



JÖNKÖPING INTERNATIONAL  
BUSINESS SCHOOL  
JÖNKÖPING UNIVERSITY

# The Growth of the Producer Service Sector

Master's thesis within economics

Author: Lovisa Skyborn

Tutor: Mikaela Backman

Tina Wallin

Jönköping

June 2015

## Master's Thesis in Economics

Title: The Growth of the Producer Service Sector  
Author: Lovisa Skyborn  
Tutors: Mikaela Backman  
Tina Wallin  
Date: June 2015  
Subject terms: Producer services, KIBS, business services, service sector,  
manufacturing industry

---

### **Abstract**

Over the past decades, the service sector has been the dominating sector regarding employment in many developed countries over the world. The role of the service sector has shifted from being regarded as a low wage and non-productive sector, to become a recognized driver of economic growth, productivity, and innovation. This thesis focuses on the producer service sector, which is stated to be one of the most fast-growing fields within services. The purpose of this thesis is twofold; firstly to analyze the growth of the producer service sector in Sweden, and secondly to analyze which sector that drives the demand for producer services. The study is conducted on municipality level in Sweden and the data is retrieved from Statistics Sweden. An analysis of the growth of the Swedish producer service sector is conducted, indicating large fluctuations of the growth when disaggregating the different industries within the producer services sector. The empirical results from the regression analysis show a negative relationship between the manufacturing industry and producer service, significant at the 1 percent level. Between the service sector and producer services a positive relationship was found, also significant at the 1 percent level, but the result cannot clearly be interpreted as a source of demand for producer services. The analysis also found a strong relationship with the level of education. Concluding the results from the regression, there are a number of factors that indicates a relationship with producer services, however it is still difficult to define which sector that drives the demand for producer services. This paper's empirical analysis suggest that, due to the negative relationship between the producer services and the manufacturing industry, either outsourcing is still a strong reason behind the continuous growth within producer services, or that demand for producer services does not come from the manufacturing industry. The result between producer services and the service sector indicates a positive relationship and need to be further studied.

## Table of Contents

<b>1</b>	<b>Introduction</b> .....	<b>1</b>
1.1	Purpose .....	2
1.2	Limitations .....	2
1.3	Disposition .....	2
<b>2</b>	<b>The Growth of the Producer Service Sector</b> .....	<b>3</b>
2.1	What are producer services? .....	3
2.2	From production to services .....	3
2.3	Reasons behind the growth in producer services .....	5
2.3.1	Outsourcing .....	6
2.3.2	Change in business industry .....	6
2.3.3	Trade .....	7
2.4	Other studies on producer services .....	8
<b>3</b>	<b>Demand for Producer Services</b> .....	<b>9</b>
3.1	Factors that drive the presence of producer services .....	9
3.1.1	Manufacturing industry .....	10
3.1.2	Service sector .....	10
3.1.3	Education .....	11
3.1.4	Income .....	11
3.1.5	Location .....	11
<b>4</b>	<b>Producer services in Sweden</b> .....	<b>12</b>
4.1	The growth of the aggregated sector .....	12
4.2	The growth in specific industries .....	15
<b>5</b>	<b>Empirical Study of Demand for Producer Services</b> .....	<b>18</b>
5.1	Method, variables and data .....	18
5.1.1	Dependent variable .....	18
5.1.2	Explanatory variables .....	18
5.1.3	Descriptive statistics .....	19
5.1.4	Correlations .....	20
5.2	Data and model description .....	21
5.3	Regression analysis .....	22
<b>6</b>	<b>Discussion</b> .....	<b>24</b>
<b>7</b>	<b>Conclusion</b> .....	<b>25</b>
	<b>List of References</b> .....	<b>26</b>
<b>Appendices</b>		
	Appendix 1 .....	28
	Appendix 2 .....	29
	Appendix 3 .....	30
<b>Figures</b>		
	Figure 4.1 Number of firms within the producer service sector in Sweden. ...	13
	Figure 4.2 Number of firms within the manufacturing industry in Sweden. ...	13
	Figure 4.3 Number of employees within the producer service sector. ....	14

Figure 4.4 Number of employees within the manufacturing industry. ....	14
Figure 4.5 Growth of producer services divided into subsectors .....	15

**Tables**

Table 4.1 Percentage increase in employees divided into subsectors .....	16
Table 4.2 Percentage increase in number of firms divided into subsectors..	16
Table 4.3 The largest growth in specific industries from 1993 to 2007 (employees).....	17
Table 4.4 The largest growth in specific industries from 1993 to 2007(firms)	17
Table 5.1 Definition of the explanatory variables .....	19
Table 5.2 Descriptive statistics.....	20
Table 5.4 Regression output .....	22

# I Introduction

Over the past decades, the service sector has been the dominating sector regarding employment in many developed countries over the world. The role of the service sector has shifted from being a low wage and non-productive sector, to play a major part in economic growth, productivity and innovation. Today, almost eight out of ten jobs are found within the service sector in Sweden, mostly within knowledge intensive business services (Jordahl, 2012). Similar figures can be found in many other development countries. In Britain, employment within the service sector rose from 61.5 percent in 1981 to 72.1 percent in 1994 (Bryson, 1997), while in United States, the employment within services rose by 85.3 percent between 1970 and 1986 (Hansen, 1990).

The manufacturing industry has on the other hand strongly decreased over the past 50 years and the share of the total occupation within manufacturing industry in Sweden today is below 20 percent. The industrial sector has also become more and more influenced by the service sector, since it buys and sells services to a larger extent. Through specialization and outsourcing, the two sectors have become more dependent on each other (Jordahl, 2012).

In the end of the 2000s, the Swedish government agency ordered the Swedish Agency for Growth Policy Analysis<sup>1</sup> (hereafter referred to as Growth Analysis) to retrieve new and additional statistics from the service sector. They concluded that it is necessary to gain a deeper knowledge in how economic growth arises in an economy based on services. Growth Analysis's report studied the service sector in four different categories; intermediary services, producer services, private personal services, and capital services (Tillväxtanalys, 2010).

The focus in this thesis is the producer service sector, which is stated to be one of the most fast-growing fields within services (Greenfield, 1966; Kutscher, 1988; Francois, 1990; Coffey, 2000 etc.) But why is it important to analyze the growth of the service sector, and especially producer services? Greenfield highlighted producer services in the 1960s and stressed that it was an important field to focus on in order to understand the economic growth. Bryson (1997) stated that: "Investigating the role and growth of business service enterprises is thus arguably of central importance for understanding contemporary economic change in the advanced capitalist economies" (p. 93). Economic theory has gone from questioning the value of services to actually emphasize its importance for economic growth.

With a close link between producer services and economic growth, it is important to analyze the rise of the producer service sector in order to understand the process of economic growth. This thesis brings new contribution to the discussion by analyzing at the growth of the producer service sector in Sweden and by analyzing which sector that drives the demand for producer services.

---

<sup>1</sup> The Swedish name of the agency is Tillväxtanalys.

<sup>2</sup> Outsourcing implies that a company moves parts of its production to an external supplier (Svensson, 2010).

## **1.1 Purpose**

The purpose of this thesis is twofold; firstly to analyze the growth of the producer service sector in Sweden, and secondly to analyze which sector that drives the demand for producer services.

## **1.2 Limitations**

The thesis is limited to the producer service sector in Sweden. In order to analyze the growth of producer services in Sweden, the sector has been examined on a finer level of aggregation for the years 1993 and 2007. During this time period the service sector have been reclassified by the Swedish Standard Industrial Classification (SNI), which implies the possibility of an inexact data. A more significant reclassification was done in 2007, which does not give continuity in the data and makes it difficult to conduct a study for longer time periods.

To analyze which sector that drives the demand for producer services, the relationship between producer services and the manufacturing industry and the service sector has been studied. The size of producer services was used as dependent variable, and the size of the manufacturing industry and the service sector as controlling variables, together with a number of control variables. All variables are external factors; internal factors are not included. The agriculture sector is not included in the study since it is a very small sector and mostly concentrated to rural areas, and not equally relevant for producer services. The test was conducted for the years 1996-2006 at municipality level. Due to lack of data of some variables it was not possible to include the years 1993-1995.

When analyzing the demand for producer services its is difficult to exclude the possibility of causality, since it is not possible to clearly state whether it is the sectors that affect the producer service or the other way around. This is important to keep in mind when analyzing the results.

## **1.3 Disposition**

The thesis begins with an introduction to the subject where also the purpose and limitations are stated. The introduction is followed by a background section, which briefly gives an overview over the history of the service sector's growth. Chapter 3 presents the theory and includes the hypothesis of the study. Chapter 4 includes the first empirical study, where the growth of the Swedish producer service sector is analyzed. Chapter 5 presents the second empirical analysis, which includes data and method descriptions, and a regression analysis on which sector that drives the demand for producer services. In chapter 6 the results from the empirical studies are discussed. This chapter is followed by a summary concluding the findings.

