D   Euro-US dollar exposures in cross-border banking

By Agustín Bénétrix (Trinity College Dublin) and Martin Schmitz

Introduction

This special feature provides stylised facts on the relative importance of the euro and the US dollar as the main denomination currencies for cross-border bank positions.[113] The dominant role of the two currencies exposes banks' balance sheets to movements in the euro-US dollar exchange rate. The currency composition of cross-border bank positions is therefore a critical dimension for the study of the international transmission of shocks across banking systems. This special feature focuses on 28 advanced and emerging market economies to analyse cross-country heterogeneity in the currency mix of banking systems' cross-border assets and liabilities, using data from the BIS locational banking statistics.[114] In addition to reporting changes in currency exposures since the global financial crisis, this special feature also considers their relation to the geographic exposures in cross-border banking as well as to the currency mix of banks' local positions. It identifies three main stylised facts, namely: that the majority of national banking systems have larger net assets in euro than in US dollars; that dispersion in net currency exposures has declined; and that exposures to the euro and the US dollar in net cross-border positions are associated with geographic exposures and banks' currency exposures in local positions.

Context

Global banks played a key role in shaping developments in international capital flows before, during and in the aftermath of the global financial crisis. Following the rapid growth in cross-border banking positions in the pre-crisis period, banks in advanced economies were a key driver of the great retrenchment of international capital flows at the peak of the global financial crisis and have recorded subdued cross-border flows ever since.[115]

Currency exposures and currency mismatches of banking systems are important for understanding the international transmission of shocks. A prominent example of this was the US dollar funding shortage which hit major European banks during the global financial crisis, after they had built up rapidly growing positions in US dollar funding markets during the pre-crisis period.[116] More

---

[113]   This special feature is based on Bénétrix, A. and Schmitz, M.,, "Euro-dollar exposures in global banking: the role of geography", Trinity College Dublin and ECB *mimeo*, April 2019.

[114]   Data for the United States were retrieved from the Treasury International Capital (TIC) System of the US Treasury.

[115]   See Milesi-Ferretti, G.-M. and Tille, C., "The great retrenchment: international capital flows during the global financial crisis", *Economic Policy*, Vol. 26(66), April 2011, pp. 289-346; McQuade, P. and Schmitz, M., "The great moderation in international capital flows: A global phenomenon?", *Journal of International Money and Finance*, Vol. 73, 2017, pp. 188-212; and McCauley R., Bénétrix, A., McGuire, P. M. and von Peter, G., "Financial deglobalisation in banking?" *Journal of International Money and Finance*, forthcoming.

[116]   McGuire, P. and von Peter, G.,"The US dollar shortage in global banking and the international policy response", *BIS Working Papers*, No 291, October 2009.

generally, valuation effects on foreign currency exposures have been found to be sizeable and a key channel for the international transmission of monetary policy, as changes in the monetary policy stance also affect banks' balance sheets via exchange rates.[117]

The US dollar and the euro have pre-eminent roles in global cross-border investment positions.[118] In global cross-border banking positions – which cover assets and liabilities vis-à-vis banks and non-banks – the shares of the US dollar and the euro stood at around 50% and 30% respectively at the end of 2017. While the US dollar has long served as the major international funding currency, recent evidence indicates that during the post-crisis period the euro has also emerged as an international funding currency, at least at the European level. This is the motivation for focusing the analysis on these two currencies.[119] For the key currencies in cross-border banking positions, "currency networks" exist which transmit monetary policy spillovers from the major central banks.[120]

Methodology

The cross-border dimension is a natural starting point to study currency exposures. This traditional approach in international economics assumes that country borders are aligned with currency areas. Each economic area issues its own currency and its use is largely confined to that area.[121] This notion is also reflected in the residence principle perspective followed in the compilation of balance of payments and international investment position statistics. However, one implication of financial globalisation is that this traditional view can be misleading, because currencies are also used across borders.[122]

To understand the relative importance of the euro and US dollar cross-border funding and lending in banking systems, this special feature analyses the euro-US dollar currency exposure in banks' net external assets.[123] As a first step, relative currency exposures are calculated for gross external positions as

$$FX_{i,t} = \frac{XB_{i,t}^{EUR} - XB_{i,t}^{USD}}{XB_{i,t}^{EUR} + XB_{i,t}^{USD}} * 100$$

---

[117] See Georgiadis, G. and Mehl, A., "Financial Globalisation and Monetary Policy Effectiveness," *Journal of International Economics*, 2016, Vol. 103, 2016, pp. 200-212.

