ANALYSIS

Productivity Effects of Foreign Acquisitions in Sweden

A sectoral analysis

2023

Summary and policy implications

In the first decade after the turn of the millennium, FDI was high on the political agenda as countries around the world struggled to attract FDI. Today, twenty years later, FDI is again on the political agenda, only this time due to growing fears that FDIs could threaten national security. As a result, in recent years several countries have started to adopt FDI controls. Sweden is one of the last EU countries on its way to implementing an investment screening regulation. The aim of the regulation is to safeguard national security interests from foreign control. At the same time, substantial empirical evidence demonstrates that cross-border investments in many cases bring superior technological capabilities and management to the host countries, and in the long run therefore contribute to economic growth.

In this analysis we have studied the productivity effects of foreign acquisitions of Swedish firms. That is, do acquired firms become increasingly competitive after being acquired by a foreign firm? For this purpose, firm-level data over the period 1997–2020 has been used and an event study approach has been applied for the quantitative analysis.

Initially we simply compared the productivity of foreign affiliates in Sweden with domestic firms. A comparison between foreign and domestically owned firms shows that on average, foreign-owned firms are more productive than domestic ones. Foreign-owned firm are also larger, more capital- and skill-intensive and trade more than domestic firms. A key question therefore becomes, are foreign-owned firms more productive because it is mostly highly productive firms that are acquired, or do they become more productive after being acquired?

To analyse whether there is cherry-picking in the sense that highly productive firms are the ones mainly acquired, we have used a quantitative method where we have followed firms for a few years before and a few years after they were acquired. The analysis of the type of firm acquired shows that productivity is indeed higher in some acquired firms, especially in the manufacturing sector. The quantitative analysis takes into account these differences between firms but, even after accounting for these differences, we find that the acquisition gives rise to a productivity increase among the acquired firms. The results are clear. On average, we find a positive productivity effect for acquired firms of around 10 per cent. These results are consistent with a number of international studies on the impact of foreign acquisitions. Having established a productivity premium post-acquisition, the next step was to analyse whether the impact of foreign acquisitions varied across firms and sectors. Comparing acquisitions between sectors, it can be seen that productivity increases in both the manufacturing and service sectors, but the effect is stronger and more persistent in the service sector. Hence, to some extent, the results suggests that the positive productivity effect of foreign acquisitions is driven by acquisitions in the service sector.

To further explore sectoral differences, the productivity effect was explored in a set of sectors that, loosely speaking, can be regarded as sensitive and non-sensitive with respect to national security interests. The analysis demonstrates that the productivity

effect is significant in both sensitive and non-sensitive sectors. However, to the extent that the impact of foreign acquisition differs across sensitive and non-sensitive sectors, the results suggest that the productivity boost is equal or even larger in sensitive sectors, as compared to other industries.

However, whether this effect can be expected to be equally large when Swedish MNEs acquire subsidiaries in Sweden or abroad has not been investigated here. In other words, it may not be the foreign ownership that is decisive, it could instead be that MNEs are international and thus possess firm-specific advantages that the purely national firms lack.

In an attempt to dig deeper into sectoral differences, we divided the data into four broad sectors:

- agriculture, mining, and quarrying
- manufacturing
- private services
- public services

In the sectoral analysis, we found that foreign acquisitions in the private services sector were driving the results and that this was true for both sensitive and less sensitive industries. Moreover, by splitting the sample into different size categories, it could be shown that the productivity effects are strongest for small firms, especially "micro" firms with 1-9 employees in the services sector. The general results observed can thus be traced back to the acquisition of the smallest firms in the private services sector. One reason for this result may be that it is the small services firms that can benefit most from the networks, financing and other assets of the foreign parent companies. Overall, the empirical results presented here provide robust evidence that foreign acquisitions increase productivity in acquired domestic firms.

What industrial policy conclusions can be drawn from this? Barriers to FDI and/or higher investor uncertainty may reduce the scope for positive knowledge transfers from abroad. Moreover, such impediments may also limit the scope for positive spillover effects of knowledge to other domestic firms and therefore hamper aggregate economic growth. If the Swedish review rules are perceived as tougher than those of other countries, this could lead to Sweden being rejected as a country to invest in. Ultimately, it could also lead to countries responding in kind and taking retaliatory measures, which would limit the opportunities for Swedish companies to invest in those countries. The positive effects of foreign acquisitions seem large, but it would be going too far to propose subsidies for foreign acquisitions. Subsidies disrupt market forces, which is not desirable, and would also require subsidizing, e.g., the acquisition of Swedish firms by Swedish MNEs. Moreover, our analysis shows that foreign acquisitions do not always lead to higher productivity, which makes it difficult to target subsidies. The scope for industrial policy is greater, however, in terms of constantly working towards an attractive investment climate in Sweden that equally benefits both national and multinational firms. A good education system, good infrastructure and a continued liberal attitude towards international trade have proven to be important factors in attracting foreign investors and do not discriminate between firms. Since the foreign investor is at a disadvantage compared to local Swedish firms,

some discriminatory measures may still be justified, for example with information and help in finding customers and subcontractors with the aim to reduce information and search costs for the foreign investors. In Sweden the investment promotion agency Business Sweden is working on these important issues.

Our findings suggests that there are significant benefits from inward investment in small firms in the service sector. For these firms it is particularly important to have good information about the new audit system, as they cannot be expected to have this knowledge in-house (unlike larger firms that have more resources to spend on legal advice). Therefore, we propose that special efforts/support be set aside to help smaller firms in this process.

Finally, since competition for FDI is tight within the EU, a screening mechanism that is perceived as non-transparent and slow by companies can lead to many investments that we want to bring to Sweden ending up in another EU country.

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1 Introduction

To summarize, previous literature suggests that it is important to consider potential cherry-picking motives as well as heterogenous effects among sectors and target firm sizes. For this reason, it is important to find a balance between the security risks of inward FDIs and the benefits from inward FDI.

Foreign Direct Investments[1] have been on the political agenda in many countries for a long time. In Sweden, in the 1960s and 1970s, there was a fear that Swedish multinational enterprises (MNE) expansion abroad would substitute for production in Sweden. [2] As foreign investors increased their interest in Sweden during the 1990s, a new debate took off, focusing on the risk of MNEs relocating their business unit and/or corporate headquarter (HQ) activities overseas (Birkinshaw Braunerhjelm, Holm and Terjesen, 2006). At the same time, in the 1990s and 2000s there was an ongoing competition across countries on how to attract FDI. During this era, we could see tax exemptions and other policy measures being offered to foreign investors (OECD 2000).

Today, foreign investments are a hot topic again, but this time due to fears that FDI could pose a risk to national security. In several countries, we have seen a shift towards more reviews and regulations of foreign investments (UNCTAD, 2022).[3] The European Union (EU) adopted a common screening framework in March 2019 which encourages member states to assess when foreign direct investment may have an impact on critical infrastructure, technology and inputs, so-called sensitive sectors. Member States are asked to specifically screen investments that may affect sensitive activities, such as those essential to the country's security, or which may negatively affect the resilience of the country's value chains.[4] This constitutes a paradigm shift from how the EU 28 countries viewed inward FDI only two decades ago.[5] The COVID-19 pandemic accelerated this process due to its effect on firms' global value chains.[6] For example, the pressure put on the health care sector in the EU during the pandemic is a significant factor behind the measures that are being introduced (UNCTAD, 2023). As global supply chains and common infrastructure have become increasingly interconnected between countries, it has been claimed that foreign

1 "Foreign direct investment (FDI) is a category of cross-border investment in which an investor resident in one economy establishes a lasting interest in and a significant degree of influence over an enterprise resident in another economy. Ownership of 10 per cent or more of the voting power in an enterprise in one economy by an investor in another economy is evidence of such a relationship" OECD (2022).

2 A firm is defined as foreign-owned firm if the parent company is located in another country and owns at least 50 per cent of the entity. We define multinational enterprises (MNEs) as firms that control and manage production facilities in at least two countries.

3 The number of new measures less favorable to investment has increased trend-wise during the period 2003-21 according to UNCTAD 2022.

4 Bohman and Nymalm (2020) document that the paradigm shifts in how we perceive Chinese FDIs in Sweden only took place as late as 2018. Government authorities, political parties and the public debate turned from a liberal view towards Chinese FDI to instead look at these as potential security risks.

5 See Chan and Meunier (2022) for a stocktaking of the EU member state preferences for the creation and nature of a pan-European screening framework.

6 Bauerle, Danzman and Meunier (2021).

investors who acquire control over domestic firms potentially constitute a threat to local firms (World Bank 2021).

Advocates of stricter regulations argue that critical inputs, services or technology should remain under domestic control. Those fears have materialized into more stringent regulations and FDI controls in many countries. While the policy change towards stricter FDI controls started already thirty years ago in the US, this process took off recently in Europe (Chan and Meunier, 2022). However, there is an obvious risk that stringent review systems will inhibit inward investment. This may be particularly relevant for a small country like Sweden, which is highly dependent on international trade and inward investment. Moreover, if the Swedish review system is perceived as tougher than that of other countries, there is a risk that the controls will trigger not only a loss of valuable investment in Sweden but may also lead to retaliation and ultimately higher barriers to Swedish outward investment as well.

Despite this new skepticism against foreign investors and FDI, the fact is that since the turn of the twenty-first century, most EU members have gradually introduced a series of FDI incentives, including investment promotion agencies (IPAs) to attract FDIs (Chan & Meunier, 2022; OECD, 2018). In the motivation for IPAs, which are thought to facilitate investment projects and post-investment services, it is a general belief, supported by substantial empirical evidence, that FDIs contribute to a country's economic development and growth (Alfaro et al. 2010; Blomström, Lipsey and Zejan, 1994, National Board of Trade, 2022).

Multinational enterprises (MNEs) and their foreign subsidiaries are important players in the global economy. A study by De Backer, Miroudot, and Rigo (2019) estimates that production by MNEs accounts for one third of world output and GDP, and two thirds of world trade. A look at the situation within the MNEs shows that the parent firms account for about 34 per cent and the subsidiaries for about 30 per cent of world exports. The study also shows that MNEs are rooted in the local economy: they interact extensively with local firms and the subsidiaries are both important customers and suppliers of inputs and services to local firms. However, foreign subsidiaries are very different from local firms, as they are often larger, more productive and more integrated into global value chains than local firms.

Sweden is a small open economy and foreign direct investment is of great importance to our economy, both as a source and recipient of such investment. A study by the Swedish Agency for Growth Policy Analysis (2020) showed that 40 per cent of those employed in the business sector work in MNEs, and that MNEs account for 90 per cent of private-sector R&D, as well as more than 75 per cent of Sweden's exports.

The effects of foreign investment on the labour market include job creation and increased demand for skilled labour, but we also tend to see increased sales, innovation and exports in the wake of FDI.[7] Other significant effects are the technical and commercial knowledge that FDIs may bring to the host country (technological

7 In Sweden, one reason for having investment facilitation towards foreign investments is the slowing growth in Swedish employment. As Swedish multinational firms invest heavily in other countries, their share of Swedish employment is decreasing. The general view has been that attracting foreign investments could potentially compensate for some of these losses (SOU 2019:21).

spillovers). This knowledge is essential for efficiency and productivity gains and, in the long run, for economic development in the host country (Kobrin, 2005).

For several countries, it has been documented that foreign-owned firms outperform domestic firms in many respects (Schiffbauer, Siedschlag and Ruane, 2017). In a recent study by Eliasson, Hansson and Lindvert (2020), it was shown that there is a positive effect of foreign acquisitions on productivity in Swedish firms. Still, their results suggest a significant heterogeneity in the productivity effects across foreign acquisitions. It was found that the positive effects were confined to small service firms and large manufacturing firms. Moreover, they found that foreign acquisitions increased the share of skilled labour, employment and the intensities of both imports and exports.

