Box 1

New insights on the currency denomination of official holdings of foreign exchange reserves

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IMF staff recently published a new dataset on the official foreign exchange reserve holdings of individual countries broken down by currency.[9] The data shows official foreign exchange reserve holdings denominated in four major currencies (euro, US dollar, pound sterling and Japanese yen) for 14 advanced economies and 37 emerging market and developing countries over the period 1999-2018. The holdings in the country sample cover a sizeable share (over 40%) of global foreign exchange reserves in euro reported to the IMF.

This box examines these data, with a focus on the share of the euro in foreign official reserves. It shows that the appeal of the euro as an official reserve currency declined in the years following the global financial crisis and the euro area sovereign debt crisis but has since stabilised. The box also provides evidence of the importance of trade and financial linkages for the currency composition of official exchange reserve holdings.

Russia and Switzerland are the largest foreign official holders of euro in the new dataset. These two countries combined account for more than half of reserve holdings denominated in euro in the new dataset and more than one-fifth of total reserves in euro (upper panel of **Chart A**). In particular, Switzerland held more than €300 billion in 2018, while Russia held about €180 billion euro, i.e. around

[9] Iancu, A., Anderson, G., Ando, S., Boswell, E., Gamba, A., Shushanik, H., Lusinyan, L., Meads, N. and Wu, Y., "Reserve Currencies in an Evolving International Monetary System," *IMF Departmental Policy Papers* 2020/02, International Monetary Fund, 2020.

39% of their total reserve holdings for each.[10] Non-euro area EU Member States are also found to be significant holders of euro-denominated foreign exchange reserves in line with their strong strategic, trade and financial links with the euro area. However, some countries with sizeable holdings of foreign exchange reserves do not report the composition of their holdings to the public, including China, India, Taiwan and Singapore, and are therefore not covered in this dataset.

The decline in the share of the euro in official foreign exchange reserve holdings since the global financial crisis has been broad-based across official reserve holders. The new disaggregated data can shed light on the 5 percentages point decline in the share of the euro in global foreign exchange reserves holdings of the countries included in the official data since the peak in mid-2010. The lower panel of **Chart A** compares the average share of the euro in official reserve holdings in the period before the global financial crisis (2004-07) and the share of the euro in official foreign exchange reserves in 2018. The black dotted line is the 45-degree line. Therefore, countries below the line decreased the share of euro-denominated assets in their official foreign exchange reserve holdings after the global financial crisis and euro area sovereign debt crisis. Most countries in the sample decreased the share of euro-denominated assets in their official foreign exchange reserves holdings, with the exception of Bulgaria, Croatia, North Macedonia, Denmark and the Czech Republic. This suggests that non-euro area EU Member States and countries with managed exchange rates vis-à-vis the euro tended to reduce the share of the euro in their official foreign exchange reserve holdings less than other countries. Although Switzerland and Russia increased their holdings of euro in absolute terms, the share of the euro in their total reserves has declined since the global financial crisis, similar to most countries. Switzerland, Russia, Serbia and Turkey also reduced the share of the euro in their holdings relatively little compared to most countries in the sample.

