European business statistics methodological manual for compiling the monthly index of production in construction

2021 edition

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European business statistics methodological manual for compiling the monthly index of production in construction

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Foreword

The index of production in construction (IPC) is an important indicator for monitoring and assessing developments in the construction sector. Furthermore, the data used for the IPC is often an input for the compilation of quarterly national accounts.

The IPC is one of the short-term business statistics requirements of the European Business Statistics Regulation (EBS Regulation). Those European Union countries accounting for 1 % or more of the value added in the construction sector ("large and medium sized countries") are required to submit the IPC on a monthly basis. (Small countries are only required to produce quarterly indicators.) Moreover, many countries that are below the threshold submit monthly data on a voluntary basis.

This manual aims to serve as a tool for producing the IPC under the EBS Regulation and for improving its quality in the current and future reporting countries.

This document is an updated version of the 2011 edition of the Guidelines for compiling the monthly Index of Production in Construction. This new edition includes the results of several meetings and exchanges between 2015 and 2021 on best national practices in the construction statistics.

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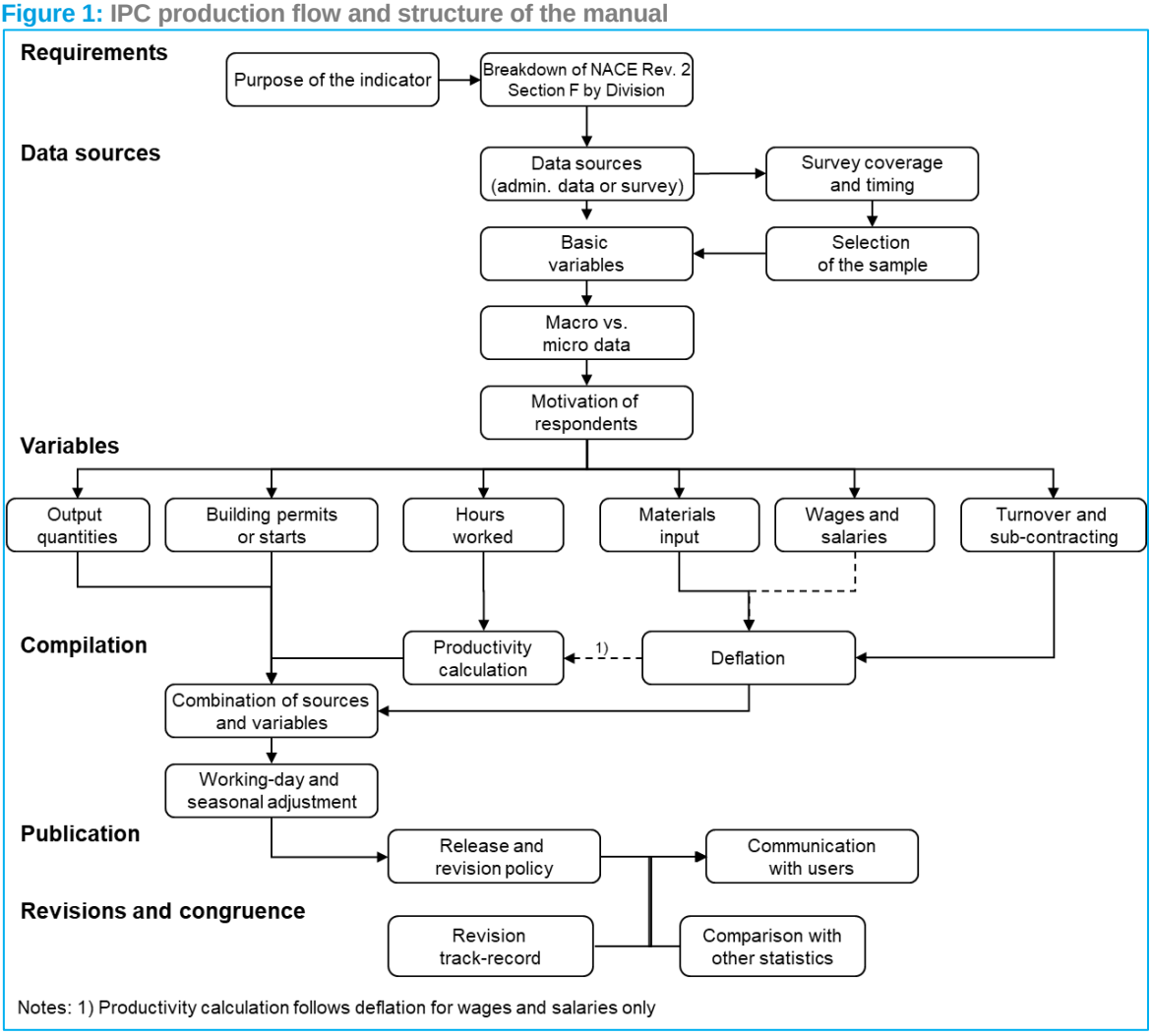
1 Help to the reader

IPC production flow and structure of the manual

The flow chart in Figure 1 presents the production flow of the IPC. The chapters of the manual follow the steps of the production flow from requirements through data sources, variables and compilation of data until the publication and revisions.

Figure 1: IPC production flow and structure of the manual



Notes: 1) Productivity calculation follows deflation for wages and salaries only

Abbreviations

CC	Classification by Types of Constructions
COICOP	Classification of Individual Consumption by Purpose
CPA 2.1	Statistical Classification of Products by Activity in the European Union, Version 2.1
EA	Euro area
EBS(R)	European Business Statistics (Regulation)
ESS	European Statistical System
EU	European Union
IPC	Index of production in construction
MS	Member States (of the EU)
NA	National accounts
NACE	Statistical Classification of Economic Activities in the European Community (in French: Nomenclature statistique des activités économiques dans la Communauté européenne)
	Section F Construction
	Div. F41 Construction of buildings
	Div. F42 Civil engineering
	Div. F43 Specialised construction activities
NSA	National Statistical Authority
NSI	National Statistical Institute
OECD	Organisation for Economic Cooperation and Development
PRODCOM	Statistical data collection, with an at least annual frequency, for the collection and dissemination of statistics on the production of industrial (mainly manufactured) goods, both in value and quantity terms. It is abbreviated from the French 'Production Communautaire'.
SBS	Structural business statistics
STS	Short-term business statistics
SWDA	Seasonally and calendar (working-day) adjusted
TF	Task Force
VAT	Value added tax
WDA	Working-day adjusted

2 Introduction

Relevance of the construction industry

The construction industry in Europe is a large employer that makes a considerable contribution to overall economic output, although its share has been decreasing since the first edition of these guidelines.

In 2019, the year before the outbreak of the COVID-19 pandemic, the construction industry in the euro area accounted for 5.3 % (down from 5.9 % in 2010) of the total value added of the euro area (EU: 5.5 %, down from 6.0 %) and 6.0 % of total employment (EU: 6.4 %).The size and importance of the sector varies, however, from country to country.

The construction industry in Europe is highly fragmented, comprising not only large and multi-national enterprises, but also a great number of smaller and medium-sized enterprises, often equipped with highly specialised machinery. In general, the construction industry is project-centred and characterised by short-term partnering between different companies. Furthermore, the planning, authorisation and actual realisation of construction projects span long periods, typically involving banks for the financing aspect. For civil engineering in particular, the public sector is the main awarding authority for construction contracts.

The prominent role of the construction industry in macro-economic analysis is due to its relatively large employment share and contribution to economic output, but sometimes with a different pattern compared with the overall business cycle. Construction activity can be subject to fiscal incentive programmes, which, in turn, can have an impact on the business cycle as well. In particular, during the financial and economic crisis of 2008, imbalances in housing markets brought construction back into the focus of economic policy makers.

Key legal requirements for the IPC

The IPC is one of the for short-term business statistics requirements of the EBS Regulation (EU) 2019/2152.

