statistics f!ash

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April 2022

INDUSTRIAL PRODUCTION

- The index measures the monthly evolution of the volume of industrial production (excluding construction). From January 2022 the indices are calculated as annual chain-linked indices instead of fixed base indices. The weighting reference is now year 2021 while the reference base is still the year 2015. Indices are produced according to Ateco 2007 classification (Italian edition of Nace Rev. 2).
- In April 2022 the seasonally adjusted industrial production index increased by 1.6% compared with the previous month. The change of the average of the last three months with respect to the previous three months was +2.0%.
- The calendar adjusted industrial production index increased by 4.2% compared with April 2021 (calendar working days being 19 versus 21 days in April 2021).
- The unadjusted industrial production index decreased by 2.8% compared with April 2021.

CHART 1. INDUSTRIAL PRODUCTION, SEASONALLY ADJUSTED INDEX AND THREE-MONTH MOVING AVERAGE
January 2017 – April 2022 (index, 2015=100)

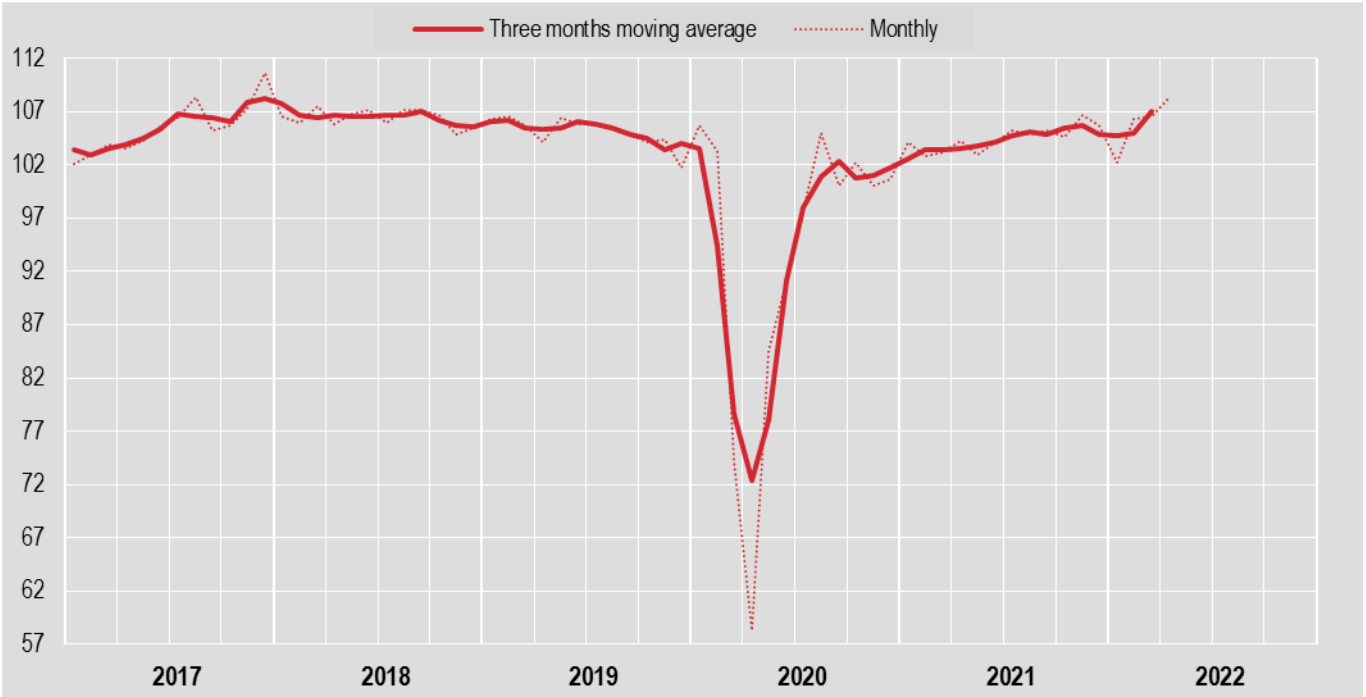


CHART 2. INDUSTRIAL PRODUCTION, MONTH ON SAME MONTH A YEAR AGO PERCENTAGE CHANGES

January 2018 – April 2022, calendar adjusted data (index, 2015=100)

