Statistical revisions – a European perspective

Gabriel Quirós, Julia Catz, Wim Haine and Nuno Silva[1, 2]

1. Introduction

Timeliness and reliability are important quality criteria for official statistics, which are the foundation for analyses and policymaking. The need for early information implies that first estimates for most economic statistics are generally based on fewer, or less complete, data sources than later estimates, and may therefore be subject to revisions, leading to more reliable results. Producers of statistics face the challenge of optimising the provision of both timely and reliable estimates. Different types of revisions can be distinguished. Regular revisions are the result of incorporating more, but less timely, quarterly or annual basic information, including – for infra-annual data – updated seasonal and working-day adjustment parameters. Major revisions undertaken at intervals of approximately five years reflect improved multi-annual source data and methodological improvements. An additional dimension of revisions exists when different geographical layers contribute to the production of aggregate statistics, for example when country results are used to compile euro area aggregates. As a key user and producer of statistics, the ECB has a strong interest in revision policies and in analysing the reliability of first estimates. This paper presents an overview of the ongoing work in the Euro Area Accounts and Economic Data Division of the ECB's Directorate-General Statistics. The reliability of euro area statistics is addressed from different perspectives. Section 2 presents an analysis of the reliability of GDP flash estimates and the possible trade-off with timeliness in the euro area, while Section 3 illustrates the administrative use of revision analyses for the case of government finance statistics. Section 4 addresses the importance of harmonised release and revision policies for the Principal European Economic Indicators (PEEIs).[3] Section 5 discusses the main challenges for the implementation of a consistent revision policy for the euro area accounts, and a conclusion is provided in Section 6.

2. GDP flash estimates: trade-off between timeliness and reliability?

An effective assessment of the economic situation not only requires that first estimates of quarterly GDP volume growth are reliable, but also that they become available in a timely manner. In recent years, the timeliness of first releases of GDP growth has improved significantly – by around 25 days – with the introduction of GDP flash estimates. Since revisions are, in general, the result of incorporating new information which becomes available

[1] European Central Bank (e-mail: gabriel.quiros@ecb.europa.eu, julia.catz@ecb.europa.eu, wim.haine@ecb.europa.eu and nuno.silva@ecb.europa.eu)

[2] The views expressed in this paper are those of the authors and do not necessarily reflect the views of the European Central Bank. Comments by Werner Bier and Marta Rodriguez-Vives are gratefully acknowledged, as is the collective work by the staff of the Euro Area Accounts and Economic Data Division.

[3] The Principal European Economic Indicators (PEEIs) are a set of key euro area and EU statistics agreed by the ECOFIN Council in February 2003 and reviewed and updated in 2008. They were developed from the September 2000 Action Plan on Economic and Monetary Union Statistical Requirements established by the European Commission (Eurostat) in close cooperation with the ECB.

after each successive release, this section addresses the question of whether the improvement in timeliness has come at the expense of reliability.

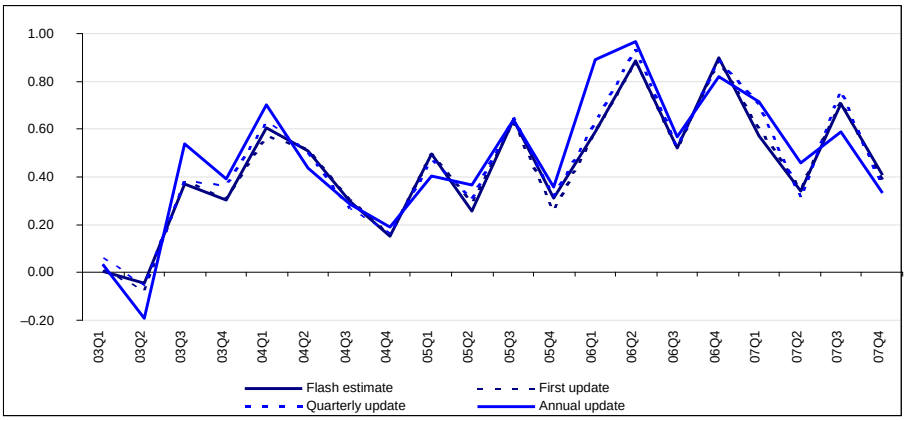
GDP flash estimates, released 45 days after the end of the reference quarter, constituted an important improvement over the first estimates of euro area GDP volume growth which were previously published with a delay of 70 days. The euro area GDP flash estimate has become a widely recognised indicator with a country coverage that now extends to 95% of euro area GDP. In order to assess its reliability, the flash estimate for any given quarter is compared with three selected subsequent releases. These involve: (i) the *first full release* for the same quarter, which is published about two weeks later; (ii) a further estimate (the *quarterly update*), which becomes available about three months later and can be assumed to include all quarterly source data;[4] and (iii) the estimate (the *annual update*), which is published in the fourth quarter of the following year when quarterly data have typically been aligned with the latest annual information.

