

## in focus

## INDUSTRY, TRADE AND SERVICES

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# Data revisions in the EBT database

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Information about macro-economic and business cycle indicators is collected and processed by many statistical agencies. With financial markets, banks and businesses demanding more up-to-date information, there is an onus on statistics to be released as quickly as possible. This usually results in provisional data being published in the form of rapid, aggregated indicators. These data may then be subsequently revised (perhaps more than once) until they are considered "final".

Users of statistics are generally aware of the trade-off that exists between using rapid (provisional) data that is often based on a smaller sample population or lower response rate and more accurate and detailed data that may only be available following lengthy delays.

The reliability of provisional data is of great importance within the modern-day economy, as announcements on the money supply, unemployment, price inflation or industrial production have large effects on the expectations and investment decisions of financial markets and businesses as well as consumers. It is unrealistic to assume that data compiled from actual observations can be provided with no delay. However, it is important that data is released as quickly as possible and that decision makers have confidence in their data sources, so they may base decisions on figures that are unlikely to be revised substantially in the future.

This paper takes data released in the 11 issues of the Monthly Panorama of European Business published in 1999 and analyses the size and frequency of the revisions over the course of a calendar year, comparing data points from 11 extractions taken from the EBT database.

This paper does not attempt to explain the reasons behind the revisions that are observed in this study. However, some of the main causes are increased response rates, benchmarking to less frequent surveys with larger sample sizes, corrections of errors during data collection/processing, or of errors in transmission of national data to Eurostat. For European totals the main causes are revisions following the reception of new or revised data within Eurostat, revisions of weighting systems or corrections of compilation errors.

<sup>&</sup>lt;sup>1</sup> The use of the word "final" is employed, although often data is never actually frozen with a fixed value. This occurs due to minor adjustments and modifications that are constantly being made in the treatment of seasonal effects and outliers.

#### Dissemination standards as reported to the IMF

The information in table 1 is available from International Monetary Fund. It may be found in the Special Data Dissemination Standard (SDDS), which established by the IMF to guide members that have, or might seek, to international capital markets in the provision of their economic and financial data to the public. This SDDS information is not inherently linked to that provided within the framework of the STS Regulation. Rather, it is provided as an indication of EU Member State practices.

From table 1 it can be seen that most revisions occur within a few months of the initial release of data. This time lag appears to be longer for the production index, with delays in the publication of "final" figures ranging from 0 (Italian data, which should not be subject to any revision) to two years for Finland and Sweden.

Eight Member States declare that they release "final" data for the producer price index within one month of the first publication date (six do not revise their producer price index at all).

Seven EU Member States declare that they release their "final" data for the employment index within 15 working days of the initial publication date (six do not revise their figures at all).

		Production	Producer prices	Employment	
В	First release	6 to 8 weeks	6 weeks, the release date is	18 months (Q)	
			" flexible"		
	Final data	3 to 4 months	Data is "final"	Data is " final"	
DK	First release	6 weeks	4 weeks	6 weeks	
	Final data	3 months	Data is "final"	3 months (Q)	
D	First release	6 weeks	Within 4 weeks	Beginning of third month after the reference period	
	Final data	1 month	Data is "final"	Revisions occur for several months after preliminary data	
EL	No information is available				
Е	First release	Within 7 weeks	Within 4 weeks	Within 7 weeks (Q)	
	Final data	Revisions are not regular	Revisions are not regular	Data is " final"	
F	First release	7 to 8 weeks	1 month	6 weeks (Q)	
	Final data	Before November of the following year	Revisions within 6 months	After 2 years, with revisions twice a year	
IRL	First release	4 months	3 weeks	October	
	Final data	Revisions are published as they occur	Revisions are published as they occur.	April	
ı	First release	45 days	Within 1 month	Within 1 quarter (Q)	
	Final data	Data is " final"	Data is "final"	Data is " final"	
L	No information is available				
NL	First release	6 weeks, except for July (2 months)	1 month	Within 1 quarter (Q)	
	Final data	3 years	6 months	Within 4 or 5 years	
Α	First release	3 months	8 days	2 working days	
	Final data	12 months 1 month after		15 working days	
Р	First release	6 weeks	6 weeks	1 month (Q)	
	Final data	February of the following year	February of the following year	Data is "final"	
FIN	First release	30 days (45 for volume index)	18 days	2 to 3 weeks	
	Final data	2 years	Data is "final"	Data is " final"	
S	First release	7 weeks	4 to 5 weeks	2 weeks	
	Final data	2 years	Data is " final"	Data is " final"	
UK	First release	26 working days to 6 weeks	2nd Monday of each month	12 weeks to 1 quarter (Q)	
	Final data	A number of revisions occur, they	Data are "final" after 5 weeks or	Revisions can occur any time there is	
		are very small in size after 6 months	after 95% of response rate to the survey, whichever is earlier	updated information	