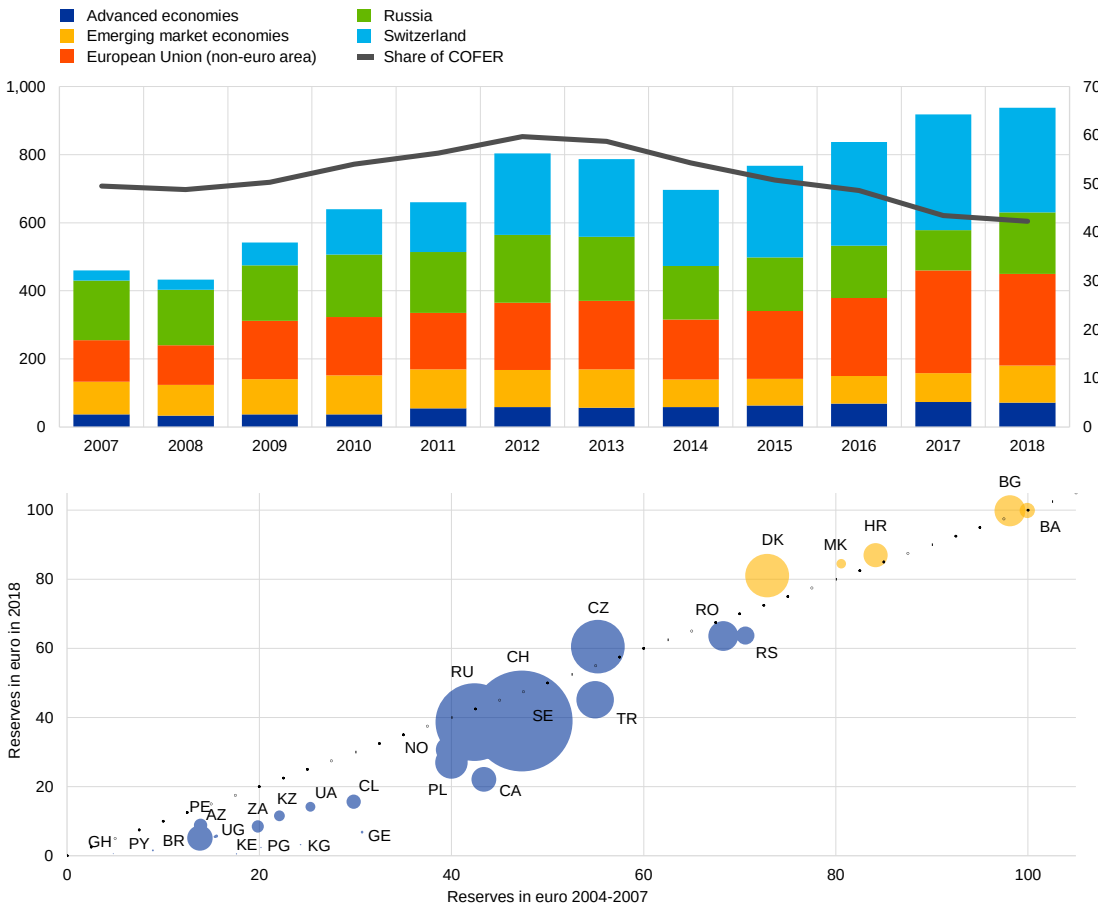
[10] As discussed in previous editions of this report, these sizeable and increasing holdings may reflect the exchange rate management policies implemented by the Swiss National Bank, which is reported to intervene in foreign exchange markets to manage the Swiss franc exchange rate – a traditional safe haven in times of uncertainty. Russia had been among the main sellers of US Treasury securities between March and December 2018 to rebalance the currency composition of its official reserves, which explains the sizeable increase in their holdings of euro that year. See also "The international role of the euro", ECB, Frankfurt am Main, June 2020.

Chart A

Switzerland and Russia increased their holdings of euro in absolute terms in recent years, yet the share of the euro in their total reserves has declined since the global financial crisis.

Evolution of euro-denominated official reserve holdings over time

(upper panel: USD billions (left-hand scale), shares of IMF COFER data (right-hand scale); lower panel: percentages of total reserves)



Sources: COFER, IMF and ECB calculations.
Notes: The chart in the upper panel shows reserves in euro by country and country groups; the sample includes 14 advanced economies and 37 emerging market economies and represents 42% of total euro-denominated official reserve holdings reported to the IMF. The chart in the lower panel compares the share of reserves in euro by country in 2018 and the average share of the euro in the period 2004-07. The size of the bubbles corresponds to the average amount of reserves held in euro between 1999 and 2018 by each country. The yellow bubbles are countries with exchange rate regimes closely linked to the euro. In 2018, Denmark was part of ERM II, Bulgaria and Bosnia and Herzegovina had a euro-based currency board, Croatia a tightly managed floating regime and North Macedonia a stabilised arrangement with the euro as a reference currency. Country ISO codes are used for country names for the sake of readability.