## **2 The Growth of the Producer Service Sector**

### **2.1 What are producer services?**

In the mid-sixties, Greenfield (1966) defined producer services as ‘those services which business firms, nonprofit institutions, and governments provide and usually sell to the producer rather than to the consumer’ (p. 1). According to him, producer services could be categorized with respect to their different duration; perishable, semi-durable and durable. Window cleaning would for example be perishable since the windows will have to be cleaned again soon, while an advertising firm promoting the sale of a certain product would be in the semi-durable category. A durable producer service would affect the firm in a longer term, such as management and consulting firms or research and development projects.

Tschetter (1987) and Markusen (1989) explained producer services by suggesting a number of areas within that type of service, including management and business consulting, engineering consulting, advertising, banking, insurance, financial services and data services. Tschetter (1987) stated that although these industries are very diverse, they all perform activities that are usually classified as overhead by other companies.

Coffey (2000) stressed that the concept of producer services to a large extent was ambiguous in literature. For some authors, he argued, the concept was synonymous with business services, while for others the concept included business services plus services such as finance, insurance, and real estate. There were also authors that added additional services to the concept.

According to Johansson *et al.* (2011) there are a number of characteristics that distinguish producer services. To begin with, they are typically supplied in a joint production, where the customer has an active part in the delivery and execution of the service. These services often require close contact between the supplier and receiver of the service. A second characteristic is that many producer services are intermediary services, which help the customer to locate suppliers, establish customer contacts or provide requested information or workforce. Thirdly, producer services are often another type of intermediary services, where the company arranges transaction contracts for buying and selling on a certain market, so that the transactions are conducted according to market supply and demand. A final characteristic for producer services is that they are often knowledge intensive. These services supply knowledge flows where there is a market for knowledge and innovations.

Those types of producer services that are more knowledge intensive are usually referred to as *advanced producer services* or *knowledge intensive business services (KIBS)*. According to Juleff-Tranter (1996), producer services are either – or both – information intensive or human capital intensive. Moolaert and Daniels (1991) describe advanced producer services as both knowledge and human capital intensive, while den Hertog (2000) described KIBS as supplying intermediary services that are knowledge based. The implication is that they rely heavily on professional knowledge within a certain field, often connected to technical disciplines. Examples of KIBS are R&D, financial services, programming services, insurance companies etc.

### **2.2 From production to services**

Sweden has during the past decades experienced a substantial structural change of the economy in terms of sector employment. The service sector has continued to grow and has

been shown to play an important part of economic growth, productivity and innovation. Sweden is not an exclusive case; the same reformation can be observed in most developed countries. The Swedish service sector outgrew the manufacturing industry around 1970, and in the first part of the 1990s, employment in the service sector had grown to approximately 70 percent (Schön, 2010). Today, 80 percent of the Swedish working population belongs to the service sector (Jordahl, 2012). The United States was the first country to become a service economy. In the middle of the 20<sup>th</sup> century, the American service sector outgrew the production sector and in the 1960s, two out of three workers were employed within the service sector (Greenfield, 1966).

The reactions to the rise of the service sector has however been mixed. The service sector was seen as a low wage and non-productive sector and there was a concern that it might slow down the economic growth. The skepticism towards the service sector continued even as far as to the 1980s, when the value of services was still questioned. The underlying reason for the disbelief in the idea of services creating economic growth presumably originates in the early economic theories by Adam Smith, and other neoclassical and classical economists, that made a distinction between “productive” and “unproductive” labor. Smith (1960) claimed that a menial servant added to the value of nothing, while a manufacturer at least added to the value of the materials he worked upon. Smith had a straight message: “A man grows rich by employing a multitude of manufacturers: he grows poor by maintaining a multitude of menial servants” (p. 295). Both workers have value to the employer, but according to Smith, the labor of a manufacturer produces something that lasts for some time, while services generally perish at the very instant of their performance without leaving any trace or value behind them. Smith’s idea of ‘unproductive labor’ included a wide range of different workers; military officers, churchmen, lawyers, physicians, musicians, dancers etc. The general conclusion was that these workers’ services, how honorable or useful they might be, produces “nothing which could afterwards purchase or procure an equal quantity of labour” (p. 295) and does not add to the stock of wealth. This view was partly supported by Karl Marx in the 19<sup>th</sup> century.

Even during the second part of the 20<sup>th</sup> century, the economic research did not keep up with the new structural change in the economy. In research, services were mostly looked upon as homogenous, and not divided into distinct sub-groups. According to Coffey (2000), the modern era of research on services started in the early to mid 1980s. When economists eventually started to focus on different sectors within services, almost total emphasis was given consumer services. Greenfield (1966), however, wanted to highlight a sector that was often overlooked, namely the ‘producer services’, or ‘business services’ as some refer to them. According to him, this was important in order to understand the process of economic growth as well as the new labor market. Prior to Greenfield, very little work had been done within producer services, so he extended the conceptual framework and established a theoretical foundation for the concept of producer services. Greenfield’s concluded findings from his thorough work on producer services was that during 1950-1960s employment in producer services showed a higher growth rate compared to the total employment and in 1960, almost a quarter of the national income was generated by producer services. Other conclusions were that the existence of producer services seemed to encourage the establishment and development of firms that use those services, and indications were found that the demand for external services were not as sensitive to declines in economic activity as expected. Greenfield also stressed the fact that management was often not aware of the extent to which the firm depended on and used external services.

Kutscher (1988) highlighted the often-heard argument that the economy could not exit as only a service-producing society and countered the concern with a number of arguments. Kutscher stated that the reason for this concern seemed to be that the society experiences the production of goods as better than production of services because it generates more income; that the production of services follows a satisfaction for production of goods; and that the society cannot maintain its wealth by only producing services. Kutscher asked himself if spending 100 dollar on a pair of skis is much better than spending the same amount on ski lift tickets and concluded that the maximized gain for the consumer does not depend on whether he or she buys goods or services. Regarding the argument that the production of goods is better than the production of services, Kutscher assumed that people mean that goods last longer than services. Although this is true for some goods, it is the opposite for goods such as newspapers and beers that are very short-lived. Some services are also short-lived, while some are very long-lasting, such as insurances, computer programming, estate planning, and funeral services.

From being very rarely discussed, the concept of producer services started to become established and more frequently studied. When research in producer services started to be recognized the governments however still lacked sufficient data. Hansen (1990) argued that governmental data lacked the level of details to clearly identify and measure producer services. Economists agreed that there was a lack of sufficient economic theories adapted to the 'serviced economy', but Moulart and Daniels (1991) did not see this as a result of neglect, but rather as a consequence of the limitation of traditional neoclassical economics. There will always be difficult to measure output in form of intangible goods, which creates a difficulty in applying and testing established economic theories.

Throughout the 90s, the awareness of the importance of producer services increased, but producer services were still seen as an intermediary to help the manufacturing industry. In 1996, Juleff-Tranter stated that producer services' principal functions were to supply intermediate inputs to production processes to either simplify the development of products or to make the operations of the firm more effective. His findings however showed that the demand for producer services to a larger extent came from the service industry. This implies a change in the role of producer services; from being divisions outsourced from the manufacturing industry to actually be its own industry, separated from production industries.

### **2.3 Reasons behind the growth in producer services**

What caused this rapid structural change during the postwar era? Clark (1951) suggested that there is a general shift in demand towards services when income is rising (cited in Svensson, 2010), which would explain the increase in services during the second half of the 20<sup>th</sup> century. Svensson (2010), however, claimed that although consumers put a larger amount of their income on services today, this is due to a relative increase in prices on services, while the volume of services and goods have stayed rather constant.

Research has indicated producer services to be a significantly fast-growing field within the service sector (Greenfield, 1966; Kutscher, 1988; Francois, 1990; Coffey, 2000 etc.), and theory suggests a number of reasons behind the rise of producer services.

### **2.3.1 Outsourcing**

Some states the rapid increase of the service sector to be a consequence of an increase in specialization, which led has led to outsourcing.<sup>2</sup> According to Svensson (2010), outsourcing is one of the largest explanatory factors behind the increase in producer services the past decades. If a company within the manufacturing industry outsources producer services, the service sector increases while the manufacturing industry decreases. The specialization can be a consequence of companies wanting to reduce overhead costs as stated by for example Tschetter (1987) and Goe (1991), but also due to a demand for more knowledge-intensive services. 20 years ago a single consultant within, for example, IT or marketing could offer a broad supply of services. Today, a more specialized knowledge is demanded to a larger extent, which further increases the demand for specialized consulting firms. According to Bryson (1997), clients to producer services firms can gain access to more specialized skills than what would have been possible to create and maintain within their own organizations. It can also reduce the companies' overhead costs since companies are able to access and pay for just-in-time knowledge instead of keeping full-time employees.

Goe (1991) stated a number of additional reasons for firms to externalize their producer services functions. The outsourcing could help the firms to focus on their core functions instead of having a too wide range of activities, and thus be more effective than other firms. It could also be to take advantage of the economies of scale, which enables firms producing only functions within producer services to do it at a lower cost, a statement shared with Andersson (2006). An additional reason for outsourcing producer services could be to transfer the cost risks that are linked with the production of these functions.

Johansson *et al.* (2011) also concluded that the growth of the producer service sector was presumed to be controlled by outsourcing processes, where each firm breaks out and externalizes both standardized routine services and specialized knowledge services.