The EBS General Implementing Regulation (EU) 2020/1197 calls for the provision of indices for production in construction (IPC), broken down by NACE Division (F41, F42 and F43) from 2021 onwards. The previous breakdown by types of constructions (buildings [CC1] and civil engineering works [CC2]) remains in force during the transitional period until the end of 2024.

The indicator is normally reported monthly, within one month and 15 days after the end of the reference period. However, countries accounting for less than 1 % of the European Union value added of construction in comparison with the total business economy may report quarterly and have two months to do so. Data are to be transmitted in unadjusted, calendar (working-day) adjusted and seasonally adjusted forms.

Scope of the IPC

The IPC measures changes in the volume of output to show the volume trend in value added over a given reference period. However, the compilation of the IPC faces similar problems as the compilation of the industrial production index, namely that value added is typically not available on a monthly basis and hence needs to be approximated. Several possible methods exist and are described in the individual sections further below.

Promotion of best practices

In an effort to promote best practices in compiling the IPC within the European Statistical System (ESS), this document attempts to rank the various methods for estimating the IPC. There is a wide variety of methods in different countries, but no single method that would be best for all reporting countries.

The ‘A methods’ represent the best approaches to be aimed for. The ‘B methods’ are acceptable and may be viable options given specific national circumstances or practical considerations. However, the ‘C methods’ are practices that should be avoided.

The main objective is to upgrade all production methods, in both Eurostat, in Member States and in all other reporting countries, from those listed under C to those recommended under B and possibly A. Implementation of the A methods could be a medium- or long-term process.

3 Requirements

Breakdown of NACE Rev.2 Section F by Division

DESCRIPTION

The IPC is to be broken down into three sub-indices according to the Divisions of the Section F of the NACE Rev.2 classification: Construction of buildings (F41), Civil engineering (F42) and Specialised construction activities (F43).

There is now a direct link between these types of activities and the activity classification of the reporting units. This was not the case previously, when the Classification of Types of Constructions (CC) was used for the IPC, in particular, because NACE Rev.2 Div. F41 and Div. F43 reporting units may also make a significant contribution to civil engineering (CC 2) and vice-versa (Div. F42 reporting units contributing to building construction [CC 1]).

The breakdown of the Section F does not appear in the A*64 breakdown (a detailed grouping of economic activities based on NACE Rev.2) of national accounts. It might need to be adapted to identify the type of gross fixed capital formation in the classification of asset types and households' final consumption (COICOP, Classification of Individual Consumption by Purpose).

CURRENT PRACTICES

The **Netherlands** compile the monthly IPC from monthly turnover data with the help of quarterly national accounts value added data. Tax data are used as the source of the monthly turnover for the companies with less than 10 employees, a sample survey for the companies under 50 employees and a census for the biggest construction companies. For the bigger companies, tax data are also used for comparison. The reporting units are classified according to the NACE Rev.2.

Romania considered that the implementation of the EBS requirements for the IPC (NACE instead of CC) is difficult for the Division F43 (Specialised construction activities) which is hard to be assigned from the data. It is also difficult to find appropriate deflators for the NACE Divisions.

In **Germany**, the continuation of building completion work (close to F43 'Specialised construction activities') is based on the first release of the value added tax (VAT) data at t+30 days, which becomes more precise in t+60, t+90, t+180 and t+240 days. The quarterly survey on building completion work improves the precision of the estimator in form of a mix model. The mix model uses the information from the quarterly survey for companies with 20 or more employees and VAT data for those with less than 20 employees. The mix model is released in t+74 days and updated in 180 days after the reference quarter.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: Kind-of-activity unit is used as the reporting unit and each unit is classified according to the NACE Rev.2 classification.

B: The share of NACE Divisions in Section F is estimated monthly based on other data sources, for example labour data and modelling.

C: Data on individual projects is used for estimating the Building and Civil engineering activities and specialised construction activities are estimated as a fixed percentage based on annual enterprise statistics.

4 Data sources

Data sources (administrative data or surveys)

DESCRIPTION

The production of short-term statistics is normally based on the compilation of data from numerous sources. The reasons for choosing different sources relate to respondent burden, cost of data gathering for the NSI, the requirements of users and the validity of the possible sources in terms of coverage and conceptual definitions.

Gathering existing information from administrative sources is attractive because it is relatively low-cost and does not impose any additional burden on businesses. However, the kind of information available from administrative sources is specific to each country, so its suitability and quality for calculating the IPC varies. Examples of such administrative data are VAT and wage and salary declarations, hours worked from trade unions, and building permits.

Often, surveys are needed to complement administrative data. In such cases, the design of surveys should endeavour to reduce the burden on respondents and minimise costs for the NSI. Therefore, multi-purpose surveys should be favoured over parallel surveys for different statistics, although stand-alone surveys could be needed for quality reasons. However, it should be kept in mind that timeliness is a particularly important aspect of the quality of the IPC.

CURRENT PRACTICES

National practices depend on the availability of data (survey or administrative sources).

From 2015 onwards, hours worked has been used as the main source of the monthly IPC in **Denmark**. Hours worked (working time account) is an existing monthly source. Tests showed good coherence with quarterly national accounts data, but the strong calendar effect of hours worked entailed systematic differences in 2nd and 4th quarters.

In **Germany**, the continuation of the Index of Production in Construction is based on hours worked adjusted for productivity for the main construction industry (building construction [F41] and civil engineering [F42]) and on turnover for building completion work (narrower than F43). Long production cycles in the main construction industry make turnover figures very volatile and therefore the continuation with hours worked is considered as a smoother basis for the IPC than turnover.

In **Italy**, data from a monthly survey of industrial turnover and new orders, deflated with producer price indices, are combined with data from trade unions' and employers' registers and national accounts data.

In **Finland**, the first estimate of the IPC is based on a survey of the largest enterprises while subsequent publications also use VAT data from the tax authority.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: Combination of administrative data and multi-purpose surveys designed to minimise respondent burden and NSI costs.

B: Stand-alone surveys used for quality reasons when administrative data are not available or sufficient.

C: Parallel surveys for different statistics.

Survey coverage and timing

DESCRIPTION

Under the EBSR, the index of production in construction (IPC) is compiled for units classified in Section F 'Construction', according to NACE Rev.2. The production by national units (KAU) of the reporting country should cover operations both in the reporting country and abroad.

To compile this index, the following data can be used:

- input data (hours worked/employment/material consumption)
- output data for gross production (production value/turnover)
- administrative data.

The monthly production variable (variable 140101) has to be reported at the two-digit NACE Rev.2 level at least.

For construction, countries should divide variable 140101 into:

- index of production in building construction (NACE Rev.2 F41),
- index of production in civil engineering (NACE Rev.2 F42) and
- index of specialised construction activities (NACE Rev.2 F43).

It is considered that the output of construction activities can be described by the index of production in construction as the combination of the three indices. Compared with the previous STS Regulation and its amendments, there is no direct link between the products 'Buildings' and 'Civil engineering works' of the Classification of Types of Constructions (CC), even if during the transitional period until 2024 the sum of F41 and F43 can be used to estimate the 'Buildings' of the CC and F42 the 'Civil engineering works'.

Under the EBS Regulation data are sent to Eurostat within:

- 1 month and 15 days following the reporting period (by countries obliged to prepare the index on a monthly basis, i.e. representing 1 % or more of the European value added in construction),
- 2 months following the reporting period (by countries obliged to prepare the index on a quarterly basis because they are representing less than 1 % of the European value added in construction).

CURRENT PRACTICES

Poland is currently (2021) the first country to transmit the monthly IPC to Eurostat. Timeliness is crucial and preliminary results are available within 30 days from the end of the reference month. The final data are available at T+60 days.

In **Germany**, to comply with the German regulation on short-term statistics, information on IPC is transmitted to Eurostat t+45 days after the reference month.