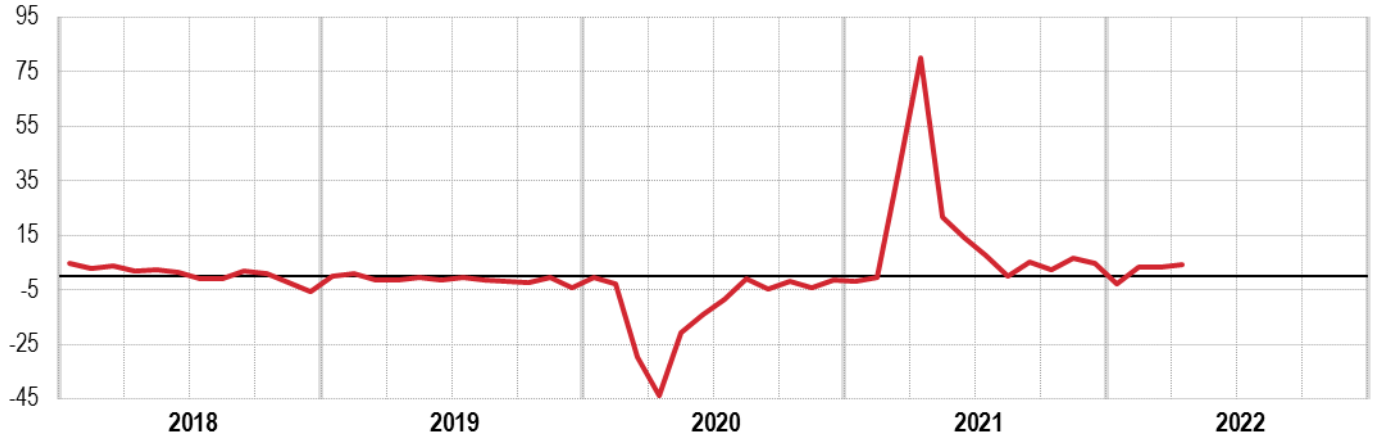


TABLE 1. INDUSTRIAL PRODUCTION INDICES (a), MONTHS ON PREVIOUS MONTHS AND ON SAME MONTHS A YEAR AGO PERCENTAGE CHANGES

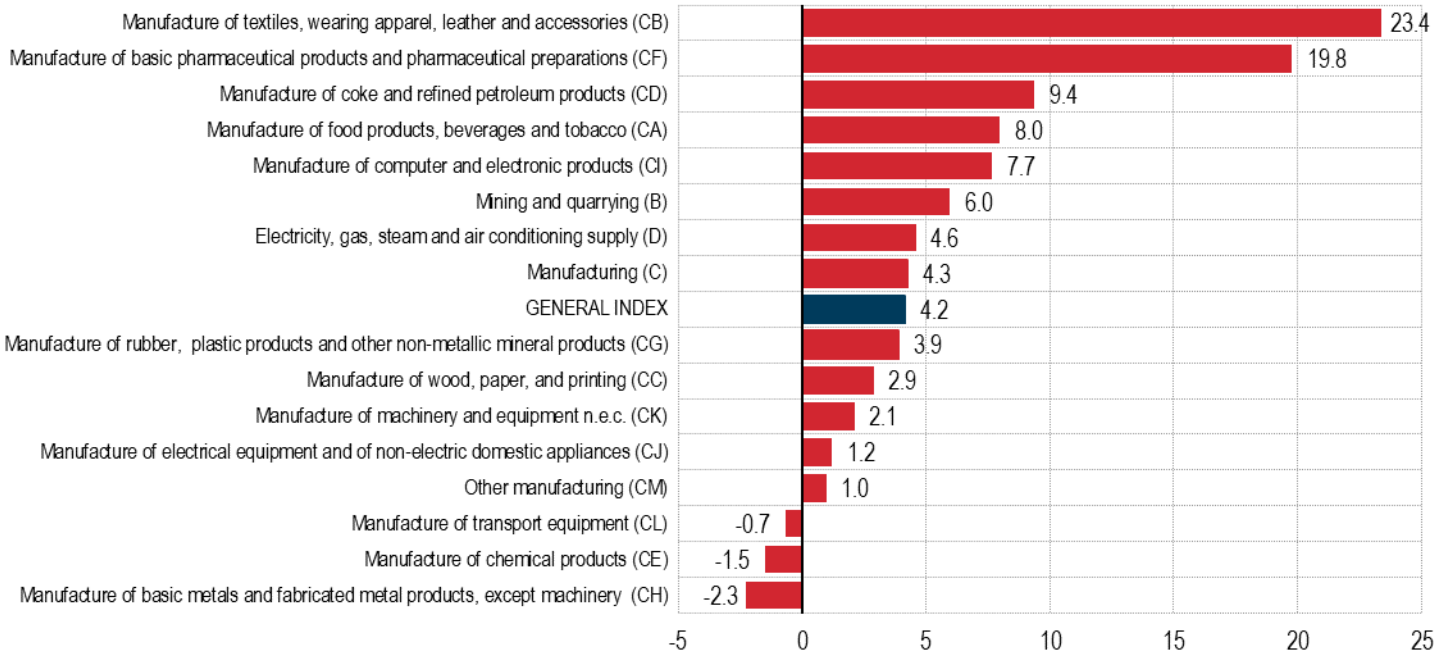
April 2022 (b) (index, 2015=100)