Empirical estimates shed light on the country-specific determinants of the share of the euro and other major reserve currencies in official foreign exchange reserve holdings. To this end simple repeated cross-sectional regressions are run using indicators for trade and financial linkages, and exchange rate anchoring, broadly following Iancu et al. (2020).[11] The model uncovers the determinants of reserve currency shares, not of the size of holdings. We confirm their findings, as trade and financial linkages and currency co-movement with respect to issuers of major reserve currencies both explain a substantial variation in the countries' allocation of reserves across currencies.[12] Stronger trade and financial linkages with reserve currency-issuing countries are positively correlated with the share of reserves held in their respective currencies.[13] The exchange rate anchoring variable is highly statistically significant and has the expected sign: countries hold a larger share of reserves in currencies vis-à-vis which they manage their own currency. The upper panel of **Chart B** reports the coefficient on a dummy variable for the euro for each year. It confirms that, after controlling for bilateral trade and financial linkages and exchange rate anchoring, the share of the euro in official foreign exchange reserves was on average about 20 percentage points lower than the US dollar even before the global financial crisis. The deterioration in the appeal of euro after the global financial crisis and the euro area sovereign debt crisis is apparent in the fall in the estimated coefficient on the euro dummy variable, which reached -40 percentage points in 2015. The coefficient does not change much in the last three years of the sample, suggesting a stabilisation in the sentiment of official reserve managers towards the euro, broadly confirming the trends in standard aggregated data.

11 The regression equation is as follows: $ReserveShare_{c,i,t} = \alpha_i + TradeShare_{c,i,t} + FinancialLinks_{c,i,t} + FXAlignment_{c,i,t} + \varepsilon_{c,i,t}$, where α_i is a dummy variable for each currency *i* (where the US dollar is the reference currency), $TradeShare_{c,i,t}$ is the share of country *c*'s trade with a reserve issuer *i*, $FinancialLinks_{c,i,t}$ is the share of a country's portfolio investment liabilities with reserve currency issuer *i* (according to the IMF CPIS data), and $FXAlignment_{c,i,t}$ is the estimated exchange rate co-movement between the currency of country *c* and reserve currency *i* (Ilzetzki, Reinhart and Rogoff, 2019, op. cit.). This regression is run separately using OLS for each year *t*. The key results are similar if an alternative specification using a generalised linear model with a logit link is used.