[118] See Bénétrix, A., Lane, P. and Shambaugh, J., "International currency exposures, valuation effects and the global financial crisis", *Journal of International Economics*, Vol. 96, January 2015, pp. 98-109.

[119] See Avdjiev, S, Bruno, V., Koch, C. and Shin, H., "Exchange Rates and the transmission of global liquidity", BIS, 2017, op. cit..

[120] See Avdjiev, S. and Takats, E., "Monetary policy spillovers and currency networks in cross-border bank lending", *BIS Working Papers*, No 549, 2016.

[121] See Avdjiev, S., McCauley, R. and Shin, H. S., "Breaking free of the triple coincidence in international finance", *Economic Policy*, Vol. 31(87), July 2016,, pp. 409-51.

[122] One example of this is the fact that the cross-border component in global banks' foreign currency positions, in particular the use of the US dollar, has gained in importance since the global financial crisis. See Aldasoro, I. and Ehlers, T., "The geography of dollar funding of non-US banks", *BIS Quarterly Review*, December 2018

[123] This measure follows the framework of Lane. P. R. and Shambaugh, J., "Financial exchange rates and international currency exposures", *American Economic Review*, Vol. 100(1), 2010, pp. 518-540 and Bénétrix, A. S., Lane, P. R. and Shambaugh, J. C., "International currency exposures, valuation effects and the global financial crisis", Journal of International Economics, Vol 96(S1), 2015.

where $XB_{i,t}^{EUR}$ and $XB_{i,t}^{USD}$ are cross-border positions of the banking system of country i in year t denominated in euro and US dollars, respectively. These indicators are computed for assets and liabilities separately and denoted as $FXA_{i,t}$ and $FXL_{i,t}$ respectively. We refer to these as currency exposures in the *gross* external positions. External banking assets and liabilities largely consist of loans and deposits, respectively, and also include debt securities.[124] The currency exposures in the gross external positions measure the extent to which a country's banking system has a larger share denominated in euro (if positive) or US dollar (if negative). By construction, these indicators range between -100 and +100.

As a second step, the euro-US dollar exposure in the *net* external position is defined as the weighted difference between the currency exposure in the gross positions ($FXA_{i,t}$ and $FXL_{i,t}$). More precisely, the currency exposure in the net position is given by

$$FXAGG_{i,t} = shA_{i,t} * FXA_{i,t} - shL_{i,t} * FXL_{i,t}$$

where the weights are

$$shA_{i,t} = \frac{XBA_{i,t}^{ALL}}{XBA_{i,t}^{ALL} + XBL_{i,t}^{ALL}} \ and \ shL_{i,t} = \frac{XBL_{i,t}^{ALL}}{XBA_{i,t}^{ALL} + XBL_{i,t}^{ALL}}$$

with $XBA_{i,t}^{ALL}$ and $XBA_{i,t}^{ALL}$ representing the sum of euro and US dollar cross-border assets and liabilities, respectively. $FXAGG_{i,t}$ also takes values between -100 and +100. A country's banking system is deemed to be "long euro" (or equivalently short US dollar) in its net position if the indicator is positive.[125] A "long euro" position implies that a country's banking system has a larger cross-border net creditor position in euro than in US dollars (or equivalently a smaller net liability position in euro than in US dollars).

Three stylised facts

A majority of national banking systems has larger net assets in euro than in US dollars. The left panel of **Chart 29** reports the cumulative distribution of net euro-US dollar exposures (*FXAGG*) in 2017. It shows that around 60% of the country sample is "long" euro, with the largest net euro exposures being recorded in non-euro area advanced and emerging market economies. This reflects the important role of the US dollar as an international funding currency, leading to larger net liability positions in US dollars, while at the same time the majority of the country sample shows net asset positions in euro. Generally, there is a wide range in net euro-dollar exposures, partly reflecting an even wider variation in terms of the currency composition of the underlying gross asset and liability positions. Unsurprisingly, euro area countries exhibit larger cross-border gross external positions denominated in euro than in US

---

[124] The BIS data do not cover off-balance sheet derivatives.

[125] By including the asset and liability weights, one takes into account if a banking system is an overall net creditor or net debtor (in terms of the combined euro and US dollar positions). For instance, a balanced euro-US dollar exposure in the gross position (i.e. 50% of assets and liabilities denominated in euro and US dollar) can be associated with a long euro position in net terms if total assets exceed total liabilities.

dollars, while the United States, Canada and many emerging market economies are on the other side of the spectrum.

