INDUSTRIAL PRODUCTION INDEX

Updating of the calculation basis and the reference base

◼ Starting from the publication of the January 2024 data, the industrial production indices are released in the new reference base 2021=100. The calculation base has also been updated and now relates to 2023. The methodological aspects and the main effects produced by the rebasing on the evolution of the indices are illustrated in this information note.

◼ The 2024 indices are calculated using the chaining method introduced by the publication of the indices relating to the month of January 2022. The innovations introduced concern not only the change in the reference base but also the sources used, the updating of the sample of enterprises used in the survey, the revision of the weighting system, the updating of the basket of goods.

◼ Starting from this edition, the survey on industrial production uses information deriving from the survey on industrial turnover, appropriately deflated, for some groups of economic activity.

◼ In the comparison between the weighting structures of the 2022 and 2023 calculation base, some variations in the weights for the different groupings emerge: a decrease in the incidence of consumer goods corresponds to an increase of the same intensity as that of intermediate goods. Furthermore, the decrease in the incidence of capital goods corresponds to the increase in the share for energy. As for the 2022 base, the sectors with the greatest incidence in the industrial production index are those of the metallurgy and manufacturing of metal products industry (15.9%) and that of the manufacturing of machinery and equipment not classified elsewhere (13,1%). The sectors with the greatest incidence in the industrial production index are those of the metallurgy and metal product manufacturing industry (with a weight of 14.4%) and that of the manufacturing of machinery and equipment not classified elsewhere (13.6%).

◼ With the transition to the 2023 calculation base, the previous basket of 612 macro items has changed, also following innovations on the sources used. Against 58 eliminated macroproducts, 40 were inserted: the number of elementary macroproducts of the new base is therefore equal to 594. For the 2023 base, the enterprises in which monthly production is recorded are just under 5,400; the responding units are instead 5,700 and communicate data relating to approximately 9,500 monthly production flows

◼ The industrial production indices starting from 1990 and up to the economic activity class level with a reference base of 2021=100 are published on the IstatData website at https://esploradati.istat.it. Calculation based data is available upon request.

CHART 1. INDUSTRIAL PRODUCTION INDEX. January 2023-December 2023, percentage changes on the same month of the previous year, data adjusted for calendar effects

TABLE 1. INDUSTRIAL PRODUCTION INDEX. Comparison between the weighting structure of link period 2021 and 2022

MAIN INDUSTRIAL GROUPINGS	Link period 2022	Link period 2023
Consumer goods	26.0711	24.8350
Consumer durable goods	3.9283	4.0910
Consumer non-durable goods	22.1429	20.7439
Capital goods	29.2581	28.6116
Intermediate goods	33.1939	34.4035
Energy	11.4769	12.1500
Total	**100,0000**	**100,0000**

Industrial production index

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

The aim is to provide an estimate, a high frequency indicator that is promptly available, of the evolution over time of the economic output in the industrial sector, measured in gross production terms.

Gross production is estimated through the *proxy* variable approach, the proxies used allow to represent the target variable accurately and they are easily measureable on a monthly basis by enterprises. This helps to reduce the statistical burden on businesses. The *proxies* used to catch the evolution of production are: the physical quantities of each individual output (different production processes use different units of measurement), the deflated output value and the hours worked (corrected using a labour productivity indicator).

For the indices of the year 2024, the calculation base is set at the year 2023 while the reference base, in line with the other economic indicators, has been updated to the year 2021.

The innovations introduced are recommended by main methodological manuals and by Eurostat[1]. Changes concern the procedure for calculating indices, the updating of the sample of enterprises used in the survey, the revision of the weighting system, the updating of the basket of goods.

Enterprises monthly provide detailed information on industrial output referred to a basket of representative goods, of all the productive activities present in the Italian industry. Aggregated data are then used to calculate individual product indicators.

The data received, appropriately aggregated, give rise to the index numbers relating to the individual product items. The elementary indices are then summarized by economic activity, according to the Laspeyres formula, using a weight structure that reflects the sectoral distribution of industrial added value in the base year of calculation (2023 in the current version). In more detail, for each level of aggregation, the first slip coefficient of the series is represented by the average of the indices relating to the year 2021 based on 2021, while for subsequent years, by the product of the latter by the annual averages of the indices based on the calculation of each year following 2021 up to the year preceding the current one.

From a quality perspective, the new chain-linking approach is expected to provide more accurate estimates. In particular:

- more frequent update of the weighting structure will limit the loss of representativeness of the base and the timeliness of the weights reflecting the industrial production structure;

- updating the sample of enterprises allows monitoring enterprises' births and deaths more effectively, enabling a more frequent sample rotation too;

- annual update of basket of goods will allow to quickly detect new relevant products and remove obsolete items.

Besides these advantages, chain-linking have drawbacks both for the user and for the producer of statistics. For users, disadvantage of chain-linked estimates is non-additivity that causes greater complexity to analyse aggregates that are not in the dissemination plan, based on the current classification scheme; for producers, the adoption of chain-linking requires a considerable additional commitment to monitor the sample of enterprises and the basket of goods.