INDICES	Index (2015=100)	Months on previous months		Months on same months a year ago	
		Apr 22 / Mar 22	Feb22-Apr22 / Nov21-Jan22	Apr 22 / Apr 21	Jan-Apr 22 / Jan-Apr 21
Industrial production seasonally adjusted	108.2	+1.6	+2.0	-	-
Industrial production calendar adjusted	107.9	-	-	+4.2	+2.1
Industrial production non – seasonally adjusted	103.7	-	-	-2.8	+1.2
Calendar working days	19				

(a) Excluding construction.
(b) Data are provisional and subject to revisions. The first revision takes place with the dissemination of the following month and takes into account additional information received from enterprises. Since 2022 data undergo also an annual revision of the previous year.

CHART 3. YEAR-ON-YEAR GROWTH RATE BY INDUSTRIAL GROUPINGS

April 2022, calendar adjusted (index, 2015=100)



The table below shows routine revisions, calculated as differences (in percentage points) between first publication and the latest estimates concerning the same reference period. Revisions to year-on-year growth rate refer to not adjusted data of the month prior to the current reference period. With regard to the short-term growth rate, an additional monthly revision for seasonally adjusted data occurs as new observations can change the seasonal factors that are applied to the whole time series.

TABLE 2. INDUSTRIAL PRODUCTION BY MAIN INDUSTRIAL GROUPINGS, REVISIONS

March 2021, percentage changes revisions, percentage points changes (index, 2015=100)

Industrial Production Index		Durable consumer goods		Non-durable consumer goods		Capital goods		Intermediate goods		Energy	
Month-on-month change (a)	Year-on-year change (b)	Month-on-month change (a)	Year-on-year change (b)	Month-on-month change (a)	Year-on-year change (b)	Month-on-month change (a)	Year-on-year change (b)	Month-on-month change (a)	Year-on-year change (b)	Month-on-month change (a)	Year-on-year change (b)
+0.2	+0.2	0.0	-0.1	+0.3	+0.1	+0.1	+0.2	+0.1	+0.1	-0.1	-0.2

(a) Figures are calculated on seasonally adjusted indices

(b) Figures are calculated on non seasonally adjusted indices

Consumer durables: examples of consumer durables include household appliances, furniture, motorcycles and audio and video equipment.

Consumer non-durables: examples of consumer non-durables include food and beverages processing and preservation, several kinds of textile manufacturing and pharmaceutical manufacturing.

Intermediate goods: examples of intermediate goods include chemical industry, metal fabrication, metal products and electrical appliances manufacturing, wood industry and textiles processing.

Capital goods: examples include production of machinery and manufacturing equipment, measuring and test equipment and vehicles.

Survey sample: subset of statistical units selected from a larger population in order to conduct a survey. In short-term statistics, a theoretical sample is defined when rebasing the indices every five year to obtain longitudinal or panel data, considering the actual corporate changes over time.

Calendar adjusted data: calendar adjusted data refer to the correction for calendar effect in a reference period (month or quarter) that may vary from year to year. This method allows a reconciliation of asymmetries for calendar differences such as the number of working days, the week days distribution in the reference period and the occurrence of public holidays (including moving holidays like Easter) and of a leap year. Working day adjusted data permit to better compare year-on-year growth rate and average annual growth rate.

Seasonal adjusted data: seasonal adjusted data refer to the statistical technique designed to remove fluctuations related to seasonal factors (such as weather conditions, administrative measures, etc.…) and calendar effects when relevant. Seasonal adjustment provides a clearer view for a trend analysis of a short-term index.

Energy: examples of energy industries include extraction of raw materials (petroleum, natural gas, coal) and refining processes and electricity, gas, steam and air conditioning supply.

