

Box 2

Global currency areas

Prepared by Massimo Ferrari

The international role of a currency can be measured based on several indicators, such as liquidity in the exchange rate market, use in international debt markets and denomination of foreign assets. These indicators measure use of a currency beyond national borders. Another important factor to consider is that, when a currency has a dominant role in the international monetary system, shocks to the currency in question propagate to other currencies. One example of this is the US dollar. A large array of bilateral exchange rates co-move strongly with the US dollar's nominal effective exchange rate. A number of factors drive that finding, including the fact that many trade and debt operations are US-dollar denominated and many countries track US monetary policy closely (see also **Box 6**). Estimating how much a currency acts as an anchor for the exchange rates of other countries is therefore one way of splitting the global economy into currency areas, i.e. groups of countries with exchange rates co-moving strongly with the US dollar or other major currencies. We use a simple framework to that end in the spirit of McCauley and Ito (2018), which consists of estimating the following model equation on monthly data¹⁶:

¹⁵ Bulgaria announced plans in July 2018 to join the Exchange Rate Mechanism II and banking union simultaneously.

¹⁶ See McCauley, R. and Ito, H., "A key currency view of global imbalances", *BIS Working Paper*, No 762, December 2018.

$$\Delta \frac{LC^i}{USD_t} = \alpha + \beta^\epsilon \Delta NEER_t^{EUR} + \beta^¥ \Delta NEER_t^{JPY} + \beta^£ \Delta NEER_t^{GBP} + \varepsilon_t$$

where LC^i/USD_t is the bilateral exchange rate of country i vis-à-vis the US dollar regressed on the nominal effective exchange rate of the euro, the yen and the pound sterling, respectively.¹⁷ The various coefficients β^j measure how much the euro, the yen and the pound sterling co-move with the bilateral exchange rate of country i against the US dollar, which captures their relevance for currency i (this is also in the spirit of the standard Frankel-Wei methodology albeit using nominal effective exchange rates in lieu of bilateral exchange rates expressed in a common numéraire currency).¹⁸ The coefficient for the US dollar is computed as $\beta^\$ = (1 - \beta^\epsilon - \beta^¥ - \beta^£)$, which can be seen as an upper bound. The β^j coefficient estimates can then be plotted on a map to provide a visual representation of global currency zones. ECB staff estimates using this methodology suggest that the US dollar plays a dominant role as a global anchor currency (see **Chart A**).

¹⁷ These are the most relevant currencies in the international monetary system aside from the US dollar. The regression is estimated based on monthly data from January 1999 to December 2018. For Japan, the euro area, the United Kingdom and the United States, loadings are set to 1 on their respective currencies.

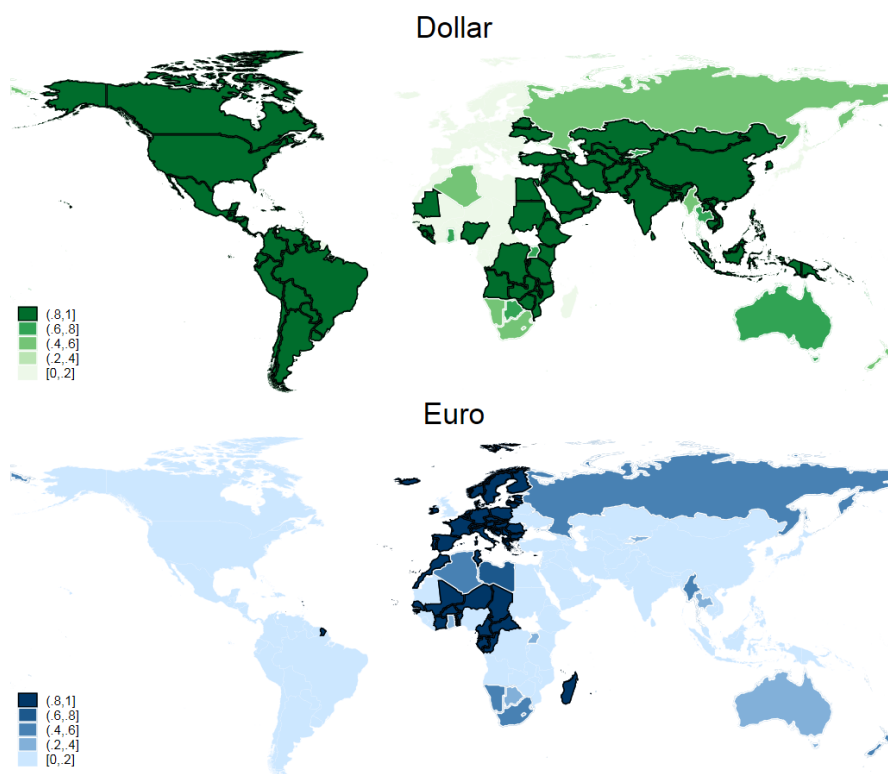
¹⁸ It has been argued that one limitation of the standard Frankel-Wei methodology is that using one particular currency as numéraire and constraining the model coefficients to sum up to 1 hampers identification itself (see Bénassy-Quéré, A., Coeuré, B. and Mignon, V., “On the identification of de facto currency pegs”, *Journal of the Japanese and International Economies*, No 20, 2006, pp. 112-127). We therefore use effective exchange rates rather than bilateral exchange rates on the right-hand side of the equation since the choice of a numéraire currency is always debatable. This makes the specification akin to a factor model, where broad measures of effective exchange rate allow shocks to be picked up by shocks that are conceivably more specific to each of the anchor currencies considered, unlike simple bilateral exchange rates.

Chart A

The euro currency area is the second most important in the world

Estimated co-movement with the dollar (upper panel) and the euro (lower panel)

(percentages derived from the β coefficient estimates discussed above)



Sources: ECB, BIS and ECB staff calculations.

Notes: The estimates are for December 2018. The boundaries shown on this map do not imply acceptance by the ECB.

The US dollar drives the exchange rates of most countries in the western hemisphere, Asia and the Middle East. The euro is an important anchor currency for non-euro area European countries and for some countries in Africa, which typically share strong economic, historical and institutional links with the euro area. Intuitively, the β coefficient estimate equals 1 on the US dollar exchange rate for Panama (which is a dollarised economy) and 1 on the euro exchange rate for Denmark (which pegs its currency vis-à-vis the euro within tight fluctuation bands). The role of the Japanese yen and the pound sterling is more limited, by contrast.