Table 1: Member States reported practise

Source: International Monetary Fund (SDDS)



#### **Observed practises**

Information collected from the 15 EU Member States within the context of STS Regulation the includes monthly indices for production, (output) prices producer and employment. These indices form the basis of this study. Table 2 shows empirical observations and describes the revisions observed in the 11 extractions made from the EBT database during 1999.

In practise, the figures tend to become stable shortly after their initial release date, most of them within 1 to 6 months. Nevertheless, it is important to note that a number of "shocks" occur in almost all Member States. By "shock" the reader should understand a complete revision of all the figures for the last 4 or 5 years. This can be observed with different degrees of

intensity depending upon which of the three indices is analysed and which of the 15 Member States is considered. The data revisions recorded in 1999 show that the changes in data for the different Member States follow similar patterns, whilst the main differences are seen between the three different indices.

	Production	Producer prices	Employment			
EU-15	Revision of several data points in all the extractions.	Two complete update of the series in 2 and 4/99	Small revisions in 5 and 9/99. Complete revisions in 2-3-4/99.			
В	Last 3 or 4 values revised nearly every month (except 4-5-6/99). A complete revision in 7/99.	Never revised.	3 " shocks" in 3-4 and 9/99.			
DK	Last 1-2 values updated almost every month. Complete revision in 5/99, mini "shocks" every 3 months (3-6-9-12/99).	Only one complete update of the series in 5/99.	Data is produced quarterly. Every 3 months there is a revision of the last 2 quarters			
D	3-4-7-9-11-12/99: revisions of the last few values. 5 and 11/99: revisions of a large part of the series.	Only one complete update of the series in 4/99.	Never revised.			
EL	Only the last data point was revised on a frequent basis. In 4/99 there was a revision of all the 1998 figures.	Only one complete update of the series in 9/99.	Every 2 months there is a revision of the last 3-6 data points.			
E	Revision of the last 1-3 figures almost every month. Complete revision in 5/99.	Never revised.	Twice in the year (4-9/99) there was a revision of the last 3 values.			
F	Revision of the last figure almost every month.  Larger revisions every 3 months.	Never revised.	Occasionally the last 1-2 data points revised. Two "shocks" during the year (4 and 10/99).			
IRL	Never revised.	Never revised.	Last 9 data points revised in 6/99.			
I	Only one complete update of the series in 4/99.	Never revised.	2 adjustments of the whole series in 4/99 and 5/99. All modifications made in 4 were removed in 5, possibly there was an error.			
L	Last 2 to 5 values revised in 2 and 12/99. A complete revision in 10/99.	Only one complete update of the series in 10/99.	Only one complete update of the series in 10/99.			
NL	Revision of the last few figures almost every month. Larger revisions in 6 and 12/99.	Occasional revisions of the last 1-2 figures. A larger revision in 6/99.	Quarterly revisions of the last 1-3 values.			
Α	Only one large revision in 10/99.	No data available.	2 revisions of a large number of values in 3 and 10/99.			
Р	Monthly revisions of the last 1-3 data points. One complete revision in 5/99.	A minor revision of the last data point occurred twice in the year.	Monthly adjustments of the last data point. One large revision occurred in 3/99.			
FIN	Very small adjustments for up to 2 years of data occurred several times.	Never revised.	Quarterly adjustments of the last 6 months of data.			
S	Monthly revisions of the last 1-3 data points. One complete revision in 4/99.	Never revised.	Quarterly adjustments of the last 1-4 months of data.			
UK	Frequent revisions of the last few values. 2 larger revisions in 7 and 9/99.	Last data point revised almost every month.	3 revisions of last 2-3 values and one complete revision in 2/99.			

