QUALITY DECLARATION
Producer and Import Price Index (PPI)

Subject area
Prices and consumption

Statistical area
Producer and Import Price Index

Product code
PR0301

Reference time
2021 (Month, quarter, and year)

Sveriges officiella statistik

Quality of the statistics

1 Relevance

1.1 Purpose and information needs

1.1.1 Purpose of the statistics
The reported statistics provide the average price development in the producer and import stages, in total and for different products that are either sold by Swedish producers (the first distribution stage) or bought from foreign suppliers (the first stage of purchase).

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) The Riksbank (Swedish central bank), 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
The statistical target characteristics are indices with a given base year equal to 100. From these indices, users can calculate new indices or ratios between any periods.

1.2.1 Unit and population
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.

The target population is limited to 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.

Imports/arrivals by household is in included in the population of interest, but is excluded from the target population. The same applies to imports/arrivals of products for further export, that is, products that are not consumed or processed in Sweden. These are excluded from imports/arrivals and from exports/dispatches.

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[1]Imports refer to products brought in from countries outside of the EU. Arrivals refer to products brought in from other EU countries
[2]Swedish Standard of Industry Classification 2007

Table 1. Overview of sections * of product codes, defined in SPIN2015.

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

Each section includes main groups, each of which consist of subgroups, consisting of detail groups. The lowest aggregation level of product codes within each section is seven digit groups.

The observation units are individual transactions for the corresponding product offer, divided into the three groups according to the type of market, i.e. export, import and the Swedish market. A product offer is the combination of company and product that is to be priced.

The target units correspond to the observation objects.

Data sources are mainly companies and authorities (hereinafter referred to as companies).

1.2.2 Variables

The observation variable is the transaction price, that is, the price of the transaction that the buyer actually pays for the product offer sampled. The price should represent the average price for the month to which the price measurement refers, and it must be reported in the trading currency (even if conversion to Swedish kronor is accepted). This makes it possible to use a uniform exchange rate (the Swedish Customs 'courses for sections A-E, Securities Statistics' courses for sections G-S, see Table 1). With regard to Swedish-made products, the *ex works* price is primarily referred to for sales on the Swedish 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 target variable is the price in Swedish kronor, and it is derived from the observation variable through the conversion using a uniform exchange rate, given that the conversion is needed.

The variables of interest are the same as the target variables.

1.2.3 Statistical measures

The PPI is defined as a chain index with yearly links of the Laspeyres type. The index is published using the base year 2020 = 100. The index figures mainly reflect the development of an average price for the period of interest. Annual average indices are unweighted arithmetic averages of the period indices calculated within the year of interest. For the complete description of the index construction, see section 2.7.2 in Statistics Sweden's presentation, www.scb.se/PR0301.

It is important to point out that PPI should not reflect price changes due to changes in quality of products but only pure price changes that are reflected in the pricing of comparable products.

1.2.4 Study domains

The PPI is calculated for five 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.

PPIs are reported for each one of the series, distributed by product group according to SPIN 2015 (see table 1). The five series are published monthly for sections A-E, and quarterly for 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 periods

PPIs are calculated monthly for sections A-E, and quarterly for sections G-S (se Table 1).

2   Accuracy

2.1   Overall accuracy

On the whole, the level of accuracy of estimates obtained at the aggregated product group levels is judged to be high, due to low non-response, accurate sampling frames and frequent use of internationally recommended methods. However, uncertainty increases as product group levels decrease.

During the first quarter of 2020, covid-19 began to spread in Sweden and around the world. During this period, an increase in overcoverage was expected (mainly due to bankruptcies and restrictions on the pandemic) as well as a higher proportion of non-responding companies. However, the observed levels of non-response and overcoverage in 2020 turned out not to differ significantly from the corresponding levels observed in 2019. Overcoverage in 2020 has increased most in the product groups that have been affected by pandemic restrictions, namely among hotels, travel services and the like. Overall, however, it was judged that the pandemic did not have a negative impact on the overall reliability of the reported statistics. The same statistical measures and methods, which were used before the pandemic broke out, have also been used in 2020.

