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PRODUCER PRICE INDEX for SCHEDULED PASSENGER AIR TRANSPORT SERVICES - a Summary

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Table of contents:

1. Introduction

This paper provides a summary of three papers written by Statistics Sweden, Statistics Austria and the UK Office for National Statistics on the development of a Producers Price Index (PPI) for Scheduled Air Transportation. The paper will provide an insight into the key aspects that a country should consider when developing such a price index by looking at the experiences of the three countries concerned as well as some reference to that of Statistics New Zealand. The paper then concludes with the main problems that countries had to deal with when developing such an index.

2. Key aspects for a country to consider when developing a Price Index:

I. Classification

Below is a table of the classifications used by the different countries (including New Zealand):

Sweden	Austria	UK	New Zealand
SE-SIC 92 – 62.10 Scheduled air transport (Swedish Standard Industrial Classification 1992)	ÖNACE 2003 – 62.1 Air transport (Austrian Statistical Classification of Economic Activities 2003)	UK SIC – 62.10/1 Scheduled passenger air transport (UK Standard Industrial Classification of Economic Activities 2003)	ANZSIC96 – I64 Air and space transport (Australian and New Zealand Standard Industrial Classification)
CPC Ver.1.1, Division 66 Air transport services: 661 Air transport services of passengers 6611 Scheduled air transport services of passengers 66110 Scheduled air transport services of passengers 662 Air transport services of freight 6621 Air transport services of letters and parcels 66210 Air transport services of letters and parcels 6629 Air transport services of other freight 66290 Air transport services of other	ÖCPA (Austrian Statistical Classification of Products by Activity) IA 62.10.1 Scheduled passenger air transportation IA 62.10.2 Scheduled freight air transportation IA 62.20.1 Non-scheduled passenger air transportation IA 62.20.2 Non-scheduled freight air transportation IA 62.20.3 Leasing of aircrafts with crew IA 62.30.1 Space transport	CPC66.11 – Scheduled air transport of passengers	ANZSCC96 731.10 Scheduled passenger transport 731.20 Non-scheduled passenger transport 732.10 Mail by air 732.20 Containerized Freight by air 732.90 Other freight by air 733.00 Transport via space 734.00 Rental of aircraft with crew

freight 663 Transport services via space 664 Rental services of aircraft with operator			

The classification is important since this will be the indicator for the scope of the index.

The Swedish paper also covers the methodology for the PPI for scheduled air transport of freight, which forms part of the air transport classification, which will be published for the first time in 2004. For purposes of this summary however the freight air transport index will not be covered. None of the countries currently measure space transport (which isn't really surprising).

II. Scope of the index

The scope of the index is influenced by the main use of the index. In all the countries (Sweden, Austria, UK and New Zealand) the main use of the index is for deflation of National Accounts aggregates. The scope clearly identifies what indexes to produce and what should be included in the index (or set of indexes) and what should be excluded from the index (or set of indexes). For deflation purposes a more detailed set of industry and product indexes will be required while if the index will be used for inflation purposes a more aggregated index will be required. Aggregated industry indexes will require additional information to calculate weights.

Sweden currently produces an index for scheduled air transport services of passengers (business and private). The **domestic** air transport of passengers index has been produced and published monthly since 1995 and quarterly since 2002. Development of the **international** air transport of passengers index started in 1999 but is not published for confidentiality reasons. This index and the domestic air transport of passengers index is weighted together to form the quarterly index of air transport of passengers which is provided to National Accounts.

Austria is still planning to publish an index for scheduled air transport services of business passengers in the PPI, after which the country will start with investigations into the compilation of an index for air freight. An index for passenger transport by air has been published in the CPI since 2000 but has a limited coverage. The PPI will cover a more extensive range of prices for domestic and international travel.

The UK clearly distinguishes between the indexes for scheduled air transport for business and private passengers for domestic and international (short-haul and long-haul) travel. The UK started development of the index for scheduled air transport services of business passengers in 1996 and has been publishing the index as an experimental index since 2000 as part of the Corporate Services Price Index. The private airfares index is published as part of the RPI (Retail Price Index). The UK does not currently produce indexes for air freight transport or non-scheduled air transport for passengers.

