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Interim technical implementation report

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Background

As a step in improving economic statistics, regular reviews are made of the Producer Price Indices for Services (SPPIs). A review of SPPI for Car rental services was started during 2008 and will be finished during 2009. SPPI for this industry has been published since 2000.

One important action to improve the quality of the price index for car rental services is to make an international comparison to find out which methods are used in other countries. Car rental was discussed during the Nordic SPPI Seminar in May 2008[1]. Norway seemed to have quite similar methods for measuring prices for Car rental services as Sweden. In both Finland and Denmark car rental is disregarded since the industry is considered to be tooo small.

Respondents in the car rental industry and the trade organization BURF have been contacted and a number of visits have been made. Some research regarding the alternative of measuring contract prices instead of unit values has also been done.

Problems and improvements

When calculating the price index for car rental services some problems have been encountered. For instance it is difficult to know if the prices reported by the respondents really are related to the period that is meant to be measured. It is also difficult to know whether the turnover reported, e.g. January, actually is for the car renting in January, or if it includes some months or days before or after this period. This problem also concerns the number of car renting days per this particular period.

It would perhaps be better to use Contract pricing instead of Unit Value, but the respondents consider this difficult. Prices are collected for two categories of cars, B and C, and the respondents consider this as a problem because the cars in a specific group can be replaced with other cars. This means that the reported rental prices no longer apply to the same cars. This is not considered as a large problem since the assumption is that the new cars are considered as comparable replacements. The intention with the index is also to measure the price trend of the car rental service in total, not of some specific car groups.

Since the number of respondents is small, the data is collected on Excel-sheets that are sent via e-mail. This is considered easy and comfortable for

[1] The Nordic countries meet annually to discuss SPPI issues

the respondents. It works fine and some respondents have even renewed their spread sheets to ease SCB´s work.

Norway has been contacted to receive some useful ideas for method improvements. Their methods differ from ours to a lesser extent, for example, they are taking into account the amount of renting days divided into groups as a price determining factor. As the number of renting days affects the daily price this could be added into the Swedish index in order to create a more accurate measure. Norway is also using a different index formula (Paasche instead of Laspeyres). For car rentals the difference in the results between these two methods is small.

Besides the unit value method used by Sweden and Norway, Netherlands uses a model pricing method. When the possibility of using model pricing in Sweden was investigated, the respondents found it hard to apply.

The plan is to visit more respondents this year as well as conducting alternative test surveys. A comparison will also be done between the development of the correspondent survey within the Swedish CPI as well as the CPI in other countries with similar industry backgrounds.

2 An overview of banking services

Thomas Olsson

Background

SPPI for Banking Services has been produced since 2004 (not yet published). This review was initiated since the price unit during 2007 noticed that the produced SPPI was not optimal. The index indicated less likely movements of prices that could not be explained in a satisfactorily way. When it also emerged that the index was not used by National Accounts (NA) it was decided that a review of the index was to be carried out during 2008.

What is to be deflated and how has it been done?

The production within the banking sector is divided into two product groups; FISIM (Financial Services Indirectly Measured) and direct bank services. FISIM is an estimate of the value of financial intermediation services that are not charged for explicitly. The direct services are services for which an explicit charge is made. The direct services are dominated by two types of services; payment services and mediation of securities.

FISIM is today calculated using the stock of loans and deposits. The stocks of loans and deposits are deflated using the GDP-deflator (the implicit price

deflator for domestic final demand). This is in line with what is recommended by the EU (as in Council Regulation (EC) No 448/98).

The direct services are deflated using NA's own "Bank service index". This index is calculated by weighing together an index for the market value of funds and a wage index for employees within the financial sector. In the "market value of funds index" it is assumed that all financial mediation fees are ad valorem prices and that the percentage fee is fixed

SPPI before the review

Previously SPPI only measured prices for payment services. Most prices collected were unit values. The banks divided the turnover with the quantity for each service respectively. For some services list prices were used. Each bank had its own weight, based on revenue. Within the banks each service had its own weight based on revenue from the specific service. All data were collected on Excel sheets via e-mail.