Bentivogli and Mirenda (2017) found foreign-owned firms to be superior with respect to size, profitability, and financial soundness versus purely domestic firms in Italy. Bandick, Görg and Karpaty (2014) showed robust evidence that foreign acquisitions increased R&D intensity in acquired domestic MNEs and non-MNEs in Swedish manufacturing. Karpaty (2007) found positive effects of foreign acquisitions on productivity in Swedish manufacturing firms. However, other studies have found that the superiority is not due to foreign ownership per se but rather that acquisitions tend to take place in high-productivity sectors, or are biased towards the best-performing domestic firms (Schiffbauer et al., 2017; and Salis, 2006). To summarize, previous literature suggests that it is important to consider potential cherry-picking motives as well as heterogeneity effects among sectors and target firm sizes. For this reason, it is important to find a balance between the security risks of inward FDIs and the benefits from inward FDIs in terms of economic growth, competition and employment. Despite this positive view of foreign investment, increased consideration of potential risk factors has become increasingly important. In Sweden, a screening mechanism for foreign acquisitions will be launched in December 2023.[8]

This report addresses two main questions:

1. How foreign acquisitions of Swedish firms affect the productivity of the acquired company.
2. Whether sectoral or firm size differences are important for the outcome and whether the productivity effects of acquisitions differ across security-sensitive and non-sensitive sectors.

The analysis uses an event study, with events occurring at different points in time, to quantify the impact of acquisition on firm performance.

The report is organized as follows. It starts with a summary of the report and conclusions. Chapter 2 presents a survey of changes in the ownership structure of the business sector. Chapter 3 discusses the motives for and effects of international acquisitions. Chapter 4 describes the data and methodology, and Chapter 5 analyses the effect of increased foreign ownership in Sweden on firm productivity.

8 The National Board of Trade (2022) has outlined the important balance between the economic and security perspectives in FDI reviews.

2 The flow of inward FDI into Sweden

Sweden is an open and transparent market for inward investments located within the EU, and this has made Swedish firms attractive to foreign investors. Today almost 680 000 employees work in 16 500 foreign-owned firms in Sweden.

Figure 1 shows how FDI flows to Sweden increased dramatically in the 1990s, mainly in the form of foreign acquisitions of domestic firms and to a lesser extent in greenfield operations (Eliasson et al., 2020). This has not always been the case. Prior to 1991, the volume of inward FDI was much lower than outward FDI. Several factors can explain this trend break in the inflow, for example the legislation requiring foreigners to obtain permission to acquire shares or holdings in Swedish firms was abolished at the end of the 1980s.[9] Another factor is Sweden's accession to the EU in 1995[10] and the reconstruction of the tax system into a system of more competitive taxes for both individuals and firms in Sweden. Large depreciations of the Swedish krona in 1992 made imports from Swedish firms relatively cheap on the world market. Moreover, an international wave of mergers and acquisitions that took off in the early 1990s and lasted for two decades increased the number of international acquisitions in most OECD countries (Makaew, 2012). This, together with a deregulation of the capital market, made foreign investments in Sweden more attractive (Braunerhjelm, Ekholm, Grundberg and Karpaty, 1996).[11]

Additional factors that drove this development were also a more positive attitude in many countries towards FDI, partly as a reaction to China beginning to welcome foreign investors in the early 1990s, together with the advances in ICT and transportation that facilitated communication and intrafirm trade within MNEs (Sjöholm, 2022).

Figure 1 also shows that inward FDI flows reached unprecedented high levels in 1999, just before the dotcom bubble burst in the early 2000s. Inward FDI flows recovered steadily for some years, but then the global financial crisis in 2008/2009 slowed down the inward investments considerably. It was not until 2010 that inward FDIs slowly started to recover again.[12]

In the years between the financial crisis in 2008/2009 and the COVID-19 pandemic in 2020/2021, inward investment in Sweden appears to have remained low, but then has rapidly increased post pandemic, in line with the global economic recovery (Business Sweden, 2022). The FDI stock follows a similar trend as the flow, but also shows how foreign influence has evolved since 1980. From Figure 2 and Figure 3, one can see that employment and the number of acquired firms also fell but then picked up again

9 OECD (1993).

10 Sweden joined the EU in 1995, but the application in 1991 to become a member of the EU is likely to have had effects on both international trade and investments pre accession (Braunerhjelm et al., 1996).

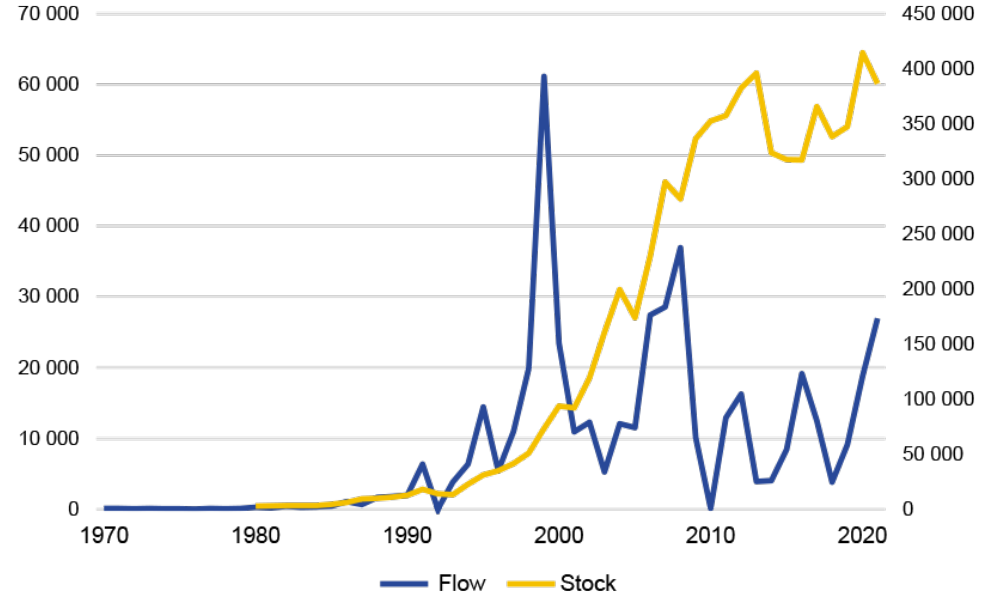
11 There was also liberalization in several sectors, such as the financial sector, the telecommunications sector and the electricity markets. These reforms increased the opportunities for foreign operators to invest in Sweden.

12 In contrast to flows, the stock of foreign direct investment tends to be much less volatile. Unfortunately, we do not have access to data over the same period of time for the stocks.

in the following years. From 2003 onwards, the trend was upwards for FDI but the growth stopped in 2008 because of the financial crisis and the ensuing international recession.

Sweden is an open and transparent market for inward investments located within the EU, and this has made Swedish firms attractive to foreign investors. Today almost 680 000 employees work in 16 500 foreign-owned firms in Sweden (Business Sweden, 2022). As is evident from Figure 1, both types of investments fluctuate significantly over time, and FDI flows are highly volatile over time. One reason for this is large and irregular transactions, for example, large acquisitions in Sweden or abroad. FDI does not usually follow general cyclical fluctuations in the same way as many other economic indicators do. Cross-border investments are mainly determined by the specific conditions in the country or in neighboring markets (Eicher, Helfman and Lenkoski, 2012).

Figure 1. Inward flows and stocks of FDI, Sweden 1970–2021, million dollars



Source: UNCTAD's FDI/TNC database, available at: http://stats.unctad.org/fdi. Foreign direct investment (FDI) inward flows and stocks in Sweden, expressed in millions of dollars.

2.1 What do multinationals do in Sweden?

In recent years, FDI in Sweden has mainly increased in the service sector, while FDI in the manufacturing sector has stagnated. Looking at the share of FDI in the service and manufacturing sectors, about 64 per cent of the investments have been directed to the service sector and 36 per cent to the manufacturing sector in 2020 (Business Sweden, 2022). Most FDI in the service sector is in finance and insurance, real estate, retail and business services. In manufacturing, investments have mainly been directed towards the chemical, pharmaceutical and food sectors.

From where?

The top investing countries in Sweden in 2020 were Norway, UK and the USA (Swedish Agency for Growth Policy Analysis, 2020). Since we want to show how

much influence foreign owners had in 2020, we have chosen to illustrate stocks instead of flows.[13] Looking at the source countries for the stock value of FDI in Sweden in 2021 in Table 1, the EU-27 are the dominant source, with 59.1 per cent of the total book value of FDI in Sweden. The shares of Other Europe and North and Central America is around 10 per cent each, Asia 3.6 per cent and the rest of the world 0.1 per cent. See Table A1 in the Appendix for a full list of the countries of origin in 2020.[14]

Table 1. The stock value of FDI, billion SEK, in Sweden in 2021

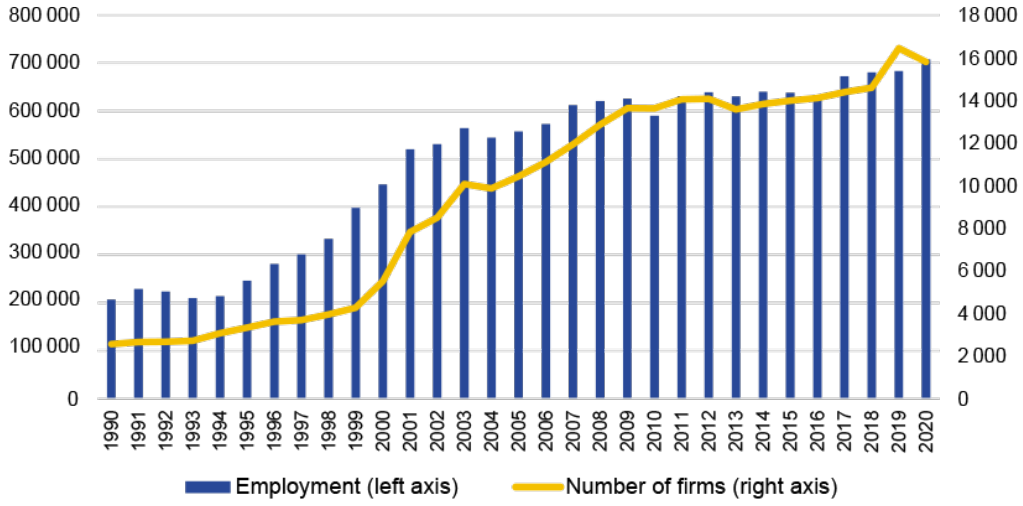
	Stock value	In per cent
EU-27	2201	59.1%
United Kingdom	624	16.8%
Other Europe	393	10.6%
North and Central America	365	9.8%
Asia	135	3.6%
Other countries	3	0.1%

Source: Statistics Sweden.

2.2 Number of foreign-owned firms and acquisitions

Figure 2 shows that the growth in the number of foreign-owned enterprises (both greenfields and acquisitions) outpaced the growth in the number of employees in foreign-owned enterprises over the period 1990-2020. The number of firms increased by 516 per cent, while the number of employees only increased by 242 per cent. This shows that the increase in the number of foreign-owned enterprises has mainly taken place in small and medium-sized enterprises.

Figure 2. The employment and the number of firms and in foreign-owned firms



Source: Statistics Sweden

13 The FDI stock consists of equity values and net loans to firms in Sweden. FDI stocks gives the current position of foreign ownership, whereas FDI flows indicates the changes in foreign ownership.

