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THE RISE OF THE DOLLAR AND FALL OF THE EURO AS INTERNATIONAL
CURRENCIES

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ABSTRACT

The modern notion of an international currency involves use in areas of international finance and trade that extend well beyond central banks' coffers. In addition to their important roles as foreign exchange reserves, international currencies are most frequently used to denominate corporate and government bonds, bank loans, and import and export invoices. These currencies offer unrivaled liquidity, constituting large shares of the volume on global foreign exchange markets, and are commonly chosen as the anchors targeted by countries with pegged or managed exchange rate regimes. In this short article, we provide evidence suggesting a recent rise in the use of the dollar, and fall of the use in the euro, with similar patterns manifesting across all these aspects of international currency use.

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The Rise of the Dollar and Fall of the Euro as International Currencies

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The modern notion of an international currency involves use in areas of international finance and trade that extend well beyond central banks' coffers. In addition to their important roles as foreign exchange reserves, international currencies are most frequently used to denominate corporate and government bonds, bank loans, and import and export invoices. These currencies offer unrivaled liquidity, constituting large shares of the volume on global foreign exchange markets, and are commonly chosen as the anchors targeted by countries with pegged or managed exchange rate regimes.¹

From its launch in 1999, the euro's global use steadily grew and, by the mid 2000s, it had cemented its status – together with the dollar – as a key international currency. Maggiori, Neiman, and Schreger (2018), however, demonstrate a surge in the use of the dollar and collapse in the use of the euro to denominate internationally traded corporate and sovereign bonds starting roughly around the time of the global financial crisis. In this article, we provide evidence suggesting that this rise of the dollar and fall of the euro might be more pervasive, with similar patterns manifesting across most aspects of international currency use.

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¹Eichengreen et al. (2017) provides an excellent overview of these characteristics of international currencies.

What forces are driving this shift? One factor may be the instability of the euro zone, made apparent by the recent turmoil in its sovereign debt markets. The early 2010s ushered in with a renewed fervor discussions of possible euro-zone exits and widespread uncertainty about what any such exit would entail. Borrowers and lenders alike might, on the margin, prefer to avoid a currency the value of which – and, even, the mere existence of which – might be in question during the next crisis. Another factor may be the sharp appreciation of the dollar (relative to the euro, as well as relative to most other currencies) and maintained liquidity of trade in dollar assets during the peak of the crisis. Dollar-denominated assets performed well precisely when such performance was most highly valued, a key feature of an international currency, as discussed in Gourinchas et al. (2011) and Maggiori (2017). Global investors, having learned from the recent crisis that the dollar but not the euro provides safety, may have shifted their expectations and are more heavily coordinating on the dollar as the only safe currency, a dynamic modeled by Farhi and Maggiori (2018) and He et al. (2019).

The strengthening of the dollar’s position at the center of the global financial and trading system may carry important benefits for the US. The disproportionate global use of the dollar suggests that the US continues to enjoy an “exorbitant privilege,” borrowing at lower costs than it otherwise would.² As demonstrated in Maggiori et al. (2018), US corporations appear uniquely able to borrow from foreigners even without issuing foreign currency bonds. The dollar’s use in trade invoicing leaves US importers and exporters less exposed to exchange rate risk. And, as articulated in Farhi and Maggiori (2018), global welfare may be higher given the existence of and coordination around a single “safe-haven” currency.

Further dollar dominance does, however, present some risks for the global economy. Unexpected changes in the value of the dollar can rapidly redistribute wealth across global borrowers and lenders, as discussed in Bruno and Shin (2015). The increased use of the dollar for borrowing makes non-US corporates more vulnerable to an unexpected dollar appreciation, and as noted in Casas et al. (2016), the increased use of the dollar for trade invoicing means that such an appreciation might

²Gourinchas and Rey (2007) measures this larger return earned on US foreign assets compared to foreign liabilities, while Caballero et al. (2008) offer a model in which this return differential emerges in equilibrium.

exacerbate home bias and dampen the scale of global trade. Finally, the euro’s declining role as an international currency, to the extent that it brings costs for the euro zone countries, comes at a difficult time for the Eurozone with several member countries saddled with high debt loads and unemployment rates still at elevated levels.