Identified problems

Coverage
The fact that SPPI only covered payment services was a problem since NA could not use the index to deflate the whole bank sector. To be able to use the index for the whole bank sector the SPPI would need to cover also FISIM and mediation of securities.

FISIM
Since it is hard to identify a price or a quantity that correctly measures the value of FISIM it is hard to measure the volume of it and to deflate the value. Most countries therefore do not include FISIM in their price indices. During this review the American index was examined. In the American index FISIM and the direct fees (commissions) are calculated together and are then divided with the stocks of loans and deposits. By using the Swedish definition (Eurostat definition) of the value of FISIM for loans and deposits, and divide them with the loan and deposit price respectively, one would calculate the stocks of loans and deposits. The American method for calculating the FISIM price is hence not applicable in Sweden.

Mediation of securities
It is doubtful whether the assumptions behind the "market value of funds index" (that NA uses to estimate the development of the prices for financial mediation) are reasonable. Even if all financial mediation fees are ad valorem prices it is not likely that the percentage fee is fixed.

Pricing methods
The Unit value method is suitable to use when the services are well specified and can be divided into homogenous sub-groups. In this index the

specifications are too general and the service groups are too heterogeneous. In the cases where list prices are used it has become clear that these are not at all representative, and they are therefore not appropriate to use in the index.

Ad valorem prices
If mediation of securities is to be included in the index a question arises; how should ad valorem prices be handled? A fee that is defined as a share of a transaction value should, according to Commission Regulation (EC) N0 1920/2001, be valued as this share of a representative unit transaction. The question is how this unit transaction should be defined. Is it as a purchase or sale of a constant number of shares or as a purchase or sale of an amount of shares with a constant value in real terms? In the first case the value should be given by a stock-market price index while in the second case the index for the value of the transaction should be given by CPI (or HICP).

Collection method
All information was earlier collected on excel-sheets that were sent via e-mail. Since e-mail is not a secure way to collect information it was desirable to change collection method.

Changes

FISIM
Development of a method for measuring the price of FISIM would demand very large resources. Considering the council regulation the GDP-deflator seems to be an acceptable method. Therefore it is more relevant to focus on producing a high quality index for direct services.

Mediation of securities
In HICP, information is collected about proportional and minimum commissions from the large banks and proportional transaction fees and administration fees from a number of the largest funds. This information is sufficient and there is no reason to expand the survey.

In HICP the fees are enumerated with the total HICP, while in NA's present index the market value of funds is used. The difference between these two methods is that in the former, price changes on the stock exchange affects the volume index, while in the latter it affects the price index. It has been discussed which method that is correct. NA prefers the market value of funds and since NA is the primary user, and the fact that this is considered as an A-method in Eurostat's handbook on price and volume measures in national accounts, this method will be applied.

Pricing method for payment services
To solve the problems in the previous survey meetings were held with all the banks. These meetings were very successful and a number of improvements have been made. The number of services has been decreased from 42 to 20

and the total number of observations has been decreased from 49 to 35 (many observations had very low weight). The services measured are much more thoroughly specified and no list prices are used.

Collection method
The excel-sheets have now been replaced with web questionnaires.

Production and consumption
In the previous SPPI only producer prices were measured. For NA to be able to deflate both the production and the consumption of banking services also consumer prices must be included. Consumer prices for payment services are collected in CPI. This is suitable to use for deflation of the private consumption of payment services. Regarding mediation of securities the HICP fund index is an acceptable deflator for both the production and the consumption. In the index for the production VAT is excluded.

Four different indices are thus delivered to NA:

1. Payments – consumption (CPI)
2. Securities – consumption (HICP)
3. Payments – production (SPPI)
4. Securities – production (HICP excl. VAT)

3 Revaluation of sampling methods in SPPI

Marcus Fridén
Ulf Johansson

Background

In the Swedish SPPI prices are collected for 35 NACE divisions. Several NACE divisions are divided into subgroups, where every subgroup is sampled separately. That makes a total of 60 samples that are drawn each year in September. Until now, the size of the sample and the methods used to draw the sample has been set by the handling officer responsible for each NACE division. The aim of this project is to come up with a best practice regarding size of each sample, sampling methodology, possible cut-offs etc. The first part of this report focuses on how the sample process works today and in the second part it is presented what is left to do within this project.