Sweden and the UK exclude non-scheduled air transport from the passenger air transport index. Austria on the other hand, is thinking of including non-scheduled air transport in the passenger air transport index since this part of the industry is

significant enough to measure. New Zealand currently includes non-scheduled air transport as a very small part of the index.

III. Industry size and characteristics

The size of the industry differs in most countries but is a relatively small percentage of the economy and usually has a small number of rather large airlines.

Sweden has 280 enterprises in the industry of which 120 provide air transport services as their main business. Only 40 enterprises are classified as providing scheduled air transport services and 80 provide non-scheduled air transport services, which is out of scope for the index. Of the 280 enterprises, the 10 largest produce 90 percent of the turnover of the industry.

Austria has one major airline group (consisting of 4 airlines) covering approximately 90 percent of the turnover of the industry and the rest of the industry consists of another 3 minor airlines (of which one only started operation in 2003). One airline within the major airline group focuses on scheduled flights while another specializes in regional business, the third concentrate on charter services and the fourth mainly serve the far western parts of Austria and other short distance destinations.

The UK has 400 companies classified to SIC 62.10/1but a large proportion is small companies providing auxiliary services (i.e. call centres and travel agencies) that are out of scope. Only 40 airlines operate scheduled and unscheduled passenger and cargo services of which 27 provide scheduled passenger air transport (72 percent of the total revenue of the UK airlines in 2001).

In sharp contrast the New Zealand market is dominated by one single airline (over 80 percent of the output in 1996) with another holding most of the remaining 20 percent and a third with only a very small percentage.

IV. Pricing methodology

When a pricing methodology is considered there are various important points to look at which include:

- **Formula and index methodology**

A decision should be made between a base weighted Laspeyres price index, where the base weight of the index is fixed and not revised for a specified period of time; or whether the index will be a chain linked Laspeyres price index, where the weights are chain linked on an annual basis. This decision will depend on the availability of data to determine weights for the split between business and private use, weights for different routes, weights for domestic and international travel, weights for different fare types. Availability of data for the different weights will depend on the characteristics of the industry in your country. As will be pointed out later, one of the main problems faced by many countries is the availability of data to determine weights for domestic airfares and international airfares. The pricing concept is also important (ie basic prices, producer prices, wholesale price or purchasers prices) The outputs index should use basic price (ie per unit revenue received by the producer from production and exclude taxes and include subsidies). All the countries measure airfares at basic prices (ie excluding taxes).

Sweden currently uses an annual chain linked Laspeyres formula for the calculation of the scheduled passenger transport index (domestic and international passenger air transport). All the other countries use the Laspeyres formula to calculate their indexes.

Aggregation may differ from one country to another. Sweden calculates the index for international air transport for passengers first as a sub-index for each flight route. The different flight routes are based on the same selection of routes as the CPI and are then weighted and aggregated to form the total index. The indexes consist of four different categories of tickets in economy class (with a weight of approximately 10 percent) and two in business class (with a weight of approximately 90 percent). The international air transport index for passengers and domestic air transport index for passengers are then aggregated to form the index of Air transport of passengers.

The UK calculates a separate index for business airfares, which consists of 14 long-haul flights, 17 short-haul flights and 9 domestic flights. These routes consist of mainly business class fares and some economy class fares where business class is not available. Fares are unrestricted where the price of the ticket is unrelated to booking period and time and includes a mix of return and one-way fares. One fare per destination for each of the last three months is collected and these three fares are averaged for the quarter.

- **Sample size**

The size and characteristics of the industry, likely responses, data quality, levels of resources will drive sample size. The scope of the index will also influence the sample size. Any sampling technique can be used but in most cases this will not be necessary and purposive sampling will be done due the size and characteristics of the industry. Most countries are concerned about respondent burden and would try to rotate samples, which is not easily solved when the industry has very few competitors like in the case of New Zealand.