I Use in Denominating Bond and Loan Contracts

Maggiore et al. (2018), using a dataset of global mutual fund positions obtained from Morningstar, first documented a broad surge in the dollar’s share and a collapse in the euro’s share of corporate and sovereign bond positions. For example, the dollar and euro were used during 2005-2008 to denominate roughly 45 and 35 percent of cross-border corporate bond positions, where the issuer (or its ultimate parent) and investor reside in different countries. Starting around the time of the global financial crisis, the dollar’s share increased and the euro’s share decreased until, by late 2017, they accounted for roughly 70 and 20 percent, respectively. Maggiore et al. show that this trend is not confined to cross-border corporate positions but also holds for the total global holdings of sovereign, sovranational, and corporate bonds.

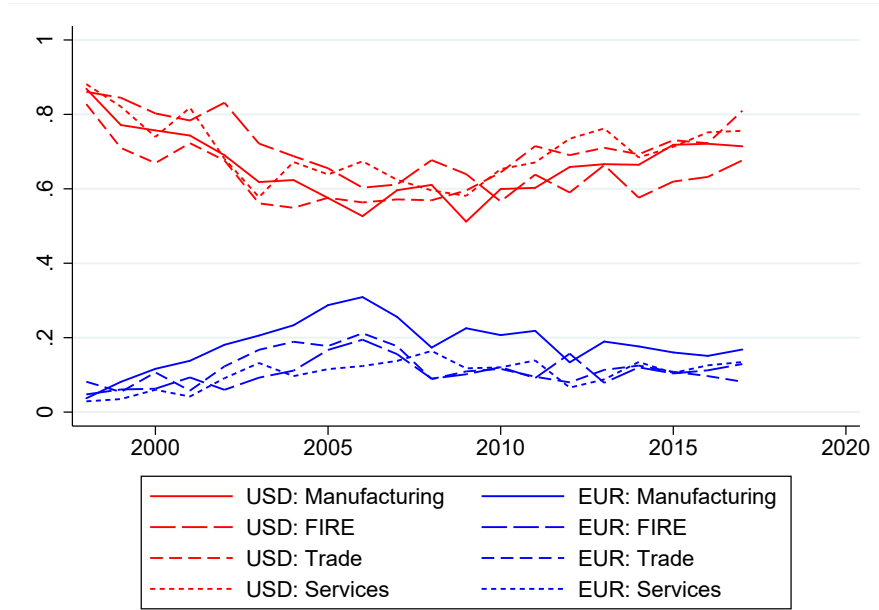


Figure 1: Dollar and Euro Use to Denominate Bank Loans, By Sector

Figure 1 demonstrates that a similar pattern is found in data on syndicated bank loans, obtained from SDC Platinum. We calculate the dollar and euro shares as the value of new issuances in each of these currencies divided by the total value of syndicated loans issued in a given year. We use the borrower's 1-digit SIC code to report these shares for four large industries: (i) manufacturing, (ii) finance, insurance, and real estate (FIRE), (iii) wholesale and retail trade (trade), and (iv) services. These data extend back to the advent of the euro in 1999 and all four blue lines clearly demonstrate the euro shares rising from nearly zero to roughly 20 percent of the total, slightly less than the share documented in mutual fund corporate bond holdings. The red lines capture the dollar shares of syndicated loans to those four industries, and they all decline during that period, reaching about 60 percent. During 2006-2008, the red lines begin their surges upward and the dollar's share of syndicated bank loans approaches 70 percent by the end of the sample. The blue lines decline over this period as the euro shares return to levels below 20 percent. Our Online Appendix additionally plots these patterns for agriculture, mining, and construction and transportation and communication, as well as for the aggregate, which closely resembles the pattern in Figure 1.³

These patterns do not only emerge in mutual fund position and syndicated lending data. ECB (2018) and Eren and Malamud (2018), for example, document a similar pattern using BIS data. Over the last decade, use of the dollar to denominate globally traded assets has significantly expanded, and it has done so at the cost of the euro.