Table 2: Observed revisions by indicator in the 15 Member States and the EU aggregate

Source: EBT



#### Differences in the number of revisions between indicators

The production index was revised on a regular basis in all the Member States, except Luxembourg, where the values changed in only 3 of the 11 extractions, Austria where the values changed once and Ireland where there were no revisions. In all other Member States, virtually every extraction showed changes in the figures for the production index. Most revisions affected only the data for the last 3 or 4 available months, whilst for the majority of Member States there were 1 to 3 complete revisions during the year. As a result, the production index for the EU total was revised in 10 out of the 11 extractions.

The producer price index did not have any revisions in 7 of the

When observing the revisions to the different indices it would be of

interest to know if the changes have

a different amplitude for different

indices. It is not easy to give a

definite answer to this question,

because the situation observed

varies greatly between Member

States. In order to help summarise

the situation some averages were

calculated to show the behaviour of

the three indices in the EU for total

for the 10 consecutive extractions<sup>2</sup>

industry. Figure 1 shows the average absolute variation recorded

compared to the first extraction.

Member States considered (B, E, F, IRL, I, FIN and S). Unlike the production index, "shocks" were observed in the data from just 5 of the countries (DK, D, EL, L and NL). In the Netherlands there were 4 more revisions, which affected only the data for the last month or two available. In Portugal revisions were seen in 2 more of the extractions, whilst in the United Kingdom revisions occurred in 7 more of the extractions. In all of these cases the only values updated were for the indices of the latest month reported in the previous extraction. The producer price index for the EU was revised 4 times during the year. Two of those revisions affected the whole series (the first one, observed in February being the most important,

with average variations of -7.5%), whilst the other two were minor revisions of the latest available data.

Most of the revisions observed for the employment index affected the data for just the last few months available (a period of 1 to 9 months). Only in a few cases did the revisions apply to the whole series (or to the majority of it), for example, Belgium (all), France (3/99 and 9/99), Austria (all), Portugal (3/99) and the United Kingdom (2/99). In the majority of cases the employment index was provided on a quarterly basis, thus explaining why in certain cases the adjustments occurred on a 3monthly basis. The employment index for the EU was revised 5 times during the year.

#### Size of revisions by indicator

0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1 0 2-99 3-99 4-99 5-99 6-99 7-99 9-99 10-99 11-99 12-99 - - - Producer prices - Employment Production

Figure 1: Average absolute variations (calculated as percentage points) observed in 10 data extractions for EU-15, total industry during 1999, compared to the January extraction. Index compiled with 1995 = 100

In general it is possible to observe that the production index is revised more often than the other two indices, and that revisions are in most cases larger in size. Nevertheless, in March 1999 there were some fairly large adjustments to the producer price index (7.64 points) and the employment index (0.59 points).

Source: EBT



<sup>\*</sup> The values shown on the y-axis are the average absolute variations of a given indicator between two consecutive extractions. The average is calculated on the data points which are common to the two extractions. The axis has been cut at 1, causing the variation of the producer price index value for the 3/99 data set (7.64) to go off the scale.

<sup>&</sup>lt;sup>2</sup> For the purposes of this study the January extraction is considered as the initial release of the data and there is no extraction in August.

