QUALITY DECLARATION
Producer and Import Price Index (PPI)

Subject and statistical area

Subject area:	Prices and consumption
Statistical area:	Producer and Import Price Index

Reference time

2017 Month, quarter, and year.

Product code

PR0301

Sveriges officiella statistik

Quality of the statistics

1 Relevance

1.1 Purpose and information needs

1.1.1 Purpose of the statistics

The purpose of producer and Import Price Indices (PPI) is to present the average price trend in the producer and import stages, in total and for different product groups. Prices are measured in the first phase of distribution when the goods are delivered from Swedish producers when goods enter into Sweden.

1.1.2 User information needs

The statistics are primarily used by

a) Statistics Sweden for the conversion of nominal amounts to amounts in fixed prices in the foreign trade in goods and other economic statistics, as well as national accounts.
b) Riksbank, National Institute of Economic Research and others for economic analysis, including as a basis for economic policy decisions.
c) Enterprises, municipalities and county councils for price regulation in long-term agreements.

1.2 Content of the statistics

1.2.1 Units and populations

The population of interest consists of all transactions in the total population carried out by Swedish producers, as well as the total import/entry[1] regarding the Swedish market.

It would not be practically possible to observe and measure the transactions described above, except in special cases. For this reason, the target population is defined as all the transactions referring to sales at the production level and purchases at the import level, of products related to product groups in departments under SPIN 2007[2], see table 1. SPIN 2007 refers to a classification of products based on activities under the Swedish Standard of Industry Classification, SNI 2007, and uses the same names for products as SNI 2007 for the corresponding activities.

Import/entry by household is in fact included under the population of interest, but is excluded from the target population. The same applies to import/entry of products for further export, that is, products that are not consumed or processed in Sweden. These are excluded from import/entry and from export/exit.

A population which is a combination of producer/importer and product is used to describe the target population. In this way, the combination of enterprise and product leads us to the specific product offering for which the price is to be measured.

[1]Import refers to products brought in from countries outside of the EU. Entry refers to products brought in from other EU countries.
[2]Swedish Standard of Industry Classification 2007

The population of enterprises changes over the year, as enterprises are dissolved, start up or change. Products can also be discontinued and emerge from one month to another, on the whole market or with a specific company. While some products are considered to be entirely new, others are treated as substitutes for one another, although they are not exactly alike.

A product offering refers to an observable specimen of a good or service offered for sale at a given price from a specific company. The price should refer to the average price during the month that the price measurement is made.

Table 1:

Department	Description
A	Agriculture, forestry and fishing
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam and air conditioning supply
E	Water supply, sewerage, waste management and remediation activities
G	Wholesale and retail trade
H	Transport and storage services
I	Hotel and restaurant services
J	Information and communication services
K	Financial and insurance services
L	Property services
M	Legal, accounting, scientific and engineering services
N	Rental and leasing, real estate and travel services
R	Services related to culture, entertainment and recreation
S	Other services

1.2.2 Variables

The observation variable is the price entry, that is, the price of the transaction that the buyer actually pays, after deducting any discounts.

With regard to Swedish-made products, the *ex works* price is primarily referred to for sales on the domestic market, and *free on board* (f.o.b.) for export sales. With regard to import prices, *cost, insurance, freight* (c.i.f.) are referred to primarily. VAT and other taxes on goods are not included.

The price development shall not include changes to the price that result from a change in quality. In principle, only genuine price changes, expressed in the pricing of comparable transactions, are to affect the development.

The price is to be reported primarily in the trade currency, although recalculation to Swedish kronor is accepted.

1.2.3 Statistical measurements

The PPI can be explained as a chain index with yearly links of the Laspeyres type. The index is published using the base year 2005 = 100.

1.2.4 Study domains

Price index figures are calculated for six different series:

- The Domestic Market Price Index, which is a producer price index for the Swedish market and therefore shows the price development on Swedish-made products sold in Sweden;
- The Export Price Index, which is a producer price index for the export market, and therefore shows the price development on Swedish-made products that are taken out of Sweden;
- The Import Price Index, which shows the price development on products brought into Sweden;
- The Producer Price Index, which shows the total price development on Swedish-made products, and which is obtained through a weighted total of the Domestic Market Price Index and the Export Price Index; and
- The Price Index for domestic supply, that shows price development on products sold in Sweden, and which is obtained through a weighted total of the Domestic Market Price Index and the Import Price Index.
- The Producer Price Index for services, which shows the price development for services furnished by Swedish enterprises.

