Methodological warning *May 2020*

Industrial production index - March 2020

Background

The health crisis and the containment measures related to Covid-19 have very important impacts on the measurement of short-term statistics such as the Industrial Production Index (IPI). These statistics are all the more important for understanding the phenomena at play in the economy over the period.

As a reminder, the calculation of industrial production indices meets both national and European imperative (European regulation on short-term statistics). The purpose of the IPI is to monitor the monthly evolution of industrial activity and construction, both at an aggregate and a fine level (up to the NAF subclass level in raw data). As such, it represents essential information for monitoring the state of the economy in France and is also an essential input for the preparation of France's quarterly accounts.

This fact sheet supplements the usual methodological documents (methodological fact sheet, Insee-methodes n°133), on certain specific points. The specific issues to which particular attention had to be paid this month are as follows: the treatment of non-response, which is much more important than usual, the expertise of automatic imputations / their adjustment if necessary, the control of seasonal and working-days adjustments.

Response rate

At the time of the release of the index, the gross response rate was just under 65% for manufacturing (compared to the usual over 90%). In weighted data - i.e. taking into account the size of the respondent companies and the weight of the series - and after integration of series collected by other bodies (Ministry of Agriculture, approved professional bodies), the response rate for manufacturing industry stands at 76%, which is a significantly higher level and is acceptable for estimating the level of industrial activity in March 2020 in a satisfactory manner, even if revisions could be higher than usual in the next publications (see below).

In detail, about 85% of the series at the NAF class level have a response rate of more than 50% and 65% of the series have a response rate of more than 70%. Taking into account the size of the series (their weight in industrial value added), more than 95% of the value added is covered with response rates above 50% and more than three quarters are covered with a response rate above 70%.

In order to help achieve sufficient response rates, highly targeted reminders - on a few large companies (around 150) spread over the most strategic branches (due to their weight and/or a low initial response rate observed) - have been carried out, in accordance with the policy implemented by INSEE in the current crisis of strong limitation of reminders.

Control and adjustment of imputations

Non-respondent firms for a given IPI campaign are usually estimated using an automatic imputation method (see Insee-methodes n°133 for a description of the formula). This method gives good results in normal times but is less well suited to the presence of reduced response rates, which was the case for a number of series (cf. above), especially insofar as this was coupled with atypical developments. That is why particular attention was paid to imputations.

To this end, INSEE relied on other data to check the quality of the imputations and adjust them if necessary. These include data on short-time working and sick leave from the "déclaration mensuelle nominative" (DSN - this is the monthly declaration filled in by employers which makes it possible to calculate employees' social protection entitlements) which made it possible to estimate the size of the shock suffered by each enterprise. To a lesser extent, INSEE also relied on electricity consumption data for certain energy-intensive sectors provided by RTE.

Almost all the imputations were compared with one or other of these external sources; about 250 identified using a prioritisation method (based on the weight of the branch studied and a plausibility score for the imputation) were subjected to in-depth manual checks, and just under a hundred were adjusted.

Production index in construction

The data on which INSEE usually relies to compile the construction production index (branch surveys conducted by the French Construction Federation and the National Federation of Public Works) could not be processed or collected for both February and March. In order to produce an estimate, INSEE and the statistical service of the Ministry of Sustainable Development (SDES) relied on the DSN (cf. above) and a survey of federations targeted on the operation of enterprises in the construction sector during the lockdown period.

Seasonal and working day adjustments

Series are seasonally adjusted – SA – and working-days adjusted – WDA. The computation is performed with the X13-Arima program available in JDemetra+ - supplied by Eurostat – at the NAF rev. 2 class level. Upper SWDA levels are obtained by class level series aggregation (indirect SWDA correction).

However, the sharp fall in most series in March should not be interpreted by SA-WDA models as a fall in the average level of activity in March and should therefore not alter the seasonal coefficients estimated over the past.

One way to solve this problem without calling into question the usual models is to allow for the presence of outliers in the models for series with an atypical seasonal profile for a given month (cf. Insee-Methodes n°133 explaining different types of outliers and Eurostat note issuing recommendations in the current crisis https://ec.europa.eu/eurostat/cros/content/treatment-covid19-seasonal-adjustmentmethodological-note_en). This method ensures that the particular evolution of March is not included in the seasonal coefficient estimation and thus does not bias the estimate of the fall in activity due to the current crisis upwards.

X13-Arima makes it possible to detect many of these outliers automatically (using adapted test statistics and detection thresholds). However, for some series, the detection can be set to fail, which necessitated a systematic manual check of the remaining series to see if an "outlier additive" had to be added.

Revisions

As mentioned above, data not available at the time of publication of the index have been estimated. With the arrival and inclusion of late responses in the index in subsequent months, and despite the special measures put in place to refine the estimation of missing data, the March index may be revised more sharply than usual. Indeed, while this revision mechanism is normal (the response rate for the last month is never 100% at the time of publication), it takes on particular importance this month with the sharp drop in the response rate. Moreover, despite the precautions taken on SA-WDA models, these could also be a source of larger than usual revisions.