According to Tschetter (1987), some claimed it to be a reflection of changes in the US business industry. Companies had started to focus on being competitive both in domestic and international markets, and therefore needed to reduce their overhead costs and activities that used to be administered within the firm, and could easily transfer them to firms specializing in those services. Consequently, the demand for producer services started to increase, but were considered as a transfer of activities (unbundling) and not contributing much to the total economy. Tschetter (1987) could thus conclude that this unbundling could only account for a small part of the producer services industries that had an above average growth.

### **2.3.2 Change in business industry**

Hansen (1990) stated that the rapid increase of producer services could not be merely a result of the manufacturing industry shifting in-house operation to outside service providers. Even though producer services could provide potential opportunity of cost-reduction for other firms, Hansen argued that it was the changing demands of firms that provide market for them.

Kutscher (1988) concluded that one obvious explanation for the growth of producer services was the total economy's growth. Kutscher explained that between 1972 and 1985

---

<sup>2</sup> Outsourcing implies that a company moves parts of its production to an external supplier (Svensson, 2010).

the US GNP growth could explain 40 percent of the producer services' output growth. He however also concluded that producer services was one sector that grew significantly faster than GNP and suggested that this could be due to a shifts in demand in the economy. The analysis thus showed that this factor only constituted for 2 percent of the growth. Another suggestion from Kutscher was that the growth could be explained by changes in business practice. The inputs that businesses need in order to produce have changed from mostly materials to also include producer services such as financials, communications and maintenance. The analysis showed that without changes in the way goods and services are produced, the growth of the producer services would have been significantly lower.

Moulaert and Daniels (1991) suggested, in line with Kutscher (1988), that the factors underlying the rapid expansion of producer services were the increasing internationalization of production and trade, along with organizational and managerial changes within large manufacturing and service enterprises. Other suggested reasons for the increase in producer services were increasing demand for information, expansion of foreign trade, increasing number of government regulations and laws within for example banking and environment, and increasing demand for data services (Tschetter, 1987).

Coffey & Bailly (1991) also stated that changes in business industry, mainly the manufacturing industry's focus on more flexible production, had stimulated the growth of producer services and suggested further research on this topic.

Coffey (2000) summarized earlier research on whether the rapid growth of producer services was 'real' or not, and concluded that empirical results pointed towards displacement effects as only a minor factor whereas the major reason for growth could be explained by an increase in demand for these services, which could be the result of changing business practice.

### **2.3.3 Trade**

Francois (1990) continued to emphasize producer services as a fast growing and important part of the service sector. In the late 1980s, people were still not convinced that the service sector would contribute to productivity growth, and in his paper Francois presented an alternative viewpoint with services as an important part of production in a modern economy. He suggested that the increase in producer services after the Second World War was partly a result of both the integration of internal markets and the expanded trade opportunities, which originated from the trade liberalization and started a process of integration of national markets as well. Francois developed a model that presented the relationship between services and changes in scale, assuming that producer services were an important part in the coordination and control of specialized production processes. He concluded that producer services were important to the realization of returns to scale, and that a growing producer service sector therefore is an essential part of production in modern economies since it facilitates an increased division of labor. The need for producer services to realize increasing returns, especially returns due to specialization, therefore suggests that an expanding sector of producer services is an important aspect of economic growth.

Also Markusen (1989) studied producer services as a fast growing category of trade. Markusen highlighted producer services as knowledge-intensive, which indicates a high acquiring cost of learning but can then be provided at a very low marginal cost, and therefore have increasing returns to scale. An example for this statement could be an engineering consultant who sells the same blueprints to different firms.

As described above, there have been numerous ways to explain the rapid increase in producer services. Many of the empirical findings have thus resulted in an outcome showing increased demand for producer services, not merely a transfer, or outsourcing, from existing services within manufacturing companies. This suggests that outsourcing is a too simple answer and that the actual reason, or reasons, behind the increase are still not unanimously concluded.

## **2.4 Other studies on producer services**

As research acknowledged the importance of producer services, the role they play started to become more deeply analyzed.

Birley and Westhead (1994) conducted a study to analyze possible differences in the characteristics between new business founders within the manufacturing or producer services industry. They could however conclude that the similarities were many more than their differences, but could also see that founders of producer services business were more likely to hold professional qualifications, such as a university degree at a postgraduate level, and started the businesses because they wanted to 'continue learning'.

Due to the general view that services was not innovative, research on services and innovation started to rise in order to prove the opposite. The discussion has included questions like whether the change in the economy was merely a consequence of large companies hiving-off some of their divisions or if small economies would experience enough economic growth from the service sector, which was assumed to have a limited ability to productivity increasing and export? Negative interpreters concluded that the service sector was doomed to low productivity growth, while at least one positive aspect of it was that it could absorb labor from the continuously automated manufacturing industry (Miles, 2000).

Scientists agree that successful product innovation is of high importance when it comes to the firm's competitiveness in the modern industrial market. Strong in-house knowledge and skills are crucial for the company to have constant product development. However, in the late 20th century, theories of external technical support as another important factor started to emerge, see for example Cutler (1991), Takac (1993), and Makun and MacPherson (1997). Makun and MacPherson (1997) connected producer services to innovation by showing that regions with strong stocks of advanced producer services have higher innovation rates. Johansson *et al.* (2011) could also conclude that the probability for a firm of having R&D activities was higher within the KIBS than within other service companies. The probability also increased with the size of the firms.

Producer services and innovation is a field that has been highly researched, but is not further discussed in this thesis. Due to its extent and importance it deserves its own paper.

### **3 Demand for Producer Services**

As economic theory went from questioning the value of services to instead emphasize its importance for economic growth, so did also research on producer services, which gradually went from focusing on the growth itself to actually follow up the impact the now large sector of producer services had on the economy. In today's economy producer services are an important part of the commercial and industrial life and a recognized contributor to economic growth.

Even in today's economy there is a continuous growth of producer services, which will be presented in coming chapter. The question of what makes this growth continue and the driving factors behind it are still unanswered. To analyze what sector that drives the demand for producer services, it is necessary to look further at what theory states are the important factors that drive the demand.

#### **3.1 Factors that drive the presence of producer services**

Already in the mid 1960s, Greenfield (1966) concluded that the existence of producer services seemed to encourage the establishment and development of firms that use those services. The theory is somewhat ambiguous when it comes to analyzing the demand for producer services. According to theory, both the manufacturing industry and the service sector are stated to drive demand for producer services. Several other factors that might have an impact on the presence of producer services are also found in theory.

Beyers and Lindahl (1996) conducted a study on what major forces that contribute to the demand for producer services. They analyzed cost-driven reasons, quasi-cost driven reasons, and non-cost considerations. Cost-driven reasons were, for example, lower transaction costs. When external services are less expensive than in-house, firms will turn to the market to acquire those services. Flexibility was a quasi-cost reason; acquiring producer services on the market help the firms to quickly adapt to changing business opportunities. Within non-cost considerations were examples such as lack of expertise, where limited in-house knowledge can be a reason for external purchase.

Beyers and Lindahl (1996) concluded that demand for producer services has not been driven by employees of downsizing companies. The reasons were rather due to lack of expertise and the creative packaging of these capabilities in new and expanding producer services business. They stated that cost-driven externalization was not responsible for the major part of producer services employment growth in recent decades.

Concluding the findings of Beyers and Lindahl, demand for producer services does not necessarily come from cost-driven actions, such as outsourcing. The demand, according to them, was more likely a result of non-cost consideration, such as adapting to new business practice, as stated by previously mentioned authors (Tschetter, 1987; Kutscher, 1988; Coffey 2000).

Beyers and Lindahl studied factors internal to the firms that potentially contribute to the demand for producer services, whereas this thesis focuses on external factors. A number of different factors that can drive the presence of producer services are further discussed below.

### **3.1.1 Manufacturing industry**

When looking at the manufacturing industry relative to the service sector, one finds different, sometimes even contradictive, theories regarding their relation. As described in the background section, the service sector outgrew the manufacturing industry in Sweden around 1970, but the question on whether the manufacturing industry has decreased at the expense of the service sector or if the manufacturing industry actually benefits from the increase of the service sector has been debated. Theory's assumption has been that the majority of the demand for producer services has come from the manufacturing industry (Juleff-Tranter, 1996).

The concept of outsourcing is a common perspective when it comes to why the growth of producer services was so rapid during the late 20<sup>th</sup> century, which can also imply that demand for producer services come from the manufacturing industry. Traditional economic-base models of regional development argue that demand from the manufacturing industry is a prerequisite for a continuous strong growth in the service sector (Hansen, 1990).

That demand for producer services comes from the manufacturing industry will be tested by including the size of the manufacturing industry as a factor that drives the presence of producer services. The first hypothesis therefore suggests that areas with a high presence of manufacturing firms also should have a high presence of producer services.

*Hypothesis 1: The manufacturing industry has a positive effect on the presence of producer services.*

### **3.1.2 Service sector**

Juleff-Tranter (1996) wanted to analyze if producer services rely on the manufacturing industry in order to provide a demand for their output. Studies started to show that the service sector itself, rather than the manufacturing sector, was the main source of demand for producer services. Based on data of the producer service sector in Sheffield and Leeds, Juleff-Tranter concluded that it was actually the service sector that appeared to be a more significant source of demand for producer services.