In **Romania**, the sample of 1500 units in size-class 4-49 employees is drawn from the business register while there is a census of the 650 units with more than 50 employees. Data are collected and validated via an online questionnaire (deadline M+25 days) on value of the works, main groups of materials, labour variables and investment. The time series are directly adjusted using

TRAMO/SEATS in JDemetra+. The national results are released at M+37 days and early results are sent to Eurostat at M+43 days.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: The entire population of reporting units is covered in a monthly survey and possibly completed with other data sources. In order to reduce the respondent burden, data could be obtained:

- from administrative sources,
- on the basis of estimates/generalisations/imputation,
- on the basis of a sample.

The representative data covering the entire population, though without burdening the smaller units (i.e. those that should as far as possible be exempt from burdensome reporting requirements), are available by the deadlines. Well-justified estimates or imputations may be used to compensate for late or missing data.

B: Data sources do not cover all units, but sufficient data are obtained in time and late data do not entail major revisions.

C: Only some units are surveyed and a very long period is needed to obtain preliminary data.

Selection of the sample

DESCRIPTION

Sampling is used in partial statistical surveys. Information is collected only from units in a sample selected from the population surveyed. The sample size and its internal structure should correspond to the size and structure of the represented population (so-called unbiased sample). The selection of the population and the sampling frame (or the administrative register) defines the coverage of the IPC. The inclusion or exclusion of activities or products is based on this choice. Sub-contractors of building developers are covered if they are in the sampling frame.

Units are selected by:

- Random sampling — all units in the population are equally likely to be selected (the same probability). Random sampling is used when the population to be surveyed is very large.
- Purposive sampling — units considered representative of a given population are selected.

To obtain more representative results, the statistical population to be surveyed is stratified prior to sampling (e.g. by type of activity, number of employees, region, turnover/production value). Units from each stratum are then selected. This requires more information on the population, but the sample will be more representative than in the case of simple sampling and can be used for a larger number of variables.

CURRENT PRACTICES

Cyprus uses a purposive sample stratified by NACE divisions and by employment size group (0- 9, 10-19, 20-49, 50+), while ensuring that enterprises from all territorial districts are adequately represented. The turnover and the types of constructions (CC) are also taken into consideration.

The sample is updated with births and deaths of significant enterprises, whenever necessary enterprises with more than 50 employees (~1 500 units) are subject to a census every month in **Poland**. A purposive stratified sample (according to NACE groups and territorial division) of at least 10 % (in practice 14-15 %) is drawn from enterprises employing 10-49 persons (population more than 11 000 units). Units with less than 10 employees are not covered by the survey. Their production is not estimated. Units with less than 10 employees are surveyed once a year.

In **Hungary**, monthly questionnaire on construction covers all 250 units (legal unit) with more than 50 employees and a sample of 1 200 units employing 5-49 persons. 95 % of all construction units, employing less than 5 persons each, do not report in the monthly survey, but their data is estimated on the basis of the per capita production value of the 5-9 employee stratum.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: Uses stratification and an adequate sampling method. Stratification ensures appropriate population coverage and allows control of the sample in terms of representativeness. Lack of stratification does not always mean lack of representativeness: it is not necessary in a homogenous population of units, which can be the case in small countries. Sampling increases the coverage of the population surveyed while limiting respondent burden, and constitutes an element in controlling the units selected.

B: Wide coverage of the population and a sufficient sample size, but no stratification or efficient sampling.

C: No stratification or control of coverage, regardless of the sampling method.

Basic variables

DESCRIPTION

The compilation of the IPC uses a volume measure, i.e. it requires the deflation and productivity adjustment of basic variables to allow for a) productivity changes where activity-of-labour measurements are collected and b) price changes where monetary data are collected.

Deflators for building construction, civil engineering and specialised construction activities should at least be available.

Where monetary data (turnover, value of output, work done) are collected, output price deflators should be used rather than deflators based on input costs. If turnover is used, this will require further adjustment to take account of stocks and work in progress.

Additionally, the target variable ‘value added at constant prices’ requires the exclusion of double counting of sub-contract work and purchased material consumption (see section Turnover and sub-contracting).

CURRENT PRACTICES

The **Netherlands** compile the monthly IPC from monthly turnover data with the help of quarterly national accounts value added data.

Payments to sub-contractors are excluded from the turnover collected in **Poland**, so there is no double counting. Hence the output covers only the production by own resources. Data are deflated by the producer price index of construction, collected from the same respondents as this output data.

The **German** IPC is based on hours worked (building construction and civil engineering) adjusted for productivity and on administrative turnover data (building completion work); it has some revisions due to the need to estimate the monthly data.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: Measurement of the volume trend in value added over a given reference period.

B: Methods that include some double counting or observe only part of construction value added.

C: Methods lacking adjustment for productivity or price changes and also including double or partial counting.

Micro and macro data

DESCRIPTION

A micro data approach involves the collection and use of individual enterprise data. This is the case when a survey is the source of the data collected. In general, the micro approach results in a higher quality of the IPC.

A macro data approach involves the collection and use of activity aggregates at any level of NACE Rev.2. This can be the case when an administrative source is used.

Advantages of the macro approach:

- No additional burden on enterprises.
- Less collection cost and burden for the NSI.
- Less data editing, imputations, calculations, etc.
- Minimum personal contact needed, mainly with register keepers.

Disadvantages:

- No direct control over population (or sample) coverage. Classification issues, population (or sample) comparability over time, or treatment of enterprise demography (births, deaths, mergers, etc.) are all usually hidden within sums.
- No real control over data quality. Outliers, data entry and other errors are hidden.
- No direct control over revisions. Revision policy cannot be transparent.

Available NSI resources and administrative burden on enterprises are both issues driving more extensive use of administrative sources, and less use of surveys. Nevertheless, the quality of the index should not be compromised. Efforts need to be made to ensure that non-survey sources of data provide the NSI with micro rather than macro data. This can be via bilateral agreements or national legislation in the context of a data integration policy. If it is not possible to get the micro data, then some form of partnership should be sought between the NSI and the administrative source (register keeper) to give the NSI the access needed to deal with all potential problems related to raw data.

CURRENT PRACTICES

National practices depend on the source of data (survey/administrative).

For example, in **Denmark** the IPC is based on hours worked, collected as a combination of survey (labour force survey) and administrative data. Both sources are already inside Statistics Denmark, so there is no additional burden on enterprises from the compilation of the IPC. When needed, analysis of the micro data is possible.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: Use of micro data, collected either from a survey or from an administrative source.

B: Macro data can be used as long as they are accompanied by supporting information, such as sample/population size, no/late response, enterprise demography, outlier treatment, cause of revisions, etc. This can be achieved in partnership with the data keeper.

C: Use of macro data without additional information.

Motivation of respondents

DESCRIPTION

Close cooperation and, in particular, personal contact with the data providers constitute a key element in ensuring quality in every step of the way from survey design to data collection and result assessment.

Construction trade associations are good places to start. They are experts in the field, they know how the construction industry works and they can give valuable advice on data availability and quality. The same applies to the leading enterprises. The NSI (regional or central offices) can approach and visit both the trade associations and leading enterprises to consult them on how to make a reliable indicator that can be beneficial to all. At the same time, the NSI can verify that enterprises are correctly reporting the variable requested.

While it can be argued that the more contacts the NSI makes at personal level the better the cooperation and motivation of respondents, resource constraints may call for a more pragmatic alternative. Instead of individual meetings, conferences or focus group meetings can still offer the necessary face-to-face interaction. At regional or central level, the NSI, the trade associations or leading enterprises may even set up a kind of partnership that meets as and when needed.

Personal contacts should aim to ensure a win-win situation for both respondents and the NSI. Respondents are motivated when they feel they own part of the process, either because their ideas are incorporated in the index production process or because their data input is important for an overall picture of the construction sector. They need to know that the time they spend answering surveys is not wasted by a faceless institution producing statistics of no use to them. They need to know that the data they provide are used to create the only official tool that can drive policymaking. NSIs can even highlight cases where the use of the IPC as an assessment tool has benefited the construction sector.

Most of the above still holds even in the case of administrative data (e.g. VAT authority). An additional layer in the cooperation network is needed here, shifting the focus to the register keeper rather than enterprises.

