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## **Measuring Swedish Offshoring**

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**Abstract.** This paper presents two studies carried out at Statistics Sweden on offshoring. The first one focuses on offshoring of Swedish industrial production and contains a labour demand perspective while the other one deals with effects from offshoring on productivity. Both studies present interesting results which to some extent differ from the media picture of Swedish offshoring. The Swedish results in this paper are related to some corresponding and relevant international studies.

## 1. Introduction

Official statistics have not yet been able to capture different aspects of globalisation clearly enough. This is partly due to the nature of statistical systems that are largely built up around the *National Accounts*. However, awareness has risen of the challenge globalisation presents to the statistical community and considerable efforts have been made to bring about improvements of official statistics.

Recently the new economy was a much debated subject to which globalisation was closely connected via the new challenges and opportunities raised by the Information and Communication Technology (ICT). As a result, markets as well as firms are now less dependent on national borders than previously.

One further aspect of globalisation is the rapid change of the physical organisation of production, which is today much less dependent on spatial constraints. The production chain can be broken down in a much more sophisticated way. More firms have to adapt themselves to international competition and more efficient production processes to survive.

In recent years, different aspects of globalisation have been the focus of the political debate, research and media coverage in Sweden and elsewhere. The main focus in the offshoring debate has been on the effects on the Swedish labour demand from relocation of Swedish jobs and production to low-wage countries.

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This paper presents two recent studies carried out by Statistics Sweden. The main issue in the first study is the measurement of the magnitude of international relocation and outsourcing while the second study, carried out in cooperation with Örebro University, focuses on the effects from offshoring on Swedish productivity.

## **2. Relocation and outsourcing of production and their driving forces**

The concepts used in various studies with regard to the international relocation of production or jobs have been rather ambiguous. Terms such as international outsourcing, offshore outsourcing or international relocation have been applied. In this paper, *international relocation* of production is defined as the replacement of domestic Swedish production with production abroad but within the same company. Correspondingly, *international outsourcing* takes place when Swedish production is replaced with production abroad in another company (Mattila and Strandell). These two phenomena together are in this paper called *offshoring*. Since these activities cannot be measured directly, most studies equalise offshoring with imports of intermediate goods and services. If the firm imports, a decision has been made not to produce by themselves or by some other firm in the country.

The ITPS<sup>2</sup> has classified the driving forces behind offshoring as three principle motivations: 1) to find new resources and skills (skills-driven), 2) to gain access to new markets (market-driven) and 3) to benefit from lower costs (cost-driven), (Mattila and Strandell). In fact, it has been a very common strategy for Swedish multinationals to practice offshoring in order to gain access to new markets.

## **3. Offshoring Swedish industrial production - a labour demand perspective**

A recent study carried out at Statistics Sweden on international relocation and outsourcing (defined here as offshoring) of industrial production in 2002-2004 used redundancy notices from the Swedish National Labour Market Board as a point of departure (Lennartsson and Lindholm). The employees made redundant were linked to workplaces. In order to determine whether production was moved abroad, the changes in imports for the relevant workplaces were then measured. A register of workplaces that have moved their production abroad was created and matched with several other registers.

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<sup>2</sup> ITPS is the National Institute of Growth Policy Studies in Sweden.

The study shows that offshoring of Swedish industrial production in 2002-2004, as defined in the study, has been quite moderate, effecting a total of 8 500, or on average 2 800, redundancy notices per year. This implies only an average of 0.4 percent of the employees in the corresponding group<sup>3</sup>.

The results of the study are presented by industry, region, size category, ownership and the country to which production has moved. This study only covered the manufacturing industry, and the source data (on redundancy notices) do not cover enterprises in which less than 5 employees were given redundancy notice. Furthermore, the results only dealt with the direct effects of offshoring. The results of the study contained some uncertainties due to possible errors such as frame coverage, non-response, measurement errors and processing errors but an overall estimation is that the data quality is fairly good.