A first glance at the development of quarter-on-quarter euro area GDP growth between Q1 2003[5] and Q4 2007 illustrates that the flash estimate contains only minor revisions when compared with the first full release and quarterly update (see Chart 1). Most of the revisions are accounted for by the annual update, which reflects the increased availability of data sources, including those at annual frequency. This is confirmed by a more detailed analysis of the flash estimate's performance in capturing turning points. In comparison with the different benchmarks, the flash estimates have been successful in indicating the direction, and even the pace, of euro area GDP growth.

Chart 1

Euro area quarter-on-quarter GDP growth, seasonally and working-day adjusted

% change



Source: Eurostat.

At the national level, GDP flash estimates also show only small revisions when compared with the first and quarterly updates. In comparison with the annual update, the flash estimates' success rate in indicating the direction of economic growth ranges from 85% for

[4] The higher frequency information (including monthly survey data and short-term statistics such as the industrial production index) and/or modelling assumptions on which GDP flash estimates are often based are generally replaced by more (complete) actual data sources with successive GDP releases for a given quarter.

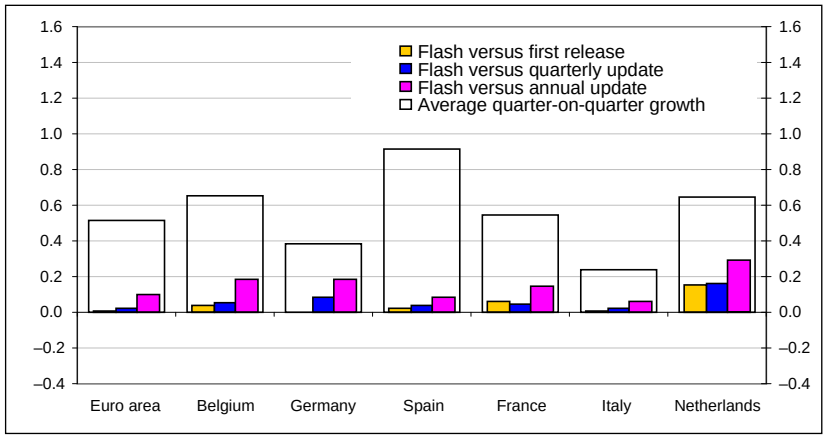
[5] On 15 May 2003, Eurostat published, for the first time, a flash estimate of euro area GDP growth referring to developments in the first quarter of 2003.

the Netherlands to 100% for Belgium and Italy, whereas the acceleration or deceleration of growth was correctly indicated from 69% of the time for Belgium to 100% for Italy. The reliability of the flash estimate is further evidenced by the results for other commonly used revision indicators.[6] At the euro area level, both the bias and the average size of revisions are close to zero. For individual countries, the average size of revisions is largest when considering the annual update, which reflects an increased availability of more complete basic information. Revisions range from around 0.1 percentage points (pp) for Spain, France and Italy to over 0.2 pp for Belgium and Germany and 0.3 pp for the Netherlands. These results are shown in Chart 2 in relation to the average quarterly growth rate in the period considered. There is no evidence of a significant bias.

Chart 2

Average size of revisions

Percentage points



Source: ECB calculations based on Eurostat data.

Two key findings can be distilled from this analysis. First, euro area results are more reliable than individual country results. This is because revisions at the disaggregate country level tend to be uncorrelated and at least partially offset at the aggregate euro area level. The second key finding is that the description of economic developments provided by the flash estimate does not significantly differ from the one provided by the first full release published around two weeks later. Despite the delay, the new basic information that becomes available does not generally require a significant revision of the earlier published flash estimate. Improvements in timeliness, as in the case of the release of flash estimates 45 days after the end of the reference quarter, do not necessarily come at the expense of lower reliability. This favourable assessment may be due to the careful preparation, by Eurostat and the national statistical institutes (NSIs), which may have introduced improvements in the methods and available sources that underlie the GDP flash estimates. These findings are also relevant for the current discussions on the feasibility of publishing the flash estimate of euro area GDP growth 30 days after the end of the reference quarter, which would better address ECB policymaking needs and bring the timeliness in line with international standards such as the "advance" GDP estimate for the United States.[7]

---

6 The bias is calculated as the arithmetic mean of revisions, whereas the average size of revisions is calculated as the arithmetic mean of absolute revisions (ie disregarding the sign).

