EUROPEAN CENTRAL BANK

EUROSYSTEM

**ECB STATISTICS BULLETIN – EURO AREA
STATISTICS METHODOLOGICAL NOTES**

CHAPTER 8 – EXCHANGE RATES

**SECTION 8.1 – EFFECTIVE
EXCHANGE RATES[1]**

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1. The effective exchange rates (EERs) of the euro are geometrically weighted averages of the bilateral exchange rates of the euro against the currencies of the euro area's main trading partners. A positive change in the index denotes an appreciation of the EER of the euro. The weights assigned to each trading partner combine information on imports and exports of manufactured goods between the euro area and these partner countries. In formal terms, the nominal EER of the euro is defined as:

$$NEER^t = \prod_{i=1}^{N} \left(e_{i,euro}^t \right)^{w_i}$$

where N stands for the number of countries in the reference group of trading partners, $e_{i,euro}^t$ is an index of the average exchange rate of the currency of partner country i vis-à-vis the euro in period t, and w_i is the trade weight assigned to the currency of trading partner i.

2. In accordance with the calculations of the nominal effective exchange rates, the real EERs of the euro are calculated as geometrically weighted averages of bilateral nominal exchange rates, which are deflated using different relative price or cost measures (see below). The real EER of the euro is hence defined as:

$$REER^t = \prod_{i=1}^{N} \left(\frac{d_{euro}^t e_{i,euro}^t}{d_i^t} \right)^{w_i}$$

where N stands for the number of competitor countries in the reference group of trading partners, $e_{i,euro}^t$ is an index of the average exchange rate of the currency of partner country i vis-à-vis the euro in period t, d_i^t and d_{euro}^t are, respectively, the deflators for the euro area and partner country i, and w_i is the trade weight assigned to the currency of trading partner i.

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[1] For additional information, see the "Daily nominal effective exchange rate of the euro" section of the ECB's website.

Trade basis

3. The weights are based on bilateral data on trade in manufactured goods, as defined in Sections 5 to 8 of the Standard International Trade Classification (i.e. excluding trade in services, agricultural, raw material and energy products) for the periods 1995-97, 1998-2000, 2001-03, 2004-06, 2007-09 and 2010-2012.[2]

Trading partners

4. The EERs are calculated against three groups of trading partners:[3]
   - EER-18: this group is composed of the non-euro area EU Member States (Bulgaria, Czech Republic, Denmark, Hungary, Poland, Romania, Sweden and the United Kingdom), plus Australia, Canada, China, Hong Kong, Japan, Norway, Singapore, South Korea, Switzerland and the United States.
   - EER-19: includes Croatia in addition to the trading partners in the EER-18.
   - EER-38: in addition to the trading partners in the EER-18, the EER-38 includes Algeria, Argentina, Brazil, Chile, Croatia, Iceland, India, Indonesia, Israel, Malaysia, Mexico, Morocco, New Zealand, the Philippines, Russia, South Africa, Taiwan, Thailand, Turkey and Venezuela.

5. The selection of countries is based on their importance as trading partners of the euro area and on data availability, in particular the availability of high quality data on price and cost indicators for use in the calculation of the REERs.

Weighting scheme

6. The EERs of the euro are calculated using trade weights that combine information on both exports and imports, excluding intra-euro area trade. Import weights are each trading partner's simple share in total euro area imports. Export weights, on the other hand, are double-weighted to account for "third-market effects". Specifically, they capture the effect of competition faced by euro area exporters in foreign markets not only from domestic producers, but also from exporters from third countries.[4] The overall weight of each partner country *i* is obtained as the weighted average of the export and import weights.[5]

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[2] These categories comprise chemicals and related products, manufactured goods, machinery and transport equipment, and miscellaneous manufactured articles.

[3] The ECB calculates an additional set of indices, the EER-12, considering Australia, Canada, Denmark, Hong Kong, Japan, Norway, Singapore, South Korea, Sweden, Switzerland, the United Kingdom and the United States as trading partners. These indices are available on the ECB's website, but do not appear in the ECB's Statistics Bulletin.

