

## **Chapter 10 - Methodological and Base Changes**

The industrial production index has existed in France in various forms since 1924 and its scope and methodology have evolved considerably to meet quality requirements and changes in the recommendations and/or regulations issued by international bodies. Most changes are generally carried out at the occasion of base changes. For several decades now, base changes have taken place every five years.

### **1- The Purpose of Re-Basing**

The industrial sector evolves over time, with new products appearing on the market while others disappear. Likewise, production processes change. In recent decades, there has been a significant rise in offshoring and outsourcing. The specific content of the products tracked as part of the industrial production index therefore needs to be regularly adapted and updated (see Chapter 3). The industrial production index is calculated relative to a base year based on a list of specific products. As the reference period moves further away, structural deformations gradually cause the calculated index to decline in relevance if they are not taken into account. It is also common practice to locate the reference year of an index (i.e. the year when the index is equal to 100 on average) in a not too distant year.

At the same time, changes in recommendations and concepts, including in adjacent areas (national accounts, including base changes in national accounts, structural statistics, index theory) and improvements in technical resources allowing for quality improvements mean that the methodology and method of calculation of the IPI need to be adapted.

For all these reasons, the base year requires regular review, as do the elementary series making up the index, the production indicators and the methodology used to aggregate indices. Since 1980, re-basing has been carried out every five years and includes an update of the weights, a redefinition of the boundaries of the series and the use of 100 as reference for a given year. Re-basing is also an opportunity to introduce a change in classification (as illustrated by the 2005 base change). Of course, these changes can result in revisions to the indices, which generally have no impact on the major developments of the index.

Since 2015, two major changes have resulted in profound changes in the processes used to update the IPI (see below). These changes do not affect the need for a base change every five years by way of updating the base year and taking into account any additional conceptual or methodological changes.

### **2- Main Characteristics of the Two Most Recent Base Changes**

#### **2.1- The 2010 Base Year**

The move to the 2010 base year for the industrial production index (IPI) has met the basic objectives of 5-year re-basing process, i.e.:

- the updating of the weights used to calculate the index;
- the change in reference date;
- the updating of the control series.

The move to the 2010 base year was also an opportunity to meet other objectives, including:

- limiting the loss of IPI coverage since the 2005 base; as the base year moves further away, the coverage of the index decreases; activities in decline whose weight had become too small have been grouped together, while other activities on the rise have been broken down into more detailed series. Thus, the

2010 base index included fewer elementary series than the 2005 base, but coverage was maintained by extending the series to new products and creating new series (see Chapter 3);

- improving the boundaries of the series and the monitoring of products, with, in particular, the elimination of distortions and the addition of non-monitored products;
- improving the relevance of the set of series by removing problematic series, adding series of use to economic analysis, merging small series and splitting the most dynamic branches;
- increasing the number of series monitored in invoicing terms to comply with UN recommendations: to bring the French IPI closer to international standards, INSEE has increased the number of series observed in invoicing terms and deflated and reduced the number of series observed in quantity terms (see Chapters 1 and 4);
- in the case of monthly campaigns, improving the division of labour among index managers;
- creating new series boundaries ahead of the next re-basing (“future IPIs”). These series will gradually be included in the calculation of the IPI as part of the new annual re-basing (see below).

## **2.2- The 2015 Base Year**

### **2.2.1-Innovations**

Since March 2018 (for the January 2018 indices), the IPI is being published using 2015=100 as base and reference year. At the time of this implementation, in addition to the change in reference year, two major changes were put in place or initiated, resulting in profound changes to the processes involved in updating the IPI:

- the implementation of a chained index with annually updated weights improves the robustness of the index over a long period and replaces the system of updating weights every five years;
- an annual process of (partial) product renewal is put in place (for a first publication with the new boundaries in 2019 (see Chapter 3) to take into account economic changes more responsively.

As part of the annual revision process, approximately one fifth of the NAF subclasses are reviewed each year. This will help to spread the burden of re-basing over several years and to take into account changes in products affecting specific branches more rapidly.

A provisional timetable has been defined for this first five-year cycle. The timetable may be amended as the cycle progresses (for example, if priority branches are identified because of lower quality). This ensures an exhaustive review of all NAF manufacturing branches, which was not always the case when a review was carried out at the time of a five-year base change due to time constraints.