The new calculation method based upon chain-linking

The European regulation on short-term statistics recommends the adoption of chain-linking method whenever the economic structure is developing fast. For those sectors where relative prices do not change significantly, the chain-linking method is still recommended to improve the quality of the indicator, overcoming typical limitations of a fixed-based index. Chain-linking allows for a better representation of economic evolution, as it uses more up-to-date information on the weighting system, on the basket of goods and on enterprises. It also reduces the problem of revisions related to the five-yearly rebasing.

---

[1]Recommendations for the Index of Industrial Production 2010 (IRIIP 2010), Department of Economic and Social Affairs, International United Nations New York, 2013 - https://unstats.un.org/unsd/industry/docs/f107_edited.pdf.
Final Report Task Force Chain-Linking in STS- Doc Eurostat/G3 STS TF Chain-Linking SEP 2012 EN- https://t.ly/3SgO.

In order to achieve comparability of data across countries EU strongly advises countries willing to implement the annual update of weights in STS in combination with chain-linking to follow several recommendations regarding these common target methodologies.

With regard to the weighting structure, an annual update is recommended, while for the chain-linking of STS volume indices the recommended common target methodology is the annual *overlap technique* that implies compiling estimates for each reference period at the weighted annual average of the previous year, with subsequent linking through annual linking factors to scale the monthly data upward to the base year[2].

It is underlined that on the occasion of this base change, the indices for the years 2022 and 2023, already calculated on the 2015 reference base with the chaining method, were brought back to the new 2021 reference base, through a sliding operation carried out through the averages of the indices for the year 2021 based on 2015 reference.

The indices of industrial production are constructed and disseminated at different levels of Ateco classification; both fixed-base indices and indices with different base periods are obtained starting from elementary indices.

The calculation of the chain-linking indices for different economic aggregates is performed at different processing levels.

At the first level, the elementary indices are calculated with reference to the link period, i.e. the ratios between current production flows in the month *i* and year *t* and the respective monthly bases of the year *t-1* (average flows of the previous year). In this phase of the calculation procedure, the value-form information is appropriately deflated using current prices, while coefficients are applied to data expressed in hours worked, which measure the evolution of productivity in the link period[3].

The second level of processing concerns a higher level of aggregation: these indices are weighted arithmetic averages (concatenated Laspeyres-type formula) which are obtained, for all aggregates, starting from elementary indices. The weighting structure is derived from a nested classification, where the sum of the weights of each aggregation level is equal to the weight of the overall index. Indices calculated at different aggregation level are subsequently brought back to the reference base using the respective rescaling coefficients.

Annex 1 shows the example relating to the raw data of the general index of how the slip coefficients and the coefficients for the transition to the different bases were used.

Innovations on the sources used for survey

An important innovation introduced starting from the 2023 calculation base from the industrial production survey (hereinafter referred to as IPI) concerns the use of data from the industrial turnover survey (FAT) for some economic activity groups. Table 2 indicates the sectors involved in the change. The feasibility analyzes carried out beforehand highlighted a good correspondence between the data from the two surveys. The innovation mainly aims to reduce the statistical burden on companies, exploiting the synergies between surveys without reducing the informative capacity of the IPI survey. The choice of the Ateco classes/groups for which to acquire the data/indexes of the FAT survey, appropriately deflated with the relative production prices, was made based on several criteria:

- the consistency of the temporal trends between the data of the two surveys in terms of indices and/or trend changes;
- the unit of measurement used in recording production, preferring the sectors recorded in value (same unit of measurement as turnover);
- the source used, with the aim of reducing the units of surveys other than companies. This was the motivation that prevailed in preferring the information coming from FAT in section B. In the IPI survey, in fact, the information on the products belonging to the ATECO classes 811, 812 and 899, derived from the monthly mailings of some regions, which are the subjects who grant the mines under concession. In class 2540 (Manufacture of weapons and ammunition) it was the National Test Bench that communicated the number of rifles and pistols tested monthly.

---

[2] Chain-linking can be performed using either the short formula (average of the previous year's chained index) or the formula with link factors (averages of indices related to the link period) up to the latest base year.

[3] Compared to the fixed base, where the productivity coefficients are related to the base year, in chain-linking productivity is related to the previous year.

TABLE 2. THE ATECO CLASSES/GROUPS SELECTED FOR THE SWITCH FROM IPI TO FAT

DESCRIPTION	Class(a)	Group	Division	Subsection
Extraction of stone, sand and clay	811, 812	81	8	B
Extraction of minerals from quarries and mines nec	891; 892; 893; 899 (I)	89	8	B
Preparation and spinning of textile fibres	1310	131	13	CB
Textile finishing	1330	133	13	CB
Wood cutting and planing	1610	161	16	CC
Manufacture of agrochemicals and other agricultural chemical products	2020	202	20	CE
Manufacture of paints, varnishes and enamels, printing inks and synthetic adhesives	2030	203	20	CE
Manufacture of synthetic and artificial fibres	2060	206	20	CE
Manufacture of refractory products	2320	232	23	CG
Cutting, shaping and finishing stones	2370	237	23	CG
Manufacture of steam generators (excluding metal containers for hot water central heating boilers)	2530	253	25	CH
Manufacture of weapons and ammunition	2540	254	25	CH
Manufacture of computers and peripherals	2620	262	26	CI
Manufacture of audio and video consumer electronics products	2640	264	26	CI
Manufacture of irradiation instruments, electro-medical and electro-therapeutic equipment	2660	266	26	CI
Manufacture of jewellery, costume jewelery and related items, processing of precious stones	3211; 3212(I); 3213	321	32	CM
Manufacture of musical instruments	3220	322	32	CM
Manufacture of sporting goods	3230	323	32	CM
Manufacture of games and toys	3240	324	32	CM

