	(0.159)	(0.223)	(0.242)	(0.209)	(0.098)
	N=37	N=106	N=142	N=128	N=76	N=197
Year 4	0.343	0.564**	-0.034	1.151***	-0.260	-0.089
	(0.583)	(0.232)	(0.294)	(0.363)	(0.171)	(0.125)
	N=15	N=75	N=82	N=82	N=54	N=106
Year 5	-0.855	0.503	0.354	0.020	-0.292	-0.230*
	(2.236)	(0.403)	(0.288)	(0.339)	(0.306)	(0.126)
	N=5	N=23	N=62	N=62	N=38	N=79

Notes: Bootstrapped standard errors in parentheses.

*   Significant at the 10% level.
**   Significant at the 5% level.
*** Significant at the 1% level.

Fig. 1:   Real GDP growth, percentage change on previous year
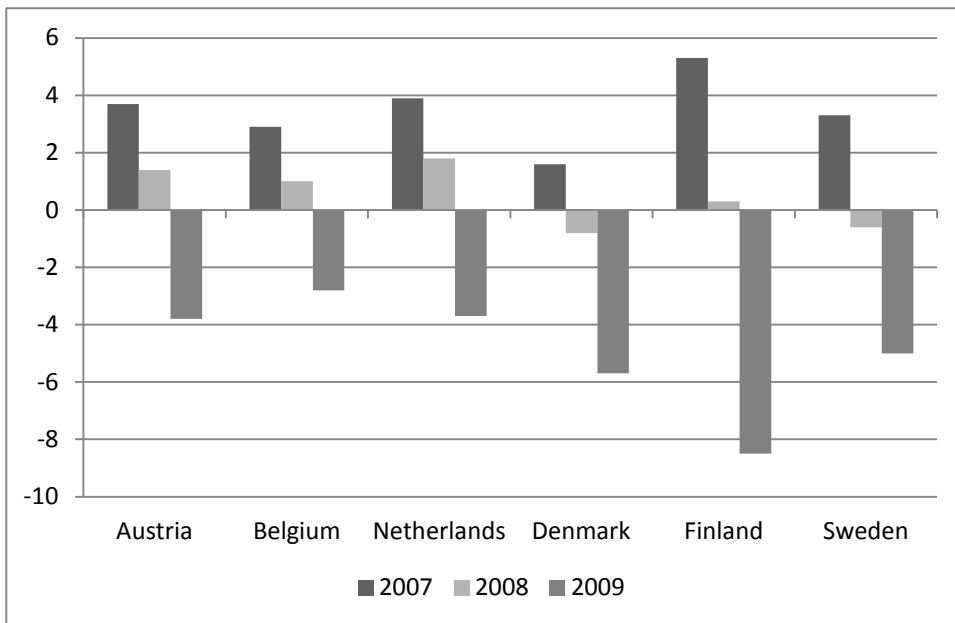
Source: Eurostat

Fig. 2:   Employment growth, percentage change on previous year
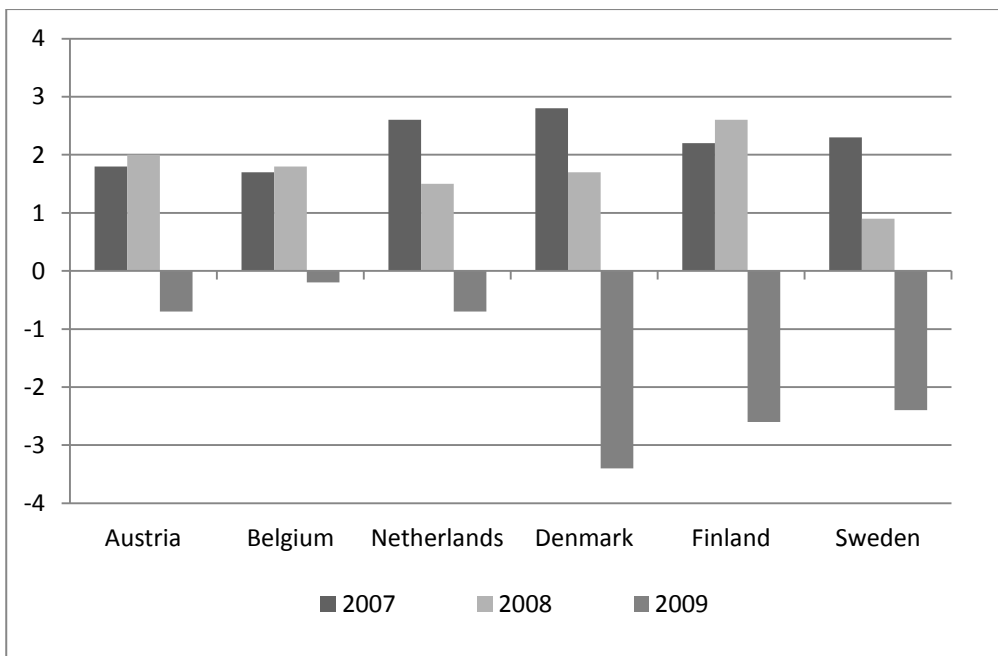
Source: EUROSTAT