14 For confidentiality reasons, it is difficult to report on individual countries' direct investments in Sweden.

Figure 3, below, shows a subset of the number of acquisitions per year. To be included, the acquired firms had to be able to be followed for at least three years before and three years after the acquisition. In the table below, many of the acquisitions have thus been omitted, partly because we only include those acquisitions that we can follow for at least seven years, and partly because we only have information on acquisitions that lead to the foreign owner gaining a majority stake in the company. This underestimates the actual number of annual acquisitions, but will be necessary for the analysis of the economic effects of foreign acquisitions. However, the trends in annual acquisitions may indicate the scale of the acquisitions that the new review authority "Inspectorate of Strategic Products" (ISP) will have to consider, including acquisitions involving much less than 50 per cent of ownership.[15] The number of new foreign acquisitions has certainly declined over the period, but this does not necessarily signal a lower foreign influence. On the contrary, we see that the size of investments, here measured as turnover per foreign acquisition, has varied greatly during the period. Large acquisitions, such as when Chinese Geely bought Volvo, mean that large values change hands.

Figure 3. The number of foreign acquisitions, by year

Note: The number refers to acquisitions within the sample for our analysis with the requirement that a firm must be identified as Swedish-owned at least three years before the acquisition and at least three years post acquisition. On the second y-axis we read off the average value of the transactions based on the total sales in the acquired firms. Source: Statistics Sweden.

2.3 Host country determinants for the inflows of FDI

National Board of Trade (2022) and Sjöholm (2022) have reviewed factors determining the inflow of foreign investments. Sjöholm divides the factors into exogenous, i.e., factors that are not so easy to change, such as geography and market size, and endogenous factors where there is scope for decision-makers to increase a country's

15 An investor can be a natural or legal person from a third country who directly or indirectly owns or controls an investment. It is therefore the final owner/control that determines the category in which an investment falls and not the form of ownership. The statement "owned or controlled", does not provide a precise definition of the investments involved. Control can occur in many ways and to varying degrees.

attractiveness. Examples of endogenous factors, i.e. those over which the country has some control, include the country's level of income and corporate taxes, the cost of labour relative to productivity, the educational level of the workforce, economic and political stability, infrastructure, and openness to trade. Sjöholm highlighted some areas where there is potential for improvement in Sweden, including the education system in Sweden, which he claims has been deteriorating for a long time and which risks reducing the inflow of high-tech foreign direct investment. Another area where there is potential for policy is the relatively high income tax rates in Sweden, which can impair the opportunities for MNEs to recruit labour to Sweden.[16] Sjöholm also advocates the need for large necessary investments in infrastructure, such as roads, railways, and electricity transmission capacity. However, both the National Board of Trade (2022) and Sjöholm (2022) find in their review of the literature that subsidies have little or no effect on investment. On the contrary, subsidies can lead to undesirable distorting effects, such as when companies change their allocation decisions for R&D activities despite the fact that it then sub-optimizes. Subsidies can also create unhealthy competition and lead to countries competing to offer the largest subsidies.

Finally, it is important for Sweden to continue to propagate as liberal trade as possible. This is particularly important today, as many countries are moving towards increased protectionism.

16 Contrary to Sjöholm, the National Board of Trade (2022) review shows that the tax level in Sweden does not constitute a decisive obstacle to foreign investment in Sweden.

3 Theory

A foreign firm may share knowledge and experience with its foreign affiliate, giving it a competitive advantage relative to other firms. This is a key theoretical argument for a jump in productivity post-foreign acquisitions.

When acquisitions lead to higher productivity in the acquired firms, this is referred to as a direct effect. FDIs may also give rise to indirect effects, for example, when FDIs increase the competition in the industry or when knowledge spills over from the foreign-owned firm to local firms.

A theoretical proposition from the theories on FDI is that MNEs have a productivity advantage relative to local firms. The reason is that there is a handicap of having less information about operating in a foreign country due to the lack of business contacts, differences in the language spoken, culture or business norms etc. To compensate for this handicap, the MNE must own some firm-specific advantages, e.g., a better product or production process, management, or brand name (Caves, 1974; Dunning 1977). Helpman, Melitz and Yeaple (2004) modeled the choice between exporting and FDI. They showed that low productivity firms only served the domestic market, while very high productivity firms made foreign direct investments. Intermediate productivity firms exported but could not cope with the high fixed costs of making foreign investments. Outsourcing and licensing could be an alternative to foreign expansion, but that can prove problematic if the firm needs to keep control over firm-specific technologies, product or service quality. Thus, the firm may choose to acquire an existing firm in the foreign market to solve these control problems. In this case, the firm may share knowledge and experience with its foreign affiliate, giving it a competitive advantage relative to other firms. This is a key theoretical argument for a jump in productivity post-foreign acquisitions.

However, the theory does not provide clear guidance on which firm can make the biggest leap after the takeover. For example, given that the most recent foreign takeovers in Sweden are in small and medium-sized firms, can these firms gain more than other firms? Moreover, since the increase in foreign ownership is mainly in the services sector, can services firms acquire more knowledge from their parents abroad than manufacturing firms?

Arvanitis and Stucki (2014) argue that SMEs are different from large firms in many ways.[17] Since the manager is usually the owner or main shareholder in SMEs, the conflict of interest between a company's management and the company's stockholders (agency problem) post acquisition may be lower in SMEs (Jensen, 1986). On the contrary, the acquisitions involving large firms may cause coordination problems within the merged entity (Williamson, 1975). In addition, Eliasson et al., (2020) argue that small knowledge-intensive firms lack international networks and are financially constrained. As small new firms are integrated into a multinational network this will

17 Arvanitis & Stucki (2014) analysed how Swiss (within border) mergers and acquisitions affected the performance of the acquiring firm.

help those firms to survive and even enter the export market.[18] These arguments suggest that acquisitions of SMEs may give rise to a higher growth and productivity. On the other hand, larger firms may have more experience from M&A and are more open to other business cultures than SMEs. To summarize: theory does not give clear predictions on whether size (or sector) is important for the potential productivity effect.

Foreign acquisitions may contribute to higher productivity in the receiving country in several ways. When acquisitions lead to higher productivity in the acquired firms, the average productivity in the industry increases. This is referred to as a *direct effect* of inward FDIs and may be due to the transfer of management skills or new technologies (enterprise-specific benefits) from the parent MNE abroad. FDIs may also give rise to *indirect effects*, for example, when FDIs increase the competition in the industry or when knowledge spills over from the foreign-owned firm to local firms.[19] The potential for positive knowledge transfer is much greater if the recipient country has a highly educated workforce and if the level of technology and knowledge is high (Keller, 1996). One would expect this to be the case in Sweden.

18 Bloch and Bhattacharya (2016) found that innovations in SMEs in Australia depended on firm size, R&D expenditures and engagement in international trade.

19 A growing number of recent studies suggest that there is robust evidence of knowledge transfer from both trade and FDI, see Keller (2021) and, in terms of results for Swedish firms, Karpaty and Lundberg (2004).

4 Empirical analysis

To answer the questions about which firms are acquired and the productivity effects of acquisitions, we start by describing the data in terms of mean differences between foreign-owned and Swedish-owned firms, as well as the sample distribution of acquired firms. Thereafter, a quantitative analysis on firms that became foreign-owned is employed to answer the question about productivity. Is it possible to empirically test the productivity effect by observing the productivity of acquired firms before and after acquisitions? To tackle this challenge the following questions are analysed:

1. Are foreign-owned firms different from Swedish-owned firms?
2. Do foreign acquisitions increase the productivity in acquired Swedish firms?
   - How sensitive are the results to the size and industry of the acquired company?
3. In which industries do foreign firms invest?
   - Do we observe large inflows in sensitive industries in Sweden?
   - Are the economic effects for firms in sensitive industries different from those in non-sensitive industries?

To answer the first question a descriptive analysis is used and for the subsequent two questions an event study method developed by Sun and Abraham (2021) is used (see Appendix for details). The idea with the event study is to compare the productivity in acquired firms (the treatment group) with productivity in other firms (the control group) before and after acquisition. The event study aims to answer the question of whether a productivity increase in firms that become foreign-owned, is due to the acquisition or if it is instead due to the fact that the acquired firms were different before the acquisition, compared to a control group of firms that were not acquired?

4.1 Concept, definitions and methodology

Productivity is a concept that is hard to measure across different industries. Therefore, total factor productivity (TFP) is used as a proxy for productivity and is estimated for each firm and year.[20] TFP is a number that illustrates how productive a firm is given the resources it uses. It is estimated as the relationship between total production (output) and a weighted index of average costs (inputs). The inputs used here are capital, labour divided into high and low skilled labour and intermediate inputs: energy, materials, and services (see Appendix for details). A higher TFP can be due to the use of better technology, management or human capital (Lipsey and Carlaw, 2004).

Data

The analysis of productivity effects due to foreign takeovers is based on a register based firm-level dataset covering the whole business sector in Sweden. The dataset spans the period 1997–2020 and is administered by Statistics Sweden (SCB). The analysis draws on three firm-level registers that have been merged: (1) annual business statements data, which contains information on the value added, employment, sales, fixed tangible assets and various inputs in the production for all firms; (2) regional

20 The tables presented in the paper use a measure of TFP proposed by Ackerberg, Caves and Frazer (2015).

labour market statistics, which contains detailed information on the educational level of workers by firms; (3) data on foreign ownership.

Treatment and control group

In order to carry out an analysis of the effect of foreign acquisitions, only acquisitions that can be observed at least three years before and three years after the acquisition have been retained. This means that it has not been possible to analyse all acquisitions. Some acquisitions are naturally excluded if they take place after 2017 or before 2000. The acquired firms that meet the criteria are defined as the "treatment group". We also follow the productivity of the firms that were never acquired; this group is defined as the "control group". In total, 4903 acquisitions are analysed.

A comparison of domestic- and foreign-owned firms

Table 2 reports the unweighted differences between foreign-owned and domestic-owned firms in mean values for several variables for the period 1997–2020.[21]

From Table 2 we can see that the average productivity levels of foreign-owned firms are higher than those for domestic-owned firms. The differences are strongly significant for both labour productivity and total factor productivity. Foreign-owned firms also have a larger share of skilled workers compared to their domestic counterparts. Foreign owned firms are also more profitable and have a relatively large stock of fixed tangible assets.[22]

Table 2. Differences between Swedish and foreign firms 1997–2020

Swedish vs. foreign firms		
Variables	**Mean difference**	**Standard error**
Log labour productivity	0.45***	0.000
Log Total Factor Productivity	2.422***	0.000
Log Capital intensity	0.211**	0.011
Log Skill intensity	0.124***	0.000
Log Profit	8.855***	0.000
Observations	9,610,871	

Note: ***; ** and * indicate significance at the 1, 5 or 10 per cent levels, respectively. Source: Statistics Sweden.

We define micro-sized firms as enterprises with 1–9 employees, small as firms with 10–49 employees, medium as firms with 50–249 employees and large as enterprises with more than 250 employees.[23]

21 Table 2 is based on the full sample of Swedish and foreign firms and thus includes both greenfield and acquired firms.

22 This comparison between domestic and foreign-owned firms show similar results to those found in other developed countries (Antras and Yeaple, 2014).

23 The definition of firm size classification is based on EU Commission recommendations (2003).

Table 3 shows the distribution of the sample of acquired firms by size and sector. The data shows that foreign acquisitions over the period studied are mainly focused on small enterprises ('Micro' and 'Small'), which together account for almost 80 per cent of all acquisitions. This confirms the picture shown in Figure 2, namely that the growth in number of employees in foreign-owned enterprises was much lower than the growth in the number of foreign-owned enterprises. Further down the table we also see that the vast majority of these small businesses are in the services sector.[24] According to Statistics Sweden, almost two-thirds of firms in Sweden were active in the service sector in 2022.

Table 3. Sample distribution of acquired firms.

		Number of acquisitions	Per cent
Total firms	Micro	1869	38%
	Small	2025	41%
	Medium	770	16%
	Large	239	5%
	All	4903	100%
Manufacturing	Micro	183	4%
	Small	369	8%
	Medium	258	5%
	Large	61	1%
Service sector	Micro	1619	33%
	Small	1556	32%
	Medium	456	9%
	Large	118	2%

Source: Statistics Sweden. Authors calculations.