Sweden uses revenue data for passenger services collected by the Services Unit of Statistics Sweden to select a sample of respondents for domestic passenger air travel. Since the top ten entities have 90 percent of the market, it will be difficult for Sweden to rotate respondents. Only one airline dominates the Swedish air transport industry for international travel.

Austria has entities in the industry that serves a specific part of the market and therefore it will also be difficult for them to rotate respondents.

The UK on the other hand has a larger population to choose from and can therefore randomly select a number of companies from the database excluding companies with less than 10 employees. The UK sample currently includes the 3 major airlines, which account for approximately 55 percent of all passengers uplifted.

- **Selection frequency**

The availability of the data, mode of selection as well as the capability of the statistical office to deal with the data determines the frequency of selection.

Sweden collects data for domestic and international passenger air transport on a monthly basis at the fifteenth of every month via an e-mail survey.

Austria currently collects prices on the second Wednesday of every month for the domestic passenger air transport which are used in the CPI. The plan is to use the CPI database as far as possible and supplement the data if necessary. Therefore the frequency will be the same as that used for the CPI data.

The UK collects one fare per destination, for the different classes of fares, for each of the last three months. The fares for the three months are then averaged for use in the index. The CSPI section is also considering adopting the RPI approach which collect prices at various periods in advance of departure, to reflect usual consumer behavior eg 6, 3 and 1 month in advance of departure dates (long-haul), 3, 1 month in advance (short-haul and domestic) via the internet.

- **Split between business and private; domestic and international travel**

This is one of the most problematic areas for many countries since data is usually not easy to obtain to determine the weights for business travel versus private travel. Most airlines can not provide detailed information of this kind.

Sweden obtained information from the dominant airline in Sweden that indicated that business class tickets accounts for 90 percent of the total weight for air tickets across most routes. Turnover data from respondents for domestic and international passenger travel by air was also obtained to determine the split between domestic and international travel.

Austrian airlines specialize in different markets and therefore the turnover of the different airlines can be used to derive weights for domestic and international travel. The problem for Austria will however be to determine weights for private and business travelers.

The UK has a clear distinction between business and private travelers. It was however difficult to obtain data to determine weights for business travelers and they used data from the annual International Passenger Survey at passport control to estimate business weights per destination. The UK currently price domestic routes as well as long-haul and short-haul international routes. These routes were chosen from information from the Civil Aviation Authority based on passenger numbers (although these passenger numbers did not distinguish between business and private travelers).

- **Pricing specifications**

Pricing specifications should be detailed enough so that price determining characteristics of the product can be identified. Enough detail about the product (flight type) as well as the transaction should be specified. This should also assist with future quality adjustments. The details should include destination, type of fare, fare characteristics such as time and day of flight, return or one-way, baggage allowance, meal details, discount policies for business classes, airpoints programs, how long in advance the flight was booked.

- **Collection mode**

New pricing regimes are coming onto the market. Both the UK and Sweden collects information directly from the airlines or Civil Aviation Authority and represent the traditional method of airline ticket booking. Other channels of airline ticket booking now exist eg Internet. The question is how should this be incorporated into the pricing methodology. This should be seen as a separate price and weighted accordingly and should be measured in addition to the traditional methods.

V. How to deal with quality issues

A big concern for all the countries is how to deal with quality issues. These include changes in the fare and service characteristics such as charge for meals, seating, mileage or frequent flyer programs, and baggage changes. The first problem would be to assign a price to this difference especially if a similar service is not available that would enable you to proxy a price.

Below is a case study, which can serve as an example of how Statistics New Zealand dealt with quality issues in this industry

CASE STUDY- Domestic AirFares.

'***In just one month, NZAir will begin a new era of low-cost air travel for all New Zealanders.***'

On the 31st of July 2002, NZAir unveiled its new no-frills express class service, which, from November 1, would replace its current economy and business classes. NZAir had responded to customer demand in delivering a range of fares, which not only showed dramatic discounts on current fare levels, but were strongly competitive with rail and car travel. These new low fares are possible because of fundamental changes made to the domestic network.

