

REVISIONS TO GDP ESTIMATES IN THE EURO AREA

ARTICLES

Revisions to GDP estimates in the euro area

First (or “flash”) estimates of GDP in the euro area are released within 45 days of the reference quarter, and revisions to those first estimates over time typically reflect the arrival of additional information. The more reliable the first estimates, the better equipped are policy-makers to assess the economic situation and outlook. Against this background, this article examines the reliability of the first estimates. It shows that the revisions to overall GDP data are generally smaller than those to GDP components. Similarly, revisions to euro area data are generally smaller than those to country data. Both results stem from a well-known statistical regularity, namely that revisions at a disaggregated level tend partially to cancel out at the aggregate level. The article also shows that the advancement of the release of first estimates by 25 days in 2003 did not result in less reliable information on developments in euro area GDP, an indication that timeliness may not necessarily come at the expense of reliability.

I INTRODUCTION

Estimates of the volume growth of quarterly GDP and its components are derived from various basic statistics and sources, including administrative data, censuses and surveys of businesses and households, and typically summarise a very large number of transactions in a single figure. An effective assessment of economic developments requires such estimates to be both reliable and timely. Therefore, Eurostat and the national statistical institutes (NSIs) seek to optimise the provision of reliable and timely estimates.

The need for early information implies that first estimates are based on fewer, or less complete, data sources than later estimates and may, therefore, be subject to revisions, leading to more reliable estimates. Revisions may include both regular and so-called benchmark revisions. Regular revisions are the result of incorporating more, but less timely, quarterly or annual basic information, including updated parameters for seasonal and working day adjustment. Benchmark revisions, undertaken at intervals of approximately five years, reflect improved multi-annual source data and methodological improvements.

Information about revisions can help policy-makers interpret first estimates. Such information might be used to assess the uncertainty surrounding the most recent data releases, for instance, or it might be used for guesses about future data releases that will incorporate future revisions.¹

This article presents the stylised facts in the revisions of first GDP estimates and its components for the euro area and the six largest euro area countries, summarised by means of selected revision indicators.² Some of these indicators show whether economic activity is changing pace, while others show how large and volatile revisions are and the extent of the bias in the first estimates.

The article is structured as follows. The revision indicators and the estimates considered for the analysis are presented in Section 2. The findings are then reported in Section 3, and the main conclusions are provided in Section 4.

2 THE ESTIMATES AND REVISION INDICATORS SELECTED FOR THE ANALYSIS

Data for quarter-on-quarter seasonally and working day-adjusted GDP and its expenditure components for the euro area are released by Eurostat, while those for the euro area countries are published, as a rule, by the NSIs. The different releases considered in this article are illustrated in Table 1, using the results for euro area GDP in the first quarter of 2003 as an example. Eurostat’s very first flash estimate for euro area GDP growth, referring to the first

¹ A possible framework for this is described by A. Cunningham, J. Eklund, C. Jeffery, G. Kapetanios and V. Labhard, “A state-space approach to extracting the signal from uncertain data”, *Journal of Business and Economic Statistics*, forthcoming.

² For previous analysis, see also the box entitled “The reliability of estimates of euro area GDP growth and its components” in the June 2006 issue of the Monthly Bulletin.

quarter of 2003, was published on 15 May 2003. Since then, Eurostat and most NSIs have published a flash estimate for GDP growth around 45 days after the end of the reference quarter.

The flash estimate is usually followed within about two weeks by a first full release that also includes the expenditure components (that for the first quarter of 2003 was published on 5 June 2003). A further estimate, referred to in the following as the quarterly update, becomes available three months later (that for the first quarter of 2003 became available on 14 August 2003). An estimate that may incorporate important new information from, in particular, annual data sources, referred to as the annual update in Table 1 below, is typically released in the fourth quarter of the subsequent year (that for the first quarter of 2003 became available on 12 November 2004).

In the following, revisions to GDP growth are calculated by taking the difference between the flash estimate, on one hand, and the first full release, the quarterly update and the annual update respectively, on the other. For the expenditure components, the first full release is compared with the subsequent two related estimates.

