

## Creation of the euro area: Implications for economic statistics

by Paul Schreyer and Wim Suyker

*“Nothing is more important for the conduct of monetary policy than good statistics”*

European Monetary Institute (the forerunner of the European Central Bank), 1996

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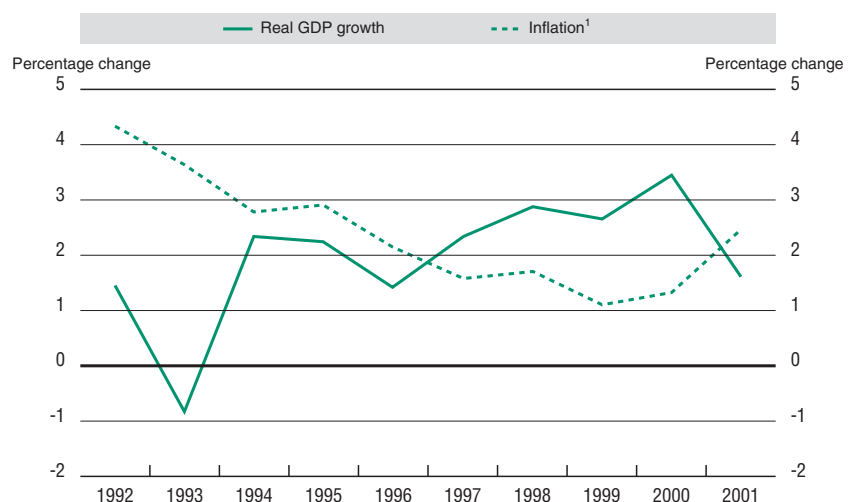
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A major event in early 2002 was the arrival of the euro banknotes and coins and the withdrawal of the existing twelve national currencies from circulation. The event has influenced every citizen in the euro area and is clearly a historic change. It heralds a new phase in forging an “ever closer union among the peoples of Europe”. In economic terms, however, the introduction in January 1999 of the single currency after determining the irrevocably fixed exchange rates of the national currencies with the euro was a more important event. It meant that decisions on monetary policy moved from national central banks to the Governing Council of the European Central Bank. This Statistics Brief highlights some of the consequences for economic statistics of the creation of the euro area.

### National accounts series for the euro area

As monetary policy decisions are based on the economic situation in the euro area as a whole, it is obvious that a consistent and exhaustive data set is needed for the area (see chart 1). These data are of significant relevance not only for the setting of monetary policy, but also for the assessment of the overall policy mix. There is also the need for monitoring economic performance at the euro area level in order to assess a country’s performance relative to that of the euro area as a whole or of the euro area with respect

Chart 1. Economic growth and inflation in the euro area



1. GDP deflator.

Source: OECD Economic Outlook, No. 70, December 2001.

## Key indicators

	2000			
	Euro area	Japan	USA	OECD
Gross Domestic Product (GDP), Billion USD (converted using PPPs*)	7397	3296	9810	26880
% of OECD total GDP	27.5	12.3	36.5	100.0
Population, millions	304.7	126.9	275.4	1122.5
GDP per capita, OECD =100	101	108	149	100
Standardised unemployment rate, %	8.9	4.7	4.0	6.4

\* PPPs: Purchasing Power Parities

Sources: OECD, *National Accounts of OECD Countries* database, 2002;  
OECD, *Main Economic Indicators*, January 2002.

to OECD Member countries (see table above). Furthermore, such data are indispensable for financial market participants and increasingly for social partners due to the need to take developments elsewhere into account during wage negotiations. This demand for statistical information goes therefore much further than for other regions, for instance OECD Europe or NAFTA (North American Free Trade Agreement, comprising Canada, Mexico and United States), for which a few key aggregates (output growth, inflation and unemployment) are sufficient in most cases.