12 The R^2 of the regression ranges between 0.7 and 0.8, depending on the year of the regression.

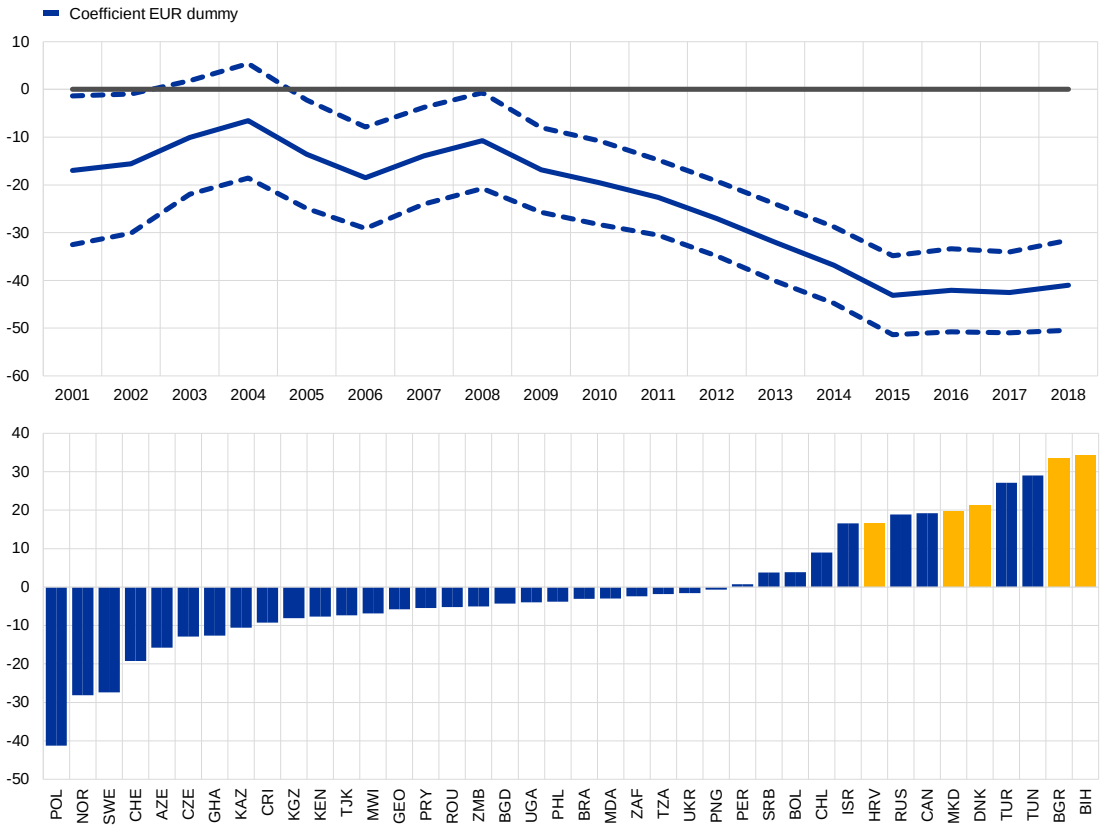
13 Each variable is generally statistically significant when included separately, but not when it is included simultaneously, suggesting that it is collinear.

Chart B

Conditional difference in the share of the euro relative to the US dollar in official reserves and countries with significantly high (low) exposure to the euro.

Annual estimates of the coefficient on the euro dummy (upper panel); residual of the regression (lower panel)

(percentage points)



Sources: IMF, Iancu et al. (2020) and ECB calculations.
Notes: Upper panel: the solid line is the estimated coefficient of the dummy variable for the euro as a reserve currency. The dotted lines are the 95% confidence intervals. Lower panel: "excess" euro reserves calculated as the residual of the above equation using data for 2018. The yellow bars are countries with exchange rate regimes anchored to the euro. In that year, Denmark was in ERM II, Bulgaria and Bosnia and Herzegovina had a euro-based currency board, Croatia a tightly managed floating regime, and North Macedonia a stabilised arrangement with the euro as a reference. Country ISO codes are used for country names for the sake of readability.

Countries that manage their exchange rate with respect to the euro hold a higher-than-predicted share of their official foreign exchange reserves in euro. The lower panel of **Chart B** displays the residual from the cross-sectional regression obtained on data from 2018. It shows the countries which held a share of euro reserves that was higher than that predicted by the model. This result reflects the nature of the currency board arrangements maintained by Bulgaria, and Bosnia and Herzegovina in 2018. Although the variables included in the regression explain a significant fraction of patterns in currency shares, the model also tends to overpredict the share of countries with significantly strong trade and financial links with the euro area, such as Poland and Sweden, which points to the relevance of other motives. Such motives could also explain the higher-than-predicted share of the euro in the official foreign exchange reserves of Canada, which has stronger trade and financial links to the United States. At the same time, commodity exporters such as Norway, Azerbaijan and Ghana may prefer to hold a higher share of their reserves in US dollars to match export revenues in this

currency. Finally, Russia also holds a higher share of euro reserves than predicted by the model, possibly reflecting Russia's attempts to diversify its holdings owing to strategic considerations.[14]

[14] See also "The international role of the euro", ECB, Frankfurt am Main, June 2020.