[4] See Martin Schmitz, Maarten De Clercq, Michael Fidora, Bernadette Lauro and Cristina Pinheiro, "Revisiting the effective exchange rates of the Euro", ECB Occasional Paper No. 134.

[5] Harmonised competitiveness indicators for individual euro area countries, following the same methodology and data sources as the EERs, are also published on the ECB's website.

Updating of trade weights

7. When the EERs of the euro were initially calculated in 1999, the first set of trade weights was based on data for the three-year period from 1995 to 1997. This weighting scheme remained in place until the first five-yearly update of the trade weights in 2004, when weights for the period 1995-97 were recalculated taking into account data revisions for that period, and new trade weights were calculated for the three-year period from 1999 to 2001.

8. In 2007 a Eurosystem workshop recommended that the trade weights should be updated more frequently. It was thus decided to update the trade weights every three years (instead of every five years) in order to reflect recent developments in the pattern of international trade in a more timely fashion.

9. In the second update of the trade weights in 2009, the weighting scheme for 1995-97 (as calculated in 2004 and adjusted after the euro area enlargements) was maintained, and new trade weights were calculated on the basis of revised manufacturing trade data for the three- year periods 1998-2000, 2001-03 and 2004-06.

10. In the third update carried out in January 2012, all existing periods were updated with revised manufacturing trade data; moreover, trade weights for the period from 2007 to 2009 were added.

11. In the fourth update carried out in August 2015, all existing periods were updated with revised manufacturing trade data; moreover, trade weights for the period from 2010 to 2012 were added. As a result, six sets of trade weights are currently available, based on trade data for the periods 1995-97, 1998-2000, 2001-03, 2004-06, 2007-09 and 2010-12. For the EERs of the euro, fixed chain-linking on a three yearly basis is used. Consequently, the indices are chain-linked at the end of each of the six periods.

12. Besides these four updates, the overall trade weights and final EERs were recalculated every time there was an enlargement of the euro area. Specifically, a country joining the monetary union is excluded from the groups of euro area trading partners and included in the euro area computations. Finally, the trade weights underlying the calculation of the effective exchange rates (EERs) of the euro and the harmonised competitiveness indicators (HCIs) of the euro area countries have been updated to reflect the enlargement of the European Union to Croatia on 1 July 2013.

Deflators

13. Deflators for the real EERs are: consumer price indices, producer price indices (PPIs), GDP deflators and unit labour costs, both for the total economy (ULCT) and for the manufacturing sector (ULCM). Deflator data are collected from several sources (mainly Eurostat, the OECD, the BIS and the IMF). For both the euro area and European Union countries, the cost and price measures are based on harmonised concepts (HICP, PPIs, ESA 2010-based ULC and GDP deflators). In case deflators are only available with a time lag, the latest observations are estimated. The data are seasonally adjusted and disaggregated from annual data if quarterly data are not available.

14. EERs based on the complete set of deflators are calculated for the EER-18 group, for the EER-19 group ULCM deflator is not available, while for the EER-38 group the consumer price index is the only available deflator.

Exchange rates

15. The bilateral exchange rates used in the calculation are, in most cases, the ECB's official daily reference rates (if not available, indicative rates published by other international organisations are used).

16. For the period before 1 January 1999, the EERs are based on a basket of the currencies of the eleven countries that formed the euro area in January 1999. The weighted geometric averages of the exchange rates of the national currencies of these countries are used in order to obtain a "proxy" euro exchange rate. The weights for the pre-1999 "theoretical" euro exchange rates are based on the share of each euro area country in the total manufacturing trade of the euro area with non-euro area countries in the period from 1995 to 1997.

Frequency and base period

17. The nominal EERs for the EER-38 are available daily. All other indicators are available monthly, with the exception of the real EER indices based on ULCT, ULCM and GDP deflators, which are available quarterly. The base period for all indices is the first quarter of 1999 (i.e. Q1 1999 = 100).