Fig. 3:   Real labour productivity growth, percentage change on previous year
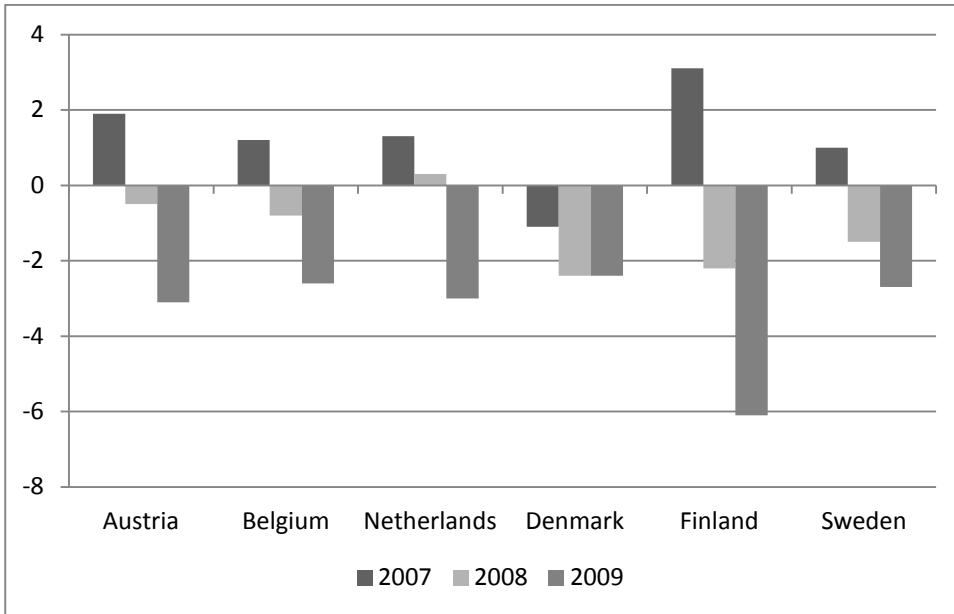
Source: EUROSTAT

Fig. 4:   Cross-border M&A sales, mill. US dollars

Source: EUROSTAT

22
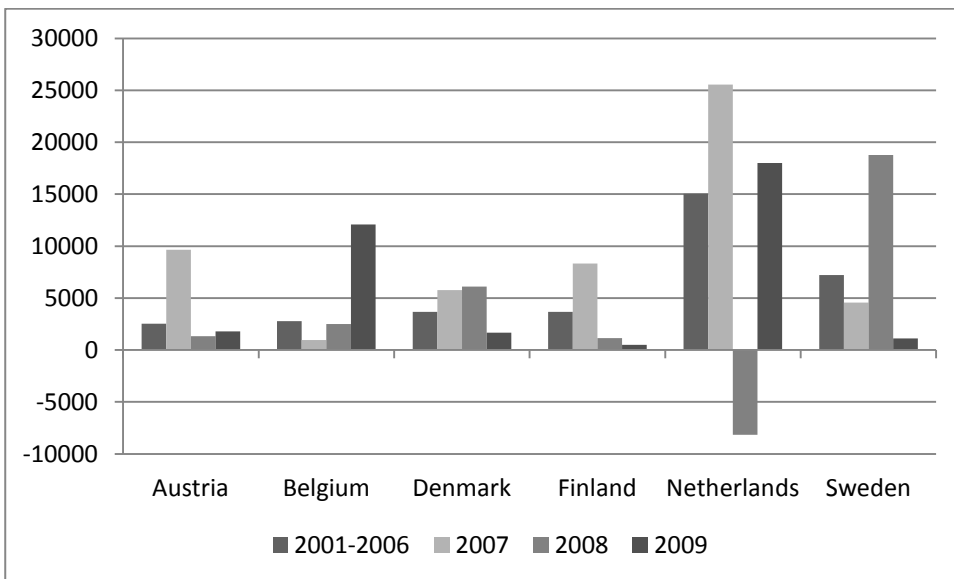
Appendix A: Data Imputation Methodology

Missing values in the *Amadeus* dataset represent a significant difficulty for the econometric analysis. For example, the raw data for Finland allows only 24 matched acquired firms for the evaluation of the effect of foreign acquisitions on firm performance in the services sector.