#### Size of revisions subject to NACE Rev. 1 levels of aggregation

	Production		Producer prices		Employment	
	Average		Average		Average	
		revision /		revision /		revision /
	Average	standard		standard		standard
NACE Rev. 1	revision	deviation	revision	deviation	revision	deviation
Total industry	0.2	1.3	0.9	0.3	0.0	
Intermediate goods	0.1	1.2	0.9	0.3	0.1	0.7
Capital goods	0.3	1.1	1.6	0.3	0.1	0.7
Durable consumer goods	0.3	0.6	0.0	0.5	0.2	0.7
Non-durable consumer goods	0.2	1.4	0.9	0.3	0.1	1.0
Mining of coal and lignite; extraction of peat (NACE Rev. 1 10)	0.3	0.6	14.6	0.4	0.1	0.5
Extraction of crude petroleum and natural gas (NACE Rev. 1 11)	0.0	NA	NA	NA	0.9	0.4
Mining of uranium and thorium ores (NACE Rev. 1 12)	NA	NA	NA	NA	0.0	NA
Manufacture of food products and beverages (NACE Rev. 1 15)	0.2	1.3	2.8	0.3	0.2	0.8
Manufacture of tobacco products (NACE Rev. 1 16)	0.5	0.8	2.2	0.3	0.4	0.8
Manufacture of textiles (NACE Rev. 1 17)	0.2	0.7	2.9	0.3	0.1	0.9
Manufacture of wearing apparel; dressing and dyeing of fur (NACE Rev. 1 18)	0.4	0.7	0.5	0.4	0.1	0.8
Tanning and dressing of leather; manufacture of luggage, handbags, etc and footwear (NACE Rev. 1 19)	0.8	0.7	0.5	0.3	0.0	NA
Manufacture of wood and products of wood and cork, etc (NACE Rev. 1 20)	0.4	1.4	3.6	0.3	0.1	0.8
Manufacture of pulp, paper and paper products (NACE Rev. 1 21)	0.2	0.6	1.0	0.3	0.1	0.6
Publishing, printing and reproduction of recorded media (NACE Rev. 1 22)	0.3	1.3	0.1	0.4	0.1	0.6
Manufacture of coke, refined petroleum products and nuclear fuel (NACE Rev. 1 23)	0.3	1.1	0.0	0.7	0.7	0.7
Manufacture of chemicals and chemical products (NACE Rev. 1 24)	0.5	1.1	0.5	0.4	0.0	0.7
Manufacture of rubber and plastic products (NACE Rev. 1 25)	0.3	1.2	0.7	0.3	0.2	0.8
Manufacture of other non-metallic mineral products (NACE Rev. 1 26)	0.3	1.1	1.2	0.3	0.1	0.7
Manufacture of basic metals (NACE Rev. 1 27)	0.8	0.6	2.0	0.3	0.4	0.5
Manufacture of fabricated metal products, except machinery and equipment (NACE Rev. 1 28)	0.3	1.0	2.9	0.3	0.1	0.5
Manufacture of machinery and equipment n.e.c. (NACE Rev. 1 29)	0.3	0.8	1.4	0.3	0.1	0.6
Manufacture of office machinery and computers (NACE Rev. 1 30)	1.5	1.3	0.6	0.6	0.5	0.8
Manufacture of electrical machinery and apparatus n.e.c. (NACE Rev. 1 31)	0.5	0.5	2.4	0.3	0.2	0.7
Manufacture of radio, television and communication equipment and apparatus (NACE Rev. 1 32)	0.7	0.8	6.3	0.3	0.3	0.8
Manufacture of medical, precision and optical instruments, watches and clocks (NACE Rev. 1 33)	0.4	1.0	0.2	0.4	0.2	0.6
Manufacture of motor vehicles, trailers and semi-trailers (NACE Rev. 1 34)	0.4	0.5	1.0	0.3	0.1	0.6
Manufacture of other transport equipment (NACE Rev. 1 35)	0.8	0.7	0.1	0.7	0.3	0.6
Manufacture of furniture, manufacturing n.e.c. (NACE Rev. 1 36)	0.3	0.9	2.1	0.3	0.1	0.8
Electricity, gas, steam and hot water supply (NACE Rev. 1 40)	0.2	1.2	0.2	0.4	0.2	0.6
Average for the 2-digit headings (Divisions) of NACE Rev. 1 listed above	0.4	0.6	2.1	0.3	0.2	0.3