2.2   Sources of uncertainty

Various model assumptions – and to a lesser extent measurement errors – are considered to be the sources of uncertainty that contribute most to overall uncertainty. Measuring the sample instead of the whole population is considered to be the second largest sources of uncertainty. Besides the sample uncertainty, it is not possible to quantify the uncertainty linked to the other sources of uncertainty.

2.2.1   Sampling

Every year, one draws a PPS sample of product offers, each of which represents a combination of enterprise (identified by corporate identity number) and a certain product. Some sample units come into the sample with the probability 1, while the remaining ones are drawn with the probability less than 1.

In summary, sample uncertainty is judged to be relatively low for estimates at the aggregated product group levels, while for estimates at the lower product group levels sample uncertainty is considered greater.

2.2.2   Frame coverage

Deficiencies in frame coverage can lead to 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.

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. If this is done properly there should be no overcoverage, only undercoverage. The frame is assessed to approximate the target population well.

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 uncertainty *Frame coverage* as a whole probably contributed little to the total uncertainty.

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 arises 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 unsertainty 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 8-20 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.

In some product groups where standardized products do not exist, this can lead to non-response. See Chapter 2.2.6 for more information on how such cases are handled.

For non-response, the prices are imputed. Targeted mean 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.

In sum, the total effect of the non-response on the statistics is judged to be relatively small because (1) the response rate is high, and (2) the non-response is compensated via imputations.

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 uncertainty is considered giving a minor contribution to overall uncertainty in the estimates of PPI.

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).

Transactions that are below the sample cut-off limit are assumed to have the same price development as the transactions that are surveyed. This assumption rests on the economic theory of small enterprises as price takers, not price setters.

When standardized products are not available, a comparable price cannot be reported between different periods. This means that the price development cannot be base don actual transactions prices. Model pricing can be used in such cases. A product specification can be constructed by the respondent and the price of this model specification, had it been sold, is reported.

The use of time-based methods is problematic for two main reasons. The first reason, is that the method does not capture any changes in productivity that might occur. The second reason, is where the service that is sold is a total service, that is not comparable over time. Measuring the price of the working time might not reflect the price development of the total service, although in this case they are assumed to be the same. The advantage of time-based methods is that it is feasible for the respondent to report.

The method of targeted mean imputation is the internationally most recommend imputation method. The price development of at least three other similar products is used to calculate an imputed price.

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 (Swedish central bank) 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 uncertainty is assumed to contribute considerably to overall uncertainty.

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

For sections A-E indices are published about 25 days after the end of the measurement period. For sections G-S indices are published about 45 days after the end of the measurement period.

The same production time applies for yearly publications.

3.2 Frequency

Price indices for the study domains in Chapter 1.2.4 are published monthly for sections A-E and quarterly for sections G-S.

3.3 Punctuality

The statistics are published (at 09:30) on the date indicated in the 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. Some percentage changes (relating to the export, import and producer price indices) are made available electronically as Economic indicators 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 available through subscription.

4.2 Possibility of additional statistics

See the website for more information:

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 data 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, and the Price Index for domestic supply, 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 are manuals released by international organizations, such as IMF, OECD and ILO, that specifies best practices in the area of price statistics.

The manuals are available on the following websites
https://www.imf.org/external/pubs/ft/ppi/2010/manual/ppi.pdf

https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-
/KS-04-14-661

https://www.imf.org/en/Publications/Manuals-
Guides/Issues/2016/12/31/Export-and-Import-Price-Index-Manual-Theory-
and-Practice-19587

5 Comparability and coherence

5.1 Comparability over time

As of 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 among groups

The PPI measures 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 The classification Official Statistics of Sweden

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).

B Confidentiality and the 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 Storage and elimination

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, in line with decision RA-MS 2019:63.

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 regulation 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 details

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