(a) The classes marked with I indicate those that were included in the IPI survey up to the 2015 base

The basket of goods

The adoption of data from FAT – as can be imagined – has significantly changed the number of the basket of Products and the Panel of enterprises included in the survey. Starting from the 2023 base, the survey of industrial production is carried out by a panel of companies that provide information on just under 1,196 products (of which 105 car models) on a monthly basis. These products are grouped into homogeneous groups to form a basket of goods, which represents the elementary level of aggregation (*macroprodotti*).

The elementary indices are then aggregated by classes, groups, divisions, subsections and ATECO sections, Main Industrial Groupings up to the overall index.

The list of surveyed products can theoretically be updated annually or less frequently, according to annual ProdCom survey and the indications from the trade associations of various industrial sectors. The updates aim at ensuring that the most representative products for each class of economic activity are annually sorted.

As always, the renewal of the base constitutes the opportunity to make changes dictated by the need to keep the list of products updated, taking into account the real weight of the monitored products and at the same time reducing the response burden on enterprises.

From this perspective, among the changes made for the new basis, the impact in terms of added value of the Ateco classes (see below) was also carefully analysed, to identify which of those with irrelevant weight could be excluded from the survey without reducing their information capacity and violate the Regulation underlying the investigation[4].

---

[4] Regulation (EU) 2019/2152 of the European Parliament and of the Council of 27 November 2019 (with subsequent Implementing Regulation (EU) 2020/1197 of 30 July 2020) which establishes the level of detail, the methodology and the frequency with which the indicators cyclical data must be produced and transmitted to Eurostat. Specifically, the regulation requires that at least 90% of the added value of section C be detected.

Five classes were chosen, three of which due to their very low weight and two due to the presence of a limited number of enterprises:

- class 1081, which occupies the 209th position in the 2021 added value ranking of the 229 manufacturing classes;
- class of 2051 present in 218th place;
- class 2343 which ranks 226th;
- the 1814 and 2670 classes which occupy the 171st and 178th position respectively[5].

Therefore, considering the changes described, 148 products were eliminated, of which 123 due to the transition to FAT (see attachment 2). At the same time, 42 new products were introduced into the survey, of which 19 were made up of the sectors covered by the FAT survey. The remainder are products that have assumed significant weight in some classes (see Table 4)

With the transition to the 2023 calculation base, the previous basket of 612 macro product items of the 2022 base (including macro products for cars) was reduced to 594: Compared to 58 macro products eliminated (53 due to the transition to FAT) 40 have been added[6].

With the update of the weighting structure, the incidence of the proxies used to measure the trend of industry output have changed compared to the previous base of 2022. As can be imagined, the share –expressed in terms of the relative weight on the general index – of products recorded in value to the detriment of the other two measures. The incidence of products recorded in quantity remains predominant, however decreasing compared to the previous base (72.7% compared to 76.3%), followed by products recorded in value of production (15.1%), whose share instead, it grows by almost 5 percentage points compared to the 2022 base. Finally, the incidence of products in hours worked is 12.2%.

TABLE 3. **PROXIES USED TO MEASURE PRODUCTS.** Weighting structure of fixed base 2015 and link period 2021, 2022 and 2023

TYPE OF PROXY	Base 2015	Base 2021	Base 2022	Base 2023
Physical quantities (a)	76,4	76,6	76,3	72,7
Hours worked	13,1	13,6	13,5	12,2
Value of production	10,5	9,8	10,1	15,1
TOTALE	**100,0**	**100,0**	**100,0**	**100,0**

(a) Include: Kilograms, Quintals, Tons, Kilowatts, Liters, Hectoliters, Hectahydrides, Pairs, Pieces, Meters, Square Meters, Cubic Meters.

---

[5] In the classes 1814, 2670 and 2343 there were only products and companies under observation while the two other classes (1081 and 2051) were indexed.

[6] A macroprodotto can be constructed from multiple elementary products.