To deal with this issue, we apply the *weighted hotdeck multiple method* (Mander and Clayton 2003) to impute data. The weighted hotdeck multiple method replaces missing values with sampled observations with complete data. Observations with missing values and complete data are stratified using the same variables that indicate the characteristics of observations. Sampling is made within strata so as to achieve better matching. Weighted hotdeck improves the imputation method by incorporating the missingness of the data in the sampling. Firstly, it fits a logistic model with independent variables that explain the occurrence of having missing values. After that, the propensity score of having missing values is predicted and it serves as weight in the last step. Finally, a weighted sampling of observations with complete data is performed to create data points for the observations with missing values. The weighted hotdeck relies on the assumption that missing values are either missing completely at random (MCAR) or missing at random (MAR).

The weighted hotdeck method has the following advantages over other imputation methods (Rubin 1987): (i) it only requires very few assumptions on the distribution of the data (Mander and Clayton 2003); (ii) it does not rely on parametric models to fit the missing values, therefore it is less sensitive to model misspecification (Andridge and Little 2010); (iii) only plausible values will be imputed (Andridge and Little 2010).

We use the *whotdeck* routine from Stata (Mander 2003) to impute the following variables with missing values: turnover, employment, fixed tangible assets, depreciation, value added, debts and fixed assets. The explanatory variables of the logistic model of missingness are 3-digit industry dummies, dummies for foreign ownership, size class, year, and a set of indicators for foreign acquisition and domestic acquisition interacted with thresholds. Five sets of imputed data are independently generated and they form a multiple imputation scheme. The multiple imputation method treats the data generation process as stochastic rather than deterministic, thus accounting for the variation across datasets. Performing an imputation five times is considered sufficient (Mander and Clayton 2003).

With imputed datasets, we are able to evaluate the effect of foreign mergers and acquisitions in the services sector in Finland for up to 65.2 (average across the five datasets) matched targets.

Each of the imputed datasets will be analysed independently using the same econometric model, i.e. the Probit model of the propensity of being acquired by foreign acquirers. However, the estimated parameters from each datasets can be combined using the Rubin's rule (Rubin 1987) in order to draw inference for the overall data.

Rubin (1987) proposes a formula to combine repeated-imputation summary statistics as follows.

Let $\mathcal{G} = (\hat{\theta}_1, \hat{\theta}_2, ..., \hat{\theta}_m)$ be the estimate of interest from m imputed datasets.

The mean of θ is given as follows:

$$\bar{\vartheta}_m = \sum_{l=1}^{m} \hat{\theta}_l / m$$

.

The average of variance of the m dataset estimates is:

$$\bar{U}_m = \sum_{l=1}^{m} Var(\hat{\theta}_l) / m$$

.

The average of the variances between the m dataset estimates is as follows:

$$B_m = \sum_{l=1}^{m} (\hat{\theta}_l - \bar{\theta}_l)^2 / (m-1)$$

The total variance is defined as:

$$\bar{U}_m + (1 + m^{-1})B_m$$

.