Public authorities collecting data that are also used by the NSI should be well aware of this further use. Personal contact is, again, the key factor. The statistician should visit the public authority colleagues and learn first-hand all the little details in the chain of processes leading to the data that will be used by the NSI. This is a way of gaining some control over the data collection process, thus enabling a more thorough quality evaluation.

CURRENT PRACTICES

Current practices depend mostly on the source of data (survey/administrative), the collection medium (post, telephone, web, etc.) and the available resources.

An example given for effective respondent motivation in **Cyprus** is the case of a leading enterprise complaining about administrative burden. Through personal contact, the NSI explained the role of the IPC in justifying the government’s early support for the construction sector during a time of economic crisis.

In **Poland**, respondents have an opportunity to explain big deviations from previous values at the end of the questionnaire. This reduces the statisticians' needs to contact the reporting units.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: Personal visits to key data providers and their trade associations or, in case of administrative data, to register keepers. Alternatively, meetings with wider participation such as conferences. Sub-populations according to activity, size and region need to be identified so that meetings cover all

eventualities. Frequency of contact depends on the stage of indicator development. The design stage is much more demanding than an established, long-running index. For new enterprises entering the sample, a first contact (visit, phone call or e-mail) with the contact person is the best option.

B: Personal contact other than face-to-face, e.g. phone call, letter, e-mail. A phone call can be more effective than a letter or an e-mail. For new enterprises entering the sample, a first contact (phone call or e-mail) with the contact person will be extremely useful, especially for 'big' enterprises.

C: No personal contact at any level. Group mail (postal or e-mail) to inform about participation in a survey.

5 Variables

Output quantities

DESCRIPTION

Output quantity information on structures can be given in square metres of area or cubic metres of volume. The advantage is that deflation is not necessary and the index can be calculated quite easily.

The big disadvantage is that structures are very heterogeneous and this approach may not take account of their different qualities. Another disadvantage it is that it is hard to imagine how an output quantity measure could be constructed to show accurately the development of production activity over a particular reference period.

It is unclear whether any country uses this method in practice for civil engineering or specialised construction activities.

The EBS Regulation, requiring the split of the IPC by NACE activity breakdown makes the use of output quantities as the only variable an unacceptable approach without the knowledge of the NACE Rev.2 activity of the reporting unit.

The Handbook on price and volume measures in national accounts classifies this approach as an unacceptable method.

CURRENT PRACTICES

None of the countries is using output quantities as the sole variable.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: n.a.

B: Output quantities together with timely price information could be used together with the NACE activity of the reporting units.

C: Use of only output quantities to measure production in construction.

Building permits or starts

DESCRIPTION

Statistics can be compiled on building activity based on the following events:

- Building permits: indicate the expected building activity, i.e. there is usually a time lag between the registration of the building permit and the economic activity, and a certain proportion of building permits do not lead to actual production activities.

- Building starts: indicate an existing, physical building activity – and hence an existing economic activity taking place over a specific period of time.

Building activity is typically measured by an area or a number of dwellings. For obtaining the volume trend in value added, an economic value for the building activity must therefore be calculated.

The statistics typically cover the building activity only, not the civil engineering work, i.e. they do not meet all the requirements for calculating the IPC.

If the statistics are compiled based on an administrative register, there is no response burden. At the same time, the use of administrative registers implies that it is more difficult or completely impossible to obtain access to micro data for data validation.

The data quality critically depends on whether the data are reported punctually. Unfortunately, a characteristic feature of building activity statistics is frequent delays in the reporting of data. In many countries, the reporting delays constitute a major problem for data quality.

With the entry into force of the EBSR the use of building permits or construction starts to compile the IPC would require the recording of the constructor activity class in the building permit. Moreover, the activity of civil engineering and specialised construction companies should be acquired from other sources.

CURRENT PRACTICES

Denmark uses statistics on building activity. However, even the Danish calculation of the volume trend in value added uses the statistics only as an indirect auxiliary variable.

- To measure new construction of dwellings and private buildings for business purposes over the period (quarter), the national accounts make use of 'activity square metres'. They are compiled by main building categories in the Copenhagen region and the rest of Denmark. They are calculated separately for these categories as the average time between building start and building completion. The resulting average building periods are distributed by month or quarter for the selected building categories. The delays in the reporting of data for each building project add a factor of uncertainty to these calculations.
- The next step is to calculate the production value for new building construction. For this purpose, hours worked are used in the current system.

In **Finland** the building and dwelling register is part of the population information system. This register includes information on building starts and the characteristics of the constructed buildings are available from the granted building permits. Data on building starts are completed based on the historical data. The national accounts use in Finland the volume index of new construction and not the IPC. Other users also prefer the volume index to the IPC.

- A commercial data provider gives annual data on building prices per cubic meter, labour input and lead times of different construction phases, as well as regional price indices.
- The current value of each project is calculated and split in time, and the value of new building activity for each month is calculated by summing up the activity of all projects and deflating the result to base year prices.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: Compilations of ongoing building activities can be an appropriate indicator of existing economic activity in the construction of new buildings. However, a precondition is that a satisfactory solution is found for estimating delayed or inadequate data, e.g. based on verifiable patterns in delays or types of inadequate data.

Secondly, the 'square-metre prices' must reflect current prices, through frequent updating of the basis for the calculations.

Thirdly, building permits or construction starts data must be linked to the activity classification via the construction companies carrying out the work.

Finally, another method needs to be used for the activity of civil engineering and specialised construction companies.

B: Unsatisfactory solutions for the problem of delays in the reporting of data on building projects and inadequate updating of the 'square-metre prices' result in uncertainty, which reduces the value of the indicator.

C: Building permits and building starts used as independent indicators for the IPC.

Hours worked

DESCRIPTION

By using hours worked to update the IPC, a proportional relationship between labour input and production activity is assumed. Obviously, this is only correct if changes in labour productivity are taken into account. Therefore, it is crucial to adjust the series of hours worked with some productivity factor. However, the method will not perform well if the productivity trend is not predictable. In practice, this means that the basic variable and the value added have to maintain a stable and predictable relationship.

Production results from a combination of factors such as capital goods, intermediate consumption (including purchased services, materials and energy) and labour, measured in number of hours worked. Purely technical progress generally produces a positive trend in the global productivity of factors (production divided by the total volume of factors). Changes in relative prices also cause substitution between factors. As this substitution requires changes in processes and more capital, it is slow to change the trend. In the short and medium term, adaptation of the amount of labour (by hiring, laying-off or firing), from the current amount to the amount needed by the production activity, is lagged. It is also expensive.

When the ratio of value added to labour is considered, the trend resulting from technical progress and substitution between factors can be either positive or negative, while a cyclical component, resulting from the lag between the current availability of labour and the actual need remains dependent on the business cycle.

Ideally, the 'productivity' factor should take into account these two components (trend and cycle). In practice, however, this is quite difficult. Because of the lag in adapting employment to the business cycle, it is not possible to estimate an econometric relationship with the value added as a forecast variable depending on hours worked and a time trend, and to use this relationship to estimate production in the present period. As the link between the business cycle and the development of productivity has to be ignored, the choice of labour variable must ensure that this link is as weak as possible.

In some countries, the contribution of foreign workers hired by foreign enterprises and working in construction projects seems to be an important topic. However, the work done by these workers should not be included in the IPC. As these workers are not registered in the country, the NA will register their income in the country of the foreign enterprise and will consider the corresponding value added as an import of services from that country. More generally, on a monthly basis, the IPC should not try to include elements that cannot be measured by the NA on an annual basis, such as the underground economy.

CURRENT PRACTICES

Of the countries reporting an index of production in construction, hours worked or a combination (unadjusted or adjusted for productivity) are used by **Belgium, Bulgaria, Germany, Denmark, France, Cyprus, Luxembourg, Portugal, Croatia** and **Norway**.

Hours worked by architects, engineers and administrative staff are not included in **France**.