Table 3: Average revisions (calculated as percentage points) of data for the period 9/98, observed in 10 extractions compared to the January extraction. Index compiled with 1995=100\*

Source: EBT

The following analysis looks at whether the revisions to indices referring to broader activity aggregates have a different nature to the revisions observed for more detailed breakdowns. Table 3 shows the average revisions calculated on the 11 extractions from the EBT database using the first (January) as the reference value. The sample data refer to the EU-15 aggregate for 9/98.

Revisions are calculated as the absolute difference between the values of a given index for a given month in two consecutive extractions. Given that positive and

negative revisions will cancel out, the mean revision does not provide a complete picture of the magnitude of the changes to the data, hence the choice of analysing absolute variations.

The values reported in the table are the average of all the revisions observed for the same data point throughout 1999. This values gives a rough indication of the variability observed across the different releases of the data. Lower values indicate lower absolute changes in the figures. It is important to note that higher values do not necessarily indicate large difference between

the values observed at the beginning and at the end of the year, but rather that one or more large revision has occurred during the calendar year.

The table shows mean absolute variations for the different levels of NACE Rev. 1 aggregation from the highest (total industry, NACE Rev. 1 Sections C to E), to the lowest (NACE Rev. 1 Divisions). An average revision calculated on Divisions 10 to 40 is also shown. There is evidence that the average size of the revisions grows with the level of detail provided. It appears that the estimates of the values of



<sup>\*</sup> It should be noted that the three indices presented have a different pattern of development. The production index tends to fluctuate (from one month to the next) with far more amplitude than either the producer price index or the employment index (both of which are relatively stable). For this reason for each series the average revision is also expressed as a share of the standard deviation of all revisions.

the indices for very detailed activities are less stable than the estimates for more aggregated data. The average revisions observed for the three indices for total industry were systematically lower than the average revisions at the detailed level of breakdown of activities.

For the production index, an average variation of 0.15 for total industry was recorded, with the main industrial groupings between 0.14 for intermediate goods and 0.33 for consumer durables. At the 2-digit level of NACE Rev. 1 there was an average of 0.44, with values up to 1.54 for NACE Rev. 1 Division 30.

Changes in the producer price index were more significant, especially for more detailed activity breakdowns, where an average variation higher than 1 was observed in 13 of the 26 activities, with a maximum of 14.6 for NACE Rev. 1 Division 10. This value was the result of a major correction applied to the EU-15 estimates during February 1999, and another important (but lower) revision applied in June of the same year. The average variation for total industry, on the other hand, was only 0.85.

The employment index showed much smaller absolute variations over the period under examination, with an average of 0.04 for total industry and a mean value of 0.22 for the 26 NACE Rev. 1 Divisions.

## Similarities between the eleven extractions

Frequent revisions can occur without altering significantly the reliability of the series presented. By saying that two series are similar we mean that the differences in the figures caused by revisions are not statistically significant. this respect the revision can be seen as a fine adjustment, rather than a major re-release of new values. On the other hand, when we say that two series are not similar, it means that a major revision has occurred, which could affect the reliability of any analysis that has been based on the previous release of the data.

In order to analyse the similarities between the series extracted an OLS regression<sup>3</sup> was performed on the 11 extractions of the production index in the EU for total industry. All data points common to all the extractions were used, in other words, series from August 1995 to October 1998 (39 months).