II Use in Denominating International Trade

Goldberg and Tille (2008) and Gopinath (2016) highlight the key role of the dollar in international goods trade, even between country pairs not involving the United States.⁴ We analyze currency use in international trade invoicing to see if we observe a rise in the dollar's use and fall in the euro's

³We also in the Online Appendix plot this evolution for various regions of the world. The global pattern is generated in large part by European borrowers switching to borrow more in dollars, and by an expansion of total borrowing by US corporations, which are more dollar intensive.

⁴Gopinath and Stein (2018) and Chahrour and Valchev (2017) offer theories linking the outsized role of the dollar in trade invoicing with its outsized role in denominating borrowing contracts.

use, similar to what we demonstrated above has occurred in their use to denominate assets. We study the dataset analyzed in Ito and Kawai (2016), which is an updated version of that constructed in Ito and Chinn (2015).⁵ We start our analysis in 1999, when the euro was introduced, and make use of all subsequent data which extends, in many cases, to 2014.⁶

We regress the dollar and euro shares in imports or exports on time and country dummies:

$$\text{Share}_{i,t}^{j,x} = \alpha_i^{j,x} + \beta_t^{j,x} + \epsilon_{i,t}^{j,x},$$

where $j \in \{\text{Imports}, \text{Exports}\}$, $x \in \{\text{EUR}, \text{USD}\}$, and $\text{Share}_{i,t}^{j,x}$ is the share of country i 's trade in direction j that is invoiced in currency x at time t . Given the small number of countries, we run this regression with equal weights, but in the Online Appendix we present the equivalent analyses when weighting by countries' trade values. The lines in Figure 2 plot the time dummies $\beta_t^{j,x}$, where we normalize their levels to equal the unweighted average in 2010 in the raw data.

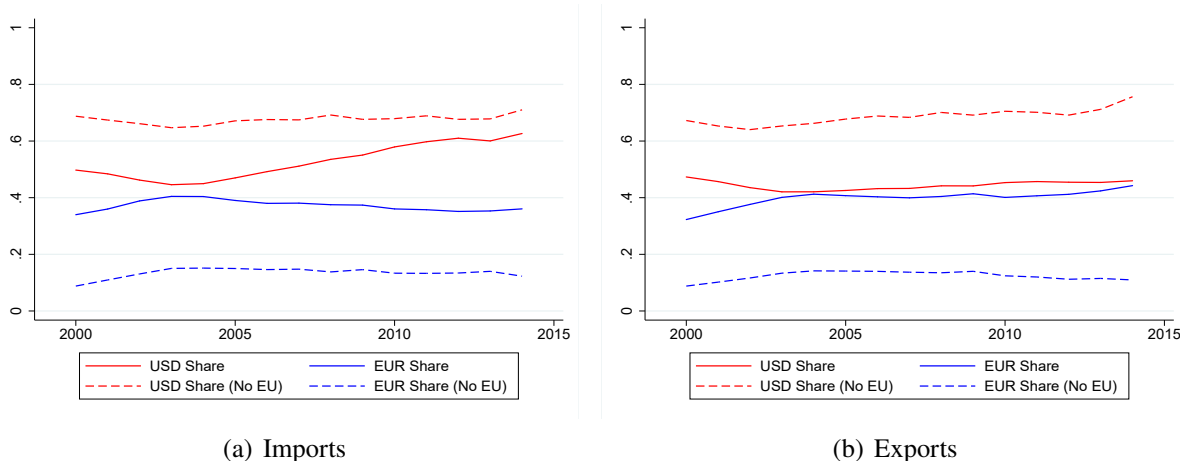


Figure 2: Dollar and Euro Use to Invoice International Trades

The solid lines in Figure 2 report the results when we include all countries in our data. Interestingly, the pattern for imports is reminiscent of those described in Section I. The euro

⁵We are grateful to Hiro Ito for providing us with these data.