As outlined above it is useful to treat the euro area as a single country rather than as an aggregate of individual countries. This does not mean that differences between the countries are considered economically irrelevant but that they are not seen of prime importance to assess the economic development in the euro area. Monitoring of economic developments in member countries is still warranted, as some key information is available earlier for some member countries. Even when national statistical offices and the Statistical Office of the European Communities (Eurostat) succeed in improving the timeliness of euro area data, country information will continue to play some role as a number of economic policies are still carried out at the national level.

A 'single country' approach for the euro area has consequences for statistics. For example, it is desirable to have a set of national accounts for the euro area with information on output (Gross Domestic Product, GDP), expenditures (private consumption, investment, exports, imports etc.), inflation, wages, savings and net government lending. Such a core set needs to be supple-

mented by short-term statistics providing, for example, monthly data on inflation, wages and unemployment. Since 1998, the OECD has produced a comprehensive annual euro area data set spanning over a long period, and partly published in the OECD Economic Outlook (see table 'Euro area: Demand, output and prices'). The data set is also extensively used in *OECD Economic Surveys* by Country. Euro area series are currently developed as part of the *National Accounts of OECD Countries*. Furthermore, the OECD *Main Economic Indicators* and *Quarterly National Accounts* publications contain key short-term statistics for the euro area.

### Easy data aggregation from 1999

From 1999 onwards – the year of the introduction of the euro – data for the euro area are relatively easy to construct<sup>1</sup>. Value series expressed in euro can simply be summed up. The same holds for volume series, as long as they are expressed in euro of the same base year<sup>2</sup>. By comparing the euro area value (volume) levels between two periods one obtains value (volume) indices, a measure of their rates of change over time. The rate of change of, for example, volume GDP in the euro area can also be presented as a weighted average of each country's rate of volume GDP change, where weights represent each

1. A minor complication not discussed in this Statistics Brief is that the euro was introduced two years later in Greece.

2. To date, most of the euro area countries use base years that are only changed every five years. Some countries, for example the Netherlands, update their price base every year. It is likely that more countries will follow this practice in the future. The OECD 'single country' approach has been designed to accommodate such changes.

### Euro area: Demand, output and prices

	1997	1998	1999	2000	2001(*)
	Percentage changes (volume)				
Private consumption	1.6	3.1	3.3	2.6	1.9
Government consumption	1.3	1.2	2.1	2.0	1.6
Gross fixed capital formation	2.4	5.3	5.4	4.5	0.6
Government	-3.4	4.9	5.2	1.9	2.7
Private residential	4.4	7.0	6.3	6.7	1.3
Private non-residential	1.1	2.0	3.7	0.8	-1.9
Final domestic demand	1.7	3.2	3.5	2.9	1.6
Stockbuilding (a)	0.1	0.4	-0.2	0.0	-0.4
Total domestic demand	1.8	3.6	3.2	2.9	1.2
Net exports (a)	0.6	-0.6	-0.5	0.6	0.4
GDP	2.3	2.9	2.7	3.5	1.6
GDP deflator	1.6	1.7	1.1	1.3	2.5
<i>Memorandum items</i>					
Private consumption deflator	2.0	1.4	1.1	2.1	2.5
Unemployment rate	11.4	10.8	9.9	8.9	8.5
General government financial balance (b)	-2.6	-2.2	-1.3	0.2	-1.2
Current account balance (b)	1.6	1.1	0.4	-0.2	0.0

(\*): OECD Forecasts

(a) Contributions to changes in real GDP

(b) As a percentage of GDP

Source: *OECD Economic Outlook*, No. 70, December 2001.

country's share in total GDP. Given value and volume indices, it is also possible to construct series of price indices by dividing the value index by the corresponding volume index. The resulting price index will itself be a weighted average of each country's price index. Other important series, for instance long-term interest rates, can also be constructed by weighting the country series, with weights proportional to the importance of the country (normally measured by GDP).

