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ABSTRACT

Written on the 50th anniversary of floating exchange rates, this paper deals with possible alternatives to a unipolar dollar-based system. It considers (1) measures of international currency use; (2) potential challengers to the dollar; (3) network externalities; and (4) the plausibility of gold and digital currencies, as alternatives to regular currencies. On the one hand, network externalities operate in favor of the status quo: the dollar as the single leading international currency. On the other hand, the danger of abuse of exorbitant privilege – for example, by debasing the currency or repeated use of sanctions – operates in favor of challengers. A good guess is that the dollar will continue to lose market share slowly to others, but will remain in the lead.

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The question of the international currency status of the dollar versus its potential rivals is not new, but has been accorded an unusual amount of attention in the last few years, among scholars and non-scholars alike. With more data available than ever before, it is a good time to take stock.

The topic of the last session of the PIIE conference in March 2023 was possible alternatives to a unipolar dollar-based system. Consider four sub-topics: (1) measures of international currency use; (2) potential challengers to the dollar; (3) the question whether a multi-polar currency system is consistent with the existence of network externalities; and (4) the plausibility of gold and digital currencies, as alternatives to regular currencies.

1. Measures of international currency use

There is a list of uses to which an international currency like the dollar is put. Some familiar functions include: a currency in which central banks and sovereign wealth funds hold international reserves; an anchor currency to which smaller countries' currencies can peg; a currency to use in denominating or invoicing trade and financial transactions; and a vehicle currency for foreign exchange trading. A standard linguistic analogy can help explain.[1] Filipinos are unlikely to speak Portuguese and Brazilians are unlikely to speak Tagalog. If a Brazilian wants to communicate with a Filipino, they are likely to find it more convenient to do so via some third language like English or Spanish. Similarly, if one of them wishes to do business with the other country, they will find it more convenient to transact via some third currency like dollars or euros (the vehicle currency), than to try to find someone who wants to take the other side of a peso-real trade.

A two-by-three table lays out these international uses, as either private or public instances of the classic three functions of money: [2]

Table 1. Roles of an International Currency

Function of money	***Governments***	***Private actors***
Store of value	International reserves held by central banks	Currency substitution (private dollarization)
Medium of exchange	Vehicle currency for foreign exchange intervention	Vehicle currency for private foreign exchange trading
Unit of account	Anchor for pegging smaller currencies	Denominating trade and financial transactions

[1] Kindleberger (1967).

[2] The schematic table began with Cohen (1971) and was adopted with slight modifications by Kenen (1983) and Frankel (1992), among others.

The first criterion is the most salient, perhaps because the data on central banks' reserve holdings are readily available. The dollar's share of foreign exchange reserves has been declining gradually since the turn of the century. In 1999, when the newborn euro took the place of the French franc and German mark[3], the dollar constituted 71 % of allocated holdings. By the end of 2022 its share had declined to 58 %.[4] That is a rate of decline of about ½ percentage points per year. But the share of the dollar remains far ahead of the share of the second-place international currency, the euro, which is 20 % and not gaining. If the dollar's share were to continue declining at the same rate, it would take another 70 years for it to fall to the euro's share.[5] The euro is in turn well ahead of the yen, which remains in third place. The yen is followed by pound sterling in fourth. The much-ballyhooed renminbi has moved into fifth place only relatively recently, having passed the Canadian dollar and Australian dollar.

Each use of the currencies internationally[6] is highly correlated with the other uses, both causally and statistically. Causally, Gopinath and Stein (2018, 2021), for example, show that international use of a currency to invoice trade (unit of account) is bi-directionally related to use of the currency financially (store of value, particularly in the case of a currency with safe-haven properties, like the dollar and yen). Statistically, a correlation is evident as well. The ranking is similar by different measures: the dollar remains number one, not only by the criterion of reserve holdings, but also by the criteria of denominating or invoicing trade[7], as well as denomination of international debt and loans, foreign exchange turnover,[8] and global payments. According to an overall measure of international currency use computed at the

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[3] Before that, Mathieson and Eichengreen (2000) characterize the currency composition of reserves as stable in the 1980s and 1990s. But the dollar share in fact declined after 1977, in tandem with the value of the dollar, and only recovered in the late 1990s.

[4] This is as a share of allocated foreign exchange reserves reported by the IMF's COFER site ($6,471 billion / $ 11,089 billion). Prasad (2019) points out that the unallocated proportion of global reserves has become less of a limitation of the COFER statistics since China began to share the currency breakdown of its reserves with the IMF, phased in over 2014-18.