⁶The sample is unbalanced, and often contains information on the currency share of invoicing of a country's imports but not of its exports (or vice-versa) and often contains information on the dollar share of trade invoicing but not the euro share (and vice-versa). The data contain many missing years internal to the sample. We linearly interpolate for such missing years, but we do not extrapolate before or after the earliest or latest available data points. The resulting coverage from 1999 to 2014 is relatively stable and typically includes data for at least 30 countries.

share, after rising between 1999 and 2005 or so, mildly declines by 2014 whereas the dollar's share rises. The pattern is absent from exports, where the shares both increase slightly from 2005 on.⁷

These data join together a variety of sources that use differing methodologies. A particular concern relates to EU countries, the data for which from the early 2000s are often sourced from Kamps (2006), which likely includes currency shares calculated using data on trade with all countries. Late in the sample, however, data for these countries often are sourced from Eurostat, which generally reports currency shares excluding trade with EU partners. We cannot rule out, therefore, that the growing dollar share of imports largely reflects differences across the sources used for early and late periods of the sample.⁸

To deal with this concern, we exclude all reporting countries that are EU members – nearly 60 percent of the data – and plot with dashed lines in Figure 2 the resulting time fixed effects. These dashed lines are much more stable, though the dollar shares do drift gently upward while the euro shares are flat or very slightly declining during the last decade. The Online Appendix calculates these trends using several alternate sources and specifications.

The time series patterns in the use of the dollar and euro to denominate international trades are less stark than the patterns for their use in denominating assets. But across a large variety of specifications, the dollar share almost always increases, though sometimes by only a small amount. The euro share is more mixed, though is most often flat or declining. Ito and Chinn (2015) state that, “The recent rise in the dollar share may reflect the effects of the global financial crisis and the euro debt crisis ... the share of the euro by non-eurozone countries in both export and import transactions was on a steadily rising trend until the mid-2000s, followed by a decline...” This is an area fruitful for more measurement and research, but we find the evidence suggestive that the rise of the dollar and fall of the euro indeed also applies to their roles in invoicing international trade.

⁷In principle, global imports equal global exports, so differences in Figures 2(a) and 2(b) reflect the fact that the data do not include all countries in the world and coverage of invoicing shares varies across the two directions of trade. For example, neither the United States nor China are included in our data (the US data have only one datapoint and there are no data for China). Exports from these large countries, therefore, show up in the imports of other countries in Figure 2(a), but are absent from the export series in Figure 2(b).

⁸In the Online Appendix we offer some simple calculations suggesting this issue is unlikely to explain the entire change in invoicing shares of EU countries, both because the increasing dollar share of imports greatly exceeds the declining euro share and because the equivalent pattern does not exist for exports.

III Volume in Foreign Exchange Trading

An important feature of international currencies is their liquidity. While not obvious how best to capture this aspect, data from the BIS Triennial Survey of FX trading demonstrate that the dollar's share of global foreign exchange trading volume, after a mild decline during the the early and mid 2000s, increased after the crisis, particularly relative to the euro.⁹

Year	US Dollar		Euro		Ratio
	\$ Trillions	Percent	\$ Trillions	Percent	
2001	1.11	44.9	0.47	19.0	2.4
2004	1.70	44.0	0.72	18.7	2.4
2007	2.85	42.8	1.23	18.5	2.3
2010	3.37	42.4	1.55	19.5	2.2
2013	4.66	43.5	1.79	16.7	2.6
2016	4.44	43.8	1.59	15.7	2.8

Table 1: Volume in Foreign Exchange Trading

Table 1 reports the volume of trading in the dollar and euro in levels and as a share of total FX volume in the BIS survey. From 2001-2010 (data are not available for 2008 or 2009), the dollar's share of trading volume declined relative to the euro's, with the ratio of dollar to euro volume dropping from 2.4 in 2001 to 2.2 by 2010.¹⁰ The 2013 survey, however, revealed that dollar trading volume grew 38 percent relative to 2010, while euro trading volume only grew by 15 percent. Further, while dollar volume declined by 5 percent between 2013 and 2016, volume dropped more than twice as much for euro trading. At the time of the most recent survey, therefore, dollar trading volume had surged to equal 2.8 times that of euro trading, recovering from its 2010 low to a record high level. To the extent that trading volume approximates liquidity, the dollar's desirability on this measure has also outpaced that of the euro over the last decade.

⁹The data capture turnover, as reported to the BIS by sales desks of reporting dealers in as many as 53 jurisdictions, of foreign exchange instruments in spot and over-the-counter (OTC) derivative markets.

¹⁰From 2001 to 2016, the share of currencies other than the dollar and euro grew steadily from 36 to 41 percent.