Sample frame

There is no sample frame for services, like the IVP[2] or the Intrastat[3] for the PPI. The best register available is the Business Register at Statistics Sweden, where all companies are classified within their respective NACE divisions.

[2] Industrins Varuproduktion (a register of products produced in Sweden)
[3] A register of products that enter Sweden's border

One company can be classified within several NACE divisions, with turnover for each division specified as a percentage of total turnover.

The sample process

As mentioned earlier, the allocation of the sample is decided by each handling officer. The variables to set are size of the sample, size of the company, NACE division level of activity, cut-off variable and limit of the cut-off variable. A breakdown of each NACE division sampled and variables chosen are presented in Table 1 below.

NACE level of activity
NACE level 1, 2 and 3 specifies down to what level of activity companies will be sampled. If this variable is set to 1 only company who have their largest share of turnover in this division can be sampled. If this variable is set to 3, also companies who have larger shares of turnover in two other NACE divisions will be considered in the sample. Setting this variable to 2 or 3, means that companies can be sampled in more than one NACE division.

Cut-off variable and cut-off limit
The cut-off variable is either turnover or number of employees. Turnover as cut-off variable is chosen in just two NACE divisions. The cut-off limits vary from 0 employees to 25. Companies with fewer employees than the cut-off limit are not considered in the sample. Setting a cut-off limit on number of employees is mainly a way of trying to reduce the respondent burden, as it is assumed to be higher for small companies.

Company size
There are several ways to define the size of a company. The ones used for sampling in the Swedish SPPI are:

omsng (Turnover within a specific NACE division)

anstp1ng (Number of employees +1 within a specific NACE division)

m1oms (Average turnover for the number of employees +1 within a specific NACE division multiplied with omsng/anstp1ng)

There are disadvantages with using either turnover or number of employees as an indicator of company size. Companies with few employees but a large turnover will not be considered in the sample if size is defined as number of employees. The same holds for companies with many employees but with a small turnover, if size is defined as turnover.

When the variables are set the sample is drawn using a Pareto πps-sample. Asymptotically and according to studies[4], a Pareto πps-sample has lower variance than an ordinary pps-sample. Large companies are sampled with certainty and represent themselves, i.e. they have their own weight. Small companies represent all small companies in the sample frame, and share the remaining weight equally.

The units sampled are companies, but what we want to measure is price changes on services. It is then up to each company to choose representative services that are comparable over time. The number of price quotations submitted by one company varies between 1 and 30.

Future work within this project

The aim of this project is to make the sample allocations more efficient. Uniformity is needed considering what is relevant to choose as cut-off limits, size variable and so on. A best practice is needed in these matters, both as references for the handling officers as well as improving the efficiency of the allocation. A best practice regarding the number of price quotations submitted by each company will also be examined. Perhaps it is more relevant to increase the number of price quotations submitted by each company instead of increasing the number of companies in the sample.

Results from the project on variance in SPPI will be taken into consideration in how the allocation of samples can be improved.

Selected variables in the last sample

Table 1. Variables chosen for each NACE division, September 2008

NACE	Sample size	Cut-off variable	Cut-off limit	NACE level	Company size
38110	50	Employees	10	3	omsng
38120	15	Employees	10	3	m1oms
38210	10	Employees	10	3	m1oms
38220	10	Employees	10	3	m1oms
39000	15	Employees	10	3	omsng
49410	50	Turnover	1	2	omsng
51211	10	Employees	0	2	m1oms
51212	5	Employees	0	2	m1oms
52100	15	Employees	15	2	omsng
52241	10	Employees	10	3	m1oms
52249	10	Employees	10	3	m1oms
52290	50	Turnover	1	3	omsng
53201	5	Employees	7	3	m1oms
53202	7	Employees	7	3	m1oms

[4] Rosén, B. (1996) On Sampling with Probabilities Proportional to Size. Statistics Sweden R&D Report 1996:1.