7 According to the US Bureau of Economic Analysis' news releases, the advance estimate of quarterly GDP growth has – over the period 1983–2005 – successfully indicated the direction of change in GDP growth 98%

3. The role of revisions in the administrative use of government finance statistics

The Stability and Growth Pact (SGP) is an agreement by EU member states on the conduct of their fiscal policy with the aim of facilitating and maintaining Economic and Monetary Union. According to the Treaty establishing the European Community, the government deficit should not be higher than 3% of GDP and the government debt should either be below 60% of GDP or decreasing towards 60% of GDP. It is of vital importance to the credibility of budgetary surveillance in Europe that the reliable compilation and timely reporting of deficit and debt statistics is ensured. One way of assessing their reliability is by monitoring the data revisions.

Deficit and debt statistics are notified twice a year (spring and autumn) by EU member states to the European Commission (Eurostat, the Statistical Office of the European Union). The government deficit and debt figures for year t-1 are first released in the spring of year t. At the same time, the results for years t-4, t-3 and t-2 may be revised. The statistics for all four previous years may be further revised in the autumn.

The Regulation[8] that legally obliges EU member states to report their deficit and debt figures to Eurostat emphasises the role of revision analysis in the monitoring of data quality by stipulating that member states must inform Eurostat of any major revision of their government deficit and debt statistics. Moreover, major revisions must be properly documented. In any case, revisions which result in the reference values of deficit (3% of GDP) and debt (60% of GDP) being exceeded, or revisions which mean that a member state's data no longer exceed the reference values, must be reported and properly documented.

Annual government finance statistics are also reported twice a year by the National Central Banks (NCBs) of the European Union to the ECB. The legal act[9] that obliges euro area NCBs to report such data to the ECB (non-euro area NCBs report on a voluntary basis) also contains an obligation to report the reasons for revisions of deficit and debt figures. All revisions of at least 0.3% of GDP for changes to deficit/surplus figures and of at least 0.5% of GDP for changes to debt figures must be explained.

In its biannual press release on government deficit and debt, Eurostat publishes the explanations for the most important revisions of deficit and debt in comparison to its previous press release. The ECB reports on the revisions of the deficit and debt data for euro area countries in a yearly data quality report, which is sent to the Governing Council of the ECB. The revisions under scrutiny in the data quality report are not so much the revisions compared to the previous data quality report, but the revisions compared to the first release of the deficit and debt ratios.

---

of the time, whereas it correctly indicated whether GDP was accelerating or decelerating 75% of the time. In comparison with the preliminary estimate, released one month later, the average size and volatility of revisions are 0.1 pp. There is no evidence of a significant bias. The average quarter-on-quarter growth in the period 1983–2005 is 0.8%.

8 Council Regulation No 2103/2005 of 12 December 2005 amending Regulation (EC) No 3605/93 as regards the quality of statistical data in the context of the excessive deficit procedure, Official Journal L337, 22.12.2005, p 1.

9 Guideline of the European Central Bank of 17 February 2005 on the statistical reporting requirements of the European Central Bank and the procedures for exchanging statistical information within the European System of Central Banks in the field of government finance statistics, Official Journal L109, 29.4.2005, p 81, as amended.

Table 1 below provides an overview of several revision indicators for euro area countries for the period 2004–2007. The indicators were calculated by comparing the last release (in autumn 2008) of the deficit- or debt-to-GDP ratio with their first release. The indicators show the average size of the revisions,[10] the tendency of the deficit or debt to deteriorate as time passes[11] and the volatility of the numbers.

Table 1

Revision indicators for 2004–2007

As a % of GDP	Government deficit			Government debt		
	Average absolute revision	Upward revision ratio	Standard deviation	Average absolute revision	Upward revision ratio	Standard deviation
Austria	0.90	0.50	1.52	0.45	0.50	0.55
Belgium	0.80	0.75	1.31	1.20	0.00	0.14
Cyprus	0.15	0.00	0.13	0.98	0.00	0.61
Finland	0.20	0.00	0.14	0.40	0.50	0.54
France	0.05	0.00	0.06	0.42	0.00	0.19
Germany	0.13	0.50	0.17	0.23	0.50	0.26
Greece	0.73	1.00	0.50	7.40	0.25	5.25
Ireland	0.25	0.25	0.35	0.40	0.00	0.18
Italy	0.50	0.50	0.66	0.68	0.50	0.99
Luxembourg	0.85	0.25	0.86	0.43	0.25	0.61
Malta	0.33	0.00	0.24	2.70	0.00	1.80
Netherlands	0.23	0.25	0.42	1.50	0.25	1.48
Portugal	0.15	0.50	0.24	0.98	0.00	1.76
Slovakia	0.38	0.25	0.48	0.70	0.00	1.01
Slovenia	0.38	0.25	0.39	1.53	0.00	0.74
Spain	0.08	0.25	0.13	0.80	0.00	1.27
Average	0.38	0.33	0.47	1.30	0.17	1.09