4.2 Method

The descriptive analysis above indicates that average productivity in foreign-owned firms is higher than in Swedish-owned firms. This can be partly explained by the fact that foreign-owned firms acquire capital-intensive firms with highly skilled workforces that conduct relatively high levels of research and development, i.e., cherry-picking. To analyse whether the acquisition as such impacts firm productivity, we conducted a statistical analysis with the aim of isolating potential acquisition effects on firm-level productivity (see Appendix for details). Specifically, the analysis compares the performance of firms before and after a foreign ownership event, while controlling for firm-specific factors that did not change over time. By controlling for firm-fixed effects, we can isolate the effect of foreign ownership on productivity of firms and conclude whether or not foreign acquisitions lead to higher productivity.[25]

24 It is perhaps not surprising that foreign acquisitions of Swedish firms are targeted at smaller firms. According to the official statistics from SCB, firms with 0-9 employees represented about 96 per cent, and firms with 10-49 employees about 3 per cent, of all firms in 2022. The data also includes foreign-owned enterprises.

25 When conducting panel data analysis, one major concern is that unobserved heterogeneity across different entities may bias the results of the analysis. For example, if we are studying the effect of a policy change on firm performance, it is possible that some unobserved factors, such as differences in management quality or access to resources, may affect the outcome variable of interest, regardless of the policy change.

5 Results

The results suggest an average productivity increase of 10 per cent due to being acquired by a foreign firm.

5.1 Foreign acquisitions and productivity

Figure 4 is a graphical illustration of the productivity path in firms that were acquired during the period 2000–2017 for all sectors (see Appendix B for details of the event study methodology).[26] Specifically, Figure 4 shows a year-by-year comparison of productivity between acquired and non-acquired firms before (t-) and after (t+) the acquisition.[27]

As a technical note, since the confidence intervals before treatment (acquisition year 0) are mostly insignificant (the significance band crosses the horizontal zero line) the assumption of parallel trends seems to be fulfilled, i.e., there is no systematic difference in the estimated productivity growth between acquired and non-acquired firms prior the foreign takeover, i.e., year 0.

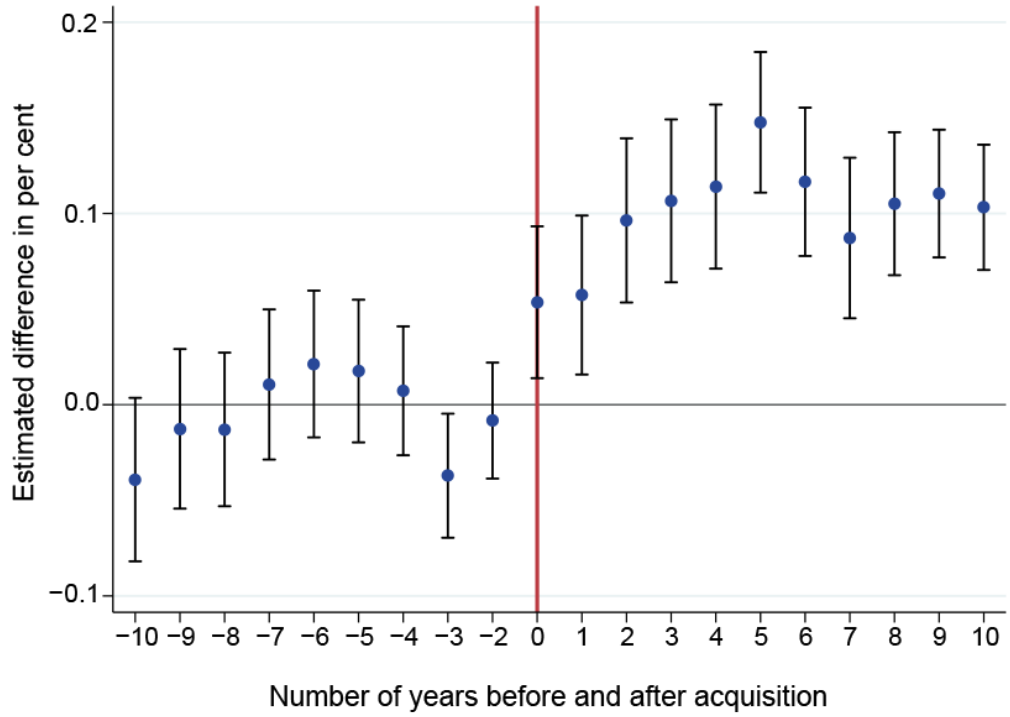
From Figure 4 it is clear that the point-estimates after the acquisition (vertical line at t=0) are located above the zero-line, suggesting that there is a positive "jump" in productivity after a foreign takeover. Overall, the results suggest an average increase of 10 per cent in the post-acquisition period for the treatment group. We can therefore conclude that in the post-event period, on average, there was a productivity premium as a result of foreign acquisition.[28] The reason for the immediate effect on productivity may be that the acquired company immediately gains market access to new markets and foreign subcontractors.

26 In the regression analyses, the size of the firm, time and firm-fixed effects are controlled for.

27 Formally, the years pre-treatment are called "leads" in event studies since the framework is forward looking towards foreign acquisition (the treatment). Correspondingly, the years post treatment are called lags. To illustrate the full dynamics, ten years pre- and post-acquisitions are included, but the effect of foreign acquisitions is likely to be contaminated by other factors some years post-acquisition.

28 Following Sun and Abraham (2022) some relative periods have been excluded in order to avoid multicollinearity. A common practice is also to exclude the year before the event in t-1.

Figure 4. Event study results: all size classes, all sectors



Notes: The coefficients shown are leads and lags (treatment occurs at '0'), estimated with Sun and Abraham (2021) estimator. Response variable is Total Factor Productivity. Control group: firms that were never acquired. The estimated coefficients are shown on the vertical axis. Standard errors are clustered by firm. The estimated event-time path of the average productivity difference is plotted against time on the x-axis. The intervals are pointwise 95 per cent confidence intervals for the corresponding average productivity difference. Source: Statistics Sweden.

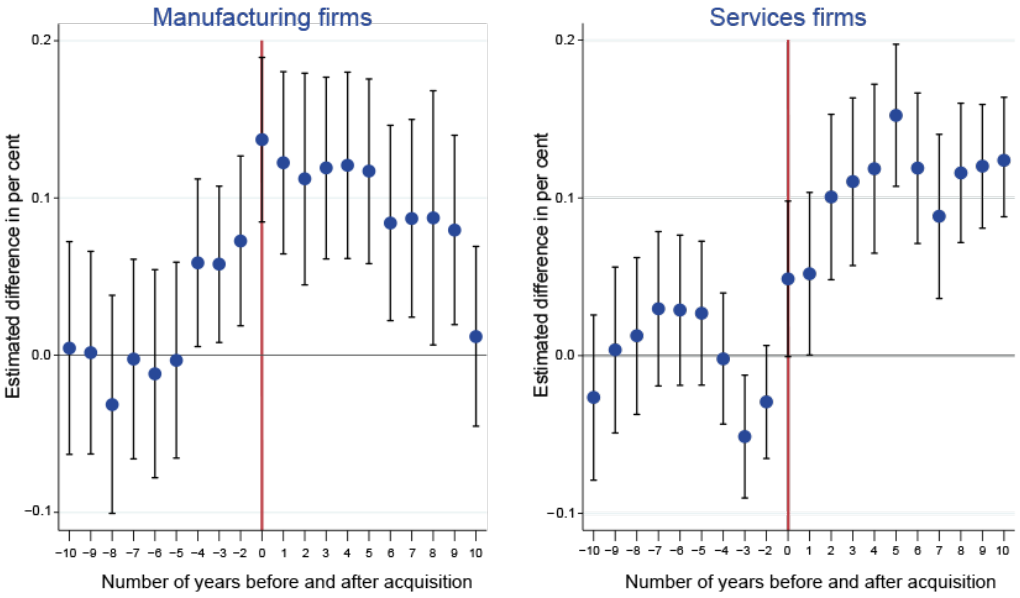
5.2 Acquisitions in the service and manufacturing sectors

Figure 5 illustrates the breakdown of firms into the manufacturing and service sectors. A technical note and an argument for careful interpretation of the results for the manufacturing sector is that the assumption of parallel trends before takeovers seems not to be met in the manufacturing sector, but is fulfilled in the service sector.[29] Hence, the results for the manufacturing sector should be interpreted carefully.

Moreover, in manufacturing, we see a return to the mean about 5 years after the acquisitions take place.

29 The assumption of parallel trends is the most important assumption in DiD models like this. The assumption implies that in the absence of foreign takeovers, the difference in productivity between acquired and never acquired firms would be constant over time. There is no formal test for this, but by studying an event study graph, one can easily see if the two groups follow the same trend in the period before one group is acquired. If this assumption does not hold, one cannot determine causality.

Figure 5. Event study results: manufacturing vs. services sectors



Note: The coefficients shown are leads and lags (treatment occurs at '0'), estimated with Sun and Abraham (2021) estimator. Response variable is Total Factor Productivity. Control group: firms that were never acquired. Source: Statistics Sweden.

5.3 Further breakdown of sectors and size groups

With those lists as a starting point, we classified the foreign acquisitions into sensitive and non-sensitive investments based on the industry code for each firm.

Sensitive vs. non-sensitive industries

A new investment screening law is proposed to enter into force in Sweden on December 1, 2023. The investment screening means that a review authority will review direct investments in activities worthy of protection. While some countries have defined sectors that wholly or partly contain such activities, the Swedish draft law does not explicitly state which sectors are more worthy of protection, but rather which activities are worthy of protection. In short, the proposed Swedish screening mechanism resembles a catch-all system.[30] There are however sectors which are more or less sensitive with respect to national security. In this report we have developed proposals for sensitive industries according to the following groups:

- food supply
- critical infrastructure
- critical technology
- critical inputs.

30 For a review of the introduction of review mechanisms in other countries, see UNCTAD (2023).

In analysing these sectors, the focus of this report is solely on examining whether the economic impact of foreign ownership is different in the sensitive sectors (see Table A2 and Table A3 in the Appendix). Potential risks of foreign owners controlling our value chains are not considered in this analysis.

To quantify the effects of foreign-owned firms in sensitive sectors with respect to national security we need some kind of classification of the sectors. We therefore chose to divide the analysis into sectors that we think meet at least one of the conditions for being called sensitive. The Swedish Civil Contingencies Agency (MSB) has suggested a list of areas that maintain or ensure functions important to society. Similarly, the UK Government (Gov.uk, 2022) produced a list of 17 sensitive areas of the economy because of the "The National Security and Investment Act". These lists have helped us to distinguish between sensitive and non-sensitive sectors.

SOU 2021:87 proposes the following seven areas of activity for inclusion in the new Investment Review Act:

- vital societal functions
- security-sensitive activities
- activities involving the exploration, extraction, processing or sale of raw materials critical to the EU or other metals and minerals critical to Sweden's supply
- activities whose main purpose involves the processing of sensitive personal data or location data
- activities related to emerging technologies and other strategically sensitive technologies
- activities which manufacture, develop, research or supply dual-use items or provide technical assistance for such items
- activities relating to the manufacture, development, research into or supply of armaments or the provision of technical assistance related to armaments.

SOU 2021:87 goes on to say that Sweden needs to assess potential impacts on critical infrastructure, dual-use technologies and products, inputs and access to sensitive information, and finally freedom and diversity of the media. Against this background, in Table 4 below we suggest a typology of sensitive sectors, while Table A2 in the Appendix provides corresponding codes. Detailed information is lost when an aggregated industry code (2-digit) is used for classification. For better precision, a more detailed 4-digit industry classification is suggested, see Table A3 in the Appendix.

Table 4. Classification of sensitive industries

AGRICULTURE	Critical infrastructure	Critical technologies	Critical inputs
Growing of cereals	Energy	Robotics	Energy
Milk production	Transport	Semiconductors	Raw materials
Raising of cattle	Communications	Artificial intelligence	
	Computing/data storage	Cyber security	
Fishing	Satellite and space technology	Quantum & nuclear technologies	
	Finance	Nano- & biotechnology	Food
	Water		
	Health		
	Media		

Note: For details see Table A2 and Table A3 in the Appendix.