Appendix B: Summary Statistics

Table B1: Summary Statistics of Foreign Acquired Firms - Services

	Austria	Belgium	Netherlands	Denmark	Finland	Sweden
Turnover	90821.1	37339.2	107146.8	49207.1	18544.2	10225.0
	(216923.5)	(168961.2)	(566103.7)	(177171.8)	(99130.1)	(33186.5)
	N=2300	N=9950	N=8100	N=5800	N=4600	N=8550
Value added	25701.8	9903.4	15830.3	-	3100.2	3658.5
	(93280.4)	(45424.2)	(70903.3)		(12616.1)	(15407.0)
	N=2256	N=9689	N=7839		N=4537	N=8130
Employment	280.4	119.0	139.8	140.1	57.7	54.5
	(858.5)	(326.8)	(370.8)	(477.3)	(254.1)	(262.4)
	N=2300	N=9950	N=8100	N=5706	N=4600	N=8467
Turnover per employee	1334.6	1013.6	2704.2	1727.8	346.9	345.1
	(11055.2)	(4648.6)	(18362.6)	(19878.0)	(903.0)	(801.6)
	N=2300	N=9950	N=8100	N=5706	N=4600	N=8467
Value added per employee	393.0	274.7	277.7	-	71.6	107.4
	(4518.9)	(6221.4)	(1627.2)		(106.6)	(291.1)
	N=2256	N=9689	N=7839		N=4537	N=8051
Age	18.8	19.5	17.8	16.8	12.7	17.7
	(23.0)	(17.4)	(17.3)	(17.7)	(12.4)	(19.0)
	N=1925	N=8555	N=6840	N=5040	N=4012	N=7325
Debt/fixed assets	2.9	21.2	57.6	14.8	6.6	9.8
	(17.1)	(594.3)	(825.0)	(594.6)	(21.5)	(36.5)
	N=2299	N=9935	N=8063	N=5777	N=4590	N=8537
Total assets per employee	544.6	122.0	266.5	412.5	55.0	193.5
	(5010.5)	(1170.0)	(4278.3)	(7268.2)	(604.3)	(1413.0)
	N=2293	N=9878	N=7969	N=5620	N=4553	N=8380

Notes: The figures shown above are the mean, standard deviation (in parenthesis) and total number of observations (N). Turnover and value added are deflated by a GDP deflator with 2006 as the base year. Foreign acquisition is defined as any ownership stake crossing a threshold of 10 per cent of total shareholding.

Table B2: Summary Statistics of Non Acquired Firms - Services

	Austria	Belgium	Netherlands	Denmark	Finland	Sweden
Turnover	101592.8	38435.8	101598.2	36616.0	8124.4	6682.9
	(271747.7)	(253376.7)	(518048.2)	(187574.3)	(54281.4)	(65059.4)
	N=522500	N=916800	N=2225600	N=501950	N=484050	N=1637900
Value added	27435.0	8372.8	15525.3	-	1774.1	1728.1
	(91872.8)	(57305.8)	(75510.6)		(9154.5)	(29551.2)
	N=513903	N=898424	N=2166217		N=479857	N=1601845
Employment	300.8	89.1	138.7	122.5	32.8	27.7
	(805.9)	(404.6)	(374.1)	(441.7)	(163.6)	(213.1)
	N=522500	N=916800	N=2225600	N=491785	N=484050	N=1616576
Turnover per employee	1369.0	1418.7	3382.8	737.1	409.6	410.9
	(10049.0)	(8924.6)	(39515.9)	(8961.4)	(4046.3)	(7175.7)
	N=522500	N=916800	N=2225600	N=491785	N=484050	N=1616576
Value added per employee	349.5	220.9	323.5	-	76.9	87.1
	(3383.4)	(7210.6)	(2890.1)		(270.2)	(587.8)
	N=513903	N=898424	N=2166217		N=479857	N=1583191
Age	17.6	17.4	22.7	13.1	14.5	16.4
	(26.5)	(13.8)	(23.7)	(13.6)	(13.5)	(16.5)
	N=401605	N=766910	N=1885315	N=388460	N=396661	N=1263425
Debt/fixed assets	3.1	27.5	57.3	10.7	4.7	7.2
	(17.8)	(1008.8)	(771.9)	(327.1)	(36.5)	(54.7)
	N=521589	N=914372	N=2215440	N=499157	N=483061	N=1630641
Total assets per employee	407.8	146.0	332.6	451.0	143.5	189.8
	(3865.1)	(1466.5)	(6274.4)	(6270.7)	(1724.7)	(1426.2)
	N=520494	N=907584	N=2190947	N=483039	N=480166	N=1600755

Notes: The figures shown above are the mean, standard deviation (in parenthesis) and total number of observations (N). Turnover and value added are deflated by a GDP deflator with 2006 as the base year. Foreign acquisition is defined as any ownership stake crossing a threshold of 10 per cent of total shareholding.