If a country's revision indicators are all above average, it does not necessarily imply that there is currently a data quality issue. Revisions of fiscal data may be due to improved data sources or improved methods of calculating accrued rather than cash amounts. Certain revisions may also be due to decisions by Eurostat on the recording of borderline transactions on which the available methodological guidance was previously unclear. The debt-to-GDP ratio is especially vulnerable to revisions in nominal GDP. In its October 2008

[10] As stated in footnote 3 above, the average size of revisions is calculated as the arithmetic mean of absolute revisions (ie disregarding the sign).

[11] This is a directional indicator that calculates the ratio between the number of upward revisions of government deficit/debt and the number of observations. It shows the likelihood of a worsening of the deficit/debt when it is revised. If the upward revision ratio equals 1, all revisions have worsened the deficit.

press release on government deficit and debt, Eurostat had no reservations on the quality of the data for euro area countries.

4. Harmonised release and revision policies for the Principal European Economic Indicators (PEEIs)

The additional geographical dimension of euro area statistics, which are compiled on the basis of country data, requires particular attention from both the producers and the users of such data. At present, the release and revision practices of Eurostat and the NSIs are not fully coordinated. This implies that revisions of national data, reflecting improved information or methodological changes, are incorporated on an ongoing basis in the euro area aggregates which are published according to a European release calendar. Frequent revisions not only entail costs for producers, but also lead to unstable estimates which are difficult to interpret. Therefore, the issue of harmonisation beyond statistical concepts and methods has become increasingly important.

In recent years, there has been progress in the establishment of a harmonised release policy, notably for GDP flash estimates, thanks to the coordination efforts by Eurostat and the NSIs. This initiative should be strengthened and extended to other statistical domains. A promising development relates to the field of national accounts for which Eurostat and the ECB are developing a harmonised release and revision policy, which includes a proposal to cluster releases at 30, 60 and 90 days after the end of the reference quarter, as well as a proposal on the timing and the extent of backward revisions. This will be further discussed in the next section. It should also be emphasised that the coordination of revisions is not limited to regular revisions, but also includes the implementation of major revisions and improved methods. The need for this is clearly illustrated by the absence of any coordination of the most recent introduction of five-yearly benchmark revisions and methodological improvements such as the chain-linked volume measures and the new treatment of Financial Intermediation Services Indirectly Measured (FISIM) in national accounts. These changes were implemented by NSIs in a staggered way over a two-year period (2005–2006), complicating the compilation and analysis of euro area national accounts. To avoid similar changeover problems, Eurostat – strongly supported by the ECB – is carefully planning the coordination of the introduction of the revised economic activity classification, NACE rev 2, across and within the different statistical domains. Finally, it is clear that an adequate communication strategy is a key component of any release and revision policy.

5. Towards a consistent revision policy for the euro area accounts

The ECB and Eurostat have been publishing quarterly euro area accounts (EAA) by institutional sector since June 2007. This dataset, currently disseminated at around T + 120 days after the reference quarter, draws on European System of National and Regional Accounts (ESA)/System of National Accounts (SNA) methodological rules to provide a comprehensive overview of the economic process – from production to financial transactions and balance sheets of the various economic agents – which is fully integrated and broadly coherent. The EAA take the euro area as a single economic territory, which has several implications from a compilation viewpoint, namely, the need to ensure that only the transactions of the various member states with countries outside the euro area are registered in the euro area rest of the world (RoW) account.

To strike the right balance between reliability and time series stability, which would ultimately benefit both users and producers, the ECB and Eurostat have been working on the definition of a harmonised and consistent revision policy for the EAA since late 2007. This is pursued

in line with the ESCB Statistical Committee (STC) and ECOFIN Council requirements, and supported by the Committee on Monetary, Financial and Balance of Payments Statistics (CMFB).