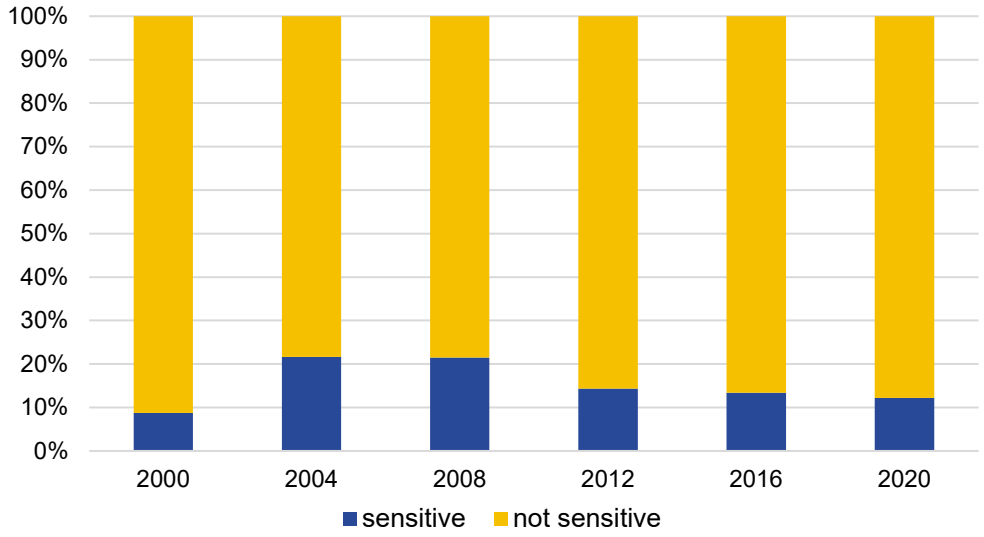
With those lists as a starting point, we classified the foreign acquisitions into sensitive and non-sensitive investments based on the industry code for each firm. Our breakdown is very preliminary and has been made at a relatively rough and aggregated level. It should only be seen as a suggestion on how to identify foreign acquisitions in sensitive sectors. In short, sensitive industries span a series of industries engaged in activities such as the extraction of raw materials, manufacturing of food, pharmaceuticals, water, transportation, infrastructure, education, health, and military defence.

Figure 6 shows the number of employees in foreign-owned firms in sensitive industries and illustrates that foreign ownership in sensitive industries increased from 10 per cent to 20 per cent in the early 2000s. Since then, foreign ownership in such industries seems to have decreased. Today, they are almost back to the same low levels as in 2000, i.e., foreign ownership in these industries is around 10 per cent. However, these estimates are sensitive to the definition of sensitive industries and should be interpreted with caution.

An alternative classification is used by the US Cybersecurity and Infrastructure Security Agency (CISA). They have developed a list of sensitive essential critical infrastructure workers and describe the share of foreign workers using a very disaggregated industry classification.[31]

31 This list of critical infrastructure was developed by US Department of Homeland Security with the aim to describe the size and importance of these sectors during the pandemic. The list, essential critical infrastructure workers (ECIW) is defined as the number of workers who "conduct a range of operations and services that are typically essential to continued critical infrastructure viability."

Figure 6. Foreign ownership in sensitive industries



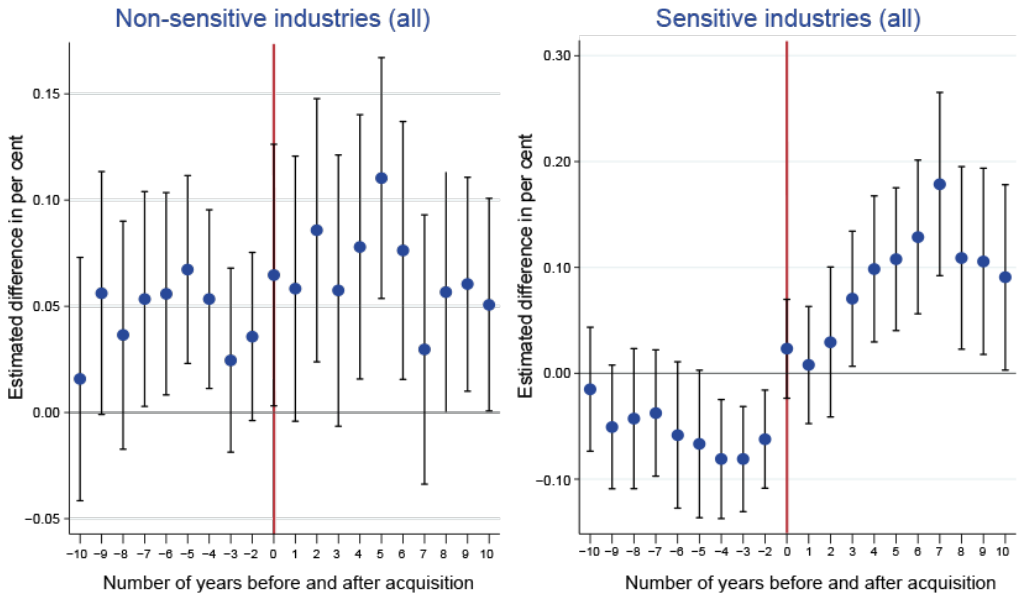
Note: The values refer to number of employees in foreign-owned firms in sensitive industries, using the broad (2-digit) definition of industries, as a share of the total number of employees in the same industry.

Productivity effects of foreign acquisitions in sensitive and non-sensitive industries

… it cannot be said with certainty that foreign acquisitions have a different effect on productivity in the two industries, but in those firms that receive a foreign owner, productivity seems to develop much better in the sensitive industries compared to the non-sensitive ones.

Figure 7 shows the results of an event study of sensitive and non-sensitive industries. In both the left and right figures, we see that the treated and control units had different growth paths a few years before the acquisitions took place and that the condition of parallel trends is therefore not strictly fulfilled. For the first two years after the acquisitions in the sensitive industries (the right-hand figure), the difference in productivity appears to be insignificant, but thereafter the productivity of the acquired firms increases by around 10 per cent. Regardless of the condition of parallel trends, productivity seems to increase more in the sensitive industries (right-hand figure) than in the non-sensitive industries (left-hand figure). In short, it cannot be said with certainty that foreign acquisitions have a different effect on productivity in the two industries, but in those firms that receive a foreign owner, productivity seems to develop much better in the sensitive industries compared to the non-sensitive ones.

Figure 7. Event study results: sensitive vs. non-sensitive industries



Note: The coefficients shown are leads and lags (treatment occurs at '0'), estimated with Sun and Abraham (2021) estimator. Response variable is Total Factor Productivity. Control group: firms in the non-sensitive sector, as well as sensitive industries which were never acquired. Source: Statistics Sweden.

The results in Figure 5 illustrate the importance of considering the industry in which the acquired firms are located.

As pointed out above, we saw that foreign acquisitions had a greater impact in the service sector compared to the manufacturing sector. In the next step we dig deeper into these results. The question we ask is whether it is the case that foreign acquisitions of sensitive firms in a specific sector leads to a worse or better outcome than in other sectors? Since there is a limited number of foreign acquisitions, we divide firms into one of four sectors (for details see Table A3 in the Appendix):

- agriculture, mining and quarrying
- manufacturing
- private services
- public services

For reasons of space, we have chosen to include the figures for these results in the Appendix. However, the results are summarized in Table 4 below.

Table 5. Summary of post treatment results in Figure A1–A4

Firm type		Productivity effects	Significance	Note
Non-sensitive	Agriculture, mining and quarrying	-	-	Table A1
	Manufacturing	≈ +10%/year	t0 - t+4	Figure A1
	Private services	≈ +10%/year	t-3 - t+10 *	Figure A1
	Public services	≈ -50%/year	t0 - t+8	Figure A1
Sensitive	Agriculture, mining and quarrying	-	-	Figure A2
	Manufacturing	-	-	Figure A2
	Private services	≈ +10%/year	t+3 - t+7	Figure A2
	Public services	≈ +60%/year	t+7	Figure A2
Manufacturing	Micro	≈ +25%/year	t+8	Figure A3
	Small	-	-	Figure A3
	Medium	-	-	Figure A3
	Large	≈ +20%/year	t-2 - t+3 *	Figure A3
Services	Micro	≈ +25%/year	t+3 - t+8	Figure A4
	Small	-	-	Figure A4
	Medium	-	-	Figure A4
	Large	-	-	Figure A4

Note: Column 3 shows the average coefficient per year. *indicates that the estimations do not fulfil the parallel trend criteria.

Figure A1 and Figure A2 show the results when foreign acquisitions are broken down into more fine-grained sectors. Although our sectoral breakdown is still very roughly divided into only 4 sectors, it illustrates large differences between these sectors.

Figure 5 illustrated the impact of foreign acquisitions on the productivity of firms in manufacturing and services, but here we have also taken into account whether the acquisitions take place in sensitive sectors. We now see, for example, that for foreign acquisitions in the private service sector, the effects are more pronounced in the sensitive sectors. For other sectors, the figures reveal considerable heterogeneity behind the more aggregated and clearer results in Figures 4 and 5. For example, Figure A1 in the Appendix shows that there are negative effects in non-sensitive sectors of public services.

Acquisitions and firm size

The positive productivity effect of foreign acquisitions in the service sector is concentrated to micro firms with 1–9 employees.

So far, we have assumed that the productivity benefits of foreign-owned firms are the same regardless of the size of the acquired firm. However, it is reasonable to assume that the importance of firm-specific benefits transferred from the foreign multinational to its subsidiaries may vary between small and large firms. We investigated this by dividing firms into the following size classes: micro, small, medium and large firms.[32]

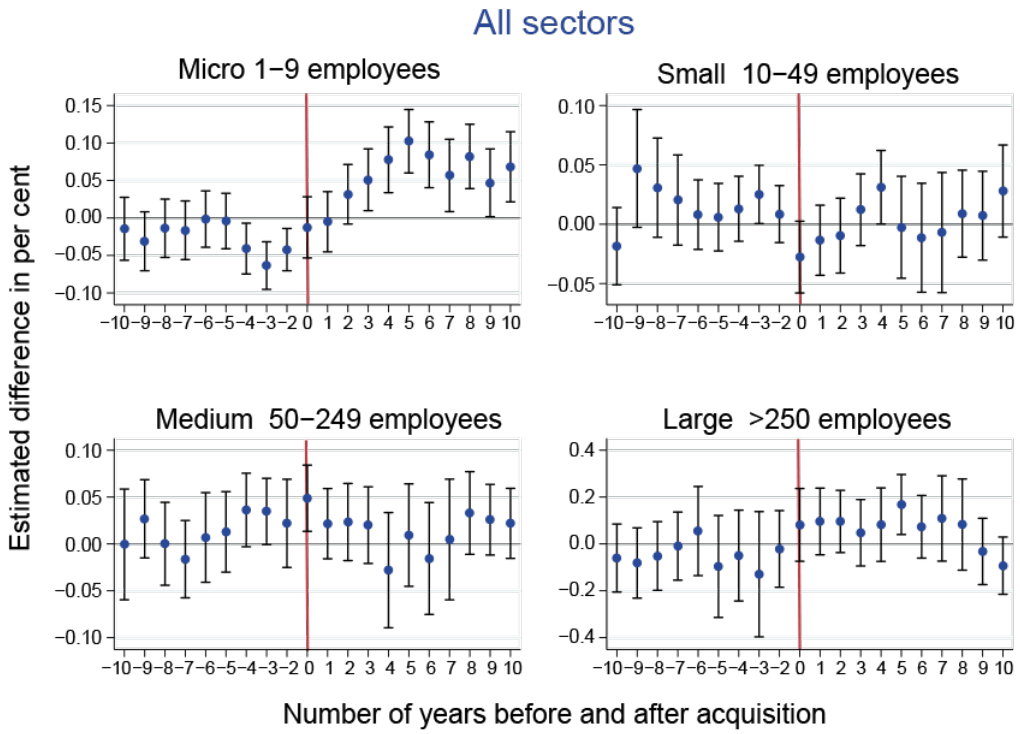
The results in Figure 8 suggest that the productivity effect we established earlier (Figure 4) is not only higher for microenterprises than those of larger firms, but it also appears that the results are not statistically significant for the other size classes.[33] The reason for these results may be, as discussed in the theory section, that small firms have the most to gain from the resources that foreign parents share with their foreign subsidiaries.[34] Startups and other small businesses do not have access to international networks and markets in the same way as multinationals. Foreign acquisitions can therefore have a very high potential for these firms if it means increased access to foreign markets and value chains. These results are particularly important as it is precisely among micro and small service firms with 1–49 employees that foreign acquisitions are most prevalent. Some other reasons for the increase in productivity may be that the foreign parent firms transfer technology and knowledge to their subsidiaries in Sweden. We also see that the proportion of highly educated people is greater in foreign-owned firms, which may indicate that there is an upgrading of the human capital in the acquired firms.