IV Use as Central Bank Reserves

Historically, when private sector participation in cross-border asset trade was more muted, the notion of what constituted an international currency was most closely tied to a currency's role in central bank reserves. An analysis of this role of international currencies yields a similar, though more nuanced, articulation of the rise of the dollar and fall of the euro.

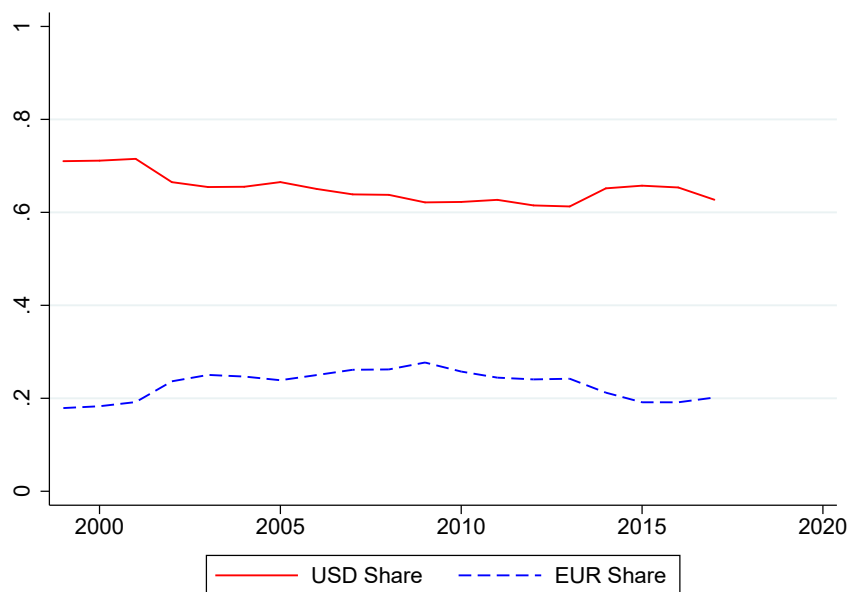


Figure 3: Dollar and Euro Use In Central Bank Reserves

Figure 3 plots the share of the dollar and euro in central bank foreign reserve holdings since 1999, data obtained from the IMF's COFER database. The combined share of the dollar and euro is declining over this period as the use of other currencies as reserves, including the Chinese renminbi and British pound, increased substantially over this period, climbing from about 11 to 17 percent of the global total. Ignoring these other currencies, though, and comparing only the dollar and the euro reveals a pattern very similar to those plotted in Figures 1 and 2 and described in Table 1 above.

Dollar reserves were 4.0 times as large as euro reserves in 1999, a ratio that steadily declined until 2009, when the value of dollar reserves were only 2.2 times as large as the value of euro reserves. Since then, dollar reserves grew slightly, while euro reserves declined by 27 percent. By

2017, central banks held 3.1 times as many dollars than euros as their foreign reserves.

V Use as an Anchor or Reference Currency

As a final measure of the importance of the dollar and euro as international currencies, we explore the extent to which they are chosen as the target for other countries that peg or manage their exchange rates. Though the trend is slower moving and the changes are less dramatic, the classification of anchor currencies in Ilzetzki, Reinhart, and Rogoff (2017) paints a picture of increasing dollar use and flat euro use consistent with our other findings above. At its inception in 1999, the euro served as the anchor currency for 53 economies, roughly half of the number anchored to the dollar. By 2015, it dropped two countries while adding four more in Latvia, Lithuania, Romania, and Serbia.¹¹ By contrast, only 5 countries that anchored to the dollar in 1999 were not also doing so in 2015 (including Latvia and Lithuania), while 19 countries that had not done so in 1999 were using the dollar as their anchor currency in 2015.¹² Indeed, a key conclusion of Ilzetzki et al. is that “the dollar is as dominant today ... as it was at the time of the early Bretton Woods era.”

VI Conclusion

By the early or mid 2000s, the dollar and euro both played significant roles as international currencies. Both were commonly used to denominate internationally traded corporate bonds and syndicated bank loans. Both commonly appeared on shipping manifests to denominate invoice prices for international trades in goods and services. Both were among the currencies traded with greatest volume on foreign exchange markets, preferred as reserves by central banks, and targeted by managed exchange rate regimes. We document that since then, the dollar’s use has grown relative

¹¹Though other countries such as Greece adopted the euro during the intervening period, the classification algorithm in Ilzetzki et al. (2017) considered Greece as anchoring to the euro in 1999, even before it formally adopted the currency.