As an explanation for the rapid growth in producer services, in line with Tschetter (1987), Kutscher (1988) excluded unbundling since he stated that the change in business practice was accounted for a large proportion of the producer service sector's output growth. Therefore the higher demand must come from new or additional services. To exemplify Kutscher highlighted increasing demand for information, specialized corporate services, new governmental regulations and laws, and increased international trade. A change of business practice was also something stated by Hansen (1990) and Coffey (2000) as a reason for growth of the producer service sector, which can imply increasing demand from both the manufacturing industry and the service sector.

According to Juleff-Tranter (1996), it is the services sector itself rather than the manufacturing industry that appears to be the main source of demand. Thus the second hypothesis states that the size of the service sector is a driving factor for the size of the producer services sector.

*Hypothesis 2: The service sector has a positive effect on the presence of producer services.*

### **3.1.3 Education**

A large part of producer services are knowledge intensive, which often requires highly educated employees. Coffey (2000) stated that skilled labor is the major factor of production for producer services, which implies that producer services would prefer proximity to that labor.

Andersson and Hellerstedt (2009) show that the overall knowledge intensity of the workers within a region has a positive influence on the set up of new firms within knowledge intensive business services.

### **3.1.4 Income**

Theory states that an increasing proportion of consumption consists of services when the income level rises. Clark (1951) suggested that there is a shift in demand towards services when income is rising (cited in Svensson, 2010).

Hansen (1990) claimed that regions that have a high density of producer services are more likely to have a higher per capital income than other regions. Francois and Woerz (2008) examined the role of services in manufactured exports and concluded that there was an increasing demand for producer services as inputs in productions within the manufacturing industry when per capita income increased. With increasing income per capita also the export of service increased, especially for business services.

### **3.1.5 Location**

According to Coffey (2000), and several other authors, producer services tend to concentrate in larger metropolitan areas, which leaves smaller metropolitan areas and nonmetropolitan relatively disadvantaged. The location factors include the location of the market (i.e. the customers), the skilled labor that constitutes the major factor of production for producer services and economies of agglomeration to reduce transactional costs.

Also Andersson (2006) found indications of that producer services tend to attract to urbanized areas. He could also see that producer services were more concentrated than the population.

## 4 Producer services in Sweden

In 2010, the Swedish Agency for Growth Policy Analysis (Growth Analysis) published a paper on services in the modern economy. The paper was the outcome of a request from the Swedish government that needed new and additional statistics from the service sector, and wanted to gain a deeper knowledge in how economic growth arise in an economy based on service. Growth Analysis's report studied the service sector in four different categories; intermediary services, producer services, private personal services, and capital services. What distinctively distinguished producer services from the other three was its emphasis on B2B (business to business). The paper also concluded that producer services were especially interesting in relations to service innovations. The more knowledge intensive the services were, the more they resulted in knowledge spillover and product and service development (Tillväxtanalys, 2010).

One of the paper's important observations was that the largest contribution to productivity growth originated from producer services. Another observation was that KIBS have experienced a steady increase and the sector's level of productivity and growth has exceeded the average for the total economy. The paper's empirical observations suggested, for example, that the link between services and the manufacturing industry appeared to have grown stronger in recent years, along with an increase in the mutual dependence between these two sectors. The analysis suggests that this has been of significant importance when it comes to the rapid Swedish productivity and growth (Tillväxtanalys, 2010).

With producer services seen as an important part of economic growth, the Swedish Ministry of Enterprise, Energy and Communications commissioned Growth Analysis to analyze producer services' role and effect on other firms' innovation capacity and long-term productivity. The paper, by Johansson *et al.* (2011), indicated that a growing supply of knowledge intensive services enables both productivity boosts and innovations in other firms.

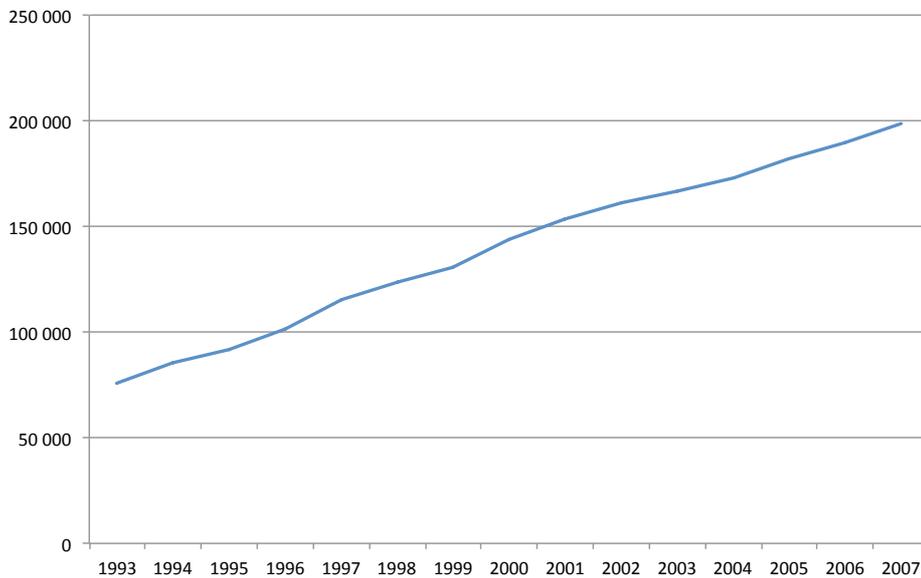
The purpose of the paper by Johansson *et al.* was also to present a view of the producer service sector in the Swedish economy by showing the size, structure and content of the sector. By doing so, Johansson *et al.* separated different industries within producer services from one another by dividing them into three levels of knowledge intensity. The industries were given different classification based on how many people with a university degree of the people working in the sector. In an industry that was ranked as very knowledge intensive at least 30 percent of the workers had a university degree; if 15-30 percent of the workers had a degree the industry was ranked as medium knowledge intensive and industries with fewer workers with a degree were ranked as low knowledge. According to Johansson *et al.*, the most rapid increase of producer services in Sweden during the 1990s and 2000s has been within the category very knowledge intensive services.

### 4.1 The growth of the aggregated sector

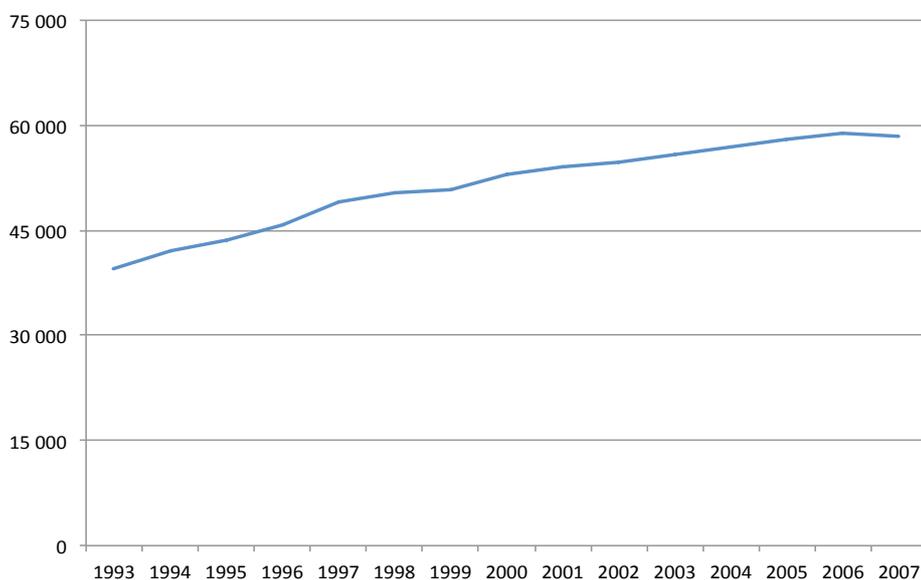
The supply of firms offering producer services is stated to have grown rapidly in Sweden since the 1990s, which has caused a substantial restructuring of the Swedish economy. The restructuring is stated to be mostly due to structural changes in companies that have chosen to outsource parts of their business, not only in areas involving administration and technology services, but also regarding R&D and innovation.

As shown in figure 4.1 below, firms operating within producer services have increased with 162% during the years 1993-2007. This can be compared to firms operating within the manufacturing industry, where there has been a growth of 64%, showed in figure 4.2.

The data is retrieved from Statistics Sweden and firms operating within producer services are defined by industry codes according to Growth Analysis's classifications. See appendix 1.