Chart 29

A majority of national banking systems has larger net assets in euro than in US dollars, while the dispersion in net currency exposures has shrunk since the crisis

Cross-country distribution of net euro-US dollar cross-border banking exposures in 2017 and changes between 2007 and 2017

(left panel: FXAGG units and cumulative distribution; right panel: FXAGG units)

● Euro area countries
● Other advanced and emerging economies
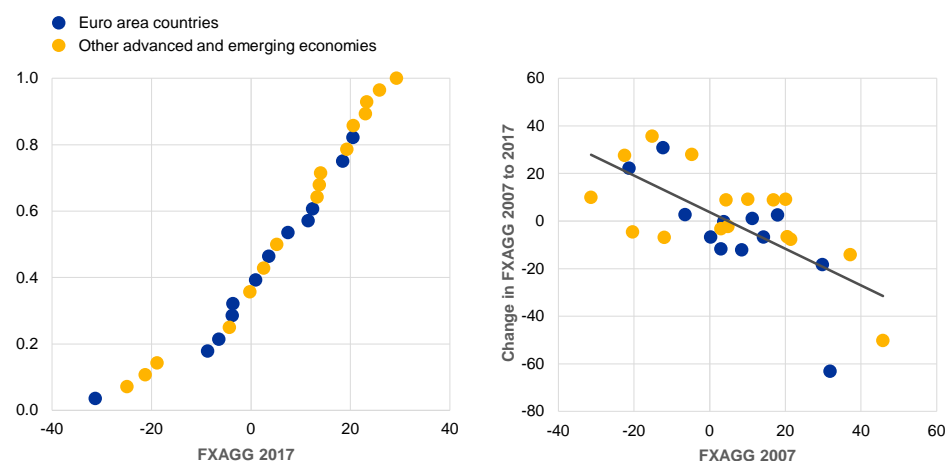
Source: Bénétrix and Schmitz (2019) based on BIS Locational banking statistics.
Notes: FXAGG for 2007 and 2017 based on a sample of 28 countries. Positive values for FXAGG indicate "long euro" positions (i.e. a country's banking system has larger cross-border net assets in euro than in US dollars). The y-axis in the left panel chart shows the cumulative distribution of FXAGG across countries.

The dispersion in net euro-US dollar currency exposures has declined since the crisis. The right panel of **Chart 29** focuses on the change in currency exposures of net positions between 2007 and 2017. It reports a negative relation between pre-crisis exposures and subsequent changes. At the same time the positions tended to be rather persistent with only a few countries switching from a net long euro to net short euro position (or vice versa). Hence, the negative relation shown in **Chart 29** implies that long and short euro positions (relative to the US dollar) became smaller in absolute terms. This is in line with the fact that since the crisis banks resident in advanced economies outside Europe increased their US dollar funding, while European banks reduced their US dollar positions.[126] This would be consistent with the drive by European banks to reduce their reliance on short-term wholesale US dollar funding, in favour of more long-term oriented funding based on domestic deposits.[127]

Patterns similar to the euro-US dollar currency exposures are found for geographic net exposures towards the euro area. Analogously to the net currency exposure measure *FXAGG*, a geographic net exposure measure *GXAGG* is

---

[126] See Aldasoro, I., Ehlers, T .and Eren, E., "Business models and dollar funding of global banks", *BIS Working Papers*, No 708, 2018.

[127] Ivashina, V., Scharfstein, D. S. and Stein, J. C., "Dollar Funding and the Lending Behavior of Global Banks," *Quarterly Journal of Economics*, Vol. 130, No 3, 2015, pp. 1241-81.

computed.[128] This metric captures banks' net external assets vis-à-vis the euro area relative to those vis-à-vis the rest of the world.[129] The left panel of **Chart 30** shows that the cumulative distribution of geographic exposures in 2017 had a similar shape as that of euro-US dollar currency exposures. In net terms, 60% of the countries in the sample are "long" towards the euro area, with 11 of these 17 countries being non-euro area countries.