The key remaining problem concerns foreign trade. Applying the 'single country' approach means that exports (imports) of goods and services should be the exports (imports) of the 12 countries to the rest of the world. These exports and imports cannot simply be measured by summing up exports or imports across member countries, as this sum includes the trade flows between euro area countries ("intra-area trade"). Including intra-area trade in exports or imports of the euro area is tantamount to including trade between regions in the exports or imports of a single country – clearly an undesirable property. Unfortunately, there is currently insufficient information in national accounts statistics to correct value and volume series for intra-area trade in goods and services for suc-

cessive years although it can relatively easily be approximated for a specific year (see box "The openness of the euro area to foreign trade"). As was indicated in the previous Statistics Brief, customs-based trade statistics allow the identification of intra-euro area flows of exports and imports. The same holds for the balance of payments statistics. For value series, a good estimate could be made using these statistics. Comparable information is not yet available for volume and price series but Eurostat envisages to release this information in the near future.

#### More methodological difficulties prior to 1999

The euro area has only existed since 1999, but longer time series are needed to analyse recent economic developments in a broader historical perspective. Constructing euro area series for the years prior to 1999 is conceptually much more difficult than for the years following 1999. The key difference is that in 1999 exchange rates between euro area countries became irrevocably fixed, whereas before 1999 these bilateral exchange rates varied over time. The question arises if and how to reflect exchange rate variations in euro area aggregates.

## The openness of the euro area to foreign trade

A widely used measure of the openness of an economy is the sum of exports and imports as a percentage of GDP. In 2000, this indicator varied from 55 per cent for Italy to 175 per cent for Ireland and 290 per cent for Luxembourg. For the euro area, the variable is 73 per cent if no correction is made for intra-area trade. This is however an incorrect indicator of the openness of the euro area and should certainly not be compared with the 20 per cent for Japan and 26 per cent for the United States. Corrected for intra-area trade, this measure of openness is 37 per cent for the euro area, indicating that the openness and the relative importance of foreign trade is only somewhat greater than that of the United States. The openness indicator would become even lower if the three remaining European Union countries join the euro area.



Consider the years 1996-97 when several European countries experienced a depreciation of their currency relative to the US dollar (USD) and the Deutsche Mark. Now assume that one wants to compute the value change of GDP in the euro area between the years 1996-97 on a USD basis. Should this value change be a simple weighted average of each country's value change of GDP in national currency, in which case exchange rate movements would largely be ignored? Alternatively, should the overall value change be a weighted average of each country's value change of GDP in USD, thereby including movements in exchange rates<sup>3</sup>? The results will vary significantly. Value aggregates for the euro area should not be on a USD basis but it could be argued that they should relate to the European Currency Unit (ECU), the precursor currency of the euro. Even then, results are sensitive to the methodological choice because there has also been variation in the exchange rates relative to the ECU (see box "OECD and Eurostat aggregation methods

3. The discussion here is conducted in terms of rates of change or indices but the present cases could also be described in terms of levels of variables.

differ for pre-1999 data"). Furthermore, the ECU was a basket of currencies that included two non-euro area countries (the United Kingdom and Denmark) and excluded two euro area countries (Finland and Austria).

The approach adopted by the OECD to deal with pre-1999 series for the 'single country' euro area is one of excluding the exchange rate effects from value and therefore price movements. Thus, changes in the value of GDP, final consumption or investment of the euro area are simply computed as weighted averages of each country's changes in the same variables. By their very nature, changes in volume aggregates would always be defined independently of exchange rate movements. This approach towards aggregating value and volume changes yields economically meaningful measures of euro area inflation as a weighted average of inflation in member countries that is not influenced by bilateral exchange rate movements.

Having settled on the exchange rate treatment, the next issue is the exact definition of weights. For example, there is a choice between weights that are held fixed and

weights that are allowed to change over time to reflect the structural shifts. In its euro area data, OECD has chosen moving weights, expressed as value shares of each country. Moving weights have the advantage of being up-to-date and their formulation as value shares makes them independent from methodologies to derive price indices. More generally, weighted averages based on value shares that are updated annually provide a good approximation to optimal indices according to the economic theory of index numbers.