¹²These countries include Afghanistan, Angola, Belarus, Brazil, Democratic Republic of Congo, Ecuador, Kyrgyzstan, Laos, Liberia, Moldova, Malawi, Russia, Suriname, Tajikistan, Tonga, Turkey, Uzbekistan, Zambia, and Zimbabwe. Some countries, such as Brazil and Ecuador, were considered to be “freely floating” in 1999 in the classification.

to the euro. The timing and magnitude of the shift varies, but the pattern is at least qualitatively evident when studying all five of these roles of international currencies.

International currency use is often described as a very slow-moving phenomenon. It remains poorly understood whether international currency would be expected to change simultaneously across all of these roles, or if not, what the sequence of any such changes would be and why. Nonetheless, we emphasize that our data demonstrate a meaningful shift away from the euro and toward the dollar that has occurred, in many of these instances, over the relatively short span of a decade. It is not only important to understand the implications for the global economy of the use of an international currency, but it appears increasingly important to understand what determines which currency the world chooses.

References

- Bruno, V. and H. S. Shin (2015). Cross-border banking and global liquidity. *The Review of Economic Studies* 82(2), 535–564.
- Caballero, R. J., E. Farhi, and P.-O. Gourinchas (2008). An equilibrium model of "global imbalances" and low interest rates. *American Economic Review* 98(1), 358–393.
- Casas, C., F. J. Díez, G. Gopinath, and P.-O. Gourinchas (2016). Dominant currency paradigm. Technical report, National Bureau of Economic Research.
- Chahrour, R. and R. Valchev (2017). International medium of exchange: Privilege and duty.
- ECB (2018). The international role of the euro.
- Eichengreen, B., A. Mehl, and L. Chitu (2017). *How global currencies work: past, present, and future*. Princeton University Press.
- Eren, E. and S. Malamud (2018). Dominant currency debt. *Swiss Finance Institute Research Paper* (18-55).

- Farhi, E. and M. Maggiori (2018). A model of the international monetary system. *The Quarterly Journal of Economics* 133(1), 295–355.
- Goldberg, L. S. and C. Tille (2008). Vehicle currency use in international trade. *Journal of international Economics* 76(2), 177–192.
- Gopinath, G. (2016). The international price system. In *Proceedings of the Jackson Hole Economic Policy Symposium*, Jackson Hole, WY.
- Gopinath, G. and J. C. Stein (2018). Banking, trade, and the making of a dominant currency. *NBER Working Paper No. 24485*.
- Gourinchas, P.-O., N. Govillot, and H. Rey (2011). Exorbitant privilege and exorbitant duty. *Working Paper UC Berkeley and LBS*.
- Gourinchas, P.-O. and H. Rey (2007). From world banker to world venture capitalist: Us external adjustment and the exorbitant privilege. In *G7 Current Account Imbalances: Sustainability and Adjustment*.
- He, Z., A. Krishnamurthy, and K. Milbradt (2019). A model of safe asset determination. *Forthcoming at the American Economic Review*.
- Ilizetki, E., C. M. Reinhart, and K. S. Rogoff (2017). Exchange arrangements entering the 21st century: Which anchor will hold? Technical report, National Bureau of Economic Research.
- Ito, H. and M. Chinn (2015). The rise of the redback: evaluating the prospects for renminbi use in invoicing. *Renminbi internationalization: achievements, prospects, and challenges*, Brookings Institution Press and the Asian Development Bank Institute, 111–58.
- Ito, H. and M. Kawai (2016). Trade invoicing in major currencies in the 1970s–1990s: Lessons for renminbi internationalization. *Journal of the Japanese and International Economies* 42, 123–145.
- Kamps, A. (2006). The euro as invoicing currency in international trade.
- Maggiori, M. (2017). Financial intermediation, international risk sharing, and reserve currencies. *American Economic Review* 107(10), 3038–3071.
- Maggiori, M., B. Neiman, and J. Schreger (2018). International currencies and capital allocation. *Working Paper*.