**Figure 4.1 Number of firms within the producer service sector in Sweden.**  
(Source: Made by author based on data from Statistics Sweden)

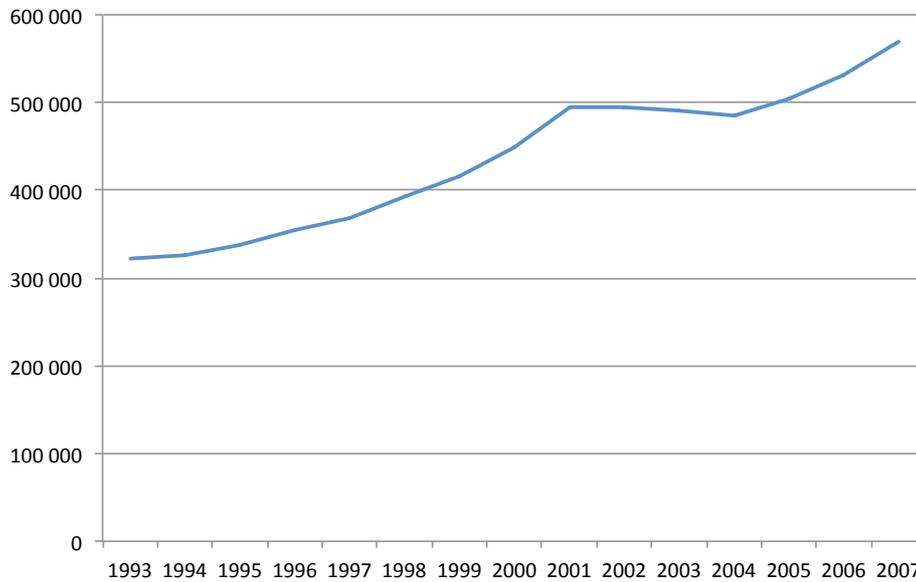


**Figure 4.2 Number of firms within the manufacturing industry in Sweden.**  
(Source: Made by author based on data from Statistics Sweden)

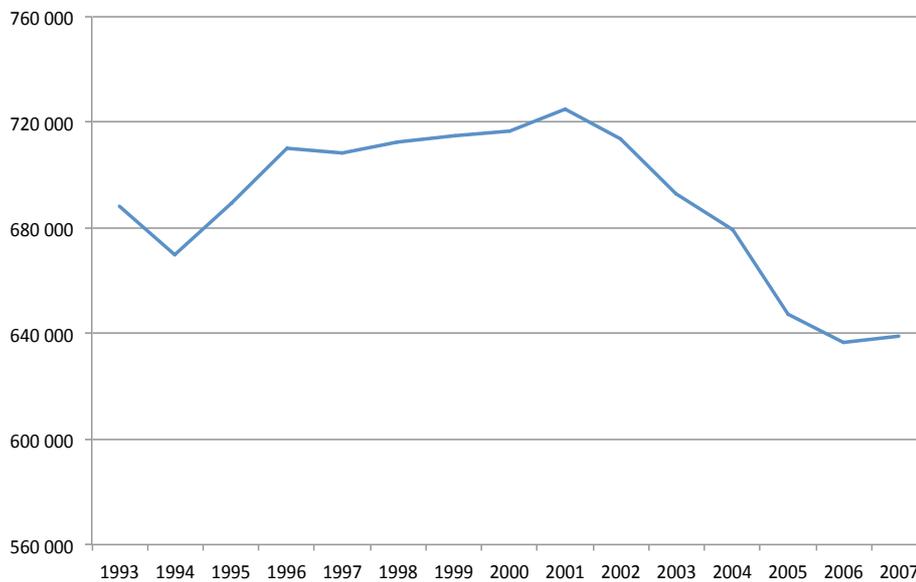
Figure 4.3 below shows an increase in the number of employees within producer services in Sweden from 1993 to 2007. Just over 300 000 people were employed within the producer services sector in 1993 as compared to almost 600 000 people that were working

within the same sector in 2007. The number employed by firms operating within producer services has thus increased by a total of 100 percent over 13 years.

Figure 4.4 however shows a decline in the number of employees within the manufacturing industry. Although the number of firms within the manufacturing industry has increased, the sector as employer has decreased with over 7%, which implies more small firms within the manufacturing industry. From the peak in 2001, the sector has been reduced with almost 86 000 jobs.



**Figure 4.3** Number of employees within the producer service sector in Sweden.  
(Source: Made by author based on data from Statistics Sweden)



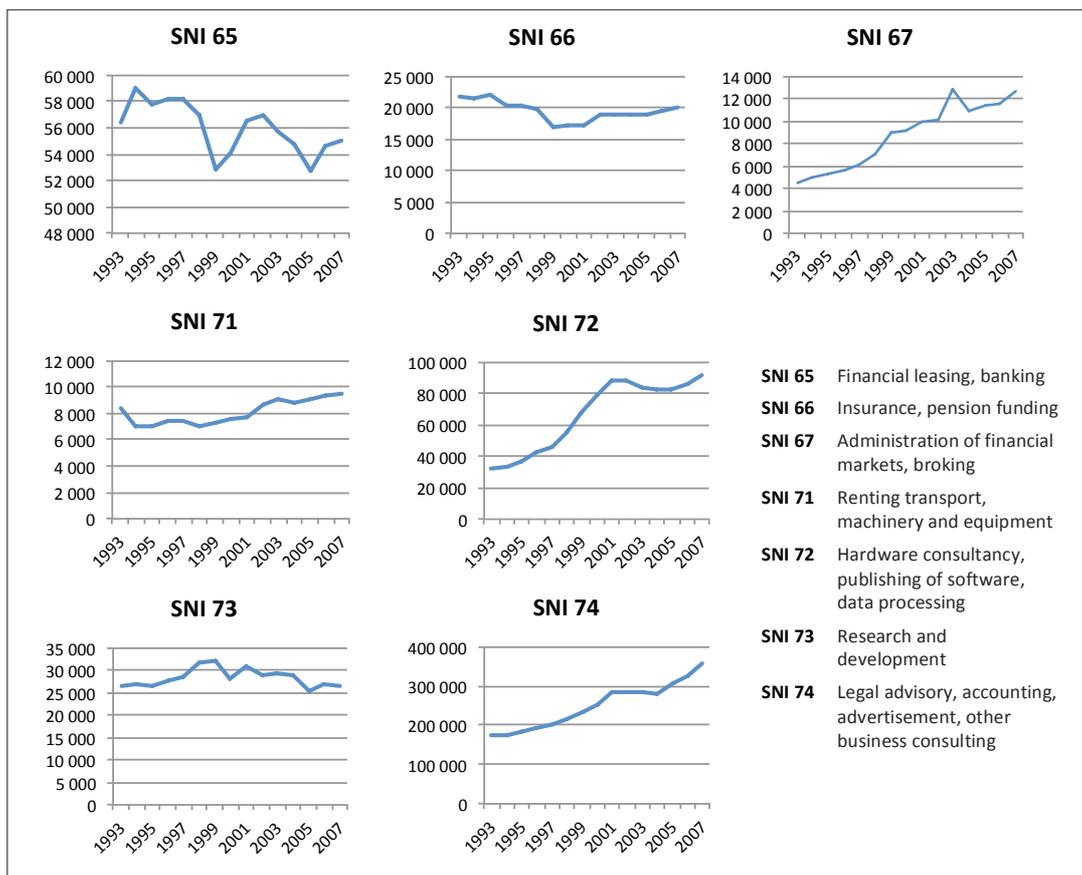
**Figure 4.4** Number of employees within the manufacturing industry in Sweden.  
(Source: Made by author based on data from Statistics Sweden)

## 4.2 The growth in specific industries

According to the statistics and in line with several researchers (Johansson *et al.*, 2011; Klaesson & Johansson, 2011), it can be concluded that there has been a significant growth of the producer service sector in Sweden. Both the actual number of firms operating in fields within producer service and the number of employed in the producer service sector has increased significantly over the analyzed time period.

However, even though the producer service sector has grown and today consists of a large number of different industries, the sector is still often seen as a whole. To find out what type of services that have increased it is necessary to look at the data on a finer level.

When dividing producer services into subsectors with different types of industries, classified by a two-digit industry codes (SNI), the data shows that although almost all subsectors have increased, some industries have grown more than other.



**Figure 4.5 Growth of producer services divided into subsectors**  
(Source: Made by author based on data from Statistics Sweden)

Figure 4.5 above shows the growth of the employment within the producer service sector divided into seven subsectors. Evidently, some subsectors have increased in employment significantly, while others have only slightly increased or even experienced a negative growth. Table 4.1 below shows the employment in the same subsectors but expressed as percentage growth. The employment in industries belonging to the subsector that includes sector hardware consultancy, publishing of software and data processing increased by 65 percent, while employment in the subsector for R&D increased by merely one percent.

Both the subsectors for insurance and pension funding, and financial leasing and banking have experienced negative growth regarding level of employment.

**Table 4.1 Percentage increase in number of employees divided into subsectors**

SNI	Subgroups the firms are operating within	Increase in number of employees within the firms from 1993 to 2007
72	Hardware consultancy, publishing of software, data processing	65%
67	Administration of financial markets, broking	65%
74	Legal advisory, accounting, advertisement, business consulting	51%
71	Renting transport, machinery and equipment	12%
73	Research and development	1%
65	Financial leasing, banking	-2%
66	Insurance, pension funding	-8%

Table 4.2 shows the growth of the actual number of firms operating within the different subgroups. As can be seen, all subsectors have experienced a growth in the number of firms, which does not correlate to the growth in employment. In some of the subsectors, this implies a shift towards more firms with fewer employees in each firm.