In **Germany**, the continuation of the Index of Production in Construction is based

- on hours worked, adjusted for productivity, for the main construction industry (building construction (F41) and civil engineering (F42)) and
- on turnover for building completion work (narrower than F43).

From 2015 onwards, hours worked has been used as the main source of the monthly IPC in **Denmark**. Hours worked (working time account) is an existing monthly source. Tests showed good coherence with quarterly national accounts data, but the strong calendar effect of hours worked entailed systematic differences in 2nd and 4th quarters.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: Hours actually worked on construction sites are a good alternative for calculating the IPC with its long production cycles. They are linked closely to the production process in the reference period and are relatively easy to establish. Only the hours worked by employees (workers) directly involved in the production process should be considered, not the hours worked in business administration.

The number of hours worked must include those performed by regular workers and those performed by temporary workers hired by outsourcing companies. Overtime has to be included. For calculating the IPC, the hours worked also need to be adjusted for changes in labour productivity (see Productivity Calculation).

Although business administration and other services, e.g. architects, are included in the value added of the construction industry, they should not be included in the IPC because the corresponding hours worked do not strictly coincide with the production process, and the inclusion of these hours would generate a productivity change linked to the business cycle.

Hours actually worked do not include any paid non-working periods (holidays, sick leave).

B: The exclusion of overtime and the hours performed by workers hired by outsourcing companies is problematic because these components are typically cyclical.

The aim of restricting hours worked to employees (workers) directly involved in the production process (excluding administrative staff) is to focus on the most cyclical component of labour input, the work force with the highest turnover rate. However in some circumstances (or countries), depending on labour market conditions, companies facing a crisis choose first to reduce administrative support staff and to retain workers in training programmes. In such circumstances or countries, the restriction to workers is inadequate. In other cases (or countries), however, the inclusion of administrative employees creates a distorting production cycle effect on productivity.

Here too, hours worked need to be adjusted for productivity in compiling the IPC (see Productivity Calculation).

C: The number of employees is used instead of hours worked; the average working time of each worker is typically a cyclical component of hours worked.

Materials input

DESCRIPTION

Data on the use of raw materials in the construction process may not be available on a monthly basis. In such cases, it is necessary to identify a proxy indicator for this variable. A natural candidate is the turnover of industrial enterprises producing and selling the building materials typically used in the construction sector. The turnover must be deflated using an output price index.

This approach is based on two crucial assumptions:

- the input material purchased is immediately used in the production process and

- the share of imports in the goods selected is not significant or at least more or less stable over time.

The first assumption seems to hold in the construction sector, where the number of small firms is very large.

In order to arrive at a composite index of industrial turnover as a proxy for the value of raw materials used in the construction sector, the following steps are required:

- selection of the relevant industry groups,
- deflation of industrial turnover indices of goods sold on the domestic market with producer price indices in the domestic market, and
- identification of a proper weighting system in order to aggregate the selected groups.

As the typical breakdown for turnover indices corresponds to the 3-digit level of the NACE classification, a preliminary list of groups can be identified using surveys that involve a list of products (in Italy, for example, the survey on the costs of construction). Then, the PRODCOM survey is useful to identify the correspondence between these products and the 3-digit groups in the NACE classification.

The criteria adopted to select the final list of groups take into account two types of information: activation coefficients of the input/output matrix for the economy and the share of products in each group used exclusively in the construction sector. For example, the production of cement, concrete and plaster and the making of cement, concrete and plaster products are the most important inputs of the construction sector according to the activation coefficients. Moreover, the products of these two groups are only used in the construction sector.

The selected groups enter into the calculation of the composite index, excluding other groups for which either the activation coefficient has a low value or the products are not mainly used in the construction sector.

The share of imports for the groups selected can be measured using the data from the input-output matrix for the economy, as a ratio between the value of imports and the total intermediate inputs used in the construction sector.

The composite index of the intermediate inputs is finally calculated using two different weighting systems:

- for each branch, different groups are aggregated by the weightings used to compile the index of domestic turnover in the industrial sector;
- different branches are aggregated through the activation coefficients (with the sum standardised to 1).

CURRENT PRACTICES

Italy uses materials input as a supplement to labour input in a Cobb-Douglas-type production function.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: The turnover of industrial enterprises producing and selling building materials typically used in the construction sector should be used after careful selection of the materials input and deflation. Materials input supplements other variables.

B: The selection of materials used supplements other variables, but the selection is based on intuition and not followed regularly.

C: Using building materials alone as the only input for the IPC.

Wages and salaries

DESCRIPTION

Wages and salaries statistics are characterised by the following features:

- Data on wages and salaries are an alternative measurement of labour input. Labour input is continuously required during the construction activity and is therefore closely linked to the production process.
- If data on wages and salaries are used as an alternative to the number of hours worked, overtime must be included, annual bonuses must be excluded and a timely labour cost index must be available for deflation.
- Ideally, only work performed by workers and self-employed people is included. Administrative work should be excluded.
- The statistics may be based on existing administrative registers. This means no extra data collection, so the response burden can be kept to a minimum.
- Data quality depends on whether the data are reported in time. Since the IPC is compiled at an early stage, a high non-response rate may be a problem.

Methodological coordination with the national accounts is required, and divergences due to different statistical processes and revisions need to be followed up.

CURRENT PRACTICES

Currently none of the countries reporting an IPC uses data on wages and salaries.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: Wages and salaries could be used as an alternative to hours worked as a measure of labour input, provided that overtime is included, annual bonuses are excluded and a timely labour cost index is available for deflating the labour input. For compiling the IPC, wages and salaries need to be deflated with an adequate labour cost index and adjusted for productivity (see Deflation and Productivity Calculation).

B: Partial coverage, for example information on overtime missing, can be acceptable. For compiling the IPC, wages and salaries need to be deflated with an adequate labour cost index and adjusted for productivity (see Deflation and Productivity Calculation).

C: Use of intermingled data sources on labour input where overtime, bonuses and administration staff salaries cannot be separated. The use of non-deflated labour costs is to be avoided.

Turnover and sub-contracting

DESCRIPTION

As the IPC is intended to measure the volume trend in the value added of the construction sector over a given reference period, an IPC based on turnover or the value of output (in the sense of the national accounts) could be contaminated by sectors that provide their output to the construction sector as its intermediate consumption (raw materials and sub-contracting). Conceptually, this is not desirable. However, ‘turnover’ and ‘output’ can be measured monthly, which is not feasible for value added. Note that IPCs compiled using activity-of-labour measurements are not affected by this problem.

The IPC is intended to be a monthly volume trend in a value added series. In particular, it should exclude work done by sub-contractors as this will lead to double counting within the construction

sector. Including purchased materials violates the 'value added' principle, but does not introduce double counting within the construction sector. Indeed, as the consumption of raw materials is almost proportional to production in the short term, the inclusion of purchased raw materials could be tolerated for the sake of simplicity or in order to limit the burden (B method). Conversely, as subcontracting is highly cyclical, eliminating this source of double counting is essential.

IPCs that use monetary measurements (turnover, value of output, work done) need to receive data from responding units net of sub-contracting payments and the value of purchased material consumption. This will usually require calculations over and above what normal business accounting systems might produce, thereby increasing the compliance burden.

Eliminating double counting when VAT returns are used to compute turnover values can be very complex, especially if the information on tax deductions is inaccurate. The amount of tax to be paid can be used to deduce the value of construction services provided, but often not enough information is available in time to compute the actual value added. Using the value of construction services provided without proper subtraction of tax deductions leads to double counting.

It should be said that small businesses rarely make payments to sub-contractors (because they act as sub-contractors), particularly in NACE Rev.2 Div. F43, which represents more than half of total construction activity (Sec. F) in the European Union.

Speculative buildings (those built to be sold later) present a particular challenge for picking up activity in the reference period. The same applies to work-in-progress. There might also be local differences between countries in how advance and interim payments for unfinished work are handled during construction projects.

