



EUROPEAN CENTRAL BANK

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THE AWM DATABASE¹

This note documents the current update of the Area-wide Model database² (AWM). This update, compared to the previous one carried out in September 2006 has several new features: the inclusion of Slovenia, new figures for the household savings ratio, the addition of seasonally adjusted HICP and HICP excluding energy series, the euro/USD exchange rate and the commodity prices breakdown into oil and non-oil (in USD). As in the previous versions of the database, it has been constructed using both euro area data reported in the Monthly Bulletin and other ECB and Eurostat data where available. It has then been backdated using the numbers of the previous version of the database (history pre-1996 has been frozen since the 5th update).

The database covers a wide range of quarterly euro area macroeconomic time-series. The updated database starts for most variables in 1970Q1 and is now available until 2006Q4. This note elaborates on the method and procedures used to update the Area-wide Model database. The first section draws on previous versions of the documentation and briefly explains the sources and methodology to build the historical data. The second section explains how the data for earlier periods are re-scaled to bring the figures in line with recent euro area aggregate data, the subsequent sections list the units of the series and the main changes with the previous version of the database, closing with a summary.

1 HISTORICAL DATA: SOURCES AND METHODOLOGY³

As in the previous version database the historical data have been frozen and rescaled to the new levels given by the recent history.

The historical data are based on the aggregation of available country information when the original AWM database was compiled. The main source for the country information is Eurostat, complemented by the OECD National Accounts, the OECD Main economic indicators, the BIS and the AMECO databases.

The method of aggregation used for most variables is the so called “Index method”⁴. The log-level index for any series X is defined as follows:

¹ This updated version of the previous document has been prepared by José Emilio Gumiel. For questions on the construction of the database please email: AWMdatabase@ecb.europa.eu. Users should be aware that this is an update of the database provided with the ECB working paper No. 42, undertaken by the ECB staff and does not represent in any way an official ECB data source. In this sense it should be viewed as an effort to gather and process all the available information in order to cover the gaps in the specific statistical needs to model the euro area.

The cut-off date for this update was 1 August 2007.

² For a description of the model see ECB working paper No. 42: ‘An Area-wide Model (AWM) for the euro area’ by Gabriel Fagan, Jérôme Henry and Ricardo Mestre (January 2001).

³ For a more detailed description of the compilation of the historical data, please refer to the previous version of the documentation

$$\ln X_z = \sum_i w_i \cdot \ln X_i$$

Where w_i is the weight of X_i in the aggregate X_z . This method is used for both the nominal and real national accounts variables. The deflators are subsequently derived. This method is also used for GDP income variables (e.g. compensation to employees and disposable income) as well as for HICP and components.

For some other variables, for example ratios, the aggregate is simply calculated as a weighted sum of the variables (without expressing in logarithms). Variables created using this method include: the net foreign assets as a ratio of GDP, and interest rates. Finally, there are some series that are just summed, e.g. employment and unemployment.

The weights used in aggregating most of the individual country series are constant GDP at market prices (PPP) for the euro area for 1995. If not all countries are available then the weights are re-scaled from the original weights. For HICP variables, 1995 HICP weights are used.

When only annual data were available with partly missing quarterly data, the annual figures were interpolated into quarterly using the available quarterly data as an indicator, following the Chow-Lin procedure, implemented as a Kalman filter. When no indicator was available the data were interpolated using a cubic spline.

2 RE-SCALING OF AREA-WIDE DATA TO MONTHLY BULLETIN DATA

As a general principle, the euro area data used are consistent with those reported in the ECB Monthly Bulletin and/or those produced by Eurostat⁵. This was achieved by either completely replacing the original country aggregation by the available official euro area series or by linking the data contained in the original AWM database to the official euro area data where necessary in order to maximise the length of the series. This linking procedure takes, as a general rule, the available euro area data from the Monthly Bulletin or Eurostat as far back as possible.

The variables are re-scaled as follows.