[5] This calculation assumes that the euro's share remains unchanged. If central banks switched out of dollars into euros, the catch-up date would be correspondingly sooner.

[6] Aiyar, et al (2023).

[7] Engel (2006), Goldberg and Tille (2008), Gopinath (2015), and Boz et al (2020).

[8] BIS (December 2022). As of April 2022, the dollar is used in almost three times as many foreign exchange transactions as the euro, its nearest competitor, whether measured by simple spot trades or derivatives. Again, following the dollar and euro in the ranking comes the yen, pound, renminbi, Australian dollar, Canadian dollar, and Swiss franc, in that order.

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Federal Reserve, the dollar remains three times as important as the euro, and far more important than the yen, pound, or renminbi.[9]

Only in the case of global SWIFT payments,[10] does the euro come close to the dollar's share as of 2023: 32.6 % of payments versus 41.7%. The SWIFT rankings again put the renminbi in fifth place, at a mere 2.3 %. Admittedly, recent growth in the renminbi (RMB) would show up more strongly if data on the Cross-Border Interbank Payment System, which China launched in 2015, or other non-SWIFT alternative payments systems could be included.

2. **The challengers**

When the Bretton Woods system came undone fifty years ago, it seemed that the dollar had lost its special status. Initially, some expected that the IMF's SDR could fill the gap.[11] After all, the SDR had originally been proposed and created as a means of repairing the Bretton Woods system by offering an alternative to dollar reserves. But the synthetic unit never caught on as an international currency.[12] To be sure, 12 countries, many of them in Africa or the Mideast, had pegged their currencies to the SDR by 1979, rising to 16 in 1982. As a percentage of peggers, this was a rise from 16.4 per cent in 1979 to 22.5 per cent in 1982. But it was all downhill from there. By 1995, the number had declined to only three (Libya, Myanmar, and Seychelles). The SDR largely fell out of use, except as an international reserve asset for central banks.[13] The SDR lacks the advantage of a home base where it is the indigenous national currency. In the common analogy, if the dollar is akin to the English language, as the world's lingua franca, then the SDR is akin to the world's Esperanto. The SDR and Esperanto were both deliberately designed for maximum usefulness, and yet remain little used in practice, precisely because they were created artificially, rather than growing organically out of a home base.

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[9] Bertaut, et al, (2021), Figure 10. The measure is a weighted average of five criteria.

[10] SWIFT (April, 2023). The Society for Worldwide International Financial Telecommunications is a messaging system that accompanies inter-bank transactions. It provides the highest-frequency measure of international currency use. Chau, Ilzetski, and Rogoff (2022).

[11] Grubel (1963), Solomon (1976), Kenen (1987), and Williamson (2009).

[12] Eichengreen and Frankel (1996), Obstfeld (2011).

[13] The IMF occasionally still issues new batches of SDRs, notably in August 2009 in response to the Global Financial Crisis. Truman (2022).

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Excitement over rival currencies tends to come in waves of pessimism regarding the role of the dollar.[14] In the last 40 years, a procession of currencies have been characterized as candidates to challenge the dollar as premier international currency. The Deutsche Mark from 1973 to 1990,[15] the Japanese Yen from 1984 to 1991[16], and the Euro in the 2000s[17], each had its turn. Since around 2009, it has been the turn of the RMB.[18]

Predictions that the RMB might challenge the dollar for the number one spot by 2020 obviously were premature. Although China's currency has two of the three necessary conditions to be a leading international currency -- economic size and the ability to keep its value -- it still lacks the third: deep, liquid, open financial markets. Much as the Chinese government craves the global stature of a major international currency, it has not been willing to give up capital controls and to achieve free convertibility. In particular, it effectively halted its efforts to internationalize Chinese financial markets after 2014, when ten years of net capital inflows gave way to ten years of net capital outflows. It has further been observed that China does not have the democratic form of government, free media, and independent central bank that characterize the homes to most international currencies.

In 2023, the five BRICs countries -- Brazil, Russia, India, China and South Africa – began talking about establishing a new currency[19], to be an alternative to the dollar. Details are scarce. China would dominate a BRICS currency, by sheer economic size. But it is hard to imagine that five such disparate countries could live with a common currency, whether or not it would be China's yuan. Russia has proposed that the BRICS currency might be a new basket of the five national currencies. If such a new synthetic currency is envisioned alongside the five existing currencies, it would fail for lack of a home base, like the SDR but more so.

