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# **PRODUCER PRICE INDEX FOR AIR TRANSPORT IN SWEDEN Appendix: Sweden**

Session on PPI for Services

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## Introduction

Service prices for domestic flights have been collected since December 1995. Until 2004, airline companies submitted price data (listed prices) for tickets for business and private travellers on a monthly basis.

During the period 1997 to 2002, the index was published annually in P 10 SM as a monthly index. Between 2002 and 2003, the price index for business and private travellers was published every quarter on Statistics Sweden's website [http://www.scb.se/templates/Product\\_12619.asp](http://www.scb.se/templates/Product_12619.asp) which was discontinued in 2004 for confidentiality reasons after the review of the index when the methodology was changed. (Old figures are still available on above website.)

Development of a service price index for international passenger transport by air began in autumn 1999. The price development for both tickets in business class and economy class was observed. The market dominates by one large enterprise and, therefore, for confidentiality reasons, the service price index for international flights of passenger transport never had been published.

In 2000, Statistics Sweden initiated a project that aimed to develop producer price indices for services designed for use in the Swedish System of National Accounts for calculating the production values of services at fixed prices at the product group level, regardless of whether the services are used by households, government or enterprises and in concordance with the European Union's recommendations.

The latest requirement is to provide PPI for the export of services. A service is defined as an exported service when the person paying for the service has a foreign address, regardless of where the service is delivered.

The scope of this paper is to describe the development process of PPI for scheduled air transport of goods but also includes information on the background to the methodology review that was carried out in 2004 for scheduled air transport of passengers.

## Classification

Table 1: In CPA Ver.1.1, Division 62 Air transport services is divided in the following Groups, Subgroups, Classes and Subclasses:

CPA	Description
62	Air transport services
<b>62.1</b>	<b>Scheduled air transportation services</b>
<b>62.10</b>	<b>Scheduled air transportation services</b>
<b>62.10.1</b>	<b>Scheduled passenger transportation services by air</b>
<b>62.10.10</b>	<b>Scheduled passenger transportation services by air</b>
<b>62.10.2</b>	<b>Scheduled freight transportation services by air</b>
<b>62.10.21</b>	<b>Scheduled transportation services of mail by air</b>
62.10.22	Scheduled transportation services of containerized freight by air
62.10.23	Scheduled transportation services of other freight by air
62.2	Non-scheduled air transportation services
62.20	Non-scheduled air transportation services
62.20.1	Non-scheduled passenger transportation services by air
62.20.10	Non-scheduled passenger transportation services by air
62.20.2	Non-scheduled freight transportation services by air
62.20.20	Non-scheduled freight transportation services by air
62.20.3	Rental services of aircraft with crew
62.20.30	Rental services of aircraft with crew
62.3	Space transportation services
62.30	Space transportation services
62.30.1	Space transportation services
62.30.10	Space transportation services

Scheduled air transport, NACE Rev 1.1 62.1, is the main part of NACE Rev 1.1 62 - Air transport.

Table 2: NACE Rev 1.1 62 - Air transport

NACE	Description
62.1	Scheduled air transport
62.2	Non-scheduled air transport
62.3	Space transport

NACE Rev 1.1 62.1 covers scheduled air transport of both passengers and goods and transport of passengers represents the major part of Air transport industry in Sweden as whole.

According to the Swedish National Accounts, there are 3 different product groups (PG) within NACE Rev 1.1 62:

Table 3: Production on product groups (current prices) within NACE Rev 1.1 62, according to Swedish National Accounts<sup>1</sup>

PG	Description	Weighting %
62A	Passengers	93,3
62B	Transport of goods	4,0
62C	Rental of aircraft	2,7

To meet the needs of the National Accounts unit , the development of PPI for services concentrates primarily on those product groups that have a relatively large weighting within the Air transport industry.

### Industry output – NACE Rev 1.1 62.10

According to the 2002 business register, which was updated in August 2002, there are 61 enterprises in Sweden that are classified under 62.1. These enterprises employed 11 249 persons. Their total net turnover was SEK 22 billion. The three largest enterprises account for slightly over 93 % of this turnover. The industry is dominated by a few large enterprises.

### Net turnover, number of enterprises and number of employees

Table 4 below shows how the variables "number of enterprises", "number of employees" and "net turnover" divided by size.

Table 4: Structure of the industry by size class for number of employees.

Number of employees	Number of enterprises	%	Net turnover, SEK 000s	%
0	34	55.7	4 170	0.0
1-9	14	23.0	69 090	0.3
10-19	3	4.9	36 809	0.2
20-49	3	4.9	733 927	3.3
50-449	4	6.6	672 472	3.0
450+	3	4.9	20 899 572	93.2
<i>Total:</i>	<i>61</i>	<i>100</i>	<i>22 416 040</i>	<i>100</i>

Source: Business Statistics 2002

The above table shows that the few large enterprises in the industry account for slightly over 93 % of turnover. A cut-off limit of 10 employees would cover almost 100 % of turnover but more than 75 % enterprises have less than 10 employees.