Working days: calendar days of the month, not including Saturdays, Sundays, religious and secular public holidays.

Industrial production index: industrial production index measures the monthly evolution of physical volume of production made by industrial establishments (excluding construction).

Main industrial groupings: consumer durables, consumer non-durables, intermediate goods and energy. Commision Regulation (EC) No 656/2007 defines, for the whole European Community, the Main Industrial Groupings (MIGS): each industrial group and industrial activity division head to a different category of this aggregate classification. Istat also releases the Consumer Goods Index, calculated as the weighted average of the durable and non-durable components.

Economic activities sections: according to classification ANA/ISIC A38. The statistical classification of economic activities in the European Community (NACE Rev. 2) – from which Ateco classification derives – do not include subsections in the structure of the aggregates.

Month on month growth rate: short-term growth rate compares a period (typically a month or quarter) with the previous period, measuring the percentage change.

Year-on-year growth rate: Y-o-Y compares a period (typically a month or quarter) with the same period from the previous year, measuring the percentage change.

Sources and Regulatory framework

The industrial production index measures the change of the volume of goods produced over time by industry (excluding construction).

The legal basis for the STS indicators are the Regulation (EU) 2019/2152 of the European Parliament and of the Council on European business statistics, repealing 10 legal acts in the field of business statistics (EBS-Regulation) and the Commission Implementing Regulation 2020/1197 laying down technical specifications and arrangements pursuant to Regulation (EU) 2019/2152 (General Implementing Act).

The survey is provided by the current National Statistical Programme in force, accessible on the Istat internet site at https://www.istat.it/it/istituto-nazionale-di-statistica/organizzazione/normativa (Italian only).

Population, analysis and survey units

The industrial production index is based on the results of a sample statistical survey, conducted among enterprises (survey units), that measures the volume of production of the goods included in a representative basket of products (analysis units). This allows the calculation of indices for product line items that, in turn, are grouped by business activity according to the Laspeyres formula and using a weighting structure that reflects the sector distribution of the industrial value added in the year set as the reference period, which now is 2021.

The reference list for identification of the enterprises that take part in the sample is made up from the Statistical Archive of Active Companies (Asia), while the selection is made upon the results of the annual PRODCOM[1] survey.

Survey design and data collection

The monthly survey of industrial production is conducted directly on a panel of approximately 5,400 companies, which provides the data concerning less 9,900 monthly production flows, generally defined in terms of physical quantity. Further statistical sources are used for the estimating production trends of specific industrial sectors. Amongst others, the survey on livestock slaughtered for red and white meat, conducted by Istat; the information provided by the National Offices for Mineral Resources, Hydrocarbons and Geothermal Energy of the Ministry of Productive Activities; the data of electrical energy production surveyed by TERNA (National Electric Network).

For the purposes of maintaining the significance of the index and in order to consider potential changes in quality of industrial products over time, the survey requests the amount of hours worked for specific products (whose weight within total index is 13.6%); the elementary indices of products are then calculated using coefficients of productivity estimated using aggregates of short-term statistics (turnover index and hours worked). Moreover, for a minor number of products (whose weight within total index is 9.8%), the survey requests value of production, purposely deflated with producer price indices.

Indicators, weighting structures and classification systems

Starting from 9th March 2022, indices of industrial production are calculated using the annual chain-linking method; for reporting period January 2022 onward, year 2021 is set as the weighting reference period and 2015 is set as the reference year. Further information are available in the methodological note attached to this bulletin (only available in Italian). Indices regarding earlier periods (January 2015 – December 2021) are still built using 2015 as a fixed base reference year, following the methodology illustrated in the detailed briefing note: “Il nuovo indice della produzione industriale in base 2015” of 19 March 2018 (only available in Italian).

The index is built according to Ateco 2007 classification of economic activities, the Italian version of Nace Rev. 2. To ensure the compliance with the European short-term statistics regulation (Council Regulation 1165/98), the reference base year for IPI is presently 2015; this change is part of the process of reference bases redefinition that took place in all European countries in 2018.

The survey allows to elaborate production indices for 614 items of products which are aggregated in order to compile indices at a higher level of aggregation: Industrial production for each economic activity (according to the classification of economic activities Ateco 2007), Industrial production general index and Industrial production for

[1] Annual survey of industrial production

Main Industrial Groupings (MIGS), as defined by Commission Regulation No. 656/2007 (Official Journal of the European Community of 14 June 2007).