32 Eliasson et al., (2020) use the size classification: small firms 1-49 employees and large firms 50 employees and more. They find the largest effect of foreign acquisitions in small firms in the service sector and in large firms in the manufacturing sector.

33 Again, we see that the treated and control micro firms had different growth paths a few years before the acquisitions took place. But the results strongly indicate that the general results we found in Figure 4 can be attributed precisely to micro enterprises. As the sample is split into smaller groups (size classes, industries etc.) the certainty may decrease, i.e., the smaller the sample size, the larger is the margin of uncertainty (large confidence interval). Moreover, the more the firm-level characteristics vary between firms, the bigger the sample needs to be to make conclusions with certainty about the results, see e.g., Conroy, (2016).

34 When similar size classes as in Eliasson et al., (2020) are used, there are significant positive effects of acquisitions of firms with 1-49 employees.

Figure 8. Event study results: different size classes



Note: The coefficients shown are leads and lags (treatment occurs at '0'), estimated with Sun and Abraham (2021) estimator. Response variable is Total Factor Productivity. Control group: firms that were never acquired. Source: Statistics Sweden.

In the next step, we examine the size effect for manufacturing and services firms in more detail. Is it the case, for example, that large manufacturing firms get a greater boost from new foreign owners than small and medium-sized firms? Figure A3 shows that for large firms (with at least 250 employees) in the manufacturing industry, productivity rises for a few years after they become foreign-owned. However, the assumption of parallel trends is not being met for the manufacturing sector. It is therefore difficult to determine with certainty the causality of productivity.

Figure A4, on the other hand, shows that it is the smallest firms in the service sector that seem to be driving our results. This means that the positive productivity effects of foreign acquisitions in the services sector to a large extent can be attributed to micro enterprises with 1-9 employees.[35]

35 From visual inspection of Figure 8, one cannot reject the assumption of parallel trends in the upper left graph (micro firms). Three and four years before the acquisition, the productivity of the acquired firms was lower than the productivity of the corresponding non-acquired firms. This can be interpreted as the acquired firms underperforming some years before the acquisition.

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Appendix

Table A1. Source countries – foreign owned firms in Sweden in 2020

Country	Freq.	Per cent	Country	Freq.	Per cent
Norway	2467	15.61	AE	13	0.08
Great Britain	1746	11.05	GI	13	0.08
USA	1634	10.34	ZA	12	0.08
Denmark	1582	10.01	CW	10	0.06
Germany	1571	9.94	IL	9	0.06
Finland	1197	7.57	NZ	9	0.06
Netherlands	1037	6.56	KW	8	0.05
France	643	4.07	TH	8	0.05
Schweiz	531	3.36	SI	7	0.04
Luxembourg	399	2.52	TW	7	0.04
CY	291	1.84	GR	6	0.04
JP	279	1.77	HU	6	0.04
IE	223	1.41	RS	6	0.04
IT	195	1.23	BG	5	0.03
BE	192	1.21	HR	5	0.03
AT	162	1.03	MY	5	0.03
JE	156	0.99	TR	5	0.03
CA	143	0.90	SK	4	0.03
EE	124	0.78	BR	3	0.02
LI	116	0.73	IM	3	0.02
China	102	0.65	RU	3	0.02
MT	102	0.65	BB	2	0.01
Spain	99	0.63	KZ	2	0.01
GG	83	0.53	MU	2	0.01
HK	70	0.44	RO	2	0.01
AU	68	0.43	VE	2	0.01
LT	58	0.37	AN	1	0.01
IN	51	0.32	BZ	1	0.01
BM	46	0.29	CL	1	0.01
LV	43	0.27	EG	1	0.01
SG	41	0.26	FO	1	0.01
KY	40	0.25	GE	1	0.01
IS	32	0.20	IQ	1	0.01
PL	31	0.20	KE	1	0.01
VG	29	0.18	LB	1	0.01
CZ	20	0.13	MC	1	0.01
KR	15	0.09	MX	1	0.01
PT	14	0.09	PA	1	0.01
SA	1	0.01			
UA	1	0.01			
			Total	**15804**	**100.00**

The event model strategy

In the analysis we are interested in evaluating the effects of foreign acquisitions of Swedish firms on the outcome variable total factor productivity. Since the focus is not on effects that only lasts for one year, but rather if the effects tend to persist over time, we use an event-study design to estimate the dynamic effects of foreign acquisitions (treatment effects) and to evaluate pre-trends (test for parallel trends). The parallel trends assumption is that absence of treatment the two groups (treated and control group) average productivity should have developed in the same way. In our set up treatment (foreign acquisitions) happens at different points in time across firms (staggered treatments) and estimates of a given coefficient can be contaminated by the effects from other periods. to solve this problem Sun and Abraham (2021) propose a model that uses cohort specific (firms that were acquired a specific year) treatment effects (CATT).

Formally, the following dynamic regression equation is estimated:

$$A_{i,t} = \alpha_i + \lambda_t + \sum_{\ell=-K}^{-2} \mu_\ell D_{i,t}^{\ell} + \sum_{\ell=0}^{L} \mu_\gamma D_{i,t}^{\ell} + \upsilon_{i,t}$$

The dynamic model allows for both leads and lags in treatment K years before and L years post treatment. In our setup K is -10 and L is +10 years. The outcome variable of interest is total factor productivity, $A_{i,t}$. The treatment status $D_{i,t} = 1$ if firm i is treated in period t and $D_{i,t} = 0$ if firm i is not treated in period t. The firms may be treated at different periods ℓ during the period g Our primary estimand of interest is the Average Treatment Effect on the Treated k periods after treatment onset, sometimes called the "event study" or "dynamic" ATT (Abraham and Sun, 2021).

Total factor productivity

We measure firm performance using a measures of total factor productivity which is estimated using the control function approach, which is widely used in production functions estimations. The measure we use are Ackerberg, Caves and Frazer (2015), henceforth ACF model. The method aim to reduce the problem of endogeneity between productivity and inputs. A profit-maximizing firm is assumed to have much more information about its production function and market demand than the econometrician trying to analyze firm-level register data. A standard ordinary least square (ols) estimation will therefore be inconsistent. The ACF model has its origins in the two-stage models of Olley and Pakes (1996) and Levinsohn and Petrin (2003), henceforth OP and LP, which consider not only standard inputs but also investment or intermediate goods.[36] Assuming a Cobb-Douglas production function

$$y_{jt} = \beta_0 + \sum_k \beta_k x_{jt}^k + \omega_{jt} + \eta_{jt}$$

Where y_{jt} is the log of firm value added and x_{jt}^k is a vector of inputs: capital (the log of book values of tangible assets), the log of labor separated in white and blue collar, the log of intermediate material and the unobserved log of productivity ω_{jt} and the

[36] The results are robust to using productivity measures of Olley and Pakes and Levinsohn and Petrin.

residual η_{jt}. Unlike OP and LP, which assume that firms can adjust certain inputs immediately and without cost, ACF assumes that the correlation between labor and productivity produces biased and inconsistent estimates and therefore needs to be estimated separately. For a more detailed description see Rovigatti & Mollisi (2018).

Table A2. Sensitive industries, 2-digit

Division	Description	Sensitive industries	Sector
01	Crop and animal production, hunting and related service activities	YES	1
03	Fishing and aquaculture	YES	1
05	Mining of coal and lignite	YES	1
06	Extraction of crude petroleum and natural gas	YES	1
07	Mining of metal ores	YES	1
08	Other mining and quarrying	YES	1
09	Mining support service activities	YES	1
10	Manufacture of food products	YES	2
11	Manufacture of beverages	YES	2
12	Manufacture of tobacco products	YES	2
19	Manufacture of coke and refined petroleum products	YES	2
20	Manufacture of chemicals and chemical products	YES	2
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	YES	2
23	Manufacture of other non-metallic mineral products	YES	2
26	Manufacture of computer, electronic and optical products	YES	2
27	Manufacture of electrical equipment	YES	2
35	Electricity, gas, steam and air conditioning supply	YES	3
36	Water collection, treatment and supply	YES	3
49	Land transport and transport via pipelines	YES	3
50	Water transport	YES	3
51	Air transport	YES	3
52	Warehousing and support activities for transportation	YES	3
53	Postal and courier activities	YES	3
60	Programming and broadcasting activities	YES	3
61	Telecommunications	YES	3
62	Computer programming, consultancy and related activities	YES	3
63	Information service activities	YES	3
64	Financial service activities, except insurance and pension funding	YES	3
65	Insurance, reinsurance and pension funding, except compulsory social security	YES	3
84	Public administration and defence; compulsory social security	YES	4
86	Human health activities	YES	4
99	Activities of extraterritorial organisations and bodies	YES	4