CURRENT PRACTICES

In **Poland**, data on the value of construction and assembly production includes production for sale (at current prices) by construction enterprises in Poland, excluding sub-contractors. The data cover completed work for which invoices have been issued, regardless of whether they have been paid.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: The best approach requires the subtraction of payments to sub-contractors and the value of purchased material consumption from turnover, along with adjustments for unsold production and work-in-progress. These adjustments should be attributed to the relevant reporting periods and deducted from final sales invoicing.

B: Subtraction of payments to sub-contractors and adjustments for movements in own product stocks are taken into account. However, no subtractions are made for building materials and unsold building stock is not accounted for.

C: Use of non-adjusted turnover, with inclusion of payments to sub-contractors.

6 Compilation

Deflation

DESCRIPTION

Calculating the IPC with turnover or value data makes it necessary to deflate the data with appropriate price indices. Therefore, appropriate price indices have to be available. Labour input collected in the form of wages and salaries also needs to be deflated in order to identify the trend in value added at constant prices.

In the context of construction statistics, the focus of attention is on the development of prices in the construction sector. For this reason, the terms cost index and price index are to be considered from the point of view of the contractors responsible for the actual construction process.

A construction cost index shows the development of costs incurred by contractors in the construction process. A producer price index shows the development of prices paid by clients to contractors; it is also referred to as an output price index.

A construction cost index measures the relationship between costs, for a constant technology and a constant input mix associated with a fixed amount of construction work. Such an index differs from a producer price index, which measures movements in prices charged to construction work clients. This is especially true when the price index is calculated from tender prices, which can vary from time to time and place to place, depending on the state of competition and market conditions. Producer price indices include changes both in productivity and in contractor margins.

In the absence of an appropriate price indicator, the construction cost index series could be an alternative. In this context, it should be noted that the Handbook on price and volume measures in national accounts regards the deflation of output measures with input prices as an unacceptable method.

CURRENT PRACTICES

National practices depend on the need for and availability of suitable deflators.

Price indices at 2-digit level of NACE are used in **Hungary**. For 3- and 4-digit level, the 2-digit price indices are used. Price indices is not distributed by counties or size groups.

In **Poland**, deflation is done with the use of the preliminary producer price index in construction (at the level of NACE groups).

In **Finland** the civil engineering time series are deflated with a cost index and the building construction series with the producer prices for the construction of new buildings.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: Deflation with a producer price index corresponding to the definition of the collected variable (construction producer prices for construction output and labour cost index for wages and salaries).

B: Deflation with a construction cost index.

C: Turnover or value series are used without deflation.

Productivity calculation

DESCRIPTION

For the monthly measurement of labour productivity, only work performed by workers contributes to the monthly variation in value added. Administrative tasks should ideally not be included in productivity calculations for labour, while the contribution of self-employed people should be included. In practice, the value added and number of hours worked by workers at construction sites are difficult to distinguish from total value added and labour input. Therefore, total labour productivity is used instead of workers' productivity.

Work performed by non-registered workers (black market) should, if possible, be taken into consideration.

In order to avoid big level shifts due to major revisions and the lack of availability of recent data, it is recommended to smooth the productivity factor between different periods.

It is crucial to adjust hours worked with a productivity factor. A common practice is to continue in the current reference period with the productivity trend observed in the past, dropping the cyclical component. The aim of the IPC is to measure the volume trend in value added over a given reference period, similar to the national accounts. National accounts are published annually and quarterly. The result of the short-term branch surveys, for example the IPC, is a monthly series of hours worked, which can be aggregated by quarter and annually.

Ideally, the series of hours worked resulting from branch surveys should be benchmarked against the value added at constant prices in the quarterly national accounts, which are published up to quarter q 1 – this is required for an A method. In this case, the ratio of the value added at constant prices to worked hours should be stable, or at least predictable (a time trend for instance).

If the relationship between the quarterly series of value added at constant prices and worked hours is too noisy in the short term, it might be difficult or inappropriate to benchmark the IPC against construction value added on a quarterly basis, and this could not be considered an A method.

Note that the IPC and the quarterly national accounts should be based on an integrated set of information – with a simplified framework for the IPC, which must be calculated each month. However, there are countries where the quarterly accounts preferably consider information other than the branch surveys (for example sales or building permits). The result can be a poor correlation between the monthly IPC and the quarterly national accounts series.

CURRENT PRACTICES

According to PEEIs in focus 2008, five EU countries use hours worked adjusted for productivity: **Belgium, Germany, France** and the **Netherlands**.

Example: Calculation of the annual productivity factor for year 2010:

Value added 2010 (fixed prices, 2009)/Value added 2009 (current prices)

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Total number of hours worked 2010/Total number of hours worked 2009

- The above annual factor is chained in the final calculations by multiplying the factor for each year.
- For periods with missing productivity figures, imputations are carried out. The imputation for 2011 was shown to be reasonable after benchmarking against the latest forecast for 2011.

None of the countries participating in the IPC Task Force practices benchmarking on a quarterly basis, which is the A method described below.

The **German** method is near to the B method (benchmarking on an annual basis). However, the development of productivity in the present period is based on an expert judgment in conjunction with the national accounts.

In **France**, productivity in the national accounts is benchmarked, and the differences between the IPC and the national accounts come from incomplete coverage of the work force in the survey.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: The ideal A practice would be to benchmark the IPC against value added on a quarterly basis. For this, the correlation between hours worked and value added also has to be good enough on a quarterly basis. Quarterly national accounts data on value added of the construction sector is not available by NACE Rev.2 Division of Section F. Because the productivity development may be different in building construction (F41), civil engineering (F42) and specialised construction activities (F43), structural business statistics could be used for estimating the infra-annual productivity.

The treatment of this correlation between quarterly series necessarily interferes with calendar (working-day) and seasonal adjustment. Concretely, the benchmarking procedure could be as follows:

- Adjust the monthly worked hours (WHm) for seasonality and working days
- Calculate SWDA hours worked on a quarterly basis (WHq)
- Calculate the quarterly productivity series by dividing the SWDA value added by SWDA hours worked, PIq = VAq / WHq
- Forecast the quarterly productivity PIq over several quarters using econometrics
- Calculate a monthly productivity PIm series from the quarterly series using a smoothing procedure.
- Calculate the IPC on a monthly basis, IPCm = WHm*PIm; the same PIm series should be used to calculate the uncorrected, SWDA and WDA index.

Productivity development has to be distributed over each month of each quarter (all reference periods), and gaps when changing to the next year have to be avoided (for example by using moving averages). The smoothing procedure minimises the change in productivity evolution but fixes quarterly productivity at the quarterly level observed in the past and forecast in the future.

B: If the correlation between the annual series is good enough to benchmark just on an annual basis, the following procedure (B method) should be followed when the national accounts of year n-1 are published:

- Calculate the ratio VA/WH until year n-1
- Forecast this annual productivity for years n, n+1, n+2 using econometrics
- Calculate a monthly series from this annual series using a smoothing procedure
- Calculate the IPC using the monthly productivity and adjust the data for working days and seasonality.

Productivity development has to be distributed over each month of each year (all reference periods), and gaps when changing to the next year have to be avoided (for example by using moving averages). The smoothing procedure minimises the sum of the squares (variance) of the monthly series to calculate, but fixes the annual average at the level observed during the past and forecast for the future. Note that the SWDA correction does not interfere with productivity estimation in this case.

C: No productivity estimation or the productivity estimation used to adjust the IPC is not appropriate, because it is not restricted to workers directly involved in production. The series of hours worked used for the IPC should differ from the hours worked in the construction industry, as published in the

national accounts on an annual basis up to year n-2.

Combination of sources and variables

DESCRIPTION

Raw data may come from administrative sources or surveys. Additionally, a number of different variables can be used for estimating the volume trend in value added. Given this abundance of potential data sources and variables, several kinds of combinations may be used to compile the IPC. The word 'combination' itself suggests an inherent complication, so this kind of method should not be the first option for NSIs but rather a last resort.