53203	8	Employees	7	3	m1oms
58131	10	Employees	10	1	m1oms
58132	5	Employees	10	1	m1oms
58290	15	Employees	15	1	anstp1ng
62010	30	Employees	15	2	anstp1ng
62020	25	Employees	15	2	anstp1ng
62030	15	Employees	25	2	anstp1ng
62090	15	Employees	10	2	anstp1ng
63110	15	Employees	15	2	anstp1ng
63120	10	Employees	10	2	anstp1ng
68310	25	Employees	10	1	omsng
68320	35	Employees	10	1	omsng
69101	31	Employees	1	1	m1oms
69102	10	Employees	1	1	m1oms
69201	26	Employees	1	2	m1oms
69202	26	Employees	10	2	m1oms
69203	10	Employees	10	3	m1oms
70210	17	Employees	5	3	m1oms
70220	40	Employees	15	3	m1oms
71110	25	Employees	1	1	anstp1ng
71121	10	Employees	10	2	anstp1ng
71122	10	Employees	10	2	anstp1ng
71123	7	Employees	10	2	anstp1ng
71124	12	Employees	10	2	anstp1ng
71129	5	Employees	10	2	anstp1ng
71200	10	Employees	10	3	anstp1ng
73112	10	Employees	10	3	anstp1ng
73119	10	Employees	5	3	anstp1ng
73120	10	Employees	15	3	m1oms
73200	15	Employees	10	1	omsng
74900	9	Employees	10	1	m1oms
77290	25	Employees	10	3	m1oms
77310	5	Employees	3	3	omsng
77320	20	Employees	10	3	omsng
77330	10	Employees	5	3	omsng
77390	15	Employees	5	3	omsng
78200	20	Employees	10	1	anstp1ng
80100	10	Employees	10	2	m1oms
80200	5	Employees	10	2	m1oms
81210	20	Employees	20	3	omsng
81221	5	Employees	5	3	omsng
81290	5	Employees	10	3	omsng
82190	10	Employees	10	3	m1oms
95110	15	Employees	15	3	anstp1ng
96011	20	Employees	2	3	m1oms
73111	20	Employees	5	3	m1oms

4 Development and production of a "Total SPPI"

Marcus Fridén
Ulf Johansson
Thomas Olsson

Background

Services Producer Price Indices (SPPIs) are calculated by product groups. As the product group indices move in different directions it is hard to get an overall picture of the price movements in the service sector. Since the beginning of the current decade there has been a rapid development of new indices and, as the number of SPPIs has increased, the possibility to provide an overall picture of the price movements in the service sector has improved. Due to this Statistics Sweden has calculated an aggregated SPPI ("Total SPPI") that is published since the first quarter of 2008.

The aggregated index has a business to all (B2A) approach and includes sales of services to businesses, public sector and consumers. SPPI mainly measures prices for business to business (B2B) services since services sold to consumers are included in the Consumer Price Index (CPI). To cover as much as possible of the service production in the Swedish economy a number of CPIs are therefore included in the aggregated SPPI. The CPIs that are included are required to be relevant from a producer perspective, and some indices are therefore adjusted to fulfil this requirement (for example by excluding effects of changed taxes).