TABLE 4. CHANGES ON THE PRODUCT PANEL

DESCRIZIONE
ELIMINATED
Products belonging to FAT classes/groups
Jellies from mine
Landmine powders
Smokeless powders
Disruptive explosives for various uses (TNT, pentrite, etc.)
Binding of printed books, newspapers and other products of the printing industry
White sugar from beetroot and raw materials
Sugars with added flavorings or colourings
Other ceramic products (electricity insulators, insulating parts for electrical machines, etc.)
Optical apparatus and instruments (including parts and accessories)
Photographic and cinematographic equipment (including parts and accessories)
Escalators and moving walkways
Scales for weighing people and families (excluding coin-operated weighing scales)
Vinyl chloride copolymers
Shredded
Fluorite
Manganese
Lead
Other tied and untied tubes
Unbound smooth tubes
Protective tubes for electrical cables
Drilling pipes
Coats, cloaks, children's overcoats
Displacement
INVOLVED INTO OTHER PRODUCTS
Numerically controlled removal machine tools
Numerically controlled definition machine tools
NEW
Products belonging to FAT classes/groups
Command/numerical control machine tools
Coated, coated or impregnated fabrics
Ignition coils, spark plugs, magnetos, starters, automotive generators
Preparations for cakes, desserts and fillings
Plastic parts for machinery and electrical appliances
Other plastic objects
Plastic footwear parts
Other general services relating to mechanical engineering
Parts of taps and valves
Other food and beverage manufacturing machines
Acoustic signaling devices for vehicles
Installation of electrical panels for the control or distribution of electricity
Bottles and large bottles of plastic materials
Capsules, caps and other closure devices made of plastic materials
Disinfectants
Other beauty products
Aluminum alloys
Electric engines
Other parts of refrigerators, freezers and heat pumps
Glass processing machines
Gas pipes (seamless)
Stainless steel and refractory tubes (without welding)
Other seamless tubes

The sample of enterprises

Net of the enterprises no longer involved in the survey due to the transition to FAT, the definition of the panel of companies to be involved in the monthly survey took place through the analysis of the results of the annual ProdCom survey. The review of the panel took place by trying to reconcile two objectives: maximizing coverage, in terms of production share, for each of the product groups considered and containing the response burden of the business system. The enterprises were chosen in the vast majority of cases from those with at least 20 employees. Even more attention than in the past, the inclusion of small-sized ones took place by looking with particular attention both to the type and intensity of the products sent, and by considering the belonging to the sector of activity where the presence of the small business could have a certain importance (such as the milling and dairy industries).

The considerations expressed above meant that numerous enterprises were excluded for the new base both due to the small size of the workforce and due to the capture of information through turnover data. Furthermore, the survey has always had a list of enterprises under observation with which to replace those which, for any reason (for example cessation of activity, change in production) were to be excluded from the survey in the future.

Furthermore – as seen in the analysis of the products –numerous productions have moved from the status of *productions under observation* to *productions under index*, not only because they were included in new macro-products, but due to a more careful examination of the requirements suitable for the transition into already existing macro-products.

In summary, for the 2023 base, the enterprises that contribute to the definition of the monthly index are just under 5,400; while the responding units are just over 5,700: they communicate data relating to approximately 9,500 monthly production flows (see Table 5).

In the numbers considered, sources different than enterprises are also included. In particular, the production survey makes use of other information such as:

- data from the monthly survey on livestock slaughtered for red and white meat conducted by Istat at authorized slaughterhouses;
- the information provided to Istat by MIMIT - General Directorate for security of supply and energy infrastructures for gas distribution
- the values on electricity production that are provided by Terna, operator of the electricity transmission networks.

TABLE 5. THE SAMPLE Comparison between link period 2022 and 2023

UNITS	AUMONT		FLOWS BETWEEN DIFFERENT BASE PERIODS		
	Link period 2022	Link period 2023	Outgoing from period 2022	Incoming from period 2022	Entering link period 2023
Enterprises	5.376	5.395	470	4.906	489
Respondent units[a]	5.697	5.705	459	5.238	467
Productions [b]	9.787	9.524	1.091	8.696	828

(a) Respondent units to the survey It also includes the 19 responding units from FAT

(b) Monthly flows provided for each single production (products by respondent units).It also includes the 19 productions units from FAT

The comparison between the 2022 and 2023 bases in terms of enterprises, responding units and productions is inevitably affected by the operations described above (choices of enterprises to include and their responding units, changes to the basket of goods and associated productions).

The comparison highlights the turnover of enterprises with a slightly positive balance between incoming units (489 enterprises) and outgoing units (470). The balance is still positive for the number of responding units (467 incoming and 459 outgoing), while it is strongly negative for the number of productions recorded monthly.

The transition to FAT inevitably plays a very significant role in the count: 74% of responding units exit and 54% of productions exit.

The following table highlights the flows by sector of economic activity. The transition to FAT has significantly reduced production in the subsections CB - Textile, clothing, leather and accessories industries and CE - Manufacturing of chemical products with a reduction of 13.7% and 20.8% respectively. The aggregate in which there was the greatest relative increase in production was CH - Metallurgy and manufacturing of metal products (excluding machines and plants): in CH the impact of the transition to FAT, although present, was less incisiveness. In addition, several productions previously under observation contribute to the index from the 2023 base. Similar reasons are behind the growth in production for the aggregates CG - Manufacture of rubber and plastic articles, other products from the processing of non-metallic minerals (+7.0) and CK - Manufacture of machinery and equipment n.e.c. (+4.4). The CA subsection Food, beverage and tobacco industries has by far the largest number of productions (just under 1,500); its dynamics was determined only by the need to update the panel of enterprises and products.