Using more than one data source may be necessary, for example where:

- an administrative register is the primary source used but timeliness does not meet the EBSR requirement, so a small-scale survey is necessary for an early estimate,
- a subpopulation (size class) in construction is not covered by administrative sources and has to be surveyed.

Using more than one basic variable may be necessary, for example where:

- not all subpopulations (activities) within construction are able to report a single variable,
- a single variable is not a good proxy for value added at constant prices for certain subpopulations (activities),
- a single variable cannot be collected on time for all subpopulations (activities or size classes) in order to meet the EBSR requirement,
- an auxiliary variable is needed to split total construction between building, civil engineering and specialised construction activities.

Regardless of the combination of sources and variables, the aim of the composite method should be to ensure the quality of the resulting IPC. In order to control and assess the quality of the IPC, the composite method can be broken down into several distinct processes (or components or steps) that can be assessed individually. These individual processes may be already covered in this manual in previous topics about sources or variables. It can be argued that the overall assessment of a method based on a combination of sources depends on the assessment of the individual processes.

CURRENT PRACTICES

Italy: Production function model: deflated raw materials turnover and hours worked.

Cyprus: Deflated production value (work done), deflated turnover and unadjusted hours worked.

Finland combines a (purposive) survey and administrative data on turnover.

Netherlands: Quarterly value added and deflator from national accounts, the deflator and the monthly working-day pattern are combined with year-on-year changes of monthly turnover.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A composite method may be assessed by evaluating separately the distinct processes and then by considering the impact (e.g. weight) of each process on the overall index. For assessment of the individual processes, please refer to the sections above.

A: Each process qualifies for an A method.

B: The impact of A and B methods is greater than the impact of C methods.

C: The impact of C methods is greater than the impact of A and B methods together.

Calendar (working-day) and seasonal adjustment

DESCRIPTION

Construction work is very sensitive to weather conditions. This poses a challenge to the seasonal adjustment of the IPC. Inappropriate treatment of weather conditions in the seasonal adjustment frequently causes instability in the seasonally adjusted IPC time series. Distinguishing between seasonal effects, i.e. effects that have a similar impact on the IPC year by year in the same period, and weather conditions that may vary considerably from one year to the next, typically in winter, is a prerequisite for obtaining seasonally adjusted results that are sufficiently stable over time

Non-adjusted, calendar adjusted and calendar and seasonally adjusted series are explicitly required by the EBS Regulation. Indeed, reporting countries are in the best position to handle calendar (working-day) effects, which vary considerably by country.

The EBS Regulation also requires countries to report seasonally adjusted data to Eurostat. As for calendar adjustments, reporting countries are in a better position than Eurostat to carry out seasonal adjustments, where the treatment of outliers requires local knowledge.

Currently, Eurostat's IPC headline figure is aggregated from the reporting countries' calendar and seasonally adjusted data (indirect seasonal adjustment). The EU and EA aggregates are published together with the data for the reporting countries. If reporting countries do not provide Eurostat with seasonally adjusted figures, Eurostat will also seasonally adjust and publish their time series (if this is technically possible).

The results of Eurostat's indirect seasonal adjustment of the EU and EA aggregates coincide with the weighted averages of the nationally reported values. The consistency of the total construction (Section F) and its components (Divisions 41, 42 and 43) should be taken into account in the selection of seasonal adjustment models and outliers.

Eurostat issued the second version of the ESS Guidelines on Seasonal Adjustment in 2015 to harmonise seasonal adjustment practices in the reporting countries and a more detailed methodological document, the Handbook on Seasonal Adjustment in 2018.

CURRENT PRACTICES

Eurostat currently adjusts national data for seasonality only if the reporting countries do not do so. TRAMO-SEATS method using the JDemetra+ package is used for automatic processing via web service.

Most EU Member States transmit the IPC in unadjusted, in calendar adjusted and in calendar and seasonally adjusted formats.

Italy overhauls its seasonal adjustment model every year in September, together with the release of the second quarter's data.

Poland adjusts the IPC for calendar days and seasonality with the use of TRAMO/SEATS method in JDemetra+.

To adjust the series **Romania** used JDemetra + v2.2 software package (TRAMO / SEATS), estimating the effect of working days, different from one month to another and the calendar effect (leap year and other national holidays) as well as for the identification and correction of outliers (occasional, transitional or permanent changes) and interpolation of missing values.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: Seasonal adjustment of the IPC is carried out using the A methods of the ESS Guidelines on Seasonal Adjustment. The A methods all involve use of TRAMO-SEATS or X-12 ARIMA, proper pre-treatment of time series with at least an annual review of the models, and a careful interactive assessment of diagnostics for the main series.

B: Overwhelming use of automatic tools for pre-treatment, seasonal adjustment and diagnostics for established methods without in-depth consideration of diagnostics and residual seasonality.

C: Non-transparent calendar and seasonal adjustment, adjustments using non-conventional methods or complete lack of adjustment.

7 Publication

Release and revision policy

DESCRIPTION

Revision policy is part of dissemination policy, which defines the rules governing dissemination of the data and the metadata.

Rare and small revisions give an impression of accurate data, and users generally do not like frequent minor revisions. However, if the first release is defective or incomplete, revisions are a necessary method to improve the quality of the data.

The monthly IPC has proved to be particularly prone to revision of the initial values. Generally, there are many reasons for revision:

- Respecting the short deadline forces reporting countries to send incomplete data, so the arrival of further survey results or administrative declarations requires revision of the initial data.
- Seasonal adjustment makes assumptions about the future development of the time series, and each new observation can lead to temporal redistribution of the whole series, also affecting the older observations.
- Because the different reporting countries have different reporting deadlines (based on their size), the initial European aggregates have to be re-calculated as soon as the smaller countries' voluntary data arrive after the first release data. In the EBS Regulation, all medium and large countries though have a common deadline, but during the transitional period 2021-2024 Denmark has a derogation for 15 additional days.
- Due to the synchronisation of different statistical processes (for example, STS with structural business statistics and national accounts), the STS data may be systematically revised several months, even years, after the first release.
- Changes in the base year and classifications entail revisions.
- Errors sometimes occur and need to be corrected as soon as possible.

There are two options for revision policy. Concurrent revision policy means that past releases are revised continuously as soon as new information becomes available. Current revision policy arranges the revisions to coincide with releases of new data at pre-announced release dates. Serious errors are an exception: they are corrected immediately, preferably with a specific news release to users.

Eurostat released in 2013 the ESS Guidelines on Common Revision Policy for PEEIs to harmonise the revision policies for different statistical domains in the reporting countries and at Eurostat.

These guidelines continue the work of the joint Eurostat and OECD Task Force on revisions; see the OECD / Eurostat Guidelines on Revisions Policy and Analysis.

CURRENT PRACTICES

In the **Eurostat** online reference database (Eurobase) short-term statistics currently apply a concurrent revision policy for the country data. Data submitted late by the reporting countries – because of a later deadline or a delay – are validated concurrently and uploaded to the online database immediately. European aggregates are released once a month. Reported errors are corrected immediately.

The **French** IPC is linked to the cycle of national accounts via the productivity coefficient. Data are systematically revised in June when the productivity coefficient is fixed for the year y-3, and revised for the more recent reference periods.

Italy has carried out an analysis of revisions.

- Size of revisions, on average, is higher for hours worked, as provisional data from building workers' Welfare Funds are used for earlier estimates (timing of business data transmissions to Welfare Funds and then to Istat). Both for unadjusted index and hours worked, positive revisions are more frequent than negative ones).
- In absolute terms, seasonally adjusted m-on-m rates are more revised than calendar adjusted and unadjusted y-on-y rates (the entire seasonally adjusted time series re-estimated every month with Tramo-Seats when adding a new information). In absolute terms, the latest revision is higher than the first revision.
- Revision 'vintages' are planned to published in a 'revision triangle' similar to that of the OECD.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: Revision policies complying with the A practices in 'ESS Guidelines on Common Revision Policy' qualify as A methods. In particular, the main elements of such a policy are communication to users and transparency, plus tools (a vintage database) for revision analyses by users.