Index figures are reported for each one of the series, distributed by product group according to SPIN 2007 (see table 1). The five top series refer to the department A-E. The Producer Price Index for services refers to the department G-S. The level of detail in the reporting differs between various product areas, depending on their economic significance, the number of enterprises submitting data, and the degree of concentration, which is relevant for confidentiality assessment. The most detailed reporting is found in the Statistical Database, where index figures for some product areas are even reported at the five-digit level (detail groups).

1.2.5 Reference times

Index figures are primarily calculated monthly for departments A-E, and quarterly for departments G-S, and show the price point for the period in relation to the average price point in 2005. The index figures mainly reflect the development of an average price for the period. The annual average index refers to unweighted arithmetic averages of the periods' index.

2 Accuracy

2.1 Overall accuracy

The PPI is calculated by aggregating prices of goods and services to indices at different category levels during the year. Then, the years are linked together in time series over several years.

The calculations are based on price observations on separate product offerings in each individual month. Price development is calculated first by comparing the current month's prices with the prices in the base period, which is the last period in the previous year. At a detailed level, the Producer Price Index is calculated for services with a weighted geometric instrument. Other reporting groups are calculated with weighted arithmetic instruments.

The total accuracy of the survey at an aggregate level is assessed to be good, resulting from low non-response, accurate sampling frames and frequent use of internationally recommended methods. However, inaccuracy increases at the lower product group levels. A detailed description of the sources of inaccuracy is available in Chapter 2.2.

2.2 Sources of inaccuracy

The source of error "measurement" is probably the largest contribution to the overall inaccuracy.

2.2.1 Sampling

A sample of the combination enterprises (identified by corporate identity number) and products are taken from the PPI every year. A sample unit can have two different types of status, taken with accuracy or taken with probability. Units with large volumes of transaction values are taken with accuracy and then removed from the frame. Then, a probability sample is taken, a "PPS sample" among the remaining units, allowing sample inaccuracy to be calculated.

A sample survey with sample inaccuracy is inevitable, since the whole population is not being surveyed. For statistical surveys, we must accept sampling errors, but we can assess them and taken them into account in our estimates of parameters in the population.

The sample is responsible for moderate inaccuracy in the estimates.

2.2.2 Frame coverage

Coverage error in a survey can consist of undercoverage and/or overcoverage. Undercoverage means that some units in the population for survey are missing in the sampling frame. Overcoverage occurs if units that do not belong to the survey population are included in the sampling frame and contained in the presentation of the results.

The basis of the frame for PPI and TPI originate in other Statistics Sweden surveys; Production of commodities and industrial services (IVP), Structural Business Statistics (FEK), and Foreign trade - exports and imports of goods (UHV). The level of non-response in these surveys is very low, and the existing non-response is estimated using tools such as model calculations. The price index that is produced should reflect the population, which is the frame, so that the frame error is assessed to only have a small effect on the price index. In addition, there is nothing systematic in the frame error that would make it larger or smaller at any specific level.

UHV has some overcoverage as a result of products imported to Sweden and then exported with no further processing. Not only does this lead to overcoverage in the frames for the Import Price Index and the Export Price Index, it also leads to undercoverage in the Domestic Market Price Index, since

there is a risk that too much of the production is counted as export. These types of transactions are cleared out as far as possible before weight calculations are begun.

PPI sample selection uses frames that are two years old, out of necessity. In the sampling process, about 20 percent of the units are eliminated, which can be an indication of overcoverage in the frames.

To alleviate burden on small enterprises, a cut-off is applied that means that enterprises with a turnover below SEK 10 million in the sampling stratum cannot be selected.

The source of error "frame coverage" as a whole probably contributed a little to inaccuracy.

2.2.3 Measurement

Measurement is done once per reference period and product offering, and is expected to refer to the measurement period's average transaction price.

For measurement, a web-based solution called SIV, which is standard at Statistics Sweden, is primarily used. The vast majority of data providers submit the prices via this solution. A small number of data providers submit the prices via email or on a paper questionnaire. See Chapter 2.3 in SCBDOK for more information on measurement instruments.