The releases mentioned above were selected with a view to covering the regular revisions, as well as the release and revision practices, of both Eurostat and the NSIs. Further releases and the estimates with respect to developments in 2008 are not considered in order to avoid any distortion of the results by the introduction of major benchmark revisions or by methodological improvements such as the introduction of chain-linked volume measures in the course of 2005-06.

It should be borne in mind that the release and revision practices of the statistical offices are not yet fully coordinated and that this may affect the analysis, in particular in the case of euro area revisions which reflect both improved information and some methodological changes on an ongoing basis, i.e. as and when information and/or methods are incorporated in one or more euro area countries, thus making it difficult to disentangle the sources of such revisions.

In terms of the revision indicators, the focus in this article is on measures that show both the extent to which first estimates are biased and how large and volatile revisions are – measures that are informative over the entire business cycle.

The first measure is the size of revisions, or the average absolute revision, which is computed as the arithmetic mean of the absolute value of the revisions. Smaller revisions imply that the corresponding preliminary data releases are more reliable, and thus provide a better starting point for policy-makers' assessments of the economic situation and outlook in the euro area.

The second measure is the volatility of revisions, computed as the standard deviation of revisions. This measure indicates how variable revisions are. As with the size of revisions, the smaller the volatility of revisions, the more reliable are the corresponding estimates.

The third measure, the bias of the estimate, or average revision, shows whether revisions are, on average, close to zero, positive or negative. This measure is similar to the absolute average revision, except that it takes into account the sign of the individual revisions. The more the average revisions tend towards zero, the more

Table 1 Releases for euro area GDP volume growth in the first quarter of 2003

(percentage changes; quarter-on-quarter)			
Flash estimate 15 May 2003	First release 5 June 2003	Quarterly update 14 August 2003	Annual update 12 November 2004
0.0	0.0	0.1	0.0

reliable the estimates are in correctly capturing GDP and its components.

These measures are only a selection of the revision indicators that might be useful. Other indicators include those that focus on tracing turning points. With respect to GDP, such indicators are considered in this article in order to measure how well the flash estimate indicates the direction of change and whether GDP is accelerating or decelerating.

3 RESULTS

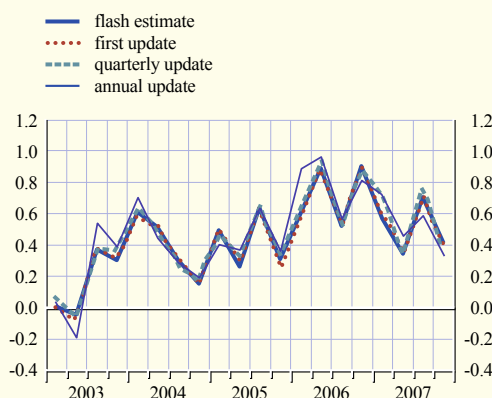
3.1 RESULTS FOR GDP

A first glance at the development of quarter-on-quarter euro area GDP growth between 2003 and 2007 illustrates that the flash estimate is not revised much when compared with the subsequent estimates (see Chart 1), except in the case of the first quarter of 2006 when the flash estimate was revised upwards by 0.3 percentage point.

The absence of major revisions to the first estimates is confirmed by the revision indicators that trace turning points, as shown in Table 2. In comparison with the different benchmarks, the flash estimates have been successful in indicating both the direction and the pace of euro area GDP growth. Also at the national level, GDP flash estimates show only small revisions

Chart 1 Euro area quarter-on-quarter GDP volume growth

(percentage changes)



Sources: Eurostat and ECB calculations.

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 the Netherlands to 100% for Belgium and Italy, while the acceleration or deceleration of growth was indicated correctly within a range of between 69% in the case of Belgium and 100% in that of Italy.