Work done

In May 2008 the aggregated SPPI for the period 2005 to quarter 1, Q1, 2008 was published. Since then also the index numbers for Q2-Q4 2008 have been calculated and published. The aggregated SPPI has been calculated and published in accordance with SPIN 2002 (the Swedish version of CPA 2002) and during the end of 2008 and the beginning of 2009 a lot of work has been done to adapt the aggregated SPPI to SPIN 2007 (CPA 2008). This work has consisted of choosing how the new aggregates should be designed, calculation of new weights etc. For the period 2005 to 2008 the following aggregates were published:

- Hotel and Restaurant Services
- Transport Services
- Bank, Post and Telecommunication Services
- Real Estate Services
- Renting of Machinery and Equipment
- Computer and Related Services
- Other Business Services
- Other Services

From 2009 the following aggregates will be published:

- Transport and Storage Services
- Hotel and Restaurant Services
- Information and Communication Services
- Professional scientific, technical and financial services
- Real estate services
- Administrative and support services
- Other Services

From 2009 six new product group indices (renting of machinery and equipment, industrial cleaning, market research, technical testing, railway transport, publishing) are included in the aggregated SPPI and the index now covers 65-70 percent (preliminary calculations) of Sweden´s service output.

Results

The results for the period 2005 to 2008 are presented in Table 2 below.

Table 2. Published index numbers for the period 2005 to 2008

		2005	2006	2007	2008
Service producer price index	*Quarter 1*	99,1	100,9	102,4	105,3
	Quarter 2	99,8	100,7	102,7	106,1
	Quarter 3	100,5	101,0	104,1	106,9
	Quarter 4	100,7	101,3	104,3	107,2
	Annual average	**100,0**	**101,0**	**103,4**	**106,4**
Hotel and restaurant services	*Quarter 1*	98,8	102,4	104,5	109,2
	Quarter 2	99,6	102,8	105,9	111,0
	Quarter 3	100,5	103,2	107,6	112,2
	Quarter 4	101,2	103,7	107,8	113,0
	Annual average	**100,0**	**103,0**	**106,4**	**111,4**
Transport services	*Quarter 1*	99,0	102,1	103,2	108,5
	Quarter 2	99,2	102,7	104,3	109,6
	Quarter 3	100,4	103,4	106,7	112,1
	Quarter 4	101,5	103,7	106,7	112,5
	Annual average	**100,0**	**103,0**	**105,2**	**110,7**
Bank, post and telecommunication	*Quarter 1*	100,0	97,0	98,0	96,5
	Quarter 2	99,9	95,4	94,2	93,3
	Quarter 3	100,0	95,3	95,8	93,5
	Quarter 4	100,1	95,0	94,7	93,1
	Annual average	**100,0**	**95,7**	**95,7**	**94,1**
Real estate services	*Quarter 1*	99,6	101,1	102,9	104,2
	Quarter 2	100,1	101,3	103,4	106,4
	Quarter 3	100,2	101,4	103,4	106,7
	Quarter 4	100,2	101,6	103,6	106,7
	Annual average	**100,0**	**101,3**	**103,3**	**106,0**
Renting of machinery and equipment	*Quarter 1*	98,0	99,7	101,7	97,1
	Quarter 2	101,7	101,2	104,9	98,6
	Quarter 3	98,2	96,9	102,8	91,9
	Quarter 4	102,1	101,3	104,4	95,6
	Annual average	**100,0**	**99,8**	**103,4**	**95,8**
Computer and related services	*Quarter 1*	100,0	99,4	99,0	102,0
	Quarter 2	100,9	97,7	98,9	102,5
	Quarter 3	99,6	97,4	99,1	102,6
	Quarter 4	99,6	97,9	101,5	102,8
	Annual average	**100,0**	**98,1**	**99,6**	**102,5**
Other business services	*Quarter 1*	98,0	102,0	104,4	109,3
	Quarter 2	99,5	101,9	105,9	110,9
	Quarter 3	101,7	102,7	107,9	111,7
	Quarter 4	100,8	102,8	108,3	112,3
	Annual average	**100,0**	**102,4**	**106,6**	**111,0**
Other services	*Quarter 1*	98,3	102,3	104,8	108,5
	Quarter 2	99,1	102,9	105,4	109,3
	Quarter 3	101,0	103,7	105,8	110,1
	Quarter 4	101,7	104,3	107,1	111,0
	Annual average	**100,0**	**103,3**	**105,8**	**109,7**

Remaining issues

Since the focus has been on adapting the aggregated SPPI to the new nomenclature and to include the new product group indices, little time has been spent on discussing if the B2A approach is appropriate and evaluating the results. The aggregated SPPI was one of the topics on the Task Force on Service Producer Prices Index in Luxembourg on 7-8 May. The issue was discussed together with other countries but no common policy was decided. Hopefully some kind of common policy regarding aggregated SPPIs will be considered in the future.