TABLE 6. THE PANEL. Comparison between link period 2022 and 2023 by economic sector

ECONOMIC ACTIVITY		PRODUCTIONS [a]				
		Aumont		Flows between different base periods		
		Link period 2022	Link period 2023	Outgoing from period 2022	Incoming from period 2022	Entering link period 2023
B	**Mining and quarrying**	27	10	19	8	2
C	**Manufacturing**	9.758	9.512	1.072	8.686	826
CA	Manufacture of food products, beverages and tobacco products	1.515	1.486	68	1.447	39
CB	Manufacture of textiles, apparel, leather and related products	1.349	1.164	256	1.093	71
CC	Manufacture of wood and paper products, and printing	610	587	41	569	18
CD	Manufacture of coke, and refined petroleum products	324	323	1	323	0
CE	Manufacture of chemicals and chemical products	968	767	248	720	47
CF	Manufacture of pharmaceuticals, medicinal chemical and botanical products	159	155	8	151	4
CG	Manufacture of rubber and plastics products, and other non-metallic mineral products	784	839	60	724	115
CH	Manufacture of basic metals and fabricated metal products (except machinery and equipment)	1.160	1.320	64	1.096	224
CI	Manufacture of computer, electronic and optical products, electro-medical equipment, measuring equipment and watches	129	102	36	93	9
CJ	Manufacture of electrical equipment and non-electric domestic appliances	365	375	21	344	31
CK	Manufacture of machinery and equipment n.e.c.	1.206	1.259	69	1.137	122
CL	Manufacture of transport equipment	551	530	107	444	86
CM	Other manufacturing, and repair and installation of machinery and equipment	638	605	93	545	60
D	**Electricity, gas, steam and air-conditioning supply**	2	2	0	2	0
Total		**9.787**	**9.524**	**1.091**	**8.696**	**828**

(a) Monthly flows provided for each single production (products by respondent units

The weighting structure

The weighting structure of the industrial production indices is desgined using various sources.

Weights of all aggregates, from economic activity classes (4-digit Ateco 2007) up to the total industry are calculated on the basis of the gross value added of factor costs measured by the SBS Frame statistical register and by the structural economic surveys that contributes to the "Enterprises economic indicators".

For the definition of the weighting structure of the 2023 base, the most recent data available relate to the year 2021.

The source for calculating weighting coefficients for aggregating quantities of products to elementary indices is annual ProdCom survey on industrial production, currently referring to year 2022. Products selected for the link period 2023 were recoded[7] according to the ProdCom list corresponding to the Nace Rev. 2 classification and relative weights are derived from the total production value (net of any reuse).

Attribution of weights for each level of aggregation is based on the assumption that, at each level, the products and the economic activities surveyed are representative of those not involved in the survey, so that the total weight of the higher level is distributed among products.

The use of annual chain-linking implies the annual update of weights, therefore the latest releases of ProdCom and SBS Frame will be used for this purpose. The timeliness of the release of SBS causes a misalignment when compared to the industrial production index, consequently to guarantee the best representativity of the weighting structure, weights are also updated for the previous year. Based on the current schedule of data release, the weights will be updated as follows:

- for the provisional/revised indices of year t, ProdCom referring to year $t-2$ and SBS Frame referring to year $t-3$ will be used;

- for the annual revised indices of year t, ProdCom $t-1$ and SBS Frame at $t-2$ will be used.

The wheights update requires that for each *"year index"* two weighting structures will be calculated on two different ProdCom/SBS Frame datasets, one for the provisional and revised indices and one for the annually revised indices.

Together with the dissemination of the indices based on the 2023 calculation, the new weights are made available.

Table 7 presents a comparison between the weighting structures for the calculation base in the years 2022 and 2023, considering the large aggregates corresponding to the Main Groupings of Industries (RPI). Some variations in the weights emerge for the different groupings. The incidence of consumer goods decreased, above all due to the decline in non-durable consumer goods, partly offset by the modest growth in durable consumption. The decrease of 1.2 percentage points for consumer goods corresponds to the increase in the incidence of the same intensity of intermediate goods. Furthermore, the loss in the incidence of capital goods of 0.6 percentage points is balanced by the increase in the share for energy.

TABLE 7. INDUSTRIAL PRODUCTION INDEX. Comparison between the weighting structure of base 2022 and base 2023

MAIN INDUSTRIAL GROUPINGS	BASE 2022	BASE 2023	DIFFERENCES
Consumer goods	26,0711	24,8350	-1,2361
Durable	3,9283	4,0910	0,1628
Non-durable	22,1429	20,7439	-1,3989
Capital goods	29,2581	28,6116	-0,6465
Intermediate goods	33,1939	34,4035	1,2096
Energy	11,4769	12,1500	0,6731
Total	**100,0000**	**100,0000**	

[7] A correspondence table is defined annually, which links each single product detected by the monthly survey to one or more codes of the ProdCom list.