The annual review can result in a wide range of operations, the most important of which are listed here (see Chapters 2 to 4 for terminology):

- change in the monitoring and tracking method (transition to monitoring in invoicing terms for certain products, or vice versa if invoicing does not appear to be appropriate);
- removal of products whose production is no longer significant;
- conversely, the creation of new series to improve the coverage of the IPI or take into account new products; in such cases, integration into the indices will only be effective after a few years to assess the main characteristics and quality of the series;
- incorporation of series created during a previous re-basing (“future IPIs”);
- redefinition of the boundaries of series (groupings of ProdEMB products; see Chapter 2.), product mergers, etc.;

- Of course, many series will remain unchanged if their quality is deemed satisfactory.

## 2.2.2-Timetable of Annual Product Review Process

Given the different production processes involved in this operation, the work required for each wave takes place over a period of approximately eighteen months (as is the case with the five-year re-basing), on a continuous basis. Apart from the first year of initialisation of this process, the various actors will also be required to complete the re-basing of the branches started the previous year and to begin the process of reviewing the next group of NAF subclasses. Table 1 shows the main steps involved in a renovation wave.

*Table 1: Main Steps of a Renovation Wave*

July N-2 to September N-2	Selection of NAF subclasses to be re-based according to specific priorities (quality, need to improve coverage of the branch, existence of series in the survey to be included in the indices - “future IPIs”, etc.)
September N-2 to January N-1	Process of reviewing and redefining the boundaries of the series; possible introduction of new products, review of deflators for the series monitored in invoicing terms. This stage is based in particular on the latest production data from the annual production survey (allowing for comparison between the output monitored as part of the IPI and the branch’s total output).
February N-1 to August N-1	Once the changes in the series are recorded and become effective, it is then necessary to proceed with the necessary preparations prior to effective integration into the indices: calculation of productivity coefficients for the series monitored in hourly terms, backcasting of the series based on new boundaries over a long period if necessary, calculation of weights based on the new boundaries, study of the impact on seasonality, review of the seasonal adjustment models, etc.
September N-1 to January N	Taking into account the various changes made to the dedicated applications, new sample of enterprises to be drawn and adjustments to be made to the questionnaires relating to products that have changed.
March N	Dissemination of the first IPI index with the changes in the boundaries of the series taken into account in January N.

The time required to implement a renovation wave is therefore 20 months from the start of operations to the publication of the first index. This does not correspond to the period between the introduction of a new product into the IPI and the dissemination of the IPI with the inclusion of that new product. This is because the new product must be tracked as part of the monthly branch surveys 1 to 2 years before the start of re-basing operations, thereby delaying the effective inclusion in the index (see Table 2).

Between the time a decision is made to integrate a new product into the production process and its actual introduction into the calculation of the IPI, a period of at least 3.5 years must be factored in. The timetable below details the corresponding sequence.

This time lag may be too long for products whose economic weight is changing rapidly (emerging product or relocation activity). In this case, non-standard creations may be considered. However, the introduction of a new product into the EMB does not only mean creating an additional question in the questionnaire; it is also important to ensure that the product fits properly into all EMB collection and index calculation processes. A new product can only be introduced into the EMB if a representative sample can be drawn for it and if it is identifiable within the EAP. Finally, it is necessary to have sufficient perspective before the actual introduction into the indices (for example, for the estimation of the seasonal and working-day adjustment models).

**Table 2: Stages of the Process Leading to the Inclusion of a New Product in the Index (Standard Cycle)**

Launch of renovation operations with NAFs including new products to be created, generally innovative products)	Early September N-4
Proposals and validation: introduction of new products	October N-4 to January N-3
Incorporation of the changes approved in January N-3 in the applications dedicated to the management of classification and collection operations	October N-3
Start of collection of the new product(s) as part of the EMB	January N-2
Launch of operations for wave N ( <i>re-registration in N-2 of NAF in relation to which the new products created in the summer wave N-4 are intended to be used in the IPI</i> )	Early September N-2
Proposals and validation: decision to use the new product(s) in the new base (depending in particular on the observed quality)	October N-2 to January N-1
Additional operations related to renovation taking into account new product(s) (calculation of weights, backcasting, etc.)	February N-1 to February N
Inclusion of the new product in an IPI series for the January N campaign	October N-1
Dissemination of the indices including the new product(s)	March N

### 2.3- Backcasting of Series

To ensure comparable data are available over an extended period, indices must be backcast in the event of base year changes. This is a vital but generally costly operation because of changes that may lead to inconsistencies between the old and new base in some branches .