The Main Industrial Groupings are: consumer durable goods, consumer non-durable goods, capital goods, intermediate goods and energy.

The Community Regulation has determined, for all Member Countries, the criteria for the definition of MIGS: entire groups and/or divisions of economic activity are assigned to different groupings according to the prevailing criteria. Istat also publishes the Consumer Goods Index, obtained as the weighted average of the consumer durable goods and consumer non-durable goods indices.

The following table shows the weights, allocated within the weighting system used for the calculation of the industrial production index, the Main Industrial Groupings and the economic activity sectors.

TABLE 1. WEIGHTING STRUCTURE BY ECONOMIC ACTIVITY

Reference year 2021, percentage values

Main Industrial Groupings		Year 2021
	Consumer goods	26,4642
	Consumer durable goods	*3,9267*
	Consumer non-durable goods	*22,5375*
	Capital goods	29,2603
	Intermediate goods	32,7975
	Energy	11,478
Economic activity sectors		
B	**Mining and quarrying**	**1,0837**
C	**Manufacturing**	**88,8588**
CA	Manufacture of food products, beverages and tobacco products	9,9691
CB	Manufacture of textiles, apparel, leather and accessories	8,0266
CC	Manufacture of wood and paper products, and printing	4,9041
CD	Manufacture of coke and refined petroleum products	0,8742
CE	Manufacture of chemicals and chemical products	4,1408
CF	Manufacture of basic pharmaceutical products and pharmaceutical preparations	3,4624
CG	Manufacture of rubber and plastic products and other non-metallic mineral products	8,1318
CH	Manufacture of basic metals and fabricated metal products, except machinery and equipment	14,3565
CI	Manufacture of computer, electronic and optical products	2,7762
CJ	Manufacture of electrical equipment and of non-electric domestic appliances	3,8651
CK	Manufacture of machinery and equipment n.e.c.	13,5519
CL	Manufacture of transport equipment	7,2564
CM	Other manufacturing, and repair and installation of machinery and equipment	7,5437
D	**Electricity, gas, steam and air conditioning supply**	**10,0575**
General index		**100.0000**

Seasonally and calendar adjusted series

In addition to the raw indices, calendar adjusted time series are also released. In accordance with the guidelines on seasonal adjustment for the European Statistical System, time series are corrected using a regression model (through the TRAMO procedure - LINUX version), which identifies the effect of the working days (calendar days of the month excluding Saturdays, Sundays and secular and religious holidays not coinciding with Saturdays and Sundays), the leap years and Easter through the introduction of a set of regressors in the univariate model that describes the trend of the series. Since the effect due to the working days is not a zero mean value on an annual basis, the calendar adjusted series calculated through this method would not present an average of 100 for the reference base year (2015 in this case). To release a set of indices with a common base and therefore allowing Eurostat to estimate the European aggregates, the adjusted time series are reported on a base of 2015=100 through a redistribution that maintains the dynamic profile unchanged. Moreover, regressors method results in the revision of the data, since each new monthly information added to the series may require new estimates of the regression parameters.

Given an equal number of working days, the procedures here described may cause discrepancies between y-o-y growth rate calculated on the raw time series and y-o-y growth rate calculated on adjusted data. Negligible differences may be determined from the redistribution and from the subsequent rounding; more relevant differences are due to the effects of the leap year and Easter[2], and to the type of model used for the correction of the calendar effects. In the case of the additive model, in fact, the differences are inversely proportional to the level of the indices and directly proportional to the absolute value of the trend variations calculated on the raw series.

Following a quality review, from August 2018 onwards new models for estimating calendar and seasonal effects at ATECO levels are adopted. Consistently with the previous rebasing procedure, to overcome the widespread problems of model instability due to the 2008-2009 economic crisis, the time series were made shorter, beginning January 2001, and the indices concerning the 1990-2000 period will not be subject to further modifications.

Finally, the seasonally adjusted indices are obtained through the TRAMO-SEATS procedure (LINUX version). Like the other seasonal adjustment procedures, also TRAMO-SEATS assumes that each intra-year time series is constituted of three different components, not directly observable: the trend-cycle, that represents the underlying medium and long-term movement; the combined seasonal and calendar effects, which are intra-year fluctuations; an irregular component, due to erratic factors. TRAMO-SEATS uses a model-based approach consisting in identifying a reliable and representative model for the time series to be seasonally adjusted.