Comparing the weighting structure of the two bases at economic activity level appears useful to catch all changes occurred (Table 8).

TABLE 8. INDUSTRIAL PRODUCTION INDEX. Comparison between the weighting structure of link period 2022 and 2023

	SETTORI DI ATTIVITÀ ECONOMICA	Link period 2022	Link period 2023	Differences
B	**Mining and quarrying**	1.0838	1,28596	0,2022
C	**Manufacturing**	88.8599	88,51912	-0,3407
CA	Manufacture of food products, beverages and tobacco products	9.9691	9,76181	-0,2073
CB	Manufacture of textiles, apparel, leather and related products	8.0263	7,12865	-0,8977
CC	Manufacture of wood and paper products, and printing	4.9059	4,56031	-0,3456
CD	Manufacture of coke, and refined petroleum products	0.8742	1,07463	0,2004
CE	Manufacture of chemicals and chemical products	4.1400	4,46264	0,3227
CF	Manufacture of pharmaceuticals, medicinal chemical and botanical products	3.4632	3,08068	-0,3825
CG	Manufacture of rubber and plastics products, and other non-metallic mineral products	8.1315	8,38088	0,2494
CH	Manufacture of basic metals and fabricated metal products (except machinery and equipment)	14.3533	15,88443	1,5311
CI	Manufacture of computer, electronic and optical products, electro-medical equipment, measuring equipment and watches	2.7758	2,74651	-0,0293
CJ	Manufacture of electrical equipment and non-electric domestic appliances	3.8657	3,84412	-0,0216
CK	Manufacture of machinery and equipment n.e.c.	13.5530	13,11598	-0,4370
CL	Manufacture of transport equipment	7.2590	7,29534	0,0364
CM	Other manufacturing, and repair and installation of machinery and equipment	7,5429	7,18314	-0,3597
D	**Electricity, gas, steam and air-conditioning supply**	10,0564	10,19492	0,1386
Total		**100,0000**	**100,0000**	

The metallurgy and manufacturing of metal products industry and the manufacturing of machinery and equipment not classified elsewhere are once again confirmed as the sectors with the greatest impact on the industrial production index. In particular, the first sector whose weight was already the greatest in the previous base grows even more, reaching 15.9% in 2023. For the second, the incidence, although among the largest, decreased by four tenths of a percentage point: it is now equal to 13.1%. Among the sectors that are growing, the following are worth mentioning: manufacturing of chemical products, manufacturing of rubber and plastic articles, other products from the processing of non-metallic minerals, manufacturing of coke and refined petroleum products and the extractive industry. On the other hand, the relevance of the textile sector drops by nine tenths of a percentage point and that of the production of basic pharmaceutical products and pharmaceutical preparations and that of the other manufacturing industries, repair and installation of machinery and equipment by around four. Section D is also growing.

Working days and seasonal adjustment

The treatment of the deterministic components and seasonality is carried out with the methodology already used for the indices on a fixed basis for 2015.

The correction procedure for calendar effects was carried out with the regression method (applied using the TRAMO procedure), which identifies the effect of working days, leap years and Easter by introducing a set of variables into the statistical model that describes the trend of the series.

The seasonally adjusted indices were obtained through the TRAMO-SEATS+ procedure. 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 seasonal component that causes 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 overall index (direct approach). Since last year, the adoption of the chain-linking led to a revision of the adjustment method of the consumer goods series, previously obtained as the weighted aggregation of durable and non-durable consumer goods, while now it is seasonally adjusted through a direct approach.

The transition to the new calculation method gave the opportunity to review statistical models used for seasonal and calendar adjustment to better represent the trend of time series. In particular, the models relating to the sectors of *Manufacture of food products, beverages and tobacco products (CA)*, *Manufacture of wood and paper products, and printing (CC)*.

Consistently with the previous base, estimated series starts from January 2001.

Further details on models used for seasonal and calendar adjustment are available upon request.

New revision policy

The industrial production indices of the most recent month are provisional and subject to a revision, occurring with the dissemination of the following month and considering additional information received from enterprises (revised indices are disseminated in the press release).

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

1. The release of the most recent data to define the weighting structure. As previously highlighted, at the moment for the indices of the year *t* there is a misalignment between the year of the link period (*t-1*) and the data available for calculating the structure of their weights (*t-3* for the SBS Frame and *t-2* for ProdCom). When the indices for the year *t+1* are released (where link period is *t*) also data *t-2* for the SBS Frame and *t-1* for the ProdCom become available, therefore data for year *t* are revised to update the weighting structure.

2. The updating and periodic revision of the short-term statistics (turnover index and hours worked) on which the used annual productivity coefficients are based, as mentioned above, for the products surveyed through the monthly flows of hours worked. These products that, as previously reported, weights for 12.2% belong to few sectors (in particular, machinery and mechanical equipment, electrical equipment, transport vehicles, repairs and systems installation). Consequently, the effect of the coefficient revision may be significant for those specific sectors.

