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A REAL-TIME DATABASE FOR THE EURO AREA

A few months ago the ECB made available in its Statistical Data Warehouse (SDW) facility a real-time database (RTDB) for the euro area.[1] The purpose of this box is to provide an overview of the dataset contained in the database, along with some illustrative facts that can be retrieved from this compilation of data vintages.

The database was constructed in the context of the RTDB project coordinated by the Euro Area Business Cycle Network. The aim was to provide a structured real-time dataset that could be easily accessible to the public, and especially to researchers interested in the extent and effects of revisions to macroeconomic data.

The database compiles time series from data that are regularly reported in the Monthly Bulletin. The latter includes, in its "Euro area statistics" section, the most recent data available up to the day before the first Governing Council meeting of the month. Whereas only the latest data appear in the Monthly Bulletin, the RTDB provides, in an electronic format, successive releases of time series for several macroeconomic variables for the euro area at the time of their original publication – i.e. before any revisions have been carried out. Such datasets are commonly termed "real-time".

The RTDB allows users to undertake comparative analysis for a large number of macroeconomic variables, since it contains approximately 230 indicators. For most variables, data vintages start in January 2001, although for a selected sub-set of 38 key series (those deemed most relevant for economic and econometric analysis) vintages have been included as of October 1999. The time span of the series generally goes back to the mid-1990s, but can extend to 35 years in some cases (e.g. for US series).[2]

The database is based on a "snapshot" approach, i.e. it shows the information as available at the moment when the snapshot was taken. This implies that, for any given series, the methodology employed can change in line with the concepts used for the data reported in the Monthly Bulletin. For instance, the country coverage differs across vintages, reflecting the successive enlargements of the euro area.

1 See the Statistical Data Warehouse in the "Statistics" section of the ECB's website.
2 A more detailed description of the dataset can be found in Giannone, D., Henry, J., Lalik, M. and Modugno, M., "An area-wide real-time database for the euro area", *Working Paper Series*, No 1145, ECB, Frankfurt am Main, January 2010. The paper documents the properties of the euro area real-time data flow and revisions, explaining in particular how such revisions can introduce uncertainty in key macroeconomic indicators and concepts, such as the non-accelerating inflation rate of unemployment (NAIRU).

Data uncertainty, as reflected in revisions, can indeed be large for certain economic indicators. This implies among other things that policy evaluation conducted on the basis of revised data may be misleading, to the extent that decisions were made on the basis of data that were available at the time but were significantly revised later.[3] Academic research has documented the empirical relevance of data revision for the analysis of not only monetary policy, but also fiscal and other policies.[4] The analysis of real-time data is also relevant to the design of appropriate econometric forecasting models. If revisions to data are large, the tools must be robust to this data uncertainty, i.e. give more weight to data that are less likely to be subject to large revisions. Data uncertainty may contribute to forecast errors, thereby having an impact on economic agents' expectation formation process as well as affecting parameters that are estimated on a given vintage of data.[5]

An example of such data uncertainty is provided in Chart A. It shows the euro area quarter-on-quarter GDP growth rate for the last quarter of 2001 as reported in the data published from April 2002 to June 2010. It can be seen that what was initially considered as a period of negative growth was ultimately assessed as a period of positive growth. The main revisions occurred at the end of 2005 as a result of the introduction of chain-linking of series at constant prices.[6] However, revisions to euro area real GDP growth are generally limited, compared with

3 See Orphanides, A., "Monetary policy rules based on real-time data", *American Economic Review*, Vol. 91, No 4, 2001, pp. 964-985.
4 See Cimadomo, J., "Fiscal policy in real-time data", *Working Paper Series*, No 919, ECB, Frankfurt am Main, July 2008, and Croushore, D., "Forecasting with real-time macroeconomic data" in Elliot, G., Granger, C.W.J. and Timmermann, A. (eds.), *Handbook of Economic Forecasting*, North-Holland, Amsterdam, 2006, pp. 961-982.
5 See, for example, Mankiw, N.G. and Shapiro, M.D., "News or Noise: An Analysis of GNP Revisions", *Survey of Current Business*, Bureau of Economic Analysis, May 1986, pp. 20-25, and Pesaran, H. and Timmermann, A., "Real-Time Econometrics," *Econometric Theory*, Vol. 21, 2005, pp. 212-231.
6 For a review of sources of revisions to such macroeconomic data, see Branchi M., et al., "Analysis of revisions to general economic statistics", *Occasional Paper Series,* No 74, ECB, Frankfurt am Main, October 2007.