**Table 1**  
**Percentage of redundancy notices due to international relocation and outsourcing by country 2002–2004**

<b>Low-wage countries</b> <b>(Average number of redundancies per year 1 687)</b>		<b>High-wage countries</b> <b>(Average number of redundancies per year 1 150)</b>	
Country	Average number of redundancies (%)	Country	Average number of redundancies (%)
China	16	Finland	13
Poland	14	Denmark	10
Hungary	11	Germany	8
Unspecified low-wage countries	7	UK	4
Estonia	7	Italy	1
Lithuania	2	Portugal	1
Mexico	1	Belgium	1
Czech Republic	1	Norway	1
Latvia	1	Netherlands	1
Other	0	Other	0
<b>Total</b>	<b>59</b>		<b>41</b>

Source: Lennartsson and Lindholm

More than a half of the redundancy notices related to production relocated to low-wage countries, with China as most common destination followed by Poland, Hungary and Estonia. In total, production relocations to low-wage countries accounted for 59 percent. Correspondingly, 41 percent of the redundancy notices related to production moves to high-wage countries, which might be somewhat surprising. Among these, Sweden's neighbouring countries dominated: Finland,

<sup>3</sup> A follow-up study showed that approximately 80 percent of redundancy notices lead to actual redundancy in this group.

Denmark and Germany. In these cases, the relocations were obviously other than cost-driven, possibly being an indication of skills-driven or market-driven offshoring.

The study clearly shows that offshoring of the manufacturing industry is much more common in large workplaces than in small ones. Furthermore, offshoring increased with the size of the workplace. Thus, in workplaces with more than 200 employees offshoring amounted to 0.55 percent of the employment in the industry while the corresponding figure for the smallest workplaces was 0.09 percent. The large workplaces also dominated with regard to offshoring to low-wage countries.

Another pattern is also clearly visible. Approximately 7 percent of all manufacturing workplaces in Sweden were owned by international enterprises (Swedish or foreign) and among these roughly 3 percent were foreign-owned. The offshoring of industry according to the study has mainly taken place in foreign-owned (54 percent) and Swedish-owned (38 percent) international enterprises. Regarding the destination of offshoring, the study shows that 53 percent of offshoring in foreign-owned companies moved to low-wage countries while a full 72 percent of Swedish-owned companies offshored to low-wage countries. The corresponding share of other enterprises was still higher (75 percent).

The electrical and optical goods industry is one of the industries most affected by offshoring, corresponding to 0.8 percent redundancy notices of employment. The textile and clothing industry and the rubber and plastic goods industry also had figures on the same level.

In conclusion, the effects of offshoring on employment in the Swedish manufacturing industry during the period 2002-2004, measured in this way, were quite marginal, indicating this to be a natural phase in the continuously ongoing structural change in the economy.

Statistics Sweden is at present engaged in an EU survey on international sourcing including the measurement of the extent of international sourcing, the factors driving it, motivations and perceived barriers as well as consequences for employment.

#### **4. Offshoring of Swedish intermediate goods and services from a productivity gain perspective**

Statistics Sweden has also carried out a study together with the Örebro University on the offshoring of intermediate goods and services in Swedish firms during the period 2000-2004. The study includes both a description of the features of Swedish offshorers and an investigation of effects on productivity from offshoring. In this study, offshoring has been defined as the purchase of intermediate goods and services abroad with the supplier and buyer remaining in their respective locations, including trade with either a foreign affiliate or an external overseas supplier (Hagsten et al).

Offshoring can generally be expected to affect productivity in a positive way, particularly so if it is cost driven. However, the patterns affecting productivity are complex, with aspects relating to the structure of the industry, the size of the country, the degree of openness, the political system etc. Swedish firms operating in a small open economy have been active in international trade for a long time and probably have already adapted their productivity to a competitive level. Sweden also has high taxes and strict labour market regulations indicating all in all that these productivity gains are not necessarily easily fetched results for Swedish firms in the ongoing globalisation process.

The data sets used in the analyses originate from International Trade Statistics, Structural Business Statistics and the Swedish Register of Education as well as the National Accounts. In some of the statistics, breaks in the time series have taken place during the period, which have made the analyses more difficult.

Starting with the characteristics of the offshorers in Sweden, it can first be noticed that the imports of goods and services have grown steadily during the last ten-year period up to 2005 and the major trade countries have not changed significantly. This implies that Sweden still trades mainly with other high-wage countries. However, imports of goods from Russia, China and Poland have shown high growth rates, although such imports are not yet very substantial in size. Similarly, the imports of services have not changed significantly, with EU 15 and North America at the top. The import of services from China has grown in recent years but is still at a low level.

The study showed that Swedish firms engaged in offshoring of services have a much higher labour productivity than Swedish firms in general. The services offshorers also have higher capital intensity as well as more employees with post-secondary education. Almost all such firms are also exporters and many are internationally affiliated. In 2004 two thirds belonged to multinational

enterprises. The mean values of the offshorers of intermediate goods follow the same pattern as their services counterparts, but on a lower level. However, capital intensity for these offshorers is much lower than for firms on average.

