

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 2007 extends the database up to 2007Q4 and includes Cyprus and Malta as part of the Euro area. As in the previous versions of the database, it has been constructed using both euro area data reported in the ECB 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 2007Q4. 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 and seasonal adjustment of the series, elaborates on the main changes with respect to the previous version of the database and on the timetable for the next updates. The document closes with a summary and an appendix with the codification of the database.

1 HISTORICAL DATA: SOURCES AND METHODOLOGY³

As in the previous version of the 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 2008.

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

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”

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

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 of 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 them in logarithms). Variables created using this method include: the net foreign assets as a ratio to 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 observations 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.
- GDP deflators are taken directly from the corresponding ECB Monthly Bulletin series (which are compiled by ECB staff as a weighted average of the national deflators using PPP weights⁶).

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

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.

- 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 to GDP, are taken from the ECB 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 ECB Monthly Bulletin databank.
- The information on household disposable income is based on the seasonally adjusted savings ratio series published by Eurostat. 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 based on the gross concept (i.e. they do not net out intra-area trade flows). While, in principle, this does not affect developments in 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).

3 UNITS AND SEASONAL ADJUSTMENT OF THE SERIES

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 1995⁸.
- Nominal series are typically in millions of ECU/euro corrected, including compensation to employees, and gross operating surplus.
- Deflators are generally set to 1.0 in 1995 (with the exception of YFD).
- HICP and its components are indices with base year 1996=100⁹.

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

⁸ The official National accounts figures published by Eurostat currently have 2000 as a reference year.

⁹ The official HICP figures published by Eurostat are scaled to the year 2000=100.

- Employment/Employees are expressed in thousands of persons.
- The unemployment rate is expressed as ratios 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.

The series that are typically seasonal, like GDP and components or HICP are provided seasonally adjusted except in the case of overall HICP and HICP excluding energy where both seasonal and seasonally adjusted data are incorporated into the database

4 **COMPARISON WITH THE PREVIOUS AWM DATABASE UPDAT AND FUTURE UPDATES**

- All the series are available up to 2007Q4.
- The data incorporates Cyprus and Malta in the euro area aggregates.
- The next update of the database is schedule to take place in September/October 2009. It will extend the database up to 2008Q4 and will include Slovakia as part of the euro area aggregates.

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 2007Q4.

Appendix: Area-Wide Model Variables

CAN_YEN	Current Account Balance/GDP
COMPR	Commodity Prices
EEN	Effective exchange rate (EER12)
EXR	Euro per USD exchange rate
GCD	Gov. Consumption Deflator
GCN_YEN	Ratio Gov. Consumption/GDP
GCR	Gov. Consumption
GDN_DIS_YEN	Public Debt Statistical Discrepancy/GDP
GDN_YEN	Ratio Public Debt/GDP
GEN_YEN	Government Expenditure/GDP
GIN_OTHER_YEN	Public Investment other/GDP
GIN_YEN	Public Investment/GDP
GIX	Implicit Public Debt Interest Rate
GLN_DIS_YEN	Net Lending Statistical Discrepancy/GDP
GLN_YEN	Ratio Gov. Net Lending/GDP
GON	Gross Operating Surplus
GPN_YEN	Ratio Gov. Primary Surplus/GDP
GRN_YEN	Ratio Gov. Revenue/GDP
GSN_YEN	Government savings/GDP
GYN_YEN	Government disposable income/GDP
HEG	HICP energy
HEGWEI	Weight of the HICP energy on overall HICP (HICP total = 1000)
HEX	HICP excluding energy (Non-seasonally adjusted)
HEXSA	HICP excluding energy (Seasonally adjusted)
HICP	Overall HICP (Non-seasonally adjusted)
HICPSA	Overall HICP (Seasonally adjusted)
INN_YEN	Gov. Interest Payments/GDP
ITD	Gross Investment Deflator
ITR	Gross Investment
KSR	Whole-Economy Capital Stock (accumulated investemtn with 1% depretaion rate per quarter)
LEN	Employees (persons)
LFN	Labour Force (persons)
LNN	Total Employment (persons)
LPROD	Labour Productivity (YER/
LSR	Stocks (level)
LTN	Long-Term Interest Rate
MTD	Imports of Goods and Services Deflator
MTR	Imports of Goods and Services (Real)
NFA_YEN	Ratio, Net Foreign assets/GDP
NFN_YEN	Ratio, Net Factor Income from Abroad/GDP
OGN_YEN	Other Net Government Income/GDP
PCD	Consumption Deflator
PCOMU	Non oil commodity prices (in USD)
PCR	Private Consumption
POILU	Oil prices (in USD)
SAX	Household's savings ratio
SSN_YEN	Social Security Contributions Total/GDP
STN	Short-Term Interest Rate (Nominal)
TDN_YEN	Direct taxes excluding social security contributions/GDP
TIN	Indirect Taxes (net of subsidies)
TIN_YEN	Ratio, Indirect Taxes (net of subsidies)/GDP
TKN_YEN	Total Revenue minus current revenue/GDP
TRN_FIRMS_YEN	Transfers to Firms/GDP
TRN_OTHER_YEN	Other Transfers/GDP
TRN_YEN	Transfers to households/GDP
ULC	Unit Labour Costs
UNN	Number of Unemployed
URX	Unemployment rate (as a percentage of labour force)
WIN	Compensation to Employees
WLN	Wealth
WRN	Wage per head
XTD	Exports of Goods and Services Deflator
XTR	Exports of Goods and Services (Real)
YED	GDP Deflator
YER	GDP (Real)
YFD	GDP at Factor Costs Deflator
YFN	GDP at Factor Costs
YIN	GDP, Income Side
YWD	World GDP Deflator
YWDX	World Demand Deflator, Composite Indicator
YWR	World GDP
YWRX	World Demand, Composite Indicator