**Table 4.2 Percentage increase in number of firms divided into subsectors**

SNI	Subgroups the firms are operating within	Increase in number of firms from 1993 to 2007
72	Hardware consultancy, publishing of software, data processing	330%
73	Research and development	219%
67	Administration of financial markets, broking	159%
74	Legal advisory, accounting, advertisement, business consulting	151%
66	Insurance, pension funding	121%
65	Financial leasing, banking	92%
71	Renting transport, machinery and equipment	31%

The statistics presented on subsector level implies that there are large fluctuations in the growth of the industries within producer services, which suggests that a growth in producer services is undoubtedly true, but most likely generalized. The sector's growth the past decades seems to be due to high growth in some specific industries that outweigh the very low or negative growth in some.

When looking at the data on the most detailed level, with five-digit classification on SNI, it is possible to see what specific types of industries that have had the largest growth in both the actual number of firms as well as the number of employees. Table 4.3 below presents the eight industries with the largest growth in terms of employment while table 4.4 presents the eight industries with the largest growth in terms of number of firms.

**Table 4.3 The largest growth in specific industries from 1993 to 2007 (employees)**

SNI	Name of industry	Increase in number of employees within the firms from 1993 to 2007
66011	Unit link insurance	4295%
65231	Investment trust activities	1115%
74402	Advertisement placement activities	606%
73203	Interdisciplinary reserach and development, predominantly on social sciences and humanities	591%
67202	Other activities auxiliary to insurance and pension funding	503%
67130	Activities auxiliary to financial intermediation	357%
72210	Publishing of software	351%
73201	Reserach and development on social sciences	338%

**Table 4.4 The largest growth in specific industries from 1993 to 2007 (firms)**

SNI	Name of industry	Increase in number of firms from 1993 to 2007
72400	Data base activities	1825%
73201	Reserach and development on social sciences	1069%
74501	Labor recruitment acitivities	895%
72210	Publishing of software	818%
74150	Management activities on holding companies	535%
73104	Research and development on medical and pharmaceutical sciences	500%
73101	Research and development on natural sciences	452%
73105	Interdisciplinary research and development on natural sciences, predominantly onnatural sciences and engineering	443%

Johansson *et al.* (2011) showed that the most rapid growth had been among producer services that were very knowledge intensive. According to them the expansion of producer services in the Swedish economy after 1990 is, to a significant extent, due to the increase in very knowledge intensive producer services. In the classification made by Johansson *et al.*, there are 35 different categories within very knowledge intensive producer services. Two of these are not classified as producer services in this thesis, leaving us with 33 different services to take a closer look at.<sup>3</sup> In table 4.3, five out of the eight industries are classified as very knowledge intensive services. The three others, 66011, 74402 and 67130, are classified as medium knowledge intensive. In fact, even within very knowledge intensive services there are large variations in growth, see appendix 2 for the full list.

<sup>3</sup> The industry codes that are not classified as producer services in this thesis are 61102 *Other sea and coastal water transport* and 70110 *Development and selling of real estate*, since they do not belong to producer services according to the classification made by Growth Analysis.

## 5 Empirical Study of Demand for Producer Services

### 5.1 Method, variables and data

To analyze which sector that drives the demand for producer services, a study on the municipalities in Sweden is conducted to test the relationships between producer services and a number of external factors that, according to theory, affect the presence of producer services.

According to location proximity theory, the cost of obtaining a service increases with distance. Andersson (2006) exemplifies this with time travel to meetings or frequency of contacts. The reasoning implies that firms demanding producer services have much to benefit from being located close to producers of those services. Advanced services are much more about tacit knowledge and not so easily transferred to others compared to, for example, export of standardized products. This also implies that firms within producer services have incentives to set up close to their customers or important production factors, such as labor. Due to this, the result from the analysis can also indicate where demand for producer services comes from.

The data used in the regressions is retrieved from Statistics Sweden for the years 1996 to 2006. The SNI used for producer services are selected according to a classification done by Growth Analysis (Tillväxtanalys, 2010).<sup>4</sup>

Another more substantial reclassification was made in 2007, which makes it more difficult to follow the different sectors for longer time-series since, but the new classification also reflects changes in the service sector since it includes more levels of subsectors within the service sector.

#### 5.1.1 Dependent variable

As dependent variable, the size of the producer service sector is used (*PS*). The variable is calculated by taking the number of employed within producer services as a fraction of all workers in the municipality.

#### 5.1.2 Explanatory variables

The size of the manufacturing industry is represented by the number of employees within firms belonging to the manufacturing industry taken as a fraction of all workers (*MANU*). The manufacturing industry is defined by Statistics Sweden's category "D" for SNI 2002 (or category "C" for SNI 2007), which includes all types of manufacturing industries.

To test the relationship with the service sector, the number of employees within firms belonging to the service industry, except for those belonging to producer services, will be used and calculated as a fraction of the workforce (*SERV*). Growth Analysis (Tillväxtanalys, 2010) divides the service sector into four different categories; intermediary services, producer services, private personal services, and capital services. They have also classified them with SNI coding. Crossing out the producer services gives us intermediary services, private personal services and capital services, which thus constitute as the remainder of the service sector.

---

<sup>4</sup> These industry codes have, if necessary, been converted into 1992's classification. See appendix 1.

Three control variables are added to the model. These variables are, according to theory, also external factors affecting the presence of producer services, and are included to test if those relationships also apply to this analysis. The variables included in the model are the level of education, the level of income and location.

Coffey (2000) concluded that skilled labor is the most important factor of production for producer services. A test on this relationship can either suggest that firms within producer services want to be close to their factor of production, or that highly educated worker see these firms as attractive employers, and consequently want to live close to them. To create a variable on education level for the municipality, all workers with a university degree of three years or more are taken as a fraction of the total workforce.

To calculate the municipality's income level, the wage sum is divided by all workers in the municipality. This gives an income per (working) capita, which is a relevant measurement for the income level in the municipality.

Location is another factor discussed in theory. According to Coffey (2000), producer services tend to concentrate in larger metropolitan areas. To test this the model includes a dummy variable for all municipalities that belongs to Sweden's three metropolitan areas; Stockholm, Göteborg and Malmö. Municipalities marked with *1* are affiliated with a metropolitan area, and municipalities marked with *0* are not. See appendix 3 for the full list.

**Table 5.1 Definition of the explanatory variables**

<b>Variables</b>	<b>Code</b>	<b>Definition</b>
<b>Manufacturing industry</b>	<i>MANU</i>	The size of the manufacturing industry, calculated as the number of employees within the manufacturing industry divided by all workers in the municipality.
<b>Service sector</b>	<i>SERV</i>	The size of the service sector, calculated as the number of employees within the services sector, except from producer services, divided by all workers in the municipality.
<b>Education</b>	<i>EDU</i>	The level of highly educated workers, calculated as employees with a university degree of three years or more divided by all workers in the municipality.
<b>Income</b>	<i>INC</i>	Income per (working) capita, calculated as the wage sum divided by all the workers in the municipality.
<b>Location</b>	<i>LOC</i>	Dummy variable, if the municipality belongs to a large metropolitan area; Stockholm, Göteborg or Malmö.

### **5.1.3 Descriptive statistics**

The descriptive data is presented in the table below (table 5.2) and shows an overview of the minimum and maximum values, the mean values, and the standard deviations of the variables for the whole time period for the analysis and for the first and last year of the sample: 1996 and 2006.

**Table 5.2 Descriptive statistics**

All years	N	Minimum	Maximum	Mean	Median	Std. Deviation
PS	3168	0.01	0.45	0.0613	0.0502	0.04105
MANU	3168	0.01	0.68	0.2316	0.2169	0.11913
SERV	3168	0.22	0.71	0.4700	0.4728	0.07553
EDU	3168	0.05	0.53	0.1278	0.1148	0.05373
INC	3168	96226	746207	242744	217332	83980.587

1996	N	Minimum	Maximum	Mean	Median	Std. Deviation
PS	288	0.02	0.23	0.0504	0.0408	0.03196
MANU	288	0.02	0.68	0.2379	0.2250	0.11892
SERV	288	0.22	0.63	0.4547	0.4565	0.07440
EDU	288	0.09	0.53	0.1922	0.1738	0.06963
INC	288	96266	642169	203913	180658	68551.456

2006	N	Minimum	Maximum	Mean	Median	Std. Deviation
PS	288	0.02	0.31	0.0752	0.0645	0.04389
MANU	288	0.02	0.59	0.2157	0.1976	0.11408
SERV	288	0.27	0.68	0.4702	0.4766	0.07393
EDU	288	0.08	0.40	0.1473	0.1322	0.05038
INC	288	138698	746207	279113	246555	90722.250

*N* indicates the number of municipalities used in the analysis. There are today a total of 290 municipalities in Sweden, but two of them have been merged since they were not autonomous for the whole period of the analysis<sup>5</sup>.

When looking at the descriptive statistics and the changes between the first year and the last year of the analysis, one can for example see an increase in income level, which is expected due to inflation and higher standards of living. One can also see an increase in the maximum, mean and median for producer services, which consists with the analysis in chapter 4. The remaining of the service sector has also increased so some extent, while the manufacturing industry has decreased regarding its maximum, mean and median, which indicates that fewer workers are employed within the manufacturing industry in 2006.