At the time of the 2010 re-basing for the dissemination of the indices from January 2013, backcasting resulted in new series being created from January 1990 to December 2012 based on the new data and the data from the previous base<sup>49</sup>. This long period has been maintained because the IPI is also used as a production indicator at INSEE to compile the quarterly accounts.

As part of the transition to the 2015 base (March 2018), a major backcasting was also carried out on the weights to build annually weighted series since 1990 (see Chapter 6). On the other hand, since the boundaries of the series were not revised at that time, the backcasting of the indices to the elementary levels (before aggregation) was a simple process since it was based directly on the changes in the elementary indices with base year 2010.

With the implementation of the annual product review process, the challenges around backcasting could have been even greater, with, potentially, changes in the monitoring of series each year. As such, the use of chaining with annually updated weights helps to deal with the matter satisfactorily by adjusting the weights in order to switch from series based on the old boundaries to those based on the new boundaries. Changes in the past over a long period of time are thus stabilised.

<sup>49</sup>Excluding exceptions and new series, backcasting required dealing with four major cases:

- re-use of the series without change (the series with base year 2005 is then reused by setting the 2010 average of the old series at 100);
- modification of the boundaries of the series with removal or addition of products (the opposite year-on-year change of the 2005 base series is applied to known data from the 2010 base series);
- splitting of the series (the opposite year-on-year change of the 2005 base series is then applied to each of the split series);
- merger of series (the 2005 base year series are summed up and the average is set at 100 in 2010).

## 3- Other Developments

### 3.1- The COLTRANE Platform for Collecting Business Surveys

To enable businesses to respond to surveys as easily as possible, INSEE is extending the possibility of responding online on a single website. Since the first online surveys introduced in the early 2000s, several systems have been developed. Drawing on past experience, INSEE designed the COLTRANE project (standing, in French, for *Collecte Transversale d'Enquêtes*, or Cross-Cutting Survey Data Collection), designed to bring together all business surveys under a single portal, with two main challenges:

- to generalise and standardise online collection across all surveys;
- to provide a single point of access for businesses to facilitate the response process and enable them to better identify surveys falling within the scope of official statistics.

Respondents are able to access the portal and view all the questionnaires sent to them from a single login account. COLTRANE is also designed to minimise the burden for the bodies responsible for conducting surveys. It automatically generates all collection instruments and ensures their standardisation. The online questionnaires accessible from COLTRANE are thus generated based on their formal description, i.e. from the metadata describing the questionnaire. COLTRANE also provides a range of services, including, for example, the generation of different types of letters announcing the survey, those used for reminders and requests for paper and downloadable questionnaires. Monthly branch surveys were incorporated into the COLTRANE system in May 2017.

### 3.2- Publication Deadlines

For flash GDP production purposes at +30 days after the end of the quarter, an “early” IPI is now calculated between +23 and +25 days after the last month of each quarter. Quality tests are underway and may lead to shorter IPI release times, provided this can be done without a significant loss of quality (balance to be struck between speed of release and index quality).

### 3.3- Integration with European Projects

In 2012, Eurostat launched a plan to integrate all existing business statistics regulations by developing a cross-cutting legal framework for the systematic collection, compilation, transmission and dissemination of European statistics related to the structure of the economic activity and competitiveness of the European business sector, a plan known as the FRIBS (Framework Regulation Integrating Business Statistics) draft regulation.

FRIBS (adopted in 2019 by the European Council and Parliament) provides for two major developments in the area of short-term indicators:

- the use of the Kind-of-Activity Unit (KAU) as the only statistical unit for short-term indicators. In the current STS Regulation, depending on the sector of activity, the statistical unit is either the KAU (as in the case of the IPI) or the enterprise. The KAU is the legal unit in almost all cases whereas the enterprise is the smallest combination of legal units that is an organisational unit producing goods or services, which benefits from a certain degree of autonomy in decision-making, especially for the allocation of its current resources;
- the introduction of new activity indicators: a production index in services and a sales volume index for all trade and no longer just for retail trade.

The current IPI is in line with the provisions of the new framework regulation. Other indicators have undergone changes to ensure compliance with the new Framework Regulation (FRIBS). This is particularly the case with the publication since March 2017 of the new monthly quantitative volume indicators on services (services production index) and trade (volume index of sales in trade). Other developments are still ongoing as part of the “INSEE 2025” project and aim to improve the quality, relevance and speed of availability of monthly production indicators<sup>50</sup>.

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<sup>50</sup>For example, by clarifying or enriching the supply of indicators, shortening production and publication deadlines, optimising methods for the imputation of missing values or the sampling design used to select the surveyed enterprises, etc.