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[14] For example, one wave of declarations that the dollar was on its way out came in 1995, at the nadir of a 10-year decline in its foreign exchange value against the mark and yen (not that there need be any connection between international use of a currency and its exchange rate). E.g., Kindleberger (1995), Kunz (1995), and Frankel (1995).

[15] Tavlas (1993).

[16] Frankel (1984), Tavlas and Ozeki (1992), Hale (1995), and Takagi (2011).

[17] Alogoskoufis and Portes (1992), Bergsten (1997), Portes and Rey (1998), Frieden (2000), Chinn and Frankel (2007), Posen (2008) and Goldberg (2010).

[18] Dobson and Masson (2009), Ito (2010), Park and Song (2010), Eichengreen (2011b), Subramanian (2011a, 2011b), Prasad and Ye (2012), Frankel (2012), and Zhang (2022).

[19] "Why a Brics currency is a flawed idea," Paul McNamara**,** *Financial Times*, Feb. 10, 2023.

Arslanalp, et al (2022), point out that the continued gradual move of global central bank reserve holdings out of dollars is not primarily into any of the aforementioned challengers, but rather into new relatively small reserve currencies, like the Canadian dollar, Australian dollar, South Korean won, Swedish krona, and Norwegian krone. In addition, some other relatively small currencies, like the Singapore dollar, South African rand and New Zealand dollar, are held as reserves or as anchors to peg to, by a few still-smaller countries in their regions. One might add these relatively small units to the list of international currencies, though obviously not as candidates for a leader. It is interesting to note that the dollar could continue to lose market share indefinitely, while yet remaining in the number one slot.

3. Is a multi-currency system consistent with network externalities?

The traditional view of international currencies accords a very strong role to network externalities.[20] Like the English language, people find the dollar convenient to use, given that everybody else is using it. This implies good reasons to have one currency dominate, at any single time, whether it is the pound, the dollar, or some future challenger. It is more efficient to use a single currency internationally for the same reasons that it is more efficient to have a single currency *within* a country.

One implication of network externalities is inertia in the world's "choice" of the top international currency. ("Choice" is put in quotes, because these models tend to have multiple equilibria and thus path-dependence.) There may be long lags between the time that one currency's fundamental determinants, particularly the size of the home economy, pass another currency, and the time that the system reaches the tipping point when the challenger currency passes the incumbent in international use. Statistical studies of reserve holdings do indeed find a lot of inertia.[21] The traditional view is that this explains why the dollar did not fully supplant the pound as the premier international currency until 1950 or so. The fundamental determinants had come to favor the dollar over the pound by around 1920: the US passed the UK in economic size in 1872 and had acquired a central bank in 1913, while Britain had lost the strength that goes with being a large international creditor as a result of borrowing during World War I. But inertia delayed the overturning of the old order.[22]

A "new view" can be associated with Eichengreen (2010, 2011a,b): that network externalities are not as large as previously believed and that multiple top leading international

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[20] Kindleberger (1981), Krugman (1984), Matsuyama et al (1993), and Gopinath and Stein (2018, 2021).

[21] Including Lindert (1969), Krugman (1984), Chinn and Frankel (2007) and Iancu et al (2020), among others.

[22] Schenk (2010).

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currencies can exist simultaneously. Eichengreen and Flandreau (2009, 2012) and Chitu, et al, (2014, 2017) argue that the dollar in fact surpassed the pound quite soon after World War I, by 1925. A reasonable interpretation of the numbers is that international use of the dollar in the 1920s and 1930s attained approximately the same level as the pound and that the dollar only pulled decisively ahead after World War II.

The global monetary system can be usefully viewed as a tradeoff between the advantage of a single currency (network externalities) and the disadvantage: namely, that the issuing country may abuse its exorbitant privilege, provoking countries to look for alternatives (Farhi and Maggiori, 2017). Abusing the exorbitant privilege used to mean "debasing the currency" -- excessive budget deficits, money growth, current account deficits, inflation, and depreciation.[23] Econometric estimation of the determination of international currency shares included the ability of a country's currency to hold its value. (The other two most standard kinds of determinants are country size, as already mentioned, and the openness and liquidity of the country's financial markets.)[24]

Lately, overuse of exorbitant privilege has taken on a second meaning. It has been increasingly evident that frequent American use of sanctions can provoke some countries to move away from reliance on dollars.

Most international sanctions historically have accomplished relatively little, especially if they were applied without strong multilateral support. Experts tended to view them usually as just a way for a country to register a clear protest, one of the few options in between armed intervention and doing nothing. But sanctions have been used more often in recent years, particularly financial sanctions.