Net exposures towards the euro and US dollar are correlated with the geography of net cross-border banking positions, but with heterogeneity across countries. The right panel of **Chart 30** compares net currency exposures to the euro (relative to US dollars) with net geographical exposures to the euro area (relative to the rest of the world) in 2017. Generally, larger cross-border net asset positions vis-à-vis the euro area are associated with larger net asset positions being denominated in euro. For emerging market economies, both the geographic and currency exposures in net positions are "long euro area" and "long euro", while "short positions" in both instances are recorded for other advanced economies such as Japan and Canada. In the case of financial centres such as the United Kingdom and Switzerland, this link is weaker, hinting at the special financial intermediation role of banks based in these countries. **Chart 30** also shows significant cross-country dispersion within each quadrant, suggesting that a number of idiosyncratic factors beyond geography – such as business models or regulatory constraints – explain why banks may prefer to have a larger part of their balance sheet to be denominated in a certain currency.

---

[128] As banks' cross-border asset and liability positions in US dollars tend to be vis-à-vis global rather US-based counterparts, we define the relative exposure vis-à-vis euro area and rest of the world counterparts.

[129] The geographic exposures for assets and liabilities is defined by $GX_{i,t} = \frac{XB_{i,t}^{EMU} - XB_{i,t}^{ROW}}{XB_{i,t}^{EMU} + XB_{i,t}^{ROW}} * 100$, where $XB_{i,t}^{EMU}$ are bank's cross-border positions vis-à-vis the euro area. Similarly, $XB_{i,t}^{ROW}$ denotes banking positions vis-à-vis non-euro area countries. As before, a second step is required to combine exposures for assets and liabilities into a net position measure. To this end, $GXAGG_{i,t} = shA_{i,t} * GXA_{i,t} - shL_{i,t} * GXL_{i,t}$, is computed with the weights $shA_{i,t}$ and $shL_{i,t}$ defined equivalently to FXAGG.

Chart 30

Net exposures to the euro are correlated with exposures to the euro area

Net cross-border exposures to the euro area and euro-US dollar exposures

(left panel: GXAGG units and cumulative distribution; right panel: GXAGG and FXAGG)

● Euro area countires
● Other advance and emerging economies
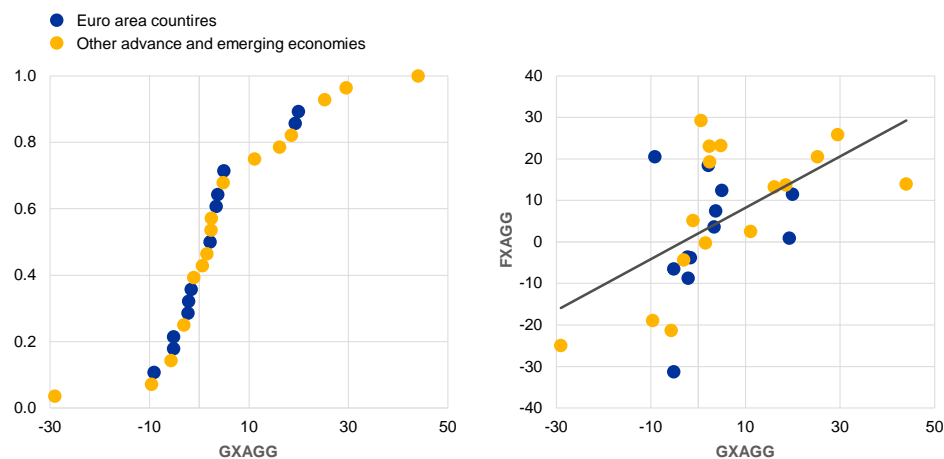
Source: Bénétrix and Schmitz (2019) based on BIS Locational banking statistics.
Notes: FXAGG and GXAGG for 2017, based on a sample of 28 countries. Positive values for FXAGG indicate "long euro" positions (i.e. a country's banking system has larger cross-border net assets in euro than in US dollars). Positive values for GXAGG indicate relatively long net asset positions vis-à-vis the euro area (compared with those vis-à-vis the rest of the world). The y-axis in the left panel chart shows the cumulative distribution of GXAGG across countries.

An even larger majority of national banking systems has larger net local assets denominated in euro than in US dollars. In the same vein as the FXAGG and GXAGG measures for cross-border positions, a measure of currency exposures is constructed for banks' local positions (i.e. vis-à-vis counterparts resident in the same country).[130] The left panel of **Chart 31** shows that almost all countries in the sample are long euro in their local net positions.

Net cross-border euro-US dollar exposures are partly the mirror image of banks' local positions. The right panel of **Chart 31** suggests that there is a negative relationship between the local and cross-border exposure measures. Hence, banking systems that are long euro in cross-border positions tend to be short euro domestically and vice versa. This relationship is more evident in the non-euro area country group, suggesting that cross-border currency exposures and local currency exposures might serve as hedges for each other.