Based on a general Cobb-Douglas production function including capital, skilled and unskilled labour, intermediates and a technology parameter (productivity), the effects on productivity from offshoring were estimated (for details, see Hagsten et al). The offshoring intensity was calculated as total imports of intermediate goods or services over total purchases. The results show that both manufacturing and services firms operating in Sweden gained from offshoring of services, with somewhat stronger effects for the manufacturers. However, the economic values were quite small. The effects from offshoring of intermediate goods to low-wage countries were minimal or non-existent, implying that only the offshoring to high-wage countries affects productivity, but even with a smaller premium than the offshoring of services. As for productivity, ownership seemed to be less important than global engagement.

## **5. Comparison of the results with other studies**

Both of the studies briefly referred to above are influenced by ongoing international studies carried out by other national statistical institutes and also by academic researchers. Thus the study on the Swedish manufacturing industry with a job loss perspective relates to a study carried out at INSEE (Aubert & Sillard). Although there were some methodological differences and the reference period in France was different (1995-2001), the results were quite similar. In France, as in Sweden, only a small amount of jobs were affected (0.35% of industrial employment). Another similarity was that offshoring was more common in both countries among foreign-owned enterprises. Regarding the destination of offshoring, there were some differences. China was the biggest single country in both studies, but a total of 40 percent of offshoring in France moved to low-wage countries and 60 percent to high-wage countries while the corresponding figures for Sweden were the opposite. One explanation might be that a large part of offshoring was to neighbouring countries, which in the Swedish case included low-wage countries (e.g. Poland, Estonia and Lithuania).

Regarding the productivity gain perspective, related studies have been carried out on data in Ireland (Görg et al) and the UK (Criscuolo and Leaver). In both of these studies, the data and methodology differ to some extent from the Swedish study which makes a direct comparison somewhat fragile. However, in a forthcoming study these three countries have been treated in a similar way showing that slight differences in the model do not distort the results (Criscuolo et al, forthcoming).

In the Irish study on international outsourcing (the term used in the study for the value of the imported intermediates), at the plants level in 1990-1998, it was shown that internationally experienced or foreign-owned firms are on average larger and have higher labour productivity than domestic non-exporting firms. Potentially positive effects from offshoring on both intermediate goods and services inputs were found. For foreign-owned plants, productivity enhancing effects were found but not for domestic plants regarding services. Furthermore, negative effects on productivity of offshoring for non-exporters were found.

In the British study, offshoring was equalised with the import of services in the manufacturing and service sector in the UK from 2000 to 2003. The source is the Annual Business Inquiry. The results showed that less than 10 percent of UK firms are offshorers of services. Such firms tend on average to be larger, have higher IT capital and pay higher salaries. The productivity gains were estimated in a somewhat different way compared to the Swedish study and the results show that a 10 percent increase in offshore intensity is associated with a 0.37 percent increase in total factor productivity. The effects come mainly from firms that are domestic and non-globally engaged.

In all three studies, it was found that multinationals and exporters in general were more productive than non-exporters. This could mean that the competition on the international market is harder and higher productivity is needed to survive. On the other hand, an opposite explanation also seems logical: the gains from entering the international market are so high that firms are spurred to try.

Swedish and Irish results coincide in that both countries experienced gains in productivity from offshoring by already internationally experienced firms. On the other hand the pure domestic firms received visible positive effects from offshoring of services in both Great Britain and Sweden.

## **6. Concluding remarks**

In this paper only some of the main results of the two offshoring studies carried out by Statistics Sweden have been highlighted. Both studies encompass many findings on a more detailed level and involve methodological development which has not been presented. These studies, both interlinked to the international development, clearly demonstrate that interesting results from offshoring can be presented, but also that further development of statistics is necessary.

One way to go forward is to create satellite accounts to track goods, services and people over borders, not only up to borders. A point of departure could be bilateral cooperation between neighbouring countries or major trade partners. World trade is not restricted by borders to the same



extent as before, but statistics are! Lately, trade and investments in border regions have been highlighted, stressing the need to analyse how regions work across national borders.

To be able to pursue studies of offshoring further, much more microdata for both national and international studies are needed. On the other hand, a trend towards more sample surveys impedes these types of studies.

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