In view of its cross-sectional nature, the EAA draws on a large set of data sources, at both the national and European levels, namely, national financial and non-financial accounts and euro area government finance statistics, balance of payments/international investment position and money and banking statistics. In this context, defining such a revision policy for the EAA not only requires coordination between European and national aggregates – as defined for all other PEEIs in the previous section – but also between national accounts and other statistical domains at both the national and European levels. This coordination exercise has two dimensions: the timing of the release and the depth or length of the revisions.

First, countries (ie at the national level) would need to make an effort to reconcile revision practices across statistical domains. Second, an attempt should be made to align revisions among countries for each statistical domain (timing of revisions). Finally, at the euro area level, coordination should be sought between statistical domains to ensure a logical release schedule. In short, the successful definition and implementation of a revision policy for such a complex statistical product as the EAA requires a broadly coordinated release policy for the major statistical domains at the national and European levels. However, it is recognised that the optimal bottom-up approach would not be achieved without the definition of a revision practice for the final product (ie the EAA) that could be taken as a reference for the underlying datasets.

In this context, as explained above, it is envisaged that the release calendar for euro area national accounts would evolve towards a cluster of three releases: (i) 30 days – advanced estimates (flash estimates) covering GDP, possibly employment and ideally few major expenditure components; (ii) 60 days – preliminary estimates of GDP, main expenditure, output and income components; flash estimates of balance of payments; and (iii) 90 days – final estimates based on a more complete set of basic information and additionally including so-called “early estimates” for integrated EAA. This approach would confine the releases for a specific quarter to the following quarter and would imply a logical compilation sequence since some parts are instrumental to the compilation of others.

Another important dimension of a revision policy concerns the depth or length of regular revisions, which requires striking the right balance between the advantage of incorporating new information and the disadvantage of frequently changing past figures. The aim is to restrict the extent of regular revisions to a limited number of past quarters, eg the quarters of the current and previous year. More extensive backward revisions of quarterly data (going back four years, for example) would be required when regular annual revisions are introduced. Major benchmark revisions should be introduced at around five-yearly intervals and be coordinated in advance between countries and statistical domains.

6. Conclusion

The ECB, being a key user and producer of statistics, has a strong interest in information on the reliability of first estimates as well as in revision practices, in particular with regard to euro area aggregate data. This paper has considered the reliability of euro area statistics from different perspectives. The flash estimates of GDP growth in the euro area were found to be reliable. Revisions to euro area aggregate GDP have generally been smaller (with a bias and average size of revisions close to zero) than revisions to individual country data. Another important finding is that improvements in timeliness – brought about by the introduction of GDP flash estimates – do not necessarily come at the expense of lower reliability. These findings are particularly important as official statistics need to be both reliable and timely. They are also of relevance for the current discussions on the feasibility of publishing the flash

estimate of euro area GDP growth 30 days after the end of the reference quarter, which would better address ECB policymaking needs and bring the timeliness into line with best practices.

The reliable compilation and timely reporting of deficit and debt statistics are of vital importance to the credibility of budgetary surveillance in the European Union. Both Eurostat and the ECB therefore monitor the revisions in these statistics. Revisions of fiscal data may be due to improved data sources. Certain revisions may also be due to decisions by Eurostat on the recording of borderline transactions on which the available methodological guidance was previously unclear.

The cross-sectional nature of the EAA raises particular challenges for the definition of a harmonised and consistent revision policy. This requires extensive coordination between European and national release and revision policies – as being sought for all PEEIs – but also between national accounts and other statistical domains, both at the national and European levels. In this context, "early estimates" for integrated EAA would be compiled at 90 days, as part of a logical compilation sequence of national accounts releases. Moreover, the right balance between the advantage of incorporating new information and the disadvantage of frequently revising past data needs to be struck. This includes the correct definition of the revision's depth at quarterly and annual frequencies, as well as the a priori coordination of so-called benchmark revisions.

References

Branchi, M, et al (2007): "Analysis of revisions to general economic statistics", *ECB Occasional Paper Series*, no 74, October.

European Central Bank (2009): "Revisions to GDP estimates in the euro area", *ECB Monthly Bulletin*, April.

Economic and Financial Affairs Council (2008): *Status report on information requirements in EMU*, Economic and Financial Committee, November.

Eurostat press release (2008): "Provision of deficit and debt data for 2007 – second notification", 22 October.

Gordo Mora, L and J Nogueira Martins (2007): "How reliable are the statistics for the Stability and Growth Pact?", *European Economy Economic Papers*, no 273.

"Revision practice for the European accounts, balance of payments/international investment position and government finance statistics", 37th meeting of the Committee on Monetary, Financial and Balance of Payments Statistics, February 2009.