### The OECD 'single country' approach to the euro area

To implement its euro area aggregation in line with the 'single country' approach, OECD forms weighted averages of the rates of change of the various national accounts variables involved. More precisely, if  $V_t^i$  is variable V for country i in period t, and if  $c_t^i$  is country i's exchange rate between the '1999 ISO euro' (see section

Presentation of national data) in period t, the euro area aggregate index is formed as  $\frac{V_t}{V_{t-1}} = \sum_{i=1}^{12} \tau_{t-1}^i \frac{V_t^i}{V_{t-1}^i}$  where

$$\tau_t^i = \frac{V_t^i c_t^i}{\sum_{i=1}^{12} V_t^i c_t^i}$$

the weights  $\tau_t^i$  correspond to each country

i's share in the total value of variable V. For each variable, the same weighting patterns are applied to value (current price) indices and to volume (constant price) indices. Once a set of indices has been calculated, a reference year is chosen to which rates of change are benchmarked – this enables one to construct level series for the data under consideration. Some time series are constructed residually, for example inventory changes. This ensures that accounting identities are respected. The series so obtained will be referred to as 'Euro area, single country approach' and expressed in euro (current price data) or in euro of the reference year (constant price data).

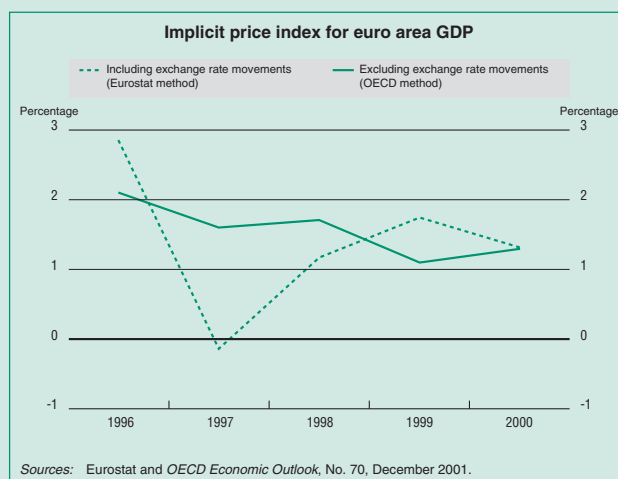
### OECD presentation of national data for countries of the euro area

As from 2002, euro area countries will publish national statistical data in euro. For national statistical offices as well as for OECD the question arises how to present time

## OECD and Eurostat aggregation methods differ for pre-1999 data

The treatment of exchange rate movements prior to 1999 constitutes a difference in euro area aggregation methods between OECD and Eurostat. Brussels-based European Commission Directorate-General Economic and Financial Affairs (DG-ECFIN) uses methods similar to OECD's in its AMECO database. Whereas treatment of the euro area is nearly identical for the post 1999 period, Eurostat uses current exchange rates to convert country-level data into a common currency, the ECU, for years prior to the introduction of the euro. As a consequence, value changes that are based on this series reflect both the value changes in member countries and the exchange rate shifts in their national currencies with respect to the ECU. This is illustrated in the graph.

It compares the price index for GDP of the euro area countries excluding (OECD method) and including (Eurostat method) the adjustment for exchange rate movements with respect to the ECU. This can lead to quite different outcomes, as can be seen for the years 1996-97. For most economic analysis, inflation numbers for the euro area representing a weighted average of the inflation of member countries and unadjusted for exchange rate movements are preferable.



series of data that cover years prior to a country's switch to the euro. The OECD opted for converting the data in national denomination into 'national euro' by applying the irrevocable conversion rate between the national currency and the euro (see glossary). This procedure has the significant advantage of preserving the time profile of all historical national series - conversion back and forth is easily carried out by multiplication with a fixed coefficient. Also, current and constant price data can be treated without distinction. Many national statistical offices will also apply this method.