A measurement error occurs when submitted information does not agree with the "true" value according to the definition of the variable. There are many reasons for this, for example that the question does not match the respondent's accounting, the question is ambiguously worded, the person has an insufficient memory, the respondent could be careless, the measurement methods could be marred by deficiencies, and more. Measurement errors naturally contribute to the inaccuracy of statistics, and can do this in a systematic way (resulting in distortion), as well as in a temporary way (does not lead to distortion but increases inaccuracy).

The use of listed prices is one example of a measurement error. Primarily, the real average transaction price is to be reported, but in some cases listed prices are reported anyway, which risks giving an erroneous picture of the price development. The difference between listed prices and transaction prices includes any discounts given to customers. A higher discount is to be regarded as a lower price. Another source of error can consist of transfer prices/internal prices that do not reflect a market price.

Another measurement error arises when selected specifications are not able to specify the product to a sufficient extent, so that not only the genuine price change is show in the index change. This might be expressed in an erroneously volatile price development, but also in a long-term systematic error due to a shift in quality.

In many product categories, it is difficult to find representative products to monitor over time, and time-based methods are used instead. For example, the hourly rate of a legal consultant is often measured, rather than the handling of an actual case. A problem with measuring hourly rates is that they involve a bias in the price index on productivity development. If the legal consultant in the example above becomes more efficient and can cover more cases in one

hour, this does not show, since only the hourly rate is noted. Time-based measurement methods are mainly used in SPIN 69, 70, and 71.

The assessment is that measurement is the largest contribution to total inaccuracy.

2.2.4 Non-response

There is an obligation under the law for selected enterprises to submit price information. Non-response in a normal month is about 2-4 percent of the price information for departments A-E and 6-7 percent per quarter for departments G-S. As a rule, non-response is not due to refusal, but to the fact that the contact person is not available. This means that non-response is greater in measurement months June and July than in other months.

On non-response, the price is imputed. Average value imputation is often used, in which price development in the most recent period for an appropriate aggregate is used to estimate the price development. This also applies in cases where no sales or import occurred during the measurement month.

This source of error is probably a moderate contribution to inaccuracy. We do not have sufficient information about non-response to judge whether it should be considered systematic or random.

2.2.5 Data processing

A production system, Pi09, was developed to perform most of the PPI calculations. Quality assurance of software and IT systems is now in place and therefore the risk of processing errors is minor. It is not possible to assess the consequences of different types of data processing.

All collected price information is reviewed at the microlevel and at the macro level. Price points with very large changes or with a major effect on the total result are extracted on a special list for extra examination. In the event of any uncertainty, the data provider is contacted.

This source of error is probably a minor contribution to inaccuracy.

2.2.6 Model assumptions

One of the major challenges in all price statistics is monitoring the same product over a longer period of time. Products change, often improving, and this must be assessed in the price statistics to ensure that only one genuine price change shows in the index. Price changes resulting from changes in quality must be eliminated. When an old product is discontinued and new one emerges, an assessment of the quality must be made. There is a manual produced by the International Monetary Fund, in which common quality assessment methods are described (IMF, Chapter 7 https://www.imf.org/external/pubs/ft/ppi/2010/manual/ppi.pdf). The most commonly used methods in the Swedish PPI are simple quantity adjustment, adjustment with the help of an expert and overlap (unless explicit assessment can be made).

In cases where prices are reported in foreign currency, the Swedish Customs' exchange rates are used to recalculate the value to Swedish kronor. The reason for using this method, instead of, for example the Riksbank average rates, is in order to promote the usability of the index as a deflator for foreign trade

estimation of export and import values in current prices. In total, about 50 percent of all export price information and about 60 percent of all import price information is submitted in foreign currency, while other prices are reported in Swedish kronor.

When the data provider recalculates price information from foreign currency to Swedish kronor, hedged or pre-defined rates and similar are used. This can lead to the index not reflecting current values of the Swedish krona.

This source of error is probably a considerable contribution to inaccuracy.

2.3 Preliminary statistics compared with final statistics

The statistics is final at the time of publication.

3 Timeliness and punctuality

3.1 Production time

The following study domains are published about 25 days after the end of the measurement period:

- Domestic Market Price Index
- Export Price Index
- Import Price Index
- Producer Price Index
- Price Index for domestic supply

The Producer Price Index for services is published about 45 days after the end of the measurement period.