Table B3: Summary Statistics of All Firms - Services

	Austria	Belgium	Netherlands	Denmark	Finland	Sweden
Turnover	101578.4	38416.1	101614.6	36721.8	8266.2	6717.1
	(271539.3)	(252597.5)	(518280.3)	(186744.6)	(54540.4)	(64870.3)
	N=526700	N=935750	N=2250000	N=513700	N=504750	N=1660200
Value added	27432.2	8387.7	15526.7	-	1805.6	1741.7
	(91847.4)	(57015.6)	(75509.8)		(9141.4)	(29397.6)
	N=518034	N=916882	N=2189915		N=500365	N=1623186
Employment	300.7	89.5	138.7	122.6	33.5	28.0
	(806.8)	(403.6)	(374.3)	(441.6)	(164.5)	(213.3)
	N=526700	N=935750	N=2250000	N=503342	N=504750	N=1638649
Turnover per employee	1368.8	1411.8	3379.8	749.1	405.3	412.9
	(10042.5)	(8942.4)	(39438.4)	(9138.1)	(3970.8)	(7236.8)
	N=526700	N=935750	N=2250000	N=503342	N=504750	N=1638649
Value added per employee	349.6	221.1	323.2	-	76.5	87.5
	(3384.3)	(7168.1)	(2885.4)		(266.8)	(593.3)
	N=518034	N=916882	N=2189915		N=500365	N=1604321
Age	17.6	17.4	22.7	13.2	14.5	16.4
	(26.5)	(13.9)	(23.7)	(13.7)	(13.5)	(16.5)
	N=405120	N=783355	N=1906125	N=398345	N=414371	N=1282580
Debt/fixed assets	3.1	27.3	57.3	10.8	4.7	7.2
	(17.8)	(1000.6)	(772.0)	(336.0)	(36.5)	(54.5)
	N=525783	N=933275	N=2239745	N=510864	N=503735	N=1652845
Total assets per employee	408.8	145.3	332.0	451.1	140.7	190.2
	(3872.3)	(1458.0)	(6262.8)	(6290.2)	(1705.8)	(1443.3)
	N=524681	N=926349	N=2214980	N=494405	N=500685	N=1622594

Notes: The figures shown above are the mean, standard deviation (in parenthesis) and total number of observations (N). Turnover and value added are deflated by a GDP deflator with 2006 as the base year. Foreign acquisition is defined as any ownership stake crossing a threshold of 10 per cent of total shareholding.

Table B4: Summary Statistics of Foreign Acquired Firms - Manufacturing

	Austria	Belgium	Netherlands	Denmark	Finland	Sweden
Turnover	94415.5	42655.7	161047.6	43880.0	13440.3	32105.6
	(194243.8)	(141898.0)	(414018.4)	(160801.7)	(45696.1)	(151955.5)
	N=1050	N=2600	N=2280	N=3200	N=2200	N=4650
Value added	23877.8	10310.3	15480.8	-	4191.1	10277.4
	(49469.8)	(23959.4)	(68315.6)		(13275.0)	(196707.1)
	N=1032	N=2521	N=2207		N=2146	N=4540
Employment	334.9	129.5	145.6	150.2	61.3	100.4
	(696.5)	(381.1)	(392.9)	(448.8)	(209.1)	(327.9)
	N=1050	N=2600	N=2280	N=3152	N=2200	N=4636
Turnover per employee	1505.8	709.7	8318.3	842.8	310.5	283.5
	(11192.2)	(3463.3)	(55807.0)	(12290.9)	(633.0)	(709.8)
	N=1050	N=2600	N=2280	N=3152	N=2200	N=4636
Value added per employee	307.9	248.4	567.1	-	88.1	73.5
	(3039.1)	(5821.4)	(1781.3)		(161.3)	(180.8)
	N=1032	N=2521	N=2207		N=2146	N=4526
Age	19.5	23.0	29.0	19.9	15.0	26.8
	(18.6)	(19.7)	(225.7)	(16.4)	(11.2)	(23.8)
	N=845	N=2230	N=2008	N=2765	N=1876	N=4080
Debt/fixed assets	2.7	5.6	93.8	8.3	3.7	5.8
	(17.0)	(26.4)	(457.4)	(149.5)	(33.4)	(44.7)
	N=1050	N=2600	N=2274	N=3188	N=2199	N=4637
Total assets per employee	280.4	106.4	562.6	338.7	49.2	77.0
	(1730.3)	(647.2)	(4918.8)	(5733.9)	(205.2)	(433.9)
	N=1050	N=2597	N=2247	N=3118	N=2194	N=4602

Notes: The figures shown above are the mean, standard deviation (in parenthesis) and total number of observations (N). Turnover and value added are deflated by a GDP deflator with 2006 as the base year. Foreign acquisition is defined as any ownership stake crossing a threshold of 10 per cent of total shareholding.