3. Responses received from the enterprises after the dissemination of the revised indices (which usually occurs around 60 days past the reference period); it involves a very limited number of responses, which accounts, on average, for approximately 2.3% of the sample (measured in production volume terms) but which may determine corrections on the disaggregated indices.

4. Subsequent corrections of information previously received from enterprises that have been reported as inaccurate by consistency checks. Usually these modifications have a minor effect on the aggregated indices, however they occasionally may cause significant revisions for specific sectors.

The revisions for the year 2023

The comparison between the annual rates of change of the indices based on 2015 and those based on 2021 shows for the general index an annual dynamic (-2.4%) better than that of the index based on 2015 (-2.9%). Here - as mentioned - the updating of three factors is at work: the responses arriving late which have a marginal impact, the productivity which exerts its effects above all in capital goods (the annual variation of the same goes from +2.2% to + 4.0%) and the role of the new weights, visible for example in the change in the variation of the energy with a greater decline (from -5.7% to 6.1%).

TABLE 9. RAW INDUSTRIAL PRODUCTION INDEX. Comparison between the 2015 and 2021 base for the year 2023 Average annual changes by main industry groupings

MAIN INDUSTRIAL GROUPINGS	AVERAGE ANNUAL CHANGES	
	Base 2015	Base 2021
	2023	2023
Consumer goods	-4,1	-4,3
Durable	-6,0	-6,7
Non-durable	-3,8	-3,8
Capital goods	2,2	4,0
Intermediate goods	-5,7	-5,5
Energy	-5,7	-6,1
Total	**-2,9**	**-2,4**

ANNEX 1. INDUSTRIAL PRODUCTION INDEX GENERAL INDEX ON THE BASIS OF REFERENCE 2015 AND 2021: EXAMPLE OF USE OF THE SLIDE COEFFICIENTS AND THE COEFFICIENTS FOR SWITCHING TO THE DIFFERENT BASES. RAW VALUES

Period	Official indices Base year 2015	Official indices Base year 2021	Slip coefficient/ concatenation (a) (b) (c)	Base of calculation	Recalculation of indices through coefficients	Differences between official and recalculated indices (d)
202001	101.2	96.4	1.04892		96.5	-0.1
202002	104.9	100	1.04892		100.0	0.0
202003	82.2	78.4	1.04892		78.4	0.0
202004	58.8	56.0	1.04892		56.1	-0.1
202005	86.5	82.4	1.04892		82.5	-0.1
202006	95.9	91.4	1.04892		91.4	0.0
202007	110.5	105.3	1.04892		105.3	0.0
202008	68.8	65.6	1.04892		65.6	0.0
202009	107.2	102.2	1.04892		102.2	0.0
202010	110.5	105.3	1.04892		105.3	0.0
202011	105.5	100.6	1.04892		100.6	0.0
202012	90.6	86.3	1.04892		86.4	-0.1
202101	93.4	89.1	1.04892		89.0	0.1
202102	103.8	98.9	1.04892		99.0	-0.1
202103	117.1	111.6	1.04892		111.6	0.0
202104	106.7	101.7	1.04892		101.7	0.0
202105	108.5	103.5	1.04892		103.4	0.1
202106	109.7	104.5	1.04892		104.6	-0.1
202107	115.5	110.1	1.04892		110.1	0.0
202108	71.0	67.7	1.04892		67.7	0.0
202109	112.7	107.4	1.04892		107.4	0.0
202110	109.7	104.6	1.04892		104.6	0.0
202111	112.7	107.5	1.04892		107.4	0.1
202112	97.9	93.4	1.04892		93.3	0.1
202201	93.7	89.3	1.04892	89.3	89.3	0.0
202202	107.4	102.4	1.04892	102.4	102.4	0.0
202203	122	116.3	1.04892	116.3	116.3	0.0
202204	103.6	98.8	1.04892	98.8	98.8	0.0
202205	115.6	110.2	1.04892	110.2	110.2	0.0
202206	108.6	103.5	1.04892	103.5	103.5	0.0
202207	110.6	105.4	1.04892	105.4	105.4	0.0
202208	73.2	69.8	1.04892	69.8	69.8	0.0
202209	112	106.8	1.04892	106.8	106.8	0.0
202210	107.7	102.7	1.04892	102.7	102.7	0.0
202211	108.5	103.4	1.04892	103.4	103.4	0.0
202212	91.3	87.0	1.04892	87.0	87.0	0.0
202301	98.1	94.4	0.99633	94.7	94.4	0.0
202302	105.0	100.8	0.99633	101.1	100.7	0.1
202303	118.1	113.2	0.99633	113.5	113.1	0.1
202304	93.0	89.4	0.99633	89.7	89.4	0.0
202305	111.6	106.7	0.99633	107.0	106.6	0.1
202306	107.8	102.8	0.99633	103.1	102.7	0.1
202307	108.1	103.1	0.99633	103.5	103.1	0.0
202308	70.2	66.9	0.99633	67.1	66.9	0.0
202309	106.4	101.8	0.99633	102.1	101.7	0.1
202310	109.9	105.2	0.99633	105.5	105.1	0.1
202311	105.4	100.9	0.99633	101.2	100.8	0.1
202312	84.0	80.6	0.99633	80.8	80.5	0.1
202401		94.1	0.97084	97.0	94.2	-0.1