A comparison of the first estimate with the flash estimate for GDP reveals that the first full release does not provide a significantly different description of economic developments than the flash estimate. This illustrates that an

Table 2 GDP volume growth estimates and turning points

(percentage of time)

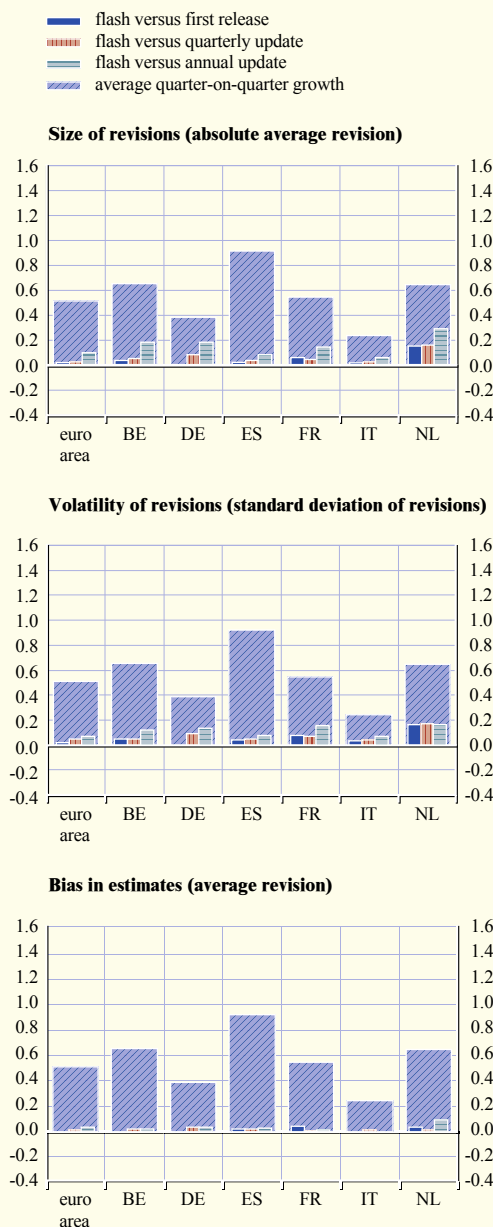
	Euro area	Belgium	Germany	Spain	France	Italy	Netherlands
Success in indicating direction of change							
Flash versus first	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Flash versus quarterly	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Flash versus annual	100.0	100.0	95.0	100.0	94.4	100.0	85.0
Success in indicating acceleration or deceleration							
Flash versus first	100.0	100.0	100.0	100.0	100.0	100.0	95.0
Flash versus quarterly	100.0	100.0	100.0	100.0	100.0	100.0	90.0
Flash versus annual	100.0	68.8	90.0	85.7	94.4	100.0	80.0

Sources: ECB calculations based on Eurostat data.

Notes: For the euro area, Germany, Italy and the Netherlands, the period from the first quarter of 2003 to the fourth quarter of 2007 is covered. For Belgium, Spain and France, the periods covered are the first quarter of 2004 to the fourth quarter of 2007, the third quarter of 2004 to the fourth quarter of 2007 and the third quarter of 2003 to the fourth quarter of 2007 respectively. The flash estimate for Belgium is released with a delay of 30 days after the reference quarter.

Chart 2 Revision indicators for GDP volume growth estimates, comparison across countries

(percentage changes and percentage points)



Sources: Eurostat and ECB calculations.
Note: Sample from the first quarter of 2003 to the fourth quarter of 2007.

improvement in timeliness, as brought about by the introduction of the flash estimates for GDP, does not necessarily come at the expense of reliability.³ This favourable assessment may

be due to the careful preparation by Eurostat and the NSIs, e.g. the introduction of improvements in the methods and available sources that underlie the GDP flash estimates.