Table B5: Summary Statistics of Non Acquired Firms - Manufacturing

	Austria	Belgium	Netherlands	Denmark	Finland	Sweden
Turnover	101006.4	36873.1	100863.8	37193.9	7747.2	6123.8
	(268409.5)	(239613.2)	(510888.2)	(210695.7)	(42075.6)	(54798.8)
	N=125900	N=222900	N=313700	N=91700	N=127250	N=298800
Value added	27999.5	8151.4	15507.6	-	1981.2	1671.7
	(97775.5)	(55241.8)	(76022.1)		(7682.4)	(35494.2)
	N=123816	N=218898	N=305204		N=126253	N=294970
Employment	303.5	90.9	138.6	125.4	36.4	29.3
	(853.8)	(385.1)	(373.6)	(427.6)	(112.8)	(137.6)
	N=125900	N=222900	N=313700	N=90023	N=127250	N=297139
Turnover per employee	1372.0	1114.9	3337.1	745.9	259.0	262.0
	(10185.5)	(7441.6)	(39506.2)	(10131.9)	(2792.3)	(5830.0)
	N=125900	N=222900	N=313700	N=90023	N=127250	N=297139
Value added per employee	361.5	184.8	322.4	-	62.6	62.7
	(3625.8)	(7143.9)	(2910.9)		(192.8)	(490.0)
	N=123816	N=218898	N=305204		N=126253	N=293523
Age	24.7	22.8	32.1	15.2	17.3	21.1
	(32.7)	(16.8)	(30.1)	(12.9)	(14.4)	(17.6)
	N=103720	N=191535	N=269295	N=75525	N=106689	N=250670
Debt/fixed assets	3.1	22.3	58.5	10.3	2.8	4.3
	(17.8)	(924.9)	(778.6)	(316.3)	(20.9)	(27.0)
	N=125683	N=222393	N=312224	N=91187	N=127094	N=298089
Total assets per employee	398.2	121.0	323.8	389.3	72.7	72.4
	(3760.4)	(1347.3)	(6234.8)	(5473.4)	(1032.9)	(745.2)
	N=125416	N=221137	N=308831	N=88565	N=126588	N=295708

Notes: The figures shown above are the mean, standard deviation (in parenthesis) and total number of observations (N). Turnover and value added are deflated by a GDP deflator with 2006 as the base year. Foreign acquisition is defined as any ownership stake crossing a threshold of 10 per cent of total shareholding.

Table B6: Summary Statistics of All Firms - Manufacturing

	Austria	Belgium	Netherlands	Denmark	Finland	Sweden
Turnover	100886.7	36840.8	100851.3	37451.4	7918.7	6525.4
	(267398.2)	(237691.1)	(511480.7)	(210703.8)	(43223.2)	(57148.0)
	N=127700	N=228350	N=320100	N=97750	N=136300	N=309000
Value added	27952.8	8155.7	15495.5	-	2044.8	1804.5
	(97465.5)	(54673.0)	(75980.5)		(7832.6)	(42392.2)
	N=125585	N=224241	N=311425		N=135206	N=304890
Employment	303.6	91.4	138.6	126.4	37.4	30.6
	(851.3)	(383.3)	(373.0)	(425.8)	(118.4)	(142.0)
	N=127700	N=228350	N=320100	N=95977	N=136300	N=307281
Turnover per employee	1371.2	1104.2	3330.5	750.7	264.8	262.2
	(10169.0)	(7382.8)	(39497.7)	(10150.4)	(3887.3)	(5734.6)
	N=127700	N=228350	N=320100	N=95977	N=136300	N=307281
Value added per employee	360.3	184.4	320.8	-	63.0	62.9
	(3612.6)	(7085.4)	(2887.6)		(195.7)	(482.8)
	N=125585	N=224241	N=311425		N=135206	N=303396
Age	24.6	22.8	32.2	15.5	17.2	21.2
	(32.5)	(16.8)	(30.1)	(13.3)	(14.2)	(17.7)
	N=105230	N=196305	N=274970	N=80765	N=114594	N=259665
Debt/fixed assets	3.1	21.9	58.2	10.6	2.8	4.3
	(17.7)	(913.8)	(774.5)	(339.8)	(20.8)	(28.2)
	N=127480	N=227842	N=318598	N=97214	N=136139	N=308257
Total assets per employee	396.4	120.2	322.6	387.1	71.5	72.5
	(3740.0)	(1333.5)	(6197.3)	(5497.2)	(1004.8)	(739.5)
	N=127211	N=226576	N=315139	N=94445	N=135604	N=305752

Notes: The figures shown above are the mean, standard deviation (in parenthesis) and total number of observations (N). Turnover and value added are deflated by a GDP deflator with 2006 as the base year. Foreign acquisition is defined as any ownership stake crossing a threshold of 10 per cent of total shareholding.