When applied to the production index for EU-15 for total industry this type of OLS analysis shows that no major shocks occurred in the series. This is the same as saying that the corrections to the data published at different stages during 1999 did not significantly alter the reliability of the figures published at the beginning of the same year. The results are less satisfactory when a similar analysis carried out at a more disaggregated level of detail. In this case the results of the regressions seem to indicate that some shocks have occurred. rendering the previously published data less Whilst reliable. some Member States revise their data on a regular basis (following a review calendar similar to that shown in table 1), there are many other causes of revisions. As such the majority of regular revisions are not systematic.

#### **Conclusions**

This paper has conducted an exploratory investigation of the nature and extent of revisions to European short-term statistics contained in the EBT database. The main results of the investigation can be summarised as follows:

- The production index is revised more often than the employment index or the producer price index.
- The EU-15 estimates are revised on a frequent basis because the revisions of the Member States are spread over the whole calendar year.
- 3) There are revisions in the data sets that users should be aware of, either due to "shocks" or to the standard practise of updating figures that is employed within the Member States.
- The revisions observed are less significant at higher levels of aggregation within the classification of economic activities.



<sup>&</sup>lt;sup>3</sup> The regression was of the form: (PROD)  $Rev_i = \alpha + \beta$  (PROD)  $Rev_{i-1}$ , where i runs from 1 to 10, and  $Rev_0$  is the first extraction of the data in January 1999. If the early releases of figures are unbiased predictors of the subsequent revisions, then it must be that  $\alpha$ =0 and  $\beta$ =1.

#### > ESSENTIAL INFORMATION - METHODOLOGICAL NOTES

Each month, during calendar year 1999, the latest available monthly indices were extracted from the Monthly Panorama of European Business data files (source: EBT). In most cases 50 monthly figures were generally available per indicator.

The sample data examined included three monthly indices for a set of industrial activities, notably a production index (working day adjusted), a producer price index (gross) and an employment index (gross).

The index of production aims to measure changes in the volume of

the gross value added created by industry, the indices for each activity being aggregated by means of a system of weighting according to gross value added at factor cost in base year 1995. The indices are adjusted to take account of the varying number of working days in the month.

The index of producer prices aims to show the changes in the ex-works selling prices of all products sold on domestic markets, excluding VAT and similar deductible taxes. The EU indices refer to overall weighted price changes. There are not yet indices for Austria. No seasonal

adjustment is carried out on these indices.

The employment index shows the development of the number of persons employed. The latter is defined as the total number of persons who work in the observation unit (inclusive of working proprietors, partners working regularly in the unit and unpaid family workers), as well as persons who work outside the unit who belong to it and are paid by sales representatives, (e.g. delivery personnel, repair maintenance teams).



#### Further information: Reference publications **Databases** Title Monthly Panorama of European Business - Annual subscription New Cronos Theme 4 Catalogue No KS-AM-00-000-EN-C Price Domain EBT (European Business Trends) To obtain information or to order publications, databases and special sets of data, please contact the **Data Shop** network: BELGIQUE/BELGIË ESPAÑA DANMARK DEUTSCHLAND FRANCE ITALIA - Roma DANMARKS STATISTIK STATISTISCHES BUNDESAMT INE Eurostat Data Shop INSEE Info Service Bibliotek og Information Eurostat Data Shop Eurostat Data Shop Berlin Otto-Braun-Straße 70-72 Eurostat Data Shop Bruxelles/Brussel Paseo de la Castellana, 183 Centro di Informazione Statistica Planistat Belgique Oficina 009 195, rue de Bercy Sede di Roma, Eurostat Data Shop Sejrøgade 11 Entrada por Estébanez Calderón 124 Rue du Commerce (Eingang: Karl-Marx-Allee) Tour Gamma A Via Ces are Balbo. 11a Handelsstraat 124 DK-2100 KØBENHAVN Ø D-10178 BERLIN E- 28046 MADRID F-75582 PARIS CEDEX 12 I-00184 ROMA Tel (49)-18 88 6 44 94 27/28 B-1000 BRUXELLES / BRUSSEL Tel. 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