At present, the feasibility of bringing the release of GDP flash estimates further forward, by 15 days, i.e. to 30 days after the end of the reference quarter, by 2012 is being investigated, in line with the amended list of Principal European Economic Indicators (PEEIs) published by the Economic and Financial Committee (EFC) in its 2008 Status Report on information requirements in Economic and Monetary Union, which was endorsed by the Ecofin Council in November 2008. This further improvement in timeliness would better accommodate policy-making needs and would bring the timeliness of euro area GDP flash estimates into line with international best practices, including the “advance” GDP estimate for the United States, which is also published around 30 days after the end of the quarter.⁴

Focussing on the other revision indicators, several findings are worth noting. First, the size and volatility of revisions between the first estimate and the quarterly update tend to be smaller than between the first estimate and the annual update, as can be seen in Chart 2. This finding, which applies to the euro area and to the individual countries concerned, is not surprising because more information becomes available

3 Flash estimates, which are released 45 days after the end of the reference quarter, constituted an important improvement over the first estimates of euro area GDP growth which had previously been published with a delay of 70 days. This advancement was in line with the timeliness requirements of the PEEIs – a set of key euro area and EU statistics required by the Ecofin Council in February 2003, and reviewed and updated in 2008. For more information, see, for example, the box entitled “Principal European Economic Indicators: progress up to September 2004” in the September 2004 issue of the Monthly Bulletin.

4 According to the news releases of the US Bureau of Economic Analysis, the advance estimate of quarterly GDP growth indicated the direction of change in GDP growth successfully 98% of the time over the period from 1983 to 2005, while it indicated whether GDP was rising or falling correctly 75% of the time. In comparison with the preliminary estimate released one month later, the average size and volatility of revisions came to 0.1 percentage point. There was no evidence of a significant bias. The average quarter-on-quarter growth in the period from 1983 to 2005 was 0.8%.

formation. The bias in revisions to exports is much larger than in the case of GDP, also when considering the higher average growth rate of exports. The picture for imports is similar to that for exports, as can be seen in Chart 3.

4 CONCLUSIONS

In this article, the reliability of first estimates in the euro area was examined, updating and extending the results outlined in a box on the topic in a previous issue of the Monthly Bulletin.⁶

An important caveat of the analysis presented in this article should be borne in mind, namely that the sample considered is relatively small. For countries such as the United States, for example, samples go back to the 1970s, and thus offer more robust results, also for different phases of the business cycle. On the other hand, one could question the relevance of the first estimates and corresponding revisions for observations of two or more decades earlier for assessing the reliability of current first estimates, as the practices of statistical offices and economic relationships change over time.

There are two key findings. The first is that the first estimates have generally been quite reliable. Notably, the revisions to overall GDP data are generally smaller than those to GDP components, and the revisions to euro area data are generally smaller than those to country data. Both results stem from the fact that revisions at a disaggregated level tend to cancel out at the aggregate level.

Related to this first finding are a few interesting results. As regards GDP, the revisions tend to be larger and more volatile when comparing the flash estimate and the annual update than when comparing the flash estimate and the first (full) release or the quarterly update. This reflects the increased availability of data sources. As regards the components of GDP, the revisions to private and government consumption appear to be smaller and less volatile, and the first estimates for those components less biased, than those to

fixed capital formation, exports and imports. This may be the result of a wider availability of an exhaustive and timely set of underlying source data. Examples include the retail trade turnover index for private consumption, and administrative data for government consumption. Gross fixed capital formation, by contrast, is generally more difficult to measure, and is often based on fewer and less timely data sources. As regards foreign trade, the lower reliability of the first estimates may be related to difficulties in the computation of trade deflators and the measurement of services.

The second key finding in the article is that the description of economic developments provided by the flash estimate does not differ significantly from that provided by the first full release published around two weeks later, which means that – despite the additional delay – the new basic information that has become available does not generally require a significant revision of the flash estimate published earlier (for euro area GDP, the bias in the flash estimate and the average size of revisions are close to zero). This shows that, as in the case of the release of flash estimates 45 days after the end of the reference quarter, improvements in timeliness do not necessarily come at the expense of lower reliability.

The two key findings are particularly important as official statistics, which form the foundations of policy-making, 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 policy-making needs and bring the timeliness into line with international standards.

⁶ See footnote 2.