#### **5.1.4 Correlations**

Table 5.3 shows the correlations between the tested variables. The table shows the directions and strengths of the linear relationships between all the variables, which indicates

<sup>5</sup> Nykvarn was founded in 1999 and Knivsta was founded in 2003. Both are included in the municipalities they originally belonged to.

that the direct effect of a variable can differ from the results presented in the regression output in table 5.4. The correlation is calculated on the aggregated dataset; calculating the correlation for each separate year gives similar results.

**Table 5.3 Correlation matrix for all years**

	lnPS	lnMANU	lnSERV	lnEDU	lnINC
lnPS	1.000				
lnMANU	-0.532***	1.000			
lnSERV	0.353***	-0.721***	1.000		
lnEDU	0.548***	-0.505***	0.394***	1.000	
lnINC	0.182***	-0.368***	0.260***	0.320***	1.000

\*\*\* Significant at the 0.01 level.

\*\* Significant at the 0.05 level.

\* Significant at the 0.1 level.

Strong correlations were found between all the variables. The manufacturing industry indicates negative correlation with all variables, whereas all other variables correlate positively with each other.

## 5.2 Data and model description

To avoid too high correlations between the manufacturing industry and the services industry, separate regressions are run for the two coefficients to isolate them from each other. The regression models were constructed as follows.

$$\ln PS_{it} = \beta_0 + \beta_1 \ln MANU_{it} + \beta_2 \ln INC_{it} + \beta_3 \ln EDU_{it} + \beta_3 LOC_i + \lambda_1 D1997_{it} \dots \lambda_{10} D2006_{it} + \varepsilon_{it} \quad (5.1)$$

$$\ln PS_{it} = \beta_0 + \beta_1 \ln SERV_{it} + \beta_2 \ln INC_{it} + \beta_3 \ln EDU_{it} + \beta_3 LOC_i + \lambda_1 D1997_{it} \dots \lambda_{10} D2006_{it} + \varepsilon_{it} \quad (5.2)$$

The variables are observed annually for each municipality  $i$ . All variables in the model except from the dummy are logged, since the log transformation generates linearity in parameters (Aczel & Saunderpandian, 2009). Log transformation also stabilizes the variance, which can be confirmed since the data was more normally distributed when using the natural logarithm. In addition, it also has a practical advantage since the logged variables are easier to interpret; the coefficients represent the elasticity of the dependent variable with respect to the explanatory variables. In other words, it is possible to interpret the coefficients as estimated percentage change in the dependent variable for a percentage change in the explanatory variables.

To take into account the variation between years, a model with year fixed effects is used, also known as least-square dummy variable (LSDV) model (Gujarati, 2003). The year dummies help to solve the stationarity problems by removing systematic trends in the variables. The year dummies also help to capture both observed and unobserved year effects. 1996 is treated as base year and 10 dummies are added to the model.

The model is tested for multicollinearity by looking at the variance inflation factors. It is also tested for heteroscedasticity by looking at the histogram and P-P plot for standardized residuals.

### 5.3 Regression analysis

The regression output is presented in table 5.4 and shows the effects of the explanatory variables on the dependent variables from the two models. Due to the fact that the model is including mostly relative variables, there is a lower probability of getting high values from the regression.

**Table 5.4 Regression output**

	Regression output 1		Regression output 2	
	Beta	Std. Error	Beta	Std. Error
(Constant)	2.865***	0.387	2.714***	0.406
Manufacturing industry	-0.254***	0.015	<i>NA</i>	<i>NA</i>
Service sector	<i>NA</i>	<i>NA</i>	0.169***	0.050
Level of education	0.905***	0.030	1.087***	0.030
Level of income	-0.401***	0.032	-0.320***	0.033
Location	0.177***	0.025	0.195***	0.026
Year dummy 1997	0.681***	0.038	0.787***	0.040
Year dummy 1998	0.716***	0.038	0.817***	0.040
Year dummy 1999	0.937***	0.038	1.041***	0.040
Year dummy 2000	0.685***	0.037	0.762***	0.038
Year dummy 2001	0.698***	0.036	0.771***	0.038
Year dummy 2002	0.640***	0.036	0.708***	0.038
Year dummy 2003	0.606***	0.036	0.665***	0.038
Year dummy 2004	0.567***	0.035	0.623***	0.037
Year dummy 2005	0.512***	0.035	0.559***	0.037
Year dummy 2006	0.741***	0.035	0.786***	0.037
N	3168		3168	
R <sup>2</sup>	0.520		0.479	
F-value	243.595		206.703	
VIF max value	2.483		2.523	

\*\*\* Significant at the 0.01 level.

\*\* Significant at the 0.05 level.

\* Significant at the 0.1 level.

The year dummies give the differential intercept coefficients, which tell by how much the intercepts differ from the base year. As one can see, the peak is in 1999, indicating a high level of producer services that year.

The regressions' F-values, t-values and the values of  $R^2$  are also presented. The regressions generated  $R^2$  values of 0.520 and 0.479, which indicates acceptable fit for the two regression models. The F-values of 206.703 and 243.593 conclude that the regressions are statistically significant.

The result from the regression analysis showed that a strong relationship was found between producer services and the manufacturing industry with a coefficient significant at a 1 percent level. The relationship was however negative and indicated that a 1 percent increase in the size of the manufacturing industry would decrease the size of the producer service sector by over 0.25 percent, keeping all other variables constant. On the other hand, a decrease in the number of employees within the manufacturing industry could imply an increase in the number of employees within the producer service sector. Both variables are measured in relative terms, and could imply a significant impact when measured in actual numbers. Applying the result to actual numbers would imply that one of the sectors could affect the other regarding hundreds of jobs. No positive relationship between producer services and the manufacturing industry can thus be concluded in this thesis, so the first hypothesis therefore has to be rejected.

The relationship between producer services and the rest of the service sector showed a statistically significant positive relationship, in line with the results of Juleff-Tranter (1996). The result indicated that a 1 percent increase in the size of the service sector would increase the size of producer services by almost 0.17 percent, keeping all other variables constant. This implies that when the number of people working within the service sector increases, there is also an increase in the number of people working within producer services. Therefore the second hypothesis cannot be rejected.

The three control variables were all significant at the 1 percent level. The result implies that a 1 percent increase in the level of highly educated labor in the municipality would increase the level of employed within the producer service sector also by approximately 1 percent.

When looking at the level of income the result, somewhat surprisingly, shows a negative relationship with producer services. However, when looking at the correlation between producer services and level of income, presented in table 5.3, one can see that it is no longer negative. This indicates that the effect is only negative in correlation with the other coefficients. It is only between the size of the manufacturing industry and the level of income that the correlation is negative.

The dummy variable for closeness to a metropolitan area showed a positive relationship, indicating that producer services tend to concentrate in larger metropolitan areas, but this needs to be studied on further in order to fully confirm the theory.

## 6 Discussion

When looking at all the types of businesses within producer services, the data shows that the highest growth in employment between 1993 and 2007 has been within insurance firms, investment companies, and marketing services. The demand for all these services does not have a clear origin; it is not possible to conclude whether it comes from the manufacturing industry or the service sector. This thesis can however conclude, as stated before, that a growth in producer services is undoubtedly true, but most likely generalized. Some industries have grown tremendously, while some have decreased.

To not find a positive relationship between the manufacturing industry and producer services is in line with earlier studies, for example Juleff-Tranter (1996), who's empirical results showed that demand does not come from the manufacturing industry, but from the service sector instead. The negative relationship can however also follow the theory of outsourcing, which implies that the firms outsource parts of their previously in-house divisions, which would result in a decrease of the manufacturing industry while the producer service sector increases. One cannot exclude the possibility of reverse causality, which could indicate that an increase in producer services might have a negative effect on the manufacturing industry. To go into more detail and analyze in what type of industries job opportunities decreases as producer services increases is a suggestion for further studies. In order to conclude whether there is an ongoing outsourcing process within the manufacturing industry, a study on spin-offs from manufacturing firms could be conducted, to see whether they belong to the producer service sector or not.

The positive, but not particularly strong, relationship between the service sector and producer services shows that more studies are needed in order to confirm that demand for producer services comes from the service sector. The result, however, indicates a positive relationship, which might suggest either that firms within the service sector have a demand for producer services or that employment shifts towards services in general.

The results also showed a strong positive relationship within level of education. One however has to deal with the problem of causality and to face the dilemma with 'the chicken or the egg, which came first'. Either highly educated people move to the cities where there are many job opportunities within knowledge intensive businesses, such as firms within producer services, or the firms within those business set up where there already are skilled labor, which is their most important factor of production.

Whether the results are practically significant or not can be debated. The results might have a notable effect in some regions, but they might be negligible in others. Consequently, it is more important to interpret the results as indications of relationships that need to be further studied.

This thesis's empirical analysis has several flaws: it is possible that proximity to customers is not equally important for all firms within the producer service sector, or that the importance of proximity depends on whether the firms sell to customers within the services sector or the manufacturing industry. The municipalities might also be too small areas for the proximity theory; to test this a study on larger regions (such as labor marker regions) can be conducted to see if the result differs. Furthermore, it is difficult to interpret the results as to whether it is demand from a specific sector that increases the producer service sector or whether it is due to changes in business practice and the movement of the division of labor. To conclude from which sector demand for producer services comes from, a more in-depth study is suggested.