The same production time applies for yearly publications.

3.2 Frequency

The following study domains are collected and published monthly:

- Domestic Market Price Index
- Export Price Index
- Import Price Index
- Producer Price Index
- Price Index for domestic supply

The Producer Price Index for services is collected and published quarterly.

3.3 Punctuality

The statistics are published (at 09:30) on the date indicated on the calendar year publishing calendar.

4 Accessibility and clarity

4.1 Access to the statistics

The statistics are made available via statistical news and via the Statistical Database on Statistics Sweden's website. The statistics are also made available via publications, such as Statistics Sweden indicators and the Construction Index. Some percentage changes (relating to the export, import and producer price indices) are made available electronically in Economic "flash statistics" in

connection with publication. The most detailed publication is entered in the Statistical Database, where index series down to SPIN 2007, at the five-digit level are often published. In some commodity groups, more detailed index series can be ordered. Average prices are not normally calculated, although some average prices of coal and petroleum products can be ordered (publication Fuel prices).

4.2 Possibility of obtaining additional statistics

Special processing can be carried out on order. See the website for more information: http://www.scb.se/hitta-statistik/statistik-efter-amne/priser-och-konsumtion/prisindex-i-producent-och-importled/prisindex-i-producent-och-importled-ppi/produktrelaterat/Fordjupad-information/skraddarsydd-statistik

Primary material is available and following special assessment and anonymisation, it can be used for research purposes.

4.3 Presentation

Key figures for Sweden (that is, the Producer Price Index, the Import Price Index, the Export Price Index, the Domestic Market Index, the Price Index for domestic supply, and the Service Price Index, presented in Chapter 1.2.4) are presented and explained on www.scb.se. This also applies to all results in tables and figures.

4.4 Documentation

For more documentation, see the tab Documentation on www.scb.se/PR0301.

There is a special documentation of the PPI, which is standardised by the International Monetary Fund. It is available on the IMF website at https://www.imf.org/external/pubs/ft/ppi/2010/manual/ppi.pdf.

- The sample project. An evaluation of PPS sampling for the Producer and Import Price Index. Background facts 2005:3, Statistics Sweden.
- Quality adjustment of ICT products - Methods and applications in the Swedish Price Index in the Producer and Import Price Index (2006) Quality adjustment of ICT products (2006) (pdf)
- The process of updating the sample for the Swedish Producer and Import Price Indices (2006)
- Pricing Large Equipment, A study for Producer Price Indices (2006) Pricing Large Equipment (2006) (pdf)
- Industrial services in PPI - Methods and applications of Swedish Producer and Import Price Indices – (2008) Industrial services in PPI (2008) (pdf)
- Non-comparable Transactions and Mix-problems Improved Quality for the Swedish Producer and Import Price Index Non-comparable Transactions and Mix-problems (pdf)
- Producer and Import Price Index for electricity power supply (2010) (pdf)

5 Comparability and coherence

5.1 Comparability over time

From the publication of the January index for 2009 (27 February 2009), PPI transitioned to the new product classification SPIN 2007. In this context, the total index figure, that is, the total aggregate for the Producer Price Index, the Domestic Market Price Index, the Export Price Index, the Import Price Index and the Price Index for domestic supply has been redefined. Defined earlier as products under A-D according to SPIN 2002, they now reflect the price development for products in departments B-E according to SPIN 2007.

Roughly, this means that products from agriculture, forestry and fishing are no longer included in the total aggregate, but they are available in the Statistical Database. Instead, electricity, heating, gas, water, waste management and remediation activities are included. This change is in line with EU recommendations and helps increase comparability between countries.

There are many differences among how product groups are defined according to the separate classifications, even at the more detailed levels. Index figures under the previous definition were calculated in parallel until December 2009, and are available in the Statistical Database. Index figures according to SPIN 2002 with base year 1990 are available in the Statistical Database up until 2009. Index figures according to Prod-SNI 97 are backcasted for the period 1990-1994, based on weighting figures that reflect the composition of production and foreign trade in 1993. For earlier indices, up to December 1994, sampling allocation, weight calculations, and reporting were based on a production classification according to an older industry classification, SNI 69. This series was reported with the reference year 1968=100. The differences between this and Prod-SNI 97 are significant. The recommendation is, if possible, to use the old series for the time before 1995. For linking, the recommendation is that linking be used at December 1994.