These fundamental changes include:

change in baggage limit from 25kg to 20kg. Pre November 4 percent of passengers were over the weight limit and another 5 percent were over 20kg. From Nov 1 NZAir was charging $5.60 per kg for luggage over the limit.

loss of frequent flyer points on the cheapest fare class. Passengers earn either distance * a factor (see table below) or 1000 points, whichever is greater.

Auckland - Wellington = 480 km one way

	Flexi saver	Fully-flex
Points earned per km	0.70	1.0

change in the number of seats - and the seat 'pitch' (the spacing between them). The number of seats increased from 122 (including 8 business class) to 136 with the removal of business class. Seat pitch in October was 33 inches.

loss of meals – NZAir offered a $10 refund for passengers who had paid the old fares for flights after November 1.

Media reports

'NZAir reckons the mid-range economy fare paid by Auckland - Wellington travellers return now is around $377. The airline expects the new mid-range economy level for that fare to settle at between $240 - $280.....' Sunday Star Times, Aug 02.

'Average fares across the NZAir domestic network will decrease by 20 percent, and by about 28 percent on main trunk routes' NZAir, 31 July 02.

Rival airline

On the 20th of August 2002, Rival airline announced it would match NZAir's new cheap prices on domestic routes while not skimping on meals, for now.

Rival air's other conditions were:

maintained 20kg baggage limit
retained frequent flyer points for all fare classes
retained business class
retained meals

This meant that both NZAir and Rival Air would have new fare schedules from November 1, including new names for the fares.

Tasks:
1. Calculate the price movement (with no quality adjustment) which should be shown. Assume fares are equally weighted, and that market share is split NZAir= 75 percent and Rival air = 25 percent.

2. Identify which quality adjustments should be made, and value them.

3. Calculate the final movement to show in the CPI. Justify your results relative to the market's information.

TABLE 1: Surveyed October fares and conditions

Airline	Return Fares	Fare Code	Fare Conditions	Advance purchase	Airpoints	Fare (retu
NZAir	Gotta Go		non-refundable	21	Y	219
NZAir	Thrifty		non-refundable	0	Y	588
NZAir	Full Economy		refundable	0	Y	718
Rival Air	$99 each way	OPXOW			Y	198
Rival Air	21 Day Advance	N21APR		21	Y	199
Rival Air	14 Day Advance	V14APR		14	Y	219

TABLE 2: Surveyed November fares and conditions

Airline	Fare Name	Fare Code	Fare Conditions	Changeable	Airpoints	Fare (retu
NZAir	Smart-saver	L	non-refundable	unchangeable	N	178
NZAir	Flexi-saver	Q	non-refundable	$50 surcharge for changes	Y	338
NZAir	Fully-flex	Y	refundable	changeable	Y	658
Rival Air		OPIOXN	non-refundable	non-changeable	Y	138
Rival Air		LIPOW	non-refundable	changes <5 days out from flight	Y	298
Rival Air		HISOW	refundable	changeable	Y	518

TABLE 3: NZAir October fares and conditions

Return Fares	Fare Code	Fare Conditions	Advance purchase	Airpoints	Fare (return)
Gotta Go		non-refundable	21	Y	219
Real Deal		non-refundable	14	Y	279
Super Thrifty		non-refundable	7	Y	359
Thrifty		non-refundable	0	Y	588
Golden Age (over 60)		refundable	0	Y	588
Full Economy		refundable	0	Y	718
Business		refundable	0	Y	926

TABLE 4: NZAir November fares and conditions

Return Fares	Fare Code	Fare Conditions	Changeable	Airpoints	Fare (return)
Smart-Saver - are 'use it or lose it' fares - so customers must make sure they get to the airport on time. If they miss the flight, they'll have to buy a new ticket.	K	non-refundable	unchangeable	N	118
	G	non-refundable	unchangeable	N	138
	S	non-refundable	unchangeable	N	158
	L	non-refundable	unchangeable	N	178
Flexi-Saver - our mid-range fares - can be changed up to 24 hours prior to the flight, but at a cost.	T	non-refundable	$50 surcharge for changes	Y	238
	W	non-refundable	$50 surcharge for changes	Y	278
	V	non-refundable	$50 surcharge for changes	Y	318
	Q	non-refundable	$50 surcharge for changes	Y	338
Fully-Flex - our range of flexible fares which can be changed at any time. Book and pay within 7 days.	H	refundable	changeable	Y	398
	M	refundable	changeable	Y	498
	B	refundable	changeable	Y	598
	Y	refundable	changeable	Y	658