While simple and useful, the results are susceptible to misinterpretation when national and international currencies are not well distinguished. More precisely, a conversion of national data in euro for pre-euro years (typically before 1999) by applying the irrevocable conversion rate is conceptually equivalent to changing the denomination of the national currency. For presentational purposes, and to distinguish the resulting euro denomination of the national currency from a true conversion into an inter-

national currency, OECD uses the label (or footnote) '[year of accession] [ISO currency code] euro' (e.g. for France the denomination will be 1999 FRF euro for data converted with the irrevocable rate and relating to years prior to the euro introduction). Generating euro area totals on the basis of fixed conversion rates for observations regarding the years prior to 1999 is only a valid option under very specific circumstances and otherwise has little, if any economic meaning. Different methods, as described earlier in this article, have to be applied to construct economically meaningful totals.

For the sake of clarity and transparency, the method applied to the calculation of euro area aggregates will be explained in OECD's statistical publications. Also the use of country-specific purchasing power parities continues to have its relevance in a single currency area. Their value lies in comparing price levels and purchasing power within a zone. Also a symmetrical treatment of countries has to be assured when forming area totals or when carrying out cross-country comparisons.

## What about purchasing power parities?

Many cross-country comparisons and aggregation procedures use purchasing power parities to convert national currencies into comparable international data. This is done on the grounds that they eliminate differences in price levels between countries in a better and less volatile way than exchange rates. Thus, they provide the preferred tool for cross-country comparisons of the levels of volume GDP, real income levels per capita, or labour productivity. OECD continues therefore to produce and publish area totals that are based on PPP conversions.

When it comes to using PPPs as converters in the case of the euro area, an issue of consistency over time arises: if a 'single country' approach is chosen for the euro area, there should only be one PPP converting the euro to a common international unit.

Using country-specific PPPs for purposes of aggregation would be similar to using regional PPPs for other single countries, for example the United States. Thus, symmetric treatment of single countries requires that there be only one PPP for the euro area. While it is possible to compute such a conversion rate for the years after 1999, there is no obvious equivalent for the years prior to 1999. One would then find oneself in the situation where PPPs for each country are used prior to 1999 and a single euro-denominated PPP for the period post 1999. This either generates a break in the treatment in 1999 or is inconsistent with a 'single country' treatment of the euro area. For the 'single country' approach regarding national accounts data that is described in the paragraphs above, the decision was made not to use PPPs and to base country-specific weights on exchange rates.

## Glossary

**ECU:** The European Currency Unit was the precursor of the euro. The ECU was a basket currency made up of the sum of fixed amounts of 12 (Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain and United Kingdom) of the 15 currencies of the European Union (EU) member states. The value of the ECU was calculated as a weighted average of the value of its component currencies. The ECU was replaced by the euro on a one-for-one basis on 1 January 1999.

**Euro:** Single European currency used instead of the ECU (see above). The euro was launched on 1 January 1999 in 11 EU member states: Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Portugal and Spain. Greece adopted the euro on 1 January 2001. See below for the irrevocable euro/national currency conversion rates.

**Euro area:** Area comprising those EU member states in which the euro has been adopted as the single currency in accordance with the Maastricht Treaty and in which a single monetary policy is conducted by the Governing Council of the European Central Bank.