ANNEX 2. LIST OF PRODUCTS DELETED DUE TO THE MOVE TO TURNOVER

DESCRIPTION	CLASS	SUB-SECTION	PRODUCTS
Extraction of stone, sand and clay	811	B	Marl for cement; Uncalcined dolomite;
	812	B	Clays and refractory earths; Bentonite; Kaolin; Smectic clays
	813		Fluorite
	891		Rock salt
Extraction of minerals from quarries and mines nec	899	B	Feldspar; Talc; Natural magnesium carbonate
Preparation and spinning of textile fibres	1310	CB	Carded yarns; Worsted yarns; Open-end yarns; Carded yarn for weaving; Carded yarns for knitting; Worsted yarn for weaving; Woolen ribbon (tops); Combed yarns for knitting; Silk yarn; Silk waste yarn; Synthetic fiber yarn; Artificial fiber yarn; Synthetic twisted yarns; Artificial twisted yarn; Linen and ramie yarns
Textile finishing	1330	CB	Yarn dyeing; Dyeing of fabrics; Finishing of fabrics and clothing items
Wood cutting and planing	1610	CC	Sawn timber; Profiled coniferous slats for roofing and cladding;
Manufacture of agrochemicals and other agricultural chemical products	2020	CE	Inorganic sulphur-based; Inorganic copper-based; Organic sulfur nitrogen; Heterocyclic organic nitrogen; Aromatic and aliphatic organic nitrogen; Triazoles; Other fungicides; Vegetable derivatives and similar synthetics; Phosphororganics; Other insecticides; Amides; Carbamates (herbicides); Urea derivatives; Benzonitrile nitroderivatives; Diazine-triazines; Phosphororganic-dipyridyls; Other herbicides; Other plant protection products
Manufacture of paints, varnishes and enamels, printing inks and synthetic adhesives	2030	CE	Enamels and colors for ceramics; Paints for building (including tempera); Wood paints; Paints for industrial use; Paints for body repairs; Auxiliary and miscellaneous products; Printing inks; Painting products for marinas and pleasure boats; Painting products for industrial maintenance and anti-corrosion; Carbon black;
Manufacture of synthetic and artificial fibres	2060	CE	Polyamide thread; Monofilament polyamides (to be included in continuous threads); Polyamide staple and bundles; Polyamide waste; Polyester thread; Monofilament polyester (to be included in continuous threads); Polyester staple and bundles; Polyester waste; Cupro waste; Polypropylene thread; Polypropylene staple and bundles; Polypropylene waste; Polyethylene filament yarn
Manufacture of refractory products	2320	CG	Silica, siliceous, aluminous and aluminous silica material; Basic material; Insulating material; Cements, mortars, concretes and similar compositions, refractory; Other refractory material;
Cutting, shaping and finishing stones	2370	CG	Marble, travertine, alabaster, cut/sawn and otherwise worked granite
Manufacture of steam generators (excluding metal containers for hot water central heating boilers)	2530	CH	Hot water boilers for industrial uses; Steam boilers for industrial uses;
Manufacture of weapons and ammunition	2540	CH	Side-by-side smoothbore shotguns; Combined rifles; Rifles, carbines, floberts; Rifles, muzzle-loading pistols; Semi-automatic rifles; Shotguns; Smoothbore over and under shotguns; Shotguns 1 smooth bore barrel; Muzzle-loading revolver; Breech-loading revolver; Other guns; Semi-automatic pistols; Loose parts of weapons;
Manufacture of computers and peripherals	2620	CI	Automatic information processing machines; Input and output peripheral units; Parts and accessories of automatic information processing machines; Scanners including barcode readers;
Manufacture of audio and video consumer electronics products	2640	CI	Radio communication apparatus; Loudspeakers not mounted in loudspeakers; Loudspeakers mounted in loudspeakers
Manufacture of irradiation instruments, electro-medical and electro-therapeutic equipment	2660	CI	Radiology equipment
Manufacture of jewellery, costume jewelery and related items, processing of precious stones	3212	CM	Jewelery and goldsmithery, (coated) with precious metals: Production sold; jewelery and goldsmithery, (coated) with precious metals: Contract processing (manufacturing only); jewelery and goldsmithery, (coated) with precious metals: Processed raw material;
	3213	CM	Watch straps and bracelets; Manufacture of costume jewelery and similar items
Manufacture of musical instruments	3220	CM	Digital pianos, keyboards and other keyboard instruments; Parts and accessories of musical instruments;
Manufacture of sporting goods	3230	CM	Ski and mountain boots for men (leather upper); Ski and mountain boots for women (leather upper); Ski and mountain boots for children (leather upper); Ski and mountain boots for men (plastic or other uppers); Ski and mountain boots for women (plastic or other uppers); Ski and mountain boots for children (plastic or other uppers); Objects and tools for sports and outdoor games; Ice skates, roller skates etc.; Objects and equipment for gymnastics and athletics;