Chart A Euro area real GDP growth rate for the fourth quarter of 2001 as reported in successive issues of the Monthly Bulletin
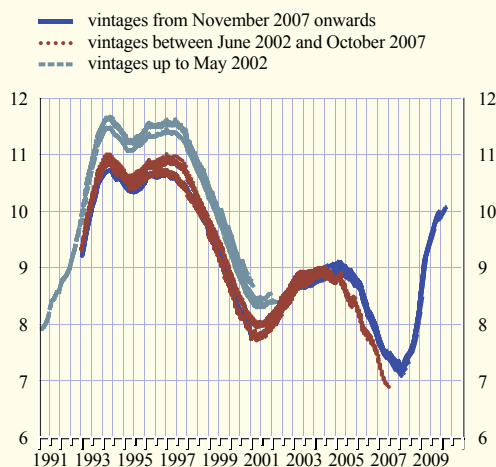
(percentage changes; quarter-on-quarter growth rate)
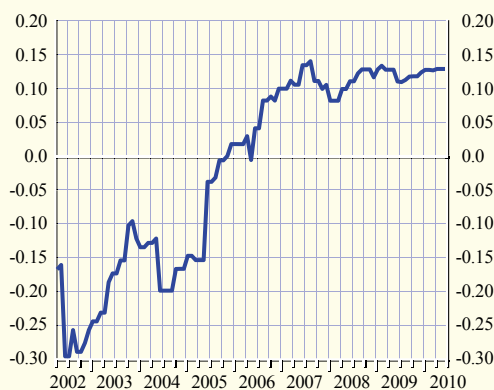
Source: ECB real-time database.

Chart B Vintages of the unemployment rate for the euro area

(percentage of labour force)

— vintages from November 2007 onwards
···· vintages between June 2002 and October 2007
---- vintages up to May 2002

Source: ECB real-time database.
Note: The different lines show the unemployment series for all available vintages. At any point, each line indicates the level of the unemployment rate at that point in time according to the respective vintage.

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those affecting both US and Japanese GDP. At the same time, euro area GDP components tend to be affected by revisions to a greater extent than GDP itself, in particular investment and exports.

One of the variables that have been subject to major revisions is the unemployment rate, the time series of which is shown in Chart B. The individual lines correspond to the time series as they were available at the time the Monthly Bulletin was published, from January 2001 to June 2010. Most revisions originated from the harmonisation of unemployment definitions and data sources across countries.

Revisions to prices and costs data can also be substantial (although revisions to the HICP are extremely limited). As an illustration, the table below reports some summary statistics on the revisions to the hourly labour costs index. Again, an important source of revisions is the ongoing harmonisation of statistics within the EU. Revisions are substantial across different sectors of economic activity. For instance, the standard deviation of the revisions to hourly labour costs in services is as large as two-thirds of the standard deviation of the series itself. However, revisions tend to average out across sectors, meaning that revisions to aggregate measures are less sizeable.[7]

With a view to facilitating empirical research into real-time issues for the euro area, the database has been made freely available online in the ECB's SDW and is updated on a quarterly basis. The dataset should in particular help to foster research on important topics such as policy assessment, forecast evaluation, expectation formation and forecasting models for the euro area.

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7   Aggregate revisions may also be smaller as a result of differences in coverage between the total index and its components.

Revisions to the annual growth rate of hourly labour costs indices (based on vintages from January 2001 to June 2010)

(annual percentage changes; percentage points)

	Total	By component		By selected economic activity		
		Wages and salaries	Employers' contribution	Mining, manufacturing and energy	Construction	Services
	1	2	3	4	5	6
Mean						
	2.85	2.85	3.12	3.14	2.97	2.75
Mean of revisions						
4 months	-0.08	0.01	-0.39	-0.05	-0.27	-0.19
6 months	-0.08	0.02	-0.34	-0.03	-0.30	-0.17
8 months	-0.03	0.01	-0.19	0.00	-0.20	-0.11
12 months	-0.01	0.00	-0.14	0.05	-0.21	-0.11
16 months	0.03	0.03	-0.03	0.02	-0.05	-0.03
Standard deviation						
	0.62	0.62	1.18	1.02	1.10	0.67
Standard deviation of revisions						
4 months	0.28	0.33	0.88	0.38	0.64	0.56
6 months	0.25	0.32	0.81	0.35	0.64	0.46
8 months	0.24	0.28	0.73	0.34	0.55	0.42
12 months	0.20	0.21	0.58	0.32	0.51	0.37
16 months	0.21	0.24	0.41	0.27	0.50	0.39

Note: For example, "4 months" refers to the difference between the estimate four months after the reference period and the estimate two years after the reference period.