**Intra-area trade:** Flows of exports and imports within a given region or group of countries.

**Irrevocable conversion rates:** The irrevocable euro/national currency conversion rates used to define the euro on 1 January 1999 (2001 for Greece) are the following:

Austria	Schilling	13.7603
Belgium	Belgian franc	40.3399
Finland	Markka	5.94573
France	French franc	6.55957
Germany	Deutsche Mark	1.95583
Greece	Drachma	340.750
Ireland	Irish pound	0.787564
Italy	Italian lira	1936.27
Luxembourg	Luxembourg franc	40.3399
Netherlands	Netherlands guilder	2.20371
Portugal	Portuguese escudo	200.482
Spain	Spanish peseta	166.386

**Purchasing Power Parities (PPPs):** Rates of currency conversion that equalise the purchasing power of different currencies by eliminating the differences in price levels between countries. In their simplest form, PPPs are simply price relatives which show the ratio of the prices in national currencies of the same good or service in different countries. The major use of PPPs is as a first step in making inter-country comparisons in real terms of gross domestic product (GDP) and its component expenditures.

**Volume index:** Most commonly presented as a weighted average of the proportionate changes in the quantities of a specified set of goods or services between two periods of time; volume indices may also compare the relative levels of activity in different countries.



## Related databases

All publications are available on paper and electronically (CD-ROM and on line at [www.SourceOECD.org](http://www.SourceOECD.org)).

- OECD Economic Outlook (biannual), OECD. The “Statistical Annex” of OECD Economic Outlook is also available free of charge at: [www.oecd.org/eco/Economic\\_Outlook](http://www.oecd.org/eco/Economic_Outlook).
- Main Economic Indicators (monthly), OECD.
- National Accounts of OECD Countries (volume 1: Main Aggregates, volume 2: Detailed Tables), OECD (forthcoming).
- Quarterly National Accounts (quarterly), OECD.

A large number of other OECD Secretariat databases also provide a complete set of statistics for the euro area.

## Further information

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**Editor in chief:** Enrico Giovannini

**Editor:** Andreas Lindner

**Editorial team:** Benoit Arnaud, Eileen Capponi, Lydia Deloumeaux, Brian Finn, Luc Garcia, Joscelyn Magdeleine

**For further information contact:**

The Editor

STATISTICS BRIEF

Statistics Directorate

OECD

2, rue André-Pascal

75775 Paris France

email: [STD.STATBRIEF@oecd.org](mailto:STD.STATBRIEF@oecd.org)

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P.O. Box 22  
Blackhorse Road  
Letchworth SG6 1YT  
England  
Tel.: +44 1462 687552  
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E-mail: [books@TurpinLtd.com](mailto:books@TurpinLtd.com)  
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OECD Washington Center  
2001 L Street N.W., Suite 650  
Washington, DC 20036-4922, USA  
Toll free: +1 (800) 456-6323  
Fax: +1 (202) 785-0350  
General information:  
+1 (202) 785-6323  
E-mail: [washington.contact@oecd.org](mailto:washington.contact@oecd.org)  
Internet: [www.oecdwash.org](http://www.oecdwash.org)

### OECD JAPAN

OECD Tokyo Centre  
Nippon Press Center Bldg., 3rd floor  
2-2-1 Uchisaiwaicho, Chiyoda-ku  
Tokyo 100-0011, Japan  
Tel.: +81 (3) 5532 0021  
Fax: +81 (3) 5532 0035  
E-mail: [center@oecdtokyo.org](mailto:center@oecdtokyo.org)  
Internet: [www.oecdtokyo.org](http://www.oecdtokyo.org)

### OECD GERMANY

OECD Bonn Centre  
August Bebel Allee 6  
53175 Bonn  
Tel.: +49 228 959 12 15  
Fax: +49 228 959 12 18  
E-mail: [bonn.contact@oecd.org](mailto:bonn.contact@oecd.org)  
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### OECD MEXICO CENTRE

OECD Mexico Centre  
Av. Presidente Mazaryk 526  
Colonia: Polanco  
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Mexico D.F., Mexico  
Tel.: +52 52 81 38 10  
Fax: +52 52 80 04 80  
E-mail: [mexico.contact@oecd.org](mailto:mexico.contact@oecd.org)  
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OECD Paris Centre  
2, rue André-Pascal  
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