In order to eliminate the seasonal component, it is necessary to select a decomposition model of the raw series into the previously listed different elements: the industrial production indices are seasonally adjusted using either an additive decomposition (the observed data are equal to the sum of the non-observable elements), or a multiplicative decomposition (the observed data are equal to the product of the non-observable elements).

The industrial production indices are calendar and seasonally adjusted separately for each economic activity sector, Main Industrial Grouping and for the general index, therefore the most aggregated indices are not calculated as synthesis of the seasonally adjusted data referring to lower classification levels. Since the addition of new monthly information allows a better evaluation of the different components of the series, each month previously published data concerning the most recent years are subject to revisions.

The statistical models used for the seasonal adjustment and for the correction are reviewed at the beginning of each year to ensure their ability to correctly represent the trend of the single time series. With the release of January 2022 data, not only unadjusted series have been updated, but also models for seasonally adjustment have been revised up to NACE Economic activity sectors level. In the next months, revision of models will be performed at division, group and class level.

To allow the user to adopt the same processing specifications used by Istat in the context of the TRAMO-SEATS procedure, specifications are available upon request for analytical purposes.

Revision of the indices

The industrial production indices concerning the most recent month are provisional and subject to revision that takes place with the dissemination of the following month and takes into account additional information received from enterprises (revised indices are released on occasion of the press release).

A second type of revision occurs annually and concerns the time series of the indices. This revision aims at incorporating three types of information into the indices available after the publication of the first revision. Specifically, the elements considered in the revision process are the following:

- Responses received from the enterprises after the dissemination of the revised indices (which usually occurs around 60 days from the end of the reference period); it involves a very limited number of responses, which accounts, on average, for approximately 1.7% of the sample (measured in terms of production volume) but which may determine corrections on the disaggregated indices.

- The ex-post corrections of information already received from the companies, and which, on the basis of successive verifications, result to be affected by errors in the measurement of the phenomenon. Usually these modifications have a minor effect on the aggregated indices, however they occasionally may cause significant revisions for specific sectors.

[2]Since the regressor takes the week prior to Easter Sunday into consideration, the differences may be more or less consistent according to whether the whole week falls completely within one month or not.

The update and periodic revision of the short-term statistics (turnover index and hours worked), on which the used annual productivity coefficients are based, as previously mentioned, for the products indicated through the monthly flows of hours worked. These products, whose weight, as previously noted, is 13.6%, are concentrated in some sectors (particularly in machinery and mechanical equipment, electrical equipment and, specifically, transport vehicles, repairs and systems installation). As a consequence, the effect of the coefficient revision may be significant for those specific sectors.

Until 2021 these revisions typically occurred when releasing the indices concerning the month of February and incorporated both the new estimates of the short-term statistics for the three previous years and the corrections based on the late responses received and on the corrections to already received information.

Starting from year 2023 retrospective revision will concern the previous year.

Exceptionally, for this year only, the annual revision were disseminated with the bulletin of 9th March 2022 (data release of January 2022) and concerns monthly indices of 2021.

Further information related to short terms indicators revisions is available at http://www4.istat.it/en/economic-trends/revisions.

Territorial breakdown

The indices are calculated and disseminated on a national level.

Timeliness

Dissemination of the monthly industrial production indices is made with a press release and series are published on the Istat data warehouse I.stat, 40 days past the end of the reference period.

Dissemination

The press releases are available on the internet site at http://www.istat.it/en/archive/industrial+production.

The monthly industrial production indices are available for free at I.Stat, the Istat data warehouse, in the section “Industry and Construction /Production/Industrial Production Index”.

The description of the execution method of the survey and the activities performed to guarantee the quality of information produced is available in the Quality Information System (SIQual) of the Istat statistical processes.

Measures adopted to handle the impact of pandemic emergency on the survey

With reference to the seasonally adjustment procedure used to treat the indicators disseminated, the seasonal adjustment models were reviewed to manage the exceptional decreases recorded taking into consideration the Eurostat guidelines, available at the URL:

https://ec.europa.eu/eurostat/documents/10186/10693286/Time_series_treatment_guidance.pdf

Therefore, since March 2020, the unusual size of the changes of the unadjusted time series were taken into account. For this purpose, additional regressors (the so-called additive outliers) were introduced in models for seasonal adjustment when statistically significant. This procedure, which aims at minimizing the revisions of past values of the seasonally adjusted series, was carried out until the reference month of January 2021. As soon as the available information will allow an overall evaluation of the great volatility phase, models will be revised/modified if necessary. In that case, revisions of seasonally adjusted data may be larger than usual.

For technical and methodological information

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