

# Note to Tables 8.1

## Chapter 8 – exchange rates

### Section 8.1 – effective exchange rates<sup>1</sup>

1. The effective exchange rates (EERs) of the euro are weighted geometric 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 a strengthening of the EER of the euro. The weights assigned to each trading partner combine information on imports and exports of manufactured goods between it and the euro area. The nominal EER of the euro is defined as:

$$(1.1) \text{NEER}^t = \prod_{i=1}^N (e_{i,euro}^t)^{w_i}$$

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

2. Real EERs of the euro are calculated as weighted geometric averages of nominal bilateral exchange rates deflated using different relative price and cost measures (see below). The real EER of the euro is hence defined as:

$$(1.2) \text{REER}^t = \prod_{i=1}^N \left( \frac{d_{euro}^t e_{i,euro}^t}{d_i^t} \right)^{w_i}$$

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

### 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 products, raw material and energy products) for the periods 1995-97, 1998-2000, 2001-03, 2004-06, 2007-09, 2010-12 and 2013-15.<sup>2</sup>

<sup>1</sup> For additional information, see the "Daily nominal effective exchange rate of the euro" section of the ECB's website.

<sup>2</sup> These categories comprise chemicals and related products, manufactured goods classified chiefly by material, machinery and transport equipment, and miscellaneous manufactured articles.

## Trading partners

4. The EERs are calculated for three groups of trading partners:<sup>3</sup>

- EER-18: this group is composed of the non-euro area EU Member States excluding Croatia (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: this group 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 is based on the importance of the trading partners for 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 real EERs.

## 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". More 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.<sup>4</sup> The overall weight of each partner country  $i$  is obtained as the weighted average of the export and import weights.<sup>5</sup>

## 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 in 2004, when the weights for the period 1995-97 were recalculated taking into account data

<sup>3</sup> 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.

<sup>4</sup> See Schmitz, Martin, De Clercq, Maarten, Fidora, Michael, Lauro, Bernadette and Pinheiro, Cristina, "Revisiting the effective exchange rates of the euro", Occasional Paper Series, No 134, ECB, Frankfurt am Main, June 2012.

<sup>5</sup> 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.

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 be updated more frequently. It was thus decided to update them every three years (instead of every five years) in order to reflect 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 weights 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 weights were updated with revised manufacturing trade data and trade weights for the period from 2010 to 2012 were added.

12. In the fifth update, carried out in August 2017, all existing weights were updated with revised manufacturing trade data and trade weights for the period from 2013 to 2015 were added. As a result, seven sets of trade weights are currently available, based on trade data for the periods 1995-97, 1998-2000, 2001-03, 2004-06, 2007-09, 2010-12 and 2013-15. Fixed chain-linking on a three-yearly basis is used for the EERs of the euro, so the indices are chain-linked at the end of each of the seven periods.

13. Besides these five updates, the overall trade weights and final EERs were recalculated every time there was an enlargement of the euro area, since a country joining Monetary Union is excluded from the groups of euro area trading partners and included in the euro area computations. Most recently, the trade weights underlying the calculation of the 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 include Croatia on 1 July 2013.

## Deflators

14. Deflators for the real EERs are: consumer price indices (CPIs), 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 EU countries, the price and cost measures are based on harmonised concepts (the Harmonised Index of Consumer Prices, PPI, unit labour costs based on the European System of Accounts 2010 and GDP deflators). In cases where deflators are only available with a time lag, the latest observations are estimated. The data are seasonally adjusted and, if quarterly data are not available, disaggregated from annual data.

15. EERs based on the complete set of deflators are calculated for the EER-18 group; for the EER-19 group the ULCM deflator is not available, while for the EER-38 group the CPI is the only available deflator.

## Exchange rates

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

17. For the period before 1 January 1999, the EERs are based on a basket of the currencies of the 11 countries that formed the euro area in January 1999. The weighted geometric averages of the exchange rates of the currencies of these countries are used 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

18. The nominal EERs for the EER-18, EER-19 and 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. 1999Q1 = 100).