B: Consistent policy for dealing with revisions, with transparency concerning major revisions, but without appropriate historical data for revision analyses.

C: Lack of a rigorously implemented revision policy.

Communication with users

DESCRIPTION

Communication with users has two elements: structure and contents. As far as structure is concerned, the Statistical Data and Metadata Exchange (SDMX) standard provides a unique set of structures, file formats and tools for data and metadata in different statistical domains. The contents of the data and metadata are the result of data compilation and contacts with data providers. The contents sometimes develop in an iterative way.

The data and metadata may be published via different media, for example in news releases, specialised publications, yearbooks and online databases.

The Commission Recommendation of 23 June 2009 on reference metadata for the European Statistical System (2009/498/EC) invites national statistical authorities to apply the statistical concepts and sub-concepts listed in the annex of the recommendation when compiling reference metadata in the different statistical areas and exchanging reference metadata within the European Statistical System or beyond.

The EBS General Implementing Regulation has formalised the use of the ESS standards in Article 11 (1): 'Member States shall provide annual quality and metadata reports for statistical business registers to the Commission (Eurostat), using the ESS standards for metadata and quality reporting.'

For short-term statistics, metadata needs to be updated annually by 15 June following the reference year of the metadata.

The aim of the SDMX standard was to develop and use more efficient processes for the exchange and sharing of statistical data and metadata among international organisations and their member countries. SDMX aims to ensure that metadata always accompany the data, making the information immediately understandable and useful. For this reason, the SDMX standards and guidelines deal with both data and metadata.

The SDMX website provides a single point of entry for all information on SDMX, ranging from the documentation on standards and guidelines to the downloadable software, together with announcements, events and information on implementation activities and data structure definitions. The SDMX User Guide and other tutorials are available via the website.

CURRENT PRACTICES

Eurostat currently publishes a generic metadata file for all short-term statistics indicators collected on the basis of the EBS Regulation, following the euro-SDMX metadata structure (ESMS). Metadata on the IPC are included in this file along with those for other indicators. Links to national ESMS metadata file can be found in the Annex of Eurostat's STS metadata file.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: The public and other users of the IPC have access to an online database that also contains links to related metadata. The metadata are structured according to the SDMX specification. Data and related metadata are updated frequently. Major revisions — changes to classifications, the base year or definitions — are announced to the public in preceding news releases or before. Users should have an opportunity to contact the producers of statistics and find the contact information at the expected location in the structured metadata.

B: Data and metadata are available to users via different media, but the synchronisation of the different communication channels is not up-to-date. Structured data formats are not used comprehensively.

C: Communication with users is ad hoc or inconsistent in different media.

8 Revisions and congruence

Revision track-record

DESCRIPTION

In practice, the reporting countries and Eurostat revise their IPCs frequently and for different reasons. Some countries introduce major revisions after the first release, whereas others do not considerably change the initial releases.

Developments in the short-term series should be confirmed by other statistical sources that become available later. If many revisions of the IPC are needed to synchronise it with the quarterly and annual statistics, the reliability of the fresh monthly figures is questionable.

On the one hand, frequent major revisions give users the impression that the first releases are inaccurate. On the other hand, revisions improve the original values and can bring them closer to a less frequent indicator (construction value added in the quarterly and annual national accounts). In this way, revisions contribute to the compilation of better time series, even if the most recent values might seem less reliable.

Large revisions (volatility) generally give an impression of low reliability of the first estimates. The bias of the first estimates is revealed by the fact that data are frequently revised in the same direction. Both volatility and bias are indicators of quality problems.

Monitoring of the revision track record is a key method for assessing the accuracy and reliability of the IPC. For this purpose, a 'vintage' database, storing the history of the values for each reference period, needs to be constantly updated.

CURRENT PRACTICES

Eurostat is asking **all reporting countries** to update annually two revision indicators (mean absolute revision and mean revision) in their ESMS metadata files for the IPC.

In **Italy**, a Task Force is studying the re-implementation of revision triangles linked to data releases – they were discontinued at the time of the latest re-basing.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: Revisions are rarely needed to align the IPC with the corresponding lower-frequency indicators in the national accounts, and this can be proven with the help of a vintage database. The temporal aggregation of the three months of the quarter shows a similar development as in quarterly national accounts, without the need for revisions.

B: The monthly IPC needs to be revised often in order to improve the coherence with national accounts, but after early revisions the two indicators show a similar development. Alternatively, unrevised data could be maintained if the differences between the index of production in construction and the corresponding aggregate in national accounts is explained in the national reference

metadata (ESMS Concept 15.3 Coherence – cross domain).

C: The development of the IPC appears independent from that of the NA and revisions are not made to align the series. Alternatively, revisions do not converge towards less frequent statistics on construction, and the difference is not justified.

Comparison with other statistics

DESCRIPTION

The compilation of the IPC faces similar problems to the compilation of the industrial production index (IPI). Since it is accepted that value added can only be measured annually, an alternative has to be used. As with the IPI, there are several possible alternatives and these are described in the specific sections under each method.

However, the fact that the observed basic variable in STS is different from the target (the volume trend in value added over a given reference period) does not mean that the divergence between the short-term statistics and national accounts should be accepted.

First, the selection of the basic variable should aim for coherence with the volume trend in value added in the less frequent statistical data collections. Second, the use of the same sources — surveys or administrative data — should be encouraged, not only because of coherence but also to reduce respondent burden. Finally, if the monthly and quarterly developments in construction differ from those revealed by the less frequent statistics, the differences should be analysed and adjusted correspondingly.

This requires methodological coordination, systematic follow-up and comparison of the different statistical processes and revisions of the data.

CURRENT PRACTICES

In **France**, the IPC is not directly aligned with the national accounts. As productivity is benchmarked, the differences between the IPC and the national accounts come from the differences in surveys and the different coverage of the work force (the IPC takes only workers into account, while the national accounts depict the total employment of the sector).

In **Hungary**, meetings of heads of departments and experts of STS and national accounts take place regularly. National accounts also revise GDP data, because the T+ 30 days GDP-estimation is based on the IPC of the first and second month of the quarter.

ALTERNATIVES

A) Best approach; B) Acceptable; C) To be avoided

A: Systematic synchronisation of the IPC with NA is applied. This also implies that the users are informed of the differences between the results and compilation methods. Ideally, the STS data are used for compiling quarterly national accounts.

B: Occasional synchronisation with delayed coherence is acceptable. If no synchronisation is applied, then the justification of differences between the IPC and the NA is explained in the national reference metadata (ESMS Concept 15.3 Coherence – cross domain).

C: Compilation of the IPC independently of the NA without justification.

9 References

Legal acts

EBS Regulation (EU) 2019/2152

The EBS General Implementing Regulation (EU) 2020/1197

Commission Recommendation of 23 June 2009 on reference metadata for the European Statistical System (2009/498/EC)

Statistical methodologies

SDMX website

ESS Guidelines on Seasonal Adjustment, Eurostat 2015

Handbook on Seasonal Adjustment, Eurostat 2018

ESS Guidelines on Common Revision Policy for PEEIs, Eurostat, 2013

OECD / Eurostat Guidelines on Revisions Policy and Analysis

Handbook on price and volume measures in national accounts, Eurostat 2016

Statistical classifications

On the Eurostat metadata server, RAMON:

- Classification by Types of Constructions (CC)
- Classification of Individual Consumption by Purpose (COICOP)
- Statistical Classification of Economic Activities in the European Community (in French: Nomenclature statistique des activités économiques dans la Communauté européenne) (NACE)

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European business statistics methodological manual for compiling the monthly index of production in construction

The index of production in construction (IPC) is an important indicator for monitoring and assessing developments in the construction sector. The calculation of the IPC is one of the short-term business statistics requirements of the European Business Statistics Regulation.

This guidelines document aims to serve as a tool for producing the IPC under the European Business Statistics Regulation and for improving its quality in the current and future reporting countries.

For more information
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