- Real GDP and components are taken from Eurostat, the original source of the corresponding Monthly Bulletin data; they are then re-scaled to the ECU-euro corrected level of 1995 and then backdated with rates of growth of the AWM's original series.

⁴ A full explanation of this method can be found in Fagan and Henry's paper "Long run money demand in the EU: Evidence for area-wide aggregates"

⁵ For a detail description of the Monthly Bulletin and Eurostat data please refer to <http://www.ecb.europa.eu> and <http://epp.eurostat.ec.eu.int> respectively

- GDP deflators are taken directly from the corresponding Monthly Bulletin series (which are compiled by ECB staff as a weighted average of the national deflators using PPP weights⁶).
- The unemployment rate is taken from Eurostat, the same series as reported in the Monthly Bulletin. Backdating is undertaken following the same approach.
- Total employment/employees, total compensation to employees and gross operating surplus are taken from the Monthly Bulletin and backdated in rates of growth.
- HICP and components are consistent with the Monthly Bulletin and backdated in rates of growth.
- Fiscal series, in the form of ratios over GDP, are taken from the Monthly Bulletin and interpolated.⁷ The series are then backdated with aggregated interpolated country data from the AMECO database. These ratios are then adapted to the accounting framework of the model.
- Finally, the short term interest rate data are taken from the Monthly Bulletin. They are backdated with the corresponding series contained in the original database (source: BIS and AMECO). The long term interest rate is taken fully from the Monthly Bulletin databank.
- The information on household disposable income series have been substituted by the recently available seasonally adjusted savings ratio. This ratio has been extended back using the old disposable income and private consumption series.

Outside these broad categories, officially published area-wide series are still relatively scarce. As a result, it is necessary, for the purpose of the AWM, to use data which are only available in the original database of the model.

In the AWM (as in the Eurostat national accounts data), exports and imports of goods and services are a gross concept (i.e. do not net out intra-area trade flows). While, in principle, this does not affect net trade and other 'balance' items of the current account, it does mean that both export and import figures overstate significantly the true trade of the area (since intra-area trade accounts for about half of gross exports). For the time being, this is dealt with by explicitly including euro-area final demand as a variable in the aggregate export equation.

3 UNITS

The units of the series generally follow Eurostat or ECB conventions:

- Real GDP and its components are in millions of ECU/euro corrected with reference year 1995.
- Nominal series are typically in millions of ECU/euro corrected, including compensation to employees, and gross operating surplus.

⁶ This procedure is necessary since the published Eurostat figures for nominal GDP and its components are expressed in terms of the current exchange rate (in ECU terms) which implies that, for earlier years, the implicit deflators calculated from the Eurostat data would be distorted by exchange rate movements.

⁷ The interpolation of series was undertaken by ECB staff in the Fiscal Policies Division in DG-Economics.

- Deflators are generally set to 1.0 in 1995 (with the exception of YFD).
- HICP and its components are indices with base year 1996=100⁸.
- Employment/Employees are expressed in thousands of persons.
- The unemployment rate is expressed as ratio to the civilian workforce (ILO definition).
- Fiscal and current account related series are represented as a percentage of GDP.
- Commodity prices, world GDP are in US dollars.

4 **COMPARISON WITH THE PREVIOUS AWM DATABASE UPDATE**

- All the series are available up to 2006Q4.
- The data incorporates the latest data on seasonally adjusted household savings ratio and data on seasonally adjusted HICP, euro/USD exchange rate and commodity prices breakdown in USD.

5 **SUMMARY**

This note presents the new update of the AWM database. This database has taken publicly available data, such as that produced by Eurostat and/or reported in the ECB Monthly Bulletin, and supplements it with aggregated country data. Data prior to 1996 are drawn from the, now frozen, previous version of the AWM database. The current version of the database extends the series to 2006Q4

⁸ The official HICP figures published by Eurostat are scaled to the year 2000=100. To avoid level shifts in the model we have kept the original scaling to 1996=100.