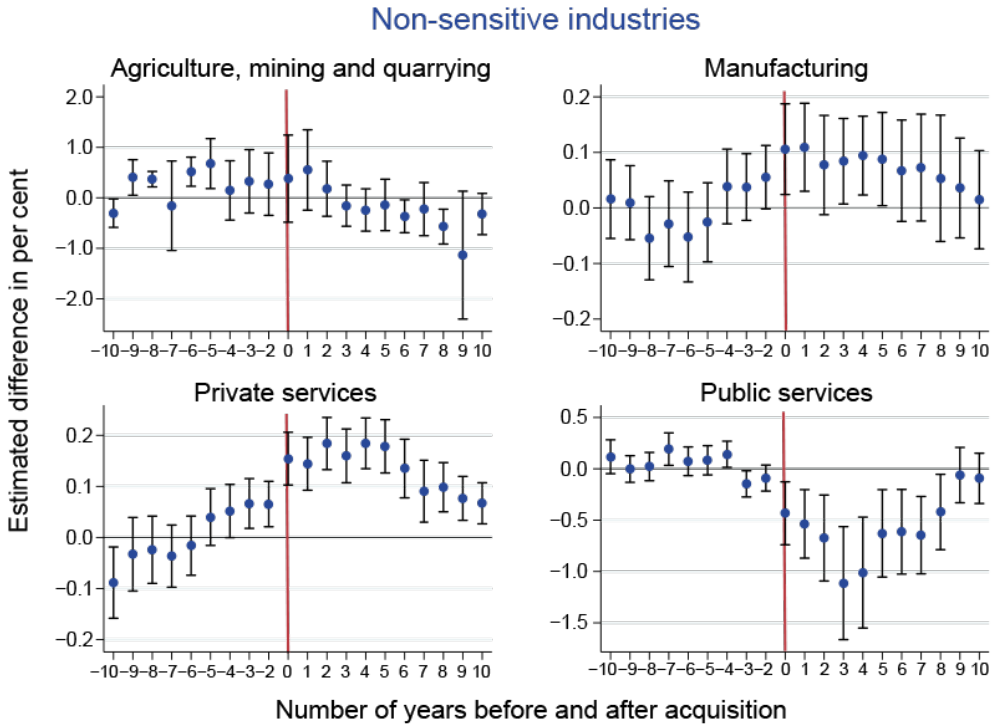
Table A3. Sensitive industries, 4-digit

SNI07	Description	AGRI	Critical	Critical	Critical
0111	Growing of cereals (except rice), leguminous crops	1	0	0	0
0141	Milk production and raising of dairy cattle	1	0	0	0
0142	Raising of other cattle and buffaloes	1	0	0	0
0146	Raising of swine/pigs	1	0	0	0
0147	Egg production and raising of poultry	1	0	0	0
0150	Mixed farming	1	0	0	0
0163	Post-harvest crop activities	1	0	0	0
0164	Seed processing for propagation	1	0	0	0
0210	Silviculture and other forestry activities	1	0	0	0
0220	Logging	1	0	0	0
0240	Support services to forestry	1	0	0	0
0311	Marine fishing	1	0	0	0
0312	Freshwater fishing	1	0	0	0
0321	Marine aquaculture	1	0	0	0
0322	Freshwater aquaculture	1	0	0	0
0510	Mining of hard coal	0	1	0	0
0520	Mining of lignite	0	1	0	0
0610	Extraction of crude petroleum	0	1	0	0
0620	Extraction of natural gas	0	1	0	0
0710	Mining of iron ores	0	1	0	0
0721	Mining of uranium and thorium ores	0	1	0	0
0729	Mining of other non-ferrous metal ores	0	1	0	0
0811	Quarrying of ornamental and building stone,	0	1	0	0
0812	Operation of gravel and sand pits; mining of clays	0	1	0	0
0891	Mining of chemical and fertiliser minerals	0	1	0	0
0893	Extraction of salt	0	1	0	0
0899	Other mining and quarrying n.e.c.	0	1	0	0
0910	Support activities for petroleum and natural gas	0	1	0	0
0990	Support activities for other mining and quarrying	0	1	0	0
1910	Manufacture of coke oven products	0	1	0	0
1920	Manufacture of refined petroleum products	0	1	0	0
2011	Manufacture of industrial gases	0	1	0	0
2015	Manufacture of fertilisers and nitrogen compounds	0	1	0	0
2051	Manufacture of explosives	0	1	0	0
2110	Manufacture of basic pharmaceutical products	0	1	0	0
2120	Manufacture of pharmaceutical preparations	0	0	1	0
2441	Precious metals production	0	1	0	0
2446	Processing of nuclear fuel	0	1	0	0
2540	Manufacture of weapons and ammunition	0	0	1	0
2611	Manufacture of electronic components	0	0	1	0
2612	Manufacture of loaded electronic boards	0	0	1	0
2620	Manufacture of computers and peripheral equipment	0	0	1	0
2630	Manufacture of communication equipment	0	0	1	0
2651	Manufacture of instruments and appliances for	0	0	1	0
2660	Manufacture of irradiation, electromedical and	0	0	1	0
2811	Manufacture of engines and turbines, except aircraft,	0	0	1	0
2891	Manufacture of machinery for metallurgy	0	0	1	0
3030	Manufacture of air and spacecraft and related	0	0	1	0
3040	Manufacture of military fighting vehicles	0	0	1	0
3316	Repair and maintenance of aircraft and spacecraft	0	0	0	1
3511	Production of electricity	0	0	0	1
3512	Transmission of electricity	0	0	0	1

3513	Distribution of electricity	0	0	0	1
3514	Trade of electricity	0	0	0	1
3521	Manufacture of gas	0	0	0	1
3522	Distribution of gaseous fuels through mains	0	0	0	1
3523	Trade of gas through mains	0	0	0	1
3530	Steam and air conditioning supply	0	0	0	1
3600	Water collection, treatment and supply	0	0	0	1
3700	Sewerage	0	0	0	1
3812	Collection of hazardous waste	0	0	0	1
3822	Treatment and disposal of hazardous waste	0	0	0	1
4211	Construction of roads and motorways	0	0	0	1
4212	Construction of railways and underground railways	0	0	0	1
4213	Construction of bridges and tunnels	0	0	0	1
4221	Construction of utility projects for fluids	0	0	0	1
4222	Construction of utility projects for electricity and	0	0	0	1
4291	Construction of water projects	0	0	0	1
4299	Construction of other civil engineering projects n.e.c.	0	0	0	1
4312	Site preparation	0	0	0	1
4313	Test drilling and boring	0	0	0	1
4910	Passenger rail transport, interurban	0	0	0	1
4920	Freight rail transport	0	0	0	1
4931	Urban and suburban passenger land transport	0	0	0	1
4939	Other passenger land transport n.e.c.	0	0	0	1
4941	Freight transport by road	0	0	0	1
4942	Removal services	0	0	0	1
4950	Transport via pipeline	0	0	0	1
5010	Sea and coastal passenger water transport	0	0	0	1
5020	Sea and coastal freight water transport	0	0	0	1
5030	Inland passenger water transport	0	0	0	1
5040	Inland freight water transport	0	0	0	1
5110	Passenger air transport	0	0	0	1
5121	Freight air transport	0	0	0	1
5122	Space transport	0	0	0	1
5221	Service activities incidental to land transportation	0	0	0	1
5222	Service activities incidental to water transportation	0	0	0	1
5223	Service activities incidental to air transportation	0	0	0	1
5224	Cargo handling	0	0	0	1
5229	Other transportation support activities	0	0	0	1
5310	Postal activities under universal service obligation	0	0	0	1
5320	Other postal and courier activities	0	0	0	1
5813	Publishing of newspapers	0	0	0	1
5829	Other software publishing	0	0	0	1
5911	Motion picture, video and television programme	0	0	0	1
5913	Motion picture, video and television programme	0	0	0	1
5914	Motion picture projection activities	0	0	0	1
5920	Sound recording and music publishing activities	0	0	0	1
6010	Radio broadcasting	0	0	0	1
6020	Television programming and broadcasting activities	0	0	0	1
6110	Wired telecommunications activities	0	0	0	1
6120	Wireless telecommunications activities	0	0	0	1
6130	Satellite telecommunications activities	0	0	0	1
6190	Other telecommunications activities	0	0	0	1
6201	Computer programming activities	0	0	0	1
6202	Computer consultancy activities	0	0	0	1
6203	Computer facilities management activities	0	0	0	1

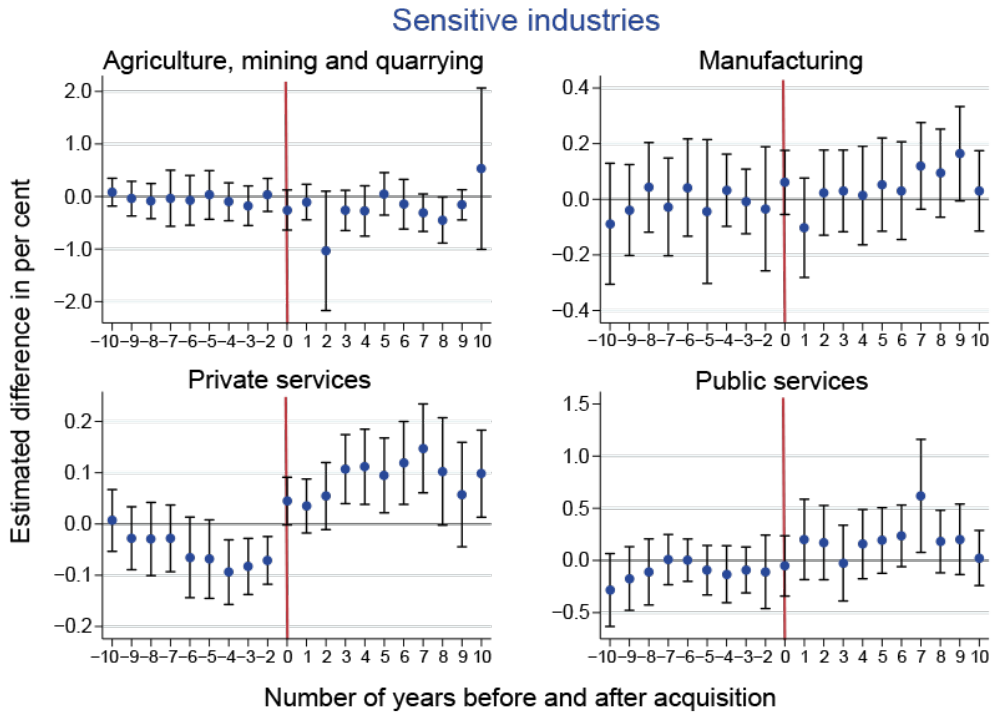
6209	Other information technology and computer service	0	0	0	1
6311	Data processing, hosting and related activities	0	0	0	1
6312	Web portals	0	0	0	1
6391	News agency activities	0	0	0	1
6399	Other information service activities n.e.c.	0	0	0	1
6411	Central banking	0	0	0	1
6419	Other monetary intermediation	0	0	0	1
6499	Other financial service activities, except insurance	0	0	0	1
6530	Pension funding	0	0	0	1
6611	Administration of financial markets	0	0	0	1
7211	Research and experimental development on	0	0	0	1
7219	Other research and experimental development on	0	0	0	1
7220	Research and experimental development on social	0	0	0	1
7312	Media representation	0	0	0	1
7320	Market research and public opinion polling	0	0	0	1
8010	Private security activities	0	0	0	1
8020	Security systems service activities	0	0	0	1
8030	Investigation activities	0	0	0	1
8110	Combined facilities support activities	0	0	0	1
8411	General public administration activities	0	0	0	1
8412	Regulation of the activities of providing health care,	0	0	0	1
8413	Regulation of and contribution to more efficient	0	0	0	1
8421	Foreign affairs	0	0	0	1
8422	Defence activities	0	0	0	1
8423	Justice and judicial activities	0	0	0	1
8424	Public order and safety activities	0	0	0	1
8425	Fire service activities	0	0	0	1
8430	Compulsory social security activities	0	0	0	1
8510	Pre-primary education	0	0	0	1
8520	Primary education	0	0	0	1
8531	General secondary education etc.	0	0	0	1
8532	Technical and vocational secondary education etc.	0	0	0	1
8541	Post-secondary non-tertiary education	0	0	0	1
8542	Tertiary education	0	0	0	1
8551	Sports and recreation education	0	0	0	1
8552	Cultural education	0	0	0	1
8559	Other education n.e.c.	0	0	0	1
8560	Educational support activities	0	0	0	1
8610	Hospital activities	0	0	0	1
8621	General medical practice activities	0	0	0	1
8622	Specialist medical practice activities	0	0	0	1
8623	Dental practice activities	0	0	0	1
8690	Other human health activities	0	0	0	1
8710	Residential nursing care activities	0	0	0	1
8720	Residential care activities for mental retardation,	0	0	0	1
8730	Residential care activities for the elderly and disabled	0	0	0	1
8790	Other residential care activities	0	0	0	1
8810	Social work activities without accommodation for the	0	0	0	1
8891	Child day-care activities	0	0	0	1
8899	Other social work activities without accommodation	0	0	0	1
9101	Library and archives activities	0	0	0	1
9492	Activities of political organisations	0	0	0	1
9900	Activities of extraterritorial organisations and bodies	0	0	0	1