During the work with updating the weights it has become clear that it is rather complicated to obtain adequate weight data. Therefore the plan is to establish better procedures for this and determine which data sources to use.

When the aggregated SPPI has been evaluated in detail and is reliable the plan is to try and establish it as an acknowledged economic indicator by promoting it more towards potential users.

5 Increased sample size in the Swedish Producer and Import Price Index

Henrik Petterson

Background

This project was launched in 2008 with the aim to increase the number of observations in the Swedish PPI from around 4000 to 5000. The project also has the ambition to review the different stages of the sampling process, from allocation of the sample to sampling and implementation.

The primary reason behind the review was that the previous sample size was small in comparison to the samples in other developed European countries. Variance estimates has also showed that the sample error is high and unevenly distributed across different business sectors. The present sample method has been in place since 5 years and it has now become possible to evaluate it.

The choice of point in time was appropriate since the stratum distribution had to be adapted to the new standard for classification of products according to activities, SPIN 2007. The result of another project dealing with variance estimations within PPI has supported a more efficient allocation of observations into homogenous strata.

Objectives

- Increase the overall sample size from 4000 to 5000 observations and at the same time improve the efficiency in the sampling procedure of PPI through reduced costs and response burden per sampling unit.
- Construct a better stratum distribution (homogenous strata) according to SPIN 2007 for products. This can be aided by new variance estimations on a stratum level.
- Set up a more systematic approach for the practical sampling process from the frame adjustments, stratification and allocation to sampling and implementation.
- Integrate the sampling procedure for Industrial services into PPI.

Summary of the work progress

Improvements in the frames for sampling
In order to improve the sources for the frames meetings with the units for foreign trade and industrial production have been arranged. At the first meeting it was decided to organize meetings on a regular basis. The purpose of these meetings is to exchange experiences with the aim to improve the coverage of the frames, and also reduce the number of variables not used. The attempt was to formalize the request of frames in order to exclude transactions, which are not in the target population (reduce the rate of over coverage). For instance export not originated from production in Sweden and import not consumed in Sweden.

Successful extension of the total sample size
The total sample size has successfully been increased to around 5000 measurements and the sampling and measurement of Industrial services has been integrated in the PPI. The increased sample size has put pressure on the organization of the statistical production to improve the productivity and to maintain the quality of the price measurements.

The recent method does not sufficiently take into account the costs for collection and price measuring. A suggestion is therefore to consider developing a cost function for sample allocation. The sample size within each stratum should ideally be a function of the marginal cost for measuring a particular unit. The marginal cost depends on the time consumed by Statistics Sweden and the respondent. There has not been enough time to investigate how the time consumed is distributed between the price measurements and different business sectors (strata). There could also be a reason to consider the response burden caused by other surveys than PPI although it is clear that it would be too complicated to insert another restriction at this time.

Improved sampling procedure
The practical sampling and initiation process has been simplified and documented, which can be used in the annual revisions. A new, more comprehensible, initiation form has been developed in cooperation with experts on measurement techniques. The questionnaires for monthly pricing have been reviewed. A one day internal kick off has been held on the subject and the aim was to share the experience of the project team and train the PPI staff on practical implications.

Remaining work

A lot of tasks have been accomplished so far but there is still some important work that is planned for, such as:

- Less and more accurate strata used for allocation of the sample will be defined.
- Focus on updating the current sample according to a scheme but also increase the number of price observations within certain selected product areas such as food items and Industrial services.
- Improve the communication with suppliers of input data (frames).
- Take cost functions into account, if possible, when allocating the sample.
- Continue the documentation of the sampling procedure, in terms of a handbook.