---

[130] This is given by $LXAGG_{i,t} = shLA_{i,t} * LXA_{i,t} - shLL_{i,t} * LXL_{i,t}$, where the local currency exposures to the euro for the gross positions are given by $LX_{i,t} = \frac{Loc_{i,t}^{EUR} - Loc_{i,t}^{USD}}{Loc_{i,t}^{EUR} + Loc_{i,t}^{USD}} * 100$. $Loc_{i,t}^{EUR}$ are banks' local positions denominated in euro and $Loc_{i,t}^{USD}$ are local positions denominated in US dollars, while $shLA_{i,t}$ and $shLL_{i,t}$ are defined as $shLA_{i,t} = \frac{LocA_{i,t}^{ALL}}{LocA_{i,t}^{ALL} + LocL_{i,t}^{ALL}}$ and $shLL_{i,t} = \frac{LocL_{i,t}^{ALL}}{LocA_{i,t}^{ALL} + LocL_{i,t}^{ALL}}$. $LocA_{i,t}^{ALL}$ and $LocL_{i,t}^{ALL}$ representing total local assets and liabilities respectively, denominated in euro and US dollar.

Chart 31

Net cross-border euro-US dollar exposures are partly the mirror image of banks' local positions

Net euro-US dollar currency exposures in cross-border and local banking positions

(left panel: LXAGG units and cumulative distribution; right panel: LXAGG and FXAGG)

- ● Euro area countries
- ● Other advanced and emerging economies
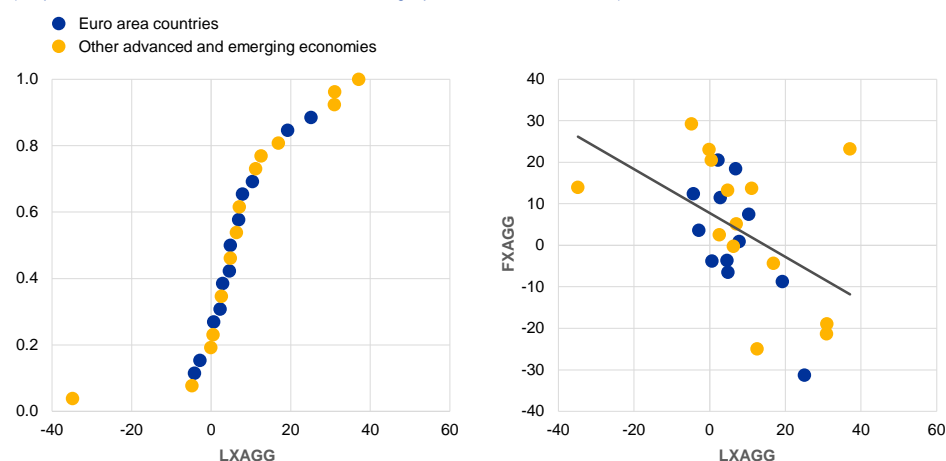
Source: Bénétrix and Schmitz (2019) based on BIS Locational banking statistics.
Notes: LXAGG for 2017, based on a sample of 26 countries (USA and CHL not included owing to lack of available data). Positive values for FXAGG (LXAGG) indicate "long euro" in the net cross-border (local) positions (i.e. a country's banking system has larger cross-border (local) net assets in euro than in US dollars). The y-axis in the left panel chart shows the cumulative distribution of LXAGG across countries.

Conclusion

This special feature analyses the relative importance of the euro and US dollar in banks' net external assets. Currency exposures and currency mismatches of banking systems are important for understanding the international transmission of shocks. This is particularly relevant for euro and US dollar exposures, as the bulk of international bank positions are denominated in these currencies. Banking systems with long euro net exposures would benefit from euro appreciations vis-à-vis the US dollar via positive balance sheet effects. These balance sheet effects can be sizeable and thus affect banks' lending capacity.

This special feature has identified three main stylised facts: the majority of banking systems in the 28 countries studied have larger net assets in euro than in US dollars, partly reflecting the important role of the US dollar as an international funding currency. The greater these exposures, the larger the effects associated with exchange rate movements. Overall, the dispersion in net euro-US dollar exposures has declined since the global financial crisis, which suggests that exchange rate movements are associated with smaller valuation effects. Net cross-border exposures towards the euro and US dollar are shaped by the geography of cross-border banking positions towards the euro area and partly mirror banks' currency exposures in local positions. The latter suggests that cross-border currency mismatches are partially hedged with local positions.