Figure A1. Event study results: non-sensitive industries, 4 sectors



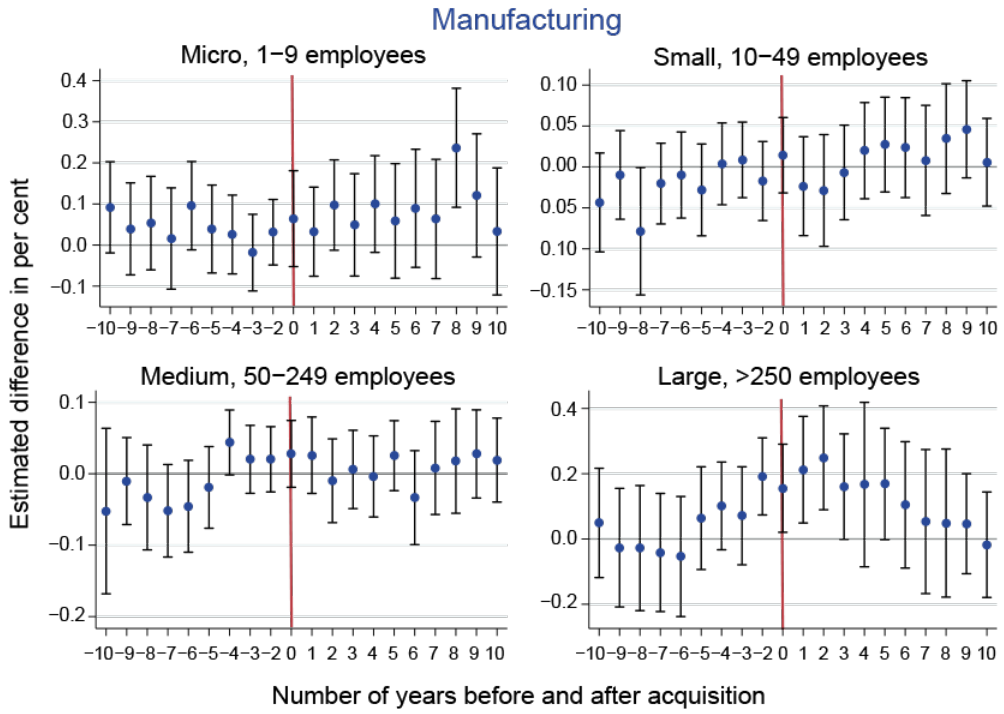
Note: Shown coefficients are leads and lags (treatment occurs at '0'), estimated with Sun and Abraham (2021) estimator. Response variable is Total Factor Productivity. Control group: firms that were never acquired. Source: Statistics Sweden.

Figure A2. Event study results: sensitive industries, 4 sectors



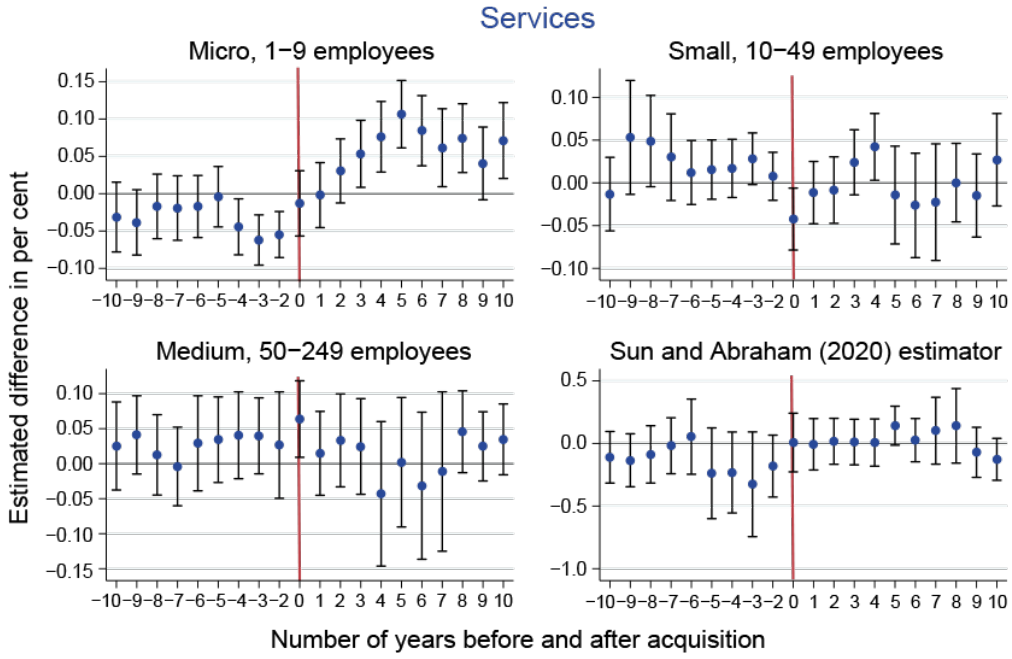
Note: Shown coefficients are leads and lags (treatment occurs at '0'), estimated with Sun and Abraham (2021) estimator. Response variable is Total Factor Productivity. Control group: firms that were never acquired. Source: Statistics Sweden.

Figure A3. Event study results: Manufacturing, different size classes



Note: Shown coefficients are leads and lags (treatment occurs at '0'), estimated with Sun and Abraham (2021) estimator. Response variable is Total Factor Productivity. Control group: firms that were never acquired. Source: Statistics Sweden.

Figure A4. Event Study Results: Services, different size classes



Note: Shown coefficients are leads and lags (treatment occurs at '0'), estimated with Sun and Abraham (2021) estimator. Response variable is Total Factor Productivity. Control group: firms that were never acquired. Source: Statistics Sweden.

Sammanfattning
Summary in Swedish

I Sverige jobbar cirka 12 procent av arbetskraften eller 700 000 personer i utlandsägda företag. Det vanligaste sättet för utländska företag att etablera sig på en ny marknad är via uppköp (eng. foreign acquisition) medan nyetablering av en verksamhet (eng. greenfield investment) är mindre vanligt förekommande. Att bli uppköpt av en utländska aktör påverkar det uppköpta företaget på flera sätt och det handlar inte enbart om byte av ägarskap. Några typiska förändringar i uppköpta företag som observerats inkluderar:

- ökad export
- ökad forsknings- och utvecklingsverksamhet (FoU)
- ökad produktivitet
- ökad sysselsättning.

De förändringar som vi ser i de förvärvade företagen kan ha flera orsaker. Förvärvet ger det lokala företaget tillgång till ett stort internationellt försäljningsnät genom vilket dess produkter kan distribueras och bla öka företagets export. Förvärv är inte helt slumpmässiga och ofta finns det någon form av teknisk komplementaritet mellan det förvärvade företaget och moderföretaget. Om man tittar närmare på detta, visar litteraturen att företag som förvärvar andra företag ofta ligger i teknisk framkant och att det förvärvade företaget därför kan dra nytta av moderföretagets know-how. Tillsammans med den rationalisering som ofta följer på ett uppköp bidrar detta till ökad produktivitet och konkurrenskraft hos det förvärvade företaget. Att vi i Sverige ofta ser en ökad forsknings- och utvecklingsverksamhet hos uppköpta företag kan tolkas som att Sverige är ett land vilket är väl anpassat för denna typ av verksamhet och att moderföretaget därför gärna förlägger en del av sin FoU-verksamhet i Sverige.

Med tanke på vad vi idag vet om de ekonomiska effekterna av utländskt ägande är det inte förvånande att många länder anstränger sig för att locka till sig utländska investerare. Trots denna positiva syn på utländska investeringar har ett ökat hänsynstagande till potentiella riskfaktorer blivit allt viktigare och 2019 beslutades på EU-nivå att införa ett så kallat ramverk för screening av utländska investeringar. I Sverige kommer en granskningsmekanism för utländska förvärv att lanseras i december 2023.

Om man tittar på flödena av utländska direktinvesteringar har de haft en uppåtgående trend under de senaste 30 åren, men har avtagit under de senaste åren. Detta gäller även inkommande direktinvesteringar i Sverige. Ökad protektionism och ekonomiska kriser i vår omvärld har påverkat investeringarna negativt.

I denna rapport görs en ekonomisk analys av utländska direktinvesteringar. I rapporten visas att utlandsägda företag i genomsnitt är mer produktiva, mer kapitalintensiva och humankapitalintensiva jämfört med lokalt ägda företag. Men en statistisk analys visar också att produktiviteten stiger med ca 10 procent i företag som blir utlandsägda jämfört med företag som kvarstår som svenskägda. Dessa effekter skiljer sig emellertid mycket mellan företagen och beror på bla företagets storlek och bransch.

Produktivitetsökningen kan huvudsakligen hänföras till förvärv av s.k. mikroföretag och startups inom tjänstesektorn. I rapporten undersöks även ekonomiska effekter av investeringar i känsliga branscher. Det sker relativt få utländska förvärv i s.k. känsliga branscher och vi ser ingen trendmässig ökning av den utländska kontrollen i dessa branscher. Produktivitetsökningarna till följd av utländska förvärv är om något större i de känsliga branscherna, särskilt inom den privata tjänstesektorn. Eftersom undersökningen har varit inriktad på att studera de ekonomiska effekterna av utländska förvärv av svenska företag har utländska nyetableringar i Sverige samt svenska multinationella företags förvärv i Sverige uteslutits.

Vilka näringspolitiska slutsatser kan man dra av detta? Hinder för utländska direktinvesteringar och/eller större osäkerhet hos investerare kan minska möjligheterna till positiva kunskapsöverföringar från utlandet. Dessutom kan sådana hinder också begränsa möjligheterna till positiva spridningseffekter av kunskap till andra inhemska företag och därmed hämma den totala ekonomiska tillväxten. De positiva effekterna av utländska förvärv verkar vara stora, men det skulle vara att gå för långt att föreslå subventioner för utländska förvärv. Subventioner stör marknadskrafterna, vilket inte är önskvärt, och det skulle också kräva att man subventionerar t.ex. svenska multinationella företags förvärv av svenska företag. Dessutom visar vår analys att utländska förvärv inte alltid leder till högre produktivitet, vilket gör det svårt att rikta subventioner till särskilda företag eller branscher. Utrymmet för näringspolitiken är dock större när det gäller att ständigt arbeta för ett attraktivt investeringsklimat i Sverige som gynnar både nationella och multinationella företag lika mycket. Ett bra utbildningssystem, god infrastruktur och en fortsatt liberal inställning till internationell handel har visat sig vara viktiga faktorer för att attrahera utländska investerare och diskriminerar inte mellan företag. Eftersom den utländska investeraren har en nackdel jämfört med lokala svenska företag kan vissa diskriminerande åtgärder fortfarande vara motiverade, t.ex. information och hjälp med att hitta kunder och underleverantörer i syfte att minska informations- och sökkostnaderna för de utländska investerarna. I Sverige arbetar Business Sweden med dessa viktiga frågor.

Slutligen tyder våra resultat på att det finns betydande fördelar med utländska investeringar i småföretag inom tjänstesektorn. För dessa företag är det särskilt viktigt att ha god information om det nya granskningssystemet, eftersom de inte kan förväntas ha denna kunskap internt (till skillnad från större företag som har mer resurser att spendera på juridisk rådgivning). Vi föreslår därför att särskilda insatser/stöd avsätts för att hjälpa de mindre företagen i denna process.

The National Board of Trade Sweden is the government agency for international trade, the EU internal market and trade policy. Our mission is to facilitate free and open trade with transparent rules as well as free movement in the EU internal market.

Our goal is a well-functioning internal market, an external EU trade policy based on free trade and an open and strong multilateral trading system.

We provide the Swedish Government with analyses, reports and policy recommendations. We also participate in international meetings and negotiations.

The National Board of Trade, via SOLVIT, helps businesses and citizens encountering obstacles to free movement. We also host several networks with business organisations and authorities which aim to facilitate trade.

As an expert agency in trade policy issues, we also provide assistance to developing countries through trade-related development cooperation. One example is Open Trade Gate Sweden, a one-stop information centre assisting exporters from developing countries in their trade with Sweden and the EU.

Our analyses and reports aim to increase the knowledge on the importance of trade for the international economy and for the global sustainable development. Publications issued by the National Board of Trade only reflect the views of the Board.

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