TABLE 5: Rival air October fares and conditions

Return Fares	Fare Code	Fare Conditions	Changeable	Airpoints	Fare (retur
$99 each way plus tax	OPXOW	non-refundable	non-changeable	Y	198
21 Day Advance	N21APR	non-refundable	non-changeable	Y	199
14 Day Advance	V14APR	non-refundable	non-changable	Y	219
10 Day Advance	L10APR	non-refundable	changes >7 days out from flight	Y	280
7 Day Advance	M7APR	non-refundable	non-changeable	Y	360
Less than 7 Days	KPXR	refundable	changeable	Y	440
Special -$239 each way	KISOW	refundable	changeable	Y	518

TABLE 5: Rival air November fares and conditions

Return Fares	Fare Code	Fare Conditions	Changeable	Airpoints	Fare (return)
	NPTWEB	non-refundable	non-changeable	Y	118
	OPIOXN	non-refundable	non-changeable	Y	138
	SIPOXN	non-refundable	non-changeable	Y	178
	VIPOW	non-refundable	changes >5 days out from flight	Y	238
	LIPOW	non-refundable	changes >5 days out from flight	Y	298
	MIPOW	non-refundable	changes >5 days out from flight	Y	378
	KISOW	refundable	changeable	Y	418
	HISOW	refundable	changeable	Y	518
	Y	refundable	changeable	Y	796

CASE STUDY- Domestic Air Fares - SOLUTIONS

Summary of tables:

Table	NZAir(0.75)	Rival Air (0.25)	Weighted avera
1 - Surveyed Oct fares	508	205	432.25
2 - Surveyed Nov fares	391	318	372.75
3 - All NZAir fares Oct	525		
4 - All Rival Air fares Oct		326	
All fares Oct			475.25
5 - All NZAir fares Nov	316		
6 - All Rival Air fares Nov		342	
All fares Nov			322.50

1. Price movement (%) = (All fares Nov / All fares Oct -1) * 100
= (322.50 / 475.25 - 1) *100
= -32.141%

Since the movement between two sets of averages is being used it is best to use all the available fares, instead of the sampled fares.

2. Baggage - change in value calculated by determining the proportion of people affected by the change in the weight limit, and valuing it.
- the four percent that are already over will continue to be over.
- 5% of passengers are affected
- value = charge for being over * change of limit * proportion affected
= $5.60 * 5kg * 0.05
= $1.40

Meals - use company refund = $10.00

Frequent flyer - not gaining 1000 pts on 1/3 of available fares
- value = points * proportion missing out * value of points * 2 (return)
= 1000 * 1/3 * 0.01 * 2
= $6.67

No value associated with seat pitch, so is not adjusted for.

3. Air NZ fares = $316 + $18.07 = $334.07

Nov average fare = AirNZ * market share + Qantas * market share
= $334.07 * 0.75 + $342 * 0.25
= $336.05

Price movement (%) = (Nov average fare / All fares Oct -1) * 100
= (336.05 / 475.25 - 1) *100
= -29.29%

3. Conclusion

Main problems that countries had to deal with:

It is evident from the papers that countries have similar problems to deal with. One of the first things that the countries had to decide was which indexes to produce and what structure to use. The most important issues that the countries then had to deal with included obtaining reliable weighting data, how to distinguish between business and leisure travelers, which fare types to choose and which routes to choose that would be representative and lastly but most important how to deal with quality issues. Most countries have not to date come up with the best ways to deal with the different kinds of quality problems. This is still a matter to be investigated further.