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
2019 Month, quarter, and year.

Product code

PR0301

Sveriges officiella statistik

Quality of the statistics

1 Relevance

1.1 Purpose and information needs

The statistical targets are price indexes for product groups on different markets. Products refer to both goods and services, and product groups can include only goods or only services, or both.

1.1.1 Purpose of the statistics

The purpose of producer and Import Price Indices (PPI) is to present the average price development in the producer and import stages, in total and for different product groups. Prices are measured in the first phase of distribution when products are sold by Swedish producers and when products are bought from foreign suppliers or entered 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 National Accounts and other economic statistics, such as foreign trade in goods e.g.
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 all 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 sections under SPIN 2015[2], see table 1. SPIN 2015 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.

[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

Import/entry by household is in included in 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.

The target object is the price of a transaction for a specific product offering. A product offering is the combination of enterprise and product for which the price should be measured. The observation objects are the prices of the transactions for the product offerings included in the sample.

The population of enterprises changes over time, as enterprises are dissolved, start up or change. Products can also be discontinued and emerge from one month to another, on the market or with a specific enterprise. While some products are considered to be entirely new, others are treated as substitutes for 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:

Section	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 transaction price, 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, customs fees and other taxes are not included. The observation variable is the price related to a specific product offering included in the sample. The difference between the observation variable and both the target variable as well as variable of interest, is that the observed price not necessarily is associated with a sale.

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 in the currency of transaction, 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 2015 = 100. Indexes are calculated using price relatives between the current period and the price reference period for the specific product offering.

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 sold outside 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;
- The Price Index for Domestic Supply, that shows the total 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 produced and sold by enterprises located in Sweden.

Index figures are reported for each one of the series, distributed by product group according to SPIN 2015 (see table 1). The five top series refer to the sections A-E. The Producer Price Index for services refers to sections 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 calculated monthly for sections A-E, and quarterly for sections G-S, and shows average the price level for the period in relation to the average price level in 2015. 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' indexes.

2 Accuracy

2.1 Overall accuracy

The PPI is calculated by aggregating prices of goods and services to indices at different product group levels each month or quarter. Then, the periods are linked together to construct a longer time series.

The calculations are based on price observations on separate product offerings in each individual period. Price relatives are calculated by comparing the current period's prices with the prices in the base period, which is the last period in the previous year. At a detailed level, sections A to E are calculated with an weighted arithmetic average, while sections G to S are calculated with a weighted geometric average. Aggregation is done using weighted arithmetic averages.

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 uncertainty

The largest contribution to the overall inaccuracy is considered to come from measurement. Non-response and sampling are considered to be the second largest sources of uncertainty. The overall accuracy is not possible to measure. The only source of uncertainty that is measurable is the uncertainty stemming from sampling.

2.2.1 Sampling

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

As such, a sample survey causes some uncertainty, since the whole population is not being surveyed. For statistical surveys, we must accept sampling errors, but we can assess them and take 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 sample frame. Overcoverage occurs if units that do not belong to the survey population are included in the sample frame and contained in the presentation of the results.

The basis of the frame for PPI originates in other Statistics Sweden surveys; Production of commodities and industrial services (IVP), Structural Business Statistics (FEK), Foreign trade - exports and imports of goods (UHV) and Foreign trade in services (UHT). The level of non-response in these surveys are very low, and 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. Therefor 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 eliminated as far as possible before weight calculations begin.

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. This 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 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 prices via this solution. A small number of data providers submit prices via email or on paper questionnaires.

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 random way (does not lead to distortion but increases inaccuracy).

The use of list prices is one example of a measurement error. Primarily, the real average transaction price is to be reported, but in some cases list prices are reported anyway, which risks giving an erroneous picture of the price development. The difference between list 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 handle more cases in one hour, this does not show, since only the hourly rate is reported. Time-based measurement methods are mainly used in SPIN 69, 70, and 71.

The assessment is that measurement gives 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. Weighted non-response in a typical month is about 3-5 percent of the price observations for sections A-E and 8-15 percent per quarter for sections G-S. Non-response is usually not due to refusal, but to the fact that the contact person is not available. This means that non-response is greater for June and July than in other months.

For non-response, the prices are imputed. Average imputation is the default method, in which price developments in the most recent period for an appropriate aggregate is used to estimate a price development for the missing observation. 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 micro level and at the macro level. Price observations with very large changes or with a major effect on the total result are put on a special list for extra examination. In the event of any uncertainty, the data provider is contacted.

This source of error is considered giving a minor contribution to inaccuracy.

2.2.6 Model assumptions

One of the major challenges in all price statistics is monitoring the exact 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 a genuine price change is being reflected in the index. Price changes resulting from changes in quality must be eliminated. When an old product is discontinued and a 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 for products in sections A-E, 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. For sections G-S the exchange rates used come from the survey Securities statistics at Statistics Sweden.

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

Prices for transactions for the study domains below are collected, and indexes 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 available in the Statistical Database, where index series down to the four digit level are published. For 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 of 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 after special assessment and anonymization 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

As o8 the publication of the January index for 2017 (27 February 2017), PPI transitioned to the product classification SPIN 2015. The differences between SPIN 2015 and SPIN 2007 are very small. Index figures according to SPIN 2007 are calculated up to the end of 2018, and published 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 made weight calculation more difficult.

Indices up to 1979 were calculated as a fixed 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 possible to compare the price development between product groups.

5.3 Other coherence

The SPIN 2015 classification that is used is comparable with the European Classification of Products by Activity (CPA 2.1). 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 statistics, for example quality adjustments can be 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 2015.

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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