<sup>1</sup> Data refers to 2001

## **Scheduled air transport of passengers**

### **Review of methodology**

At the end of 2003, work began to review the service price index for air transport of passengers. The methodology review concerns the transition from listed prices to transaction prices. The review covered both domestic and international air transport of passengers and was carried out in cooperation with the enterprises involved.

From the fourth quarter 2003, the enterprises concerned should choose a few routes and ticket types that can be considered representative for the enterprise. The enterprises are asked every quarter to submit an average invoiced price for both business and private travellers on the selected domestic and international routes and the selected ticket types.

## **Scheduled air transport of goods**

During the spring of 2003, a project was initiated to define a price measurement method for the scheduled air transport of goods, NACE Rev.1.1 62.10, and to test this.

The prices for transportation of post should also be collected as this is a significant part within the air transport of goods.

### **Price formation**

Visits have been made to the largest companies in the industry to increase industry knowledge and to help define the services that can be followed over time. The setting of prices for air transport of goods depends on a number of different and continuously changing factors, such as distance, weight, domestic, international, return freight, type of freight, and it can be problematic to differentiate the services from each other. Every transportation can be considered a unique service, individually tailor-made for every customer. This causes difficulties in finding constant and repetitive services that are able to be followed over time. After consulting enterprises in the industry, we have chosen a number of factors that they feel have the greatest significance for the price. It is impossible to cover all the factors that influence the setting of prices but those that are considered possible to follow are customer, type of freight, weight and route.

The largest enterprises in the industry dominate both the domestic and international air transport of goods market while the smaller enterprises in the industry work with the air transport of passengers and allow their freight to be transported by the larger enterprises.

### **Statistical terminology**

The object that the survey identified for measurement, the target object, is air transport services for goods in Sweden and abroad, carried out by Swedish enterprises for both Swedish and foreign enterprises.

The target variable is the price for the service that the customer actually pays.

The target population consists of all enterprises in Sweden that are employed in the air transport of goods.

Sweden's Statistical Databases are used as a sample frame.

### **The sample process**

NACE Rev.1.1 62.10 consists of scheduled air transport of passengers and goods. The sampling frame does not contain a more detailed information about which enterprises are active with the

air transport of passengers and/or goods. Enterprises in the industry were contacted by telephone and around 10 enterprises that work with the air transport of goods took part in a test survey.

**Problems encountered**

The lack of a detailed breakdown on which enterprises carry out goods transport in NACE Rev.1.1 62.10 has been a serious problem for the development of a service price index for the air transport of goods.

**Collection process**

The enterprises receive introductory information and questionnaires by mail. They can then choose different response alternatives (mail, fax or e-mail).

**Price measurement methods**

Model pricing was chosen as the method. This means that the enterprises choose a representative contract during the first quarter and are then asked to set a price for the same service in the following quarters. It is important for this method to regularly update the representative services. When one of the enterprise's representative services are no longer representative, it should be replaced with a more representative service.

The enterprises were asked to select themselves at least four representative and recurring services.

The index figure refers to one quarter and, if the service has been carried out several times during the period, the price data should represent an average for the quarter.

**Assumptions, weights and index calculation**

A geometric index, Jevons, is used for the calculations. This is because of the lack of the weighting information that would be necessary for a more advanced index. Jevons is the only index that can deal with disparate prices. For 62.10.2, scheduled freight air transportation services, one index is calculated for each enterprise. A total index is then calculated for the whole industry by weighting together the indexes from different enterprises.

**Index calculation**

The index is calculated in two stages:

1. Firstly, *the index for the respective enterprise v* is calculated according to Jevons:

$${}^j I_{0t} = \left( \prod_{i=1}^n \frac{{}^j P_{it}}{{}^j P_{i0}} \right)^{1/n} \tag{4-1}$$

where  ${}^j P_t$  = price for the service i, enterprise j, at moment in time t and  ${}^j P_0$  = price for the service i, enterprise j, at base moment in time 0.

2. Secondly, the index for the industry is calculated by weighting together the indexes for the respective enterprises according to the following:

$$I_{0t} = \prod_{j=1}^m \left( {}^j I_{0t} \right)^{j_w} \quad (4-3)$$

where  ${}^j w$  = proportion for the enterprise, where the large enterprises have their own weight and the small enterprises equally divide the rest.

base = 4th quarter 2003

weight period = 2002

## **Conclusions**

The results of the test survey were positive and many useful comments were received. It is now considered possible, after a few smaller changes in the questionnaire, to go ahead with the production of an index.