## 7 Conclusion

The purpose of this thesis was to analyze the growth of the producer service sector in Sweden, and also to analyze which sector that drives the demand for producer services. This has been done through a presentation of previous research, a study on the growth of producer services in Sweden by looking at what industries that have accounted for the largest growth, and by running a regression analysis to test the relationship between producer services and the manufacturing industry and the service sector.

When looking at the growth of producer services in Sweden, a large increase in both employment and firms within producer services was found, but there were also large fluctuations between the types of industries belonging to the producer service sector. This concludes that a more in-depth study needs to be conducted in order to fully understand the growth of and demand for producer services in Sweden. Due to the extended service sector with more different types of services, the need for deeper analysis increases. To start studying different sectors within producer services, instead of reviewing at it as a whole – as economist used to do with the service sector – is a suggestion for further studies. This will be facilitated by the new SNI-classification, which enables studies on more detailed levels of the service sector.

Concluding the results from the regression, there are a number of factors that indicates a relationship with producer services. It is however still difficult to define which sector that drives the demand for producer services, but this thesis's empirical analysis suggest a significant effect of a negative relationship with the manufacturing industry, which concludes that either outsourcing is still a strong reason behind the continuous growth within producer services, or that demand for producer services come from other sectors. The analysis also found a positive relationship with the service sector, but the result cannot clearly be interpreted as a source of demand for producer services.

So what can be said about the demand for producer services? Classic economic theory states that distance creates more transactions costs, which indicates that firms within producer services want to be close to their customers. A standardized product can easily be shipped, but an advanced service is much more about tacit knowledge and not so easily transferred to others. Since this thesis only could find a negative relationship between the manufacturing industry and producer services, and the indicated relationship between the services sector and producer service was positive but not strong, and it is difficult to conclude where demand for producer services comes from. It most likely comes from changes in business practice and the general division of labor, as stated by several authors, but from what sector, what type of businesses, if it is overall or from specific industries, or if it can be more explained by the size of the firms is left to further studies.

In addition to the suggestions for further studies that have been previously mentioned, it would be interesting to analyze the future growth of producer services. Will it continue to growth and be even more divided into different sectors? How does the continuous growth affect the manufacturing industry in the long run? What will happen to the division of labor? There are a number of question left to be answered, which will be important contributions to further discussions and research.

## List of References

- Aczel, A.D & Saunderepandian, J. (2009). *Complete Business Statistics*. New York: McGraw-Hill.
- Andersson, M. (2006). Co-location of Manufacturing and Producer Services: A Simultaneous Equations Approach. In C. Karlsson, B. Johansson, & R. Stough (Eds.), *Entrepreneurship and Dynamics in the Knowledge Economy* (p. 94-125). New York: Routledge
- Andersson, M. & Hellerstedt, K. (2009). Location Attributes and Start-ups in Knowledge-Intensive Business Services. *Industry and Innovation*, 16(1), 103-121.
- Beyers, W. B. & Lindahl, D. P. (1996). Explaining the Demand for Producer Services: Is Cost-driven Externalization the Major Factor? *Papers in Regional Science*, 75(3), 351-374.
- Birley, S. & Westhead, P. (1994). New Producer Services Businesses: Are They Any Different From New Manufacturing Ventures? *The Service Industries Journal*, 14(4), 455-481.
- Bryson, J. R. (1997). Business Service Firms, Service Space, and the Management of Change. *Entrepreneurship and Regional Development*, 9(2), 93-111.
- Coffey, W. J. & Bailly, A. S. (1991). Producer Services and Flexible Production: An Exploratory Analysis. *Growth & Change*, 22(4), 96-117.
- Coffey, W. J. (2000). The Geographies of Producer Services. *Urban Geography*, 21(2), 170-183.
- Cutler, W.G. (1991). Acquiring Technology from Outside. *Research Technology Management*, 34(3), 11-18.
- den Hertog, P. (2000). Knowledge-Intensive Business Services as Co-producers of Innovation. *International Journal of Innovation Management*, 4(4), 491-528.
- Francois, J. F. (1990). Producer Services, Scale, and the Division of Labor. *Oxford Economic Papers*, 42(4), 715-729.
- Francois, J. F. and Woerz, J. (2008). Producer Services, Manufacturing Linkages, and Trade. *Journal of Industry, Competition and Trade*, 8(3), 199-229.
- Greenfield, H. I. (1966). *Manpower and the Growth of Producer Services*. New York: Columbia University Press.
- Goe, W. R. (1991). The Growth of Producer Services Industries: Sorting Through the Externalization Debate. *Growth & Change*, 22(4), 118-141.
- Gujarati, D.N. (2003). *Basic Econometrics*. New York: McGraw-Hill.
- Hansen, N. (1990). Do Producer Services Induce Regional Economic Development? *Journal of Regional Science*, 30(4), 465-476.
- Johansson, B., Alpfält, T. Boström, A., Johansson, S., Löf, H. & Larjani, P. N. (2011). *Producenttjänster, ekonomisk omväxling och produktivitet*. Tillväxtanalys. PM 2011:52

- Jordahl, H. (Ed.). (2012). *Den svenska tjänstesektorn*. Lund: Studentlittertur AB.
- Juleff-Tranter, L.E. (1996). Advance Producer Services: Just a Service to Manufacturing? *The Service Industries Journal*, 16(3), 389-400.
- Kutscher, R. E. (1988). Growth of Service Employment in the United States. In B. R. Guile & J. B. Quinn (Eds.), *Policies for Growth, Trade and Employment*. Washington: National Academy Press
- Makun, P. & MacPherson, A. D. (1997). Externally-assisted Product Innovation in the Manufacturing Sector: The Role of Location, In-house R&D and Outside Technical Support. *Regional Studies*, 31(7), 659-668.
- Markusen, J. R. (1989). Trade in Producer Services and in Other Specialized Inputs. *The American Economic Review*, 79(1), 85-95.
- Miles, I. (2000). Service Innovation: Coming of Age in the Knowledge-Based Economy. *International Journal of Innovation Management*, 4(4), 371-389.
- Moulaert, F. & Daniels P. W. (Eds.). (1991). *The Changing Geography of Advanced Producer Services*. London: Belhaven Press.
- Statistics Sweden (2015). Retrived on June 2, 2015, from [http://www.scb.se/Grupp/Hitta\\_statistik/Regional%20statistik/Kartor/\\_Dokument/Storstadsomr\\_karta.pdf](http://www.scb.se/Grupp/Hitta_statistik/Regional%20statistik/Kartor/_Dokument/Storstadsomr_karta.pdf)
- Schön, L. (2010). *Sweden's Road to Modernity: An Economic History*. Stockholm: SNS Förlag.
- Smith, A. (1960). *The Wealth of Nations*. London: J.M. Dent & Sons Ltd. (Original work published 1776)
- Svensson, R. (2010). Outsourcing av producenttjänster. *Ekonomisk debatt*, 6, 43-56.
- Takac, P.F. (1993). Outsourcing Technology. *Management Decision*, 31(1), 26-37.
- Tillväxtanalys (2010). *Tjänsternas betydelse för tillväxt och omvandling i svensk ekonomi*. Rapport 2010:13.
- Tschetter, J. (1987). Producer Services Industries: Why Are They Growing So Rapidly? *Monthly Labor Review*, 110(12), 31-40.

## Appendix 1

The following SNI codes are classified as producer services (Tillväxtanalys, 2010).

SNI 2002	65110 – 67202
	71100 – 74879

The above SNI codes converted into SNI 92.

SNI 92	65110 – 67202
	71100 – 74849

## Appendix 2

Full list of growth in employment within very knowledge intensive business services.

SNI of the industries	Growth in employment from 1993 to 2007
65231	1115%
73203	591%
67202	503%
72210	351%
73201	338%
72220	241%
73105	241%
74872	215%
74850	173%
74140	134%
72400	132%
66012	111%
74150	76%
65232	72%
67120	69%
74202	52%
74111	42%
74130	33%
74501	23%
73102	21%
65220	13%
74201	9%
74120	8%
73104	0%
73103	-1%
65120	-8%
73101	-8%
67110	-11%
65210	-42%
65110	-48%
74112	-53%
66020	-74%
73202	-88%

## Appendix 3

The list of municipalities belonging to the metropolitan areas is retrieved from Statistics Sweden (2015).

Stockholm	Botkyrka
	Danderyd
	Ekerö
	Haninge
	Huddinge
	Järfälla
	Lidingö
	Nacka
	Norrtälje
	Nykvarn
	Nynäshamn
	Salem
	Sigtuna
	Sollentuna
	Solna
	Stockholm
	Sundbyberg
	Södertälje
	Tyresö
	Täby
	Upplands Väsby
	Upplands-Bro
	Vallentuna
	Vaxholm
	Värmdö
	Österåker

Göteborg	Ale
	Alingsås
	Göteborg
	Härryda
	Kungsbacka
	Kungälv
	Lerum
	Lilla Edet
	Mölnådal
	Partille
	Stenungsund
	Tjörn
	Öckerö
Malmö	Burlöv
	Eslöv
	Höör
	Kävlinge
	Lomma
	Lund
	Malmö
	Skurup
	Staffanstorps
	Svedala
	Trelleborg
	Vellinge