Change of commodity classification was done in part for the measurement year 1988, from CCCN to HS classification, in part for the measurement year 1998 from HS to KN classification. These changes have not affected the published classification, but they have rendered weight calculation more difficult.

Indices up to 1979 were calculated as a quick base index, which means that a yearly update of weights was not made.

5.2 Comparability between domains

The PPI calculates the average price development using the same index formula for all subgroups included in the survey. It is therefore completely possible to compare the price development between product groups.

5.3 Other coherence

The SPIN 2007 classification that is used is comparable with the European Classification of Products by Activity (CPA 2008). This enables comparison of the price development both for product groups and for the total PPI between European countries.

An important use of PPI is the recalculation of amounts in current prices to a value in fixed prices, in the national accounts system, foreign trade statistics and other economic statistics. The delimitations and standards that are used agree reasonably well. On the other hand, the short period economic statistics

are not distributed by product groups, which is why fixed price calculation is somewhat more schematic there.

Comparisons with the price development for consumer prices (Consumer Price Index (CPI)) are difficult for several reasons, for example because taxes are handled differently, and because weighting figures differ. In addition, there are methodological differences between the two statistics products, for example quality valuation is carried out using different methods.

5.4 Numerical consistency

Published values include all index figures and combined aggregate values of these. There are no shortcomings in the numerical consistency between these statistical values.

General information

A SOS classification

With regard to statistics included in Official Statistics of Sweden (SOS), special rules apply for quality and accessibility, see the Official Statistics Act (2001:99) and the Official Statistics Ordinance (2001:100), and the Statistics Sweden Regulations on the Quality of the Official Statistics (SCB-FS 2016:17).

The statistics are official up to and including the four-digit level according to SPIN 2007.

B Confidentiality and handling of personal data

For confidentiality regarding the authority's specific task for the production of statistics, Chapter 24, Section 8 of the Public Access to Information and Secrecy Act (2009:400) applies.

To safeguard that information subject to confidentiality belong to natural persons or enterprises, it is ensured that the information cannot be disclosed directly or indirectly in the statistics that is published.

Rules for handling personal data are contained in the Personal Data Act (1998:204), the Official Statistics Act (2001:99) and the Official Statistics Ordinance (2001:100). Everyone has the right to receive information free of charge once per calendar year about his/her own personal data that is handled by Statistics Sweden. If the personal information is handled in conflict with the Personal Data Act, the individual has the right to request that the personal data is corrected, blocked or erased.

Information about the contact person for the survey is saved to facilitate any future contacts.

C Archiving and discarding material

There is a culling decision, under National Archives culling decision RA-MS 1998:7 (with changes including 2006:57), that states that forms may be discarded after two years.

Submitted information is subject to the provisions of Chapter 24, Section 8 of the Public Access to Information and Secrecy Act (2009:400). On publication, no single data provider or their information will be identifiable.

The final observation register is saved in Statistics Sweden's internal databases.

D Obligation to provide information

The obligation to provide information applies under the Official Statistics Act (2001:99), the Official Statistics Ordinance (2001:100), and Statistics Sweden's Regulations (SCB FS 2013:4 and SCB FS 2012:9).

E EU regulations and international reporting

Regulation under Council Regulation (EC) No 1165/98 on short-term statistics. Council Regulation (EC) Regulation No 1158/2005 and No 1893/2006.

Statistics Sweden reports indices for different product groups to Eurostat. This is done in connection with publishing. Other international reporting takes place via an email form sent to various international organisations.

F History

Price index series divided into rough product groups have been calculated and are available from 1860. From 1920, a wholesale price index with a more fixed structure and detailed product group classification than before is reported monthly. Statistics were given their modern design in 1963, when a more systematic international industry classification was introduced.

As the production of services has had an increasing significance in Swedish economy, the need for good price statistics in this area has also increased. In the mid-1990s, the development of the Producer Price Index for services (TPI) with indices for rents, hotel services and domestic air travel began. Subsequently, the TPI was developed for even more product groups and continues to be developed.

G Contact information

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