The US government's exploitation of the dollar's global dominance in order to extend the extraterritorial reach of US law and policy has been deemed "weaponization of the dollar."[25] An attempt to shut Iran out of the international banking system was among the economic sanctions applied against the country in response to its threatened development of nuclear weapons. Initially, in 2005, the US had multilateral support. True, Europeans occasionally grumbled about

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[23] The 1973 collapse of the monetary system was not simply the culmination of the Triffin Dilemma (1960), but was accelerated by the fiscal and monetary expansion of the Vietnam War era, under Presidents Lyndon Johnson and Richard Nixon. Since 1973, the US has accumulated another $31 trillion in national debt, attaining the highest ratio to GDP since the end of World War II.

[24] Dooley, Lizondo, and Mathieson (1989), Mathieson and Eichengreen (2000), Chinn and Frankel (2007), Ito and McCauley (2020), Aizenman et al (2020), Lusinyan et al (2020), Arslanalp et al, (2022), and Chinn et al (2022).

[25] Frankel, 2019, "How a Weaponized Dollar Could Backfire," *The Guardian*, Oct. 23.

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US extraterritoriality, suspecting that the US might be quicker to impose large penalties on European banks than on their American peers for violating sanctions. In any case, sanctions were relaxed when Iran agreed to halt its nuclear weapons program under a 2015 nuclear deal, the Joint Comprehensive Plan of Action.

The sanctions lost much of their multilateral support when Donald Trump reinstated them in September 2020. Trump in 2018 had withdrawn the US from the 2015 agreement, which Iran had not been violating. For this reason, in the eyes of the international community,[26] it became harder to justify sanctions in the name of a global public good and easier to characterize them as an abuse of the American exorbitant privilege. Not just China, but Europe as well looked for channels to pay for purchases of Iranian oil outside the US-controlled banking system. The episode fed concerns that the dollar might lose its long-standing primacy.

When Russia seized Crimea and invaded the eastern provinces of Ukraine in 2014, financial sanctions were intended to be an important component of the multilateral response. Their effects turned out to be rather limited. Worse, the Moscow government spent the subsequent seven years building up its financial defenses. With the aid of substantial current account surpluses, Russia's central bank accumulated $643 billion worth of international reserves, equal to an impressive 40% of GDP. Furthermore, the Bank of Russia, almost alone among the world's central banks, deliberately shifted the composition of its international reserves out of dollars, and into renminbi, other currencies, and gold.

Before the 2022 invasion of Ukraine, cutting off Russian banks from the global financial system, via the SWIFT messaging system or otherwise, seemed an ambitious goal. In the event, the US and its allies were able to accomplish that and a lot more. The US Treasury, together with the EU, Japan, other G-7 countries, Switzerland, Korea and Singapore, jointly took almost unprecedentedly strong action on February 28. They denied the Russian authorities (the central bank plus the sovereign wealth fund) access to their foreign exchange reserves and other assets held overseas, thereby disarming the carefully prepared defenses. As a result, the ruble suddenly plummeted 30%, on top of earlier declines, bringing it below one cent in value.

Over time, however, the ruble fully recovered. Even though the western countries applied sanctions at the outer end of what was expected before the invasion, the effect as of 2023 seems to have been less than expected. Facilitating evasion of sanctions is the expansion of alternative payment mechanisms, in renminbi or other non-dollar currencies.

A few recent studies examine whether the countries that are geopolitically the least aligned with the US and thus the most exposed to the threat of sanctions are generally the ones that have been shifting their reserve holdings out of dollars. Eichengreen et al (2017) use a dummy variable reflecting whether the country in question has a defense pact with the US. Mosler and Potrafke (2020) use the rate at which the country votes in agreement with the US in United

[26] *Politico*, September 21, 2020.

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Nations General Assembly resolutions. Arslanlap, et al (2022), use both variables. The case of Russia notwithstanding, the general finding is little significant effect of these geopolitical variables on dollar holdings.

4. Alternatives to national currencies

National currencies are not necessarily the only sort of international reserves, nor, for that matter, the only sort of international unit of account or means of payment. One alternative asset, though until recently considered by most economists "a relic of the barbarous past", is now regaining an active role as a component of international reserves. That is gold. The other alternative is a new one: cryptocurrency (a sign of a barbarous future?).

We long thought that central bank holdings of gold were an anachronism. Monetary authorities in many countries still held some gold, but did not treat it as an active part of their international reserves. That is, they did not buy or sell it. In recent years, however, central banks, especially in Asia, have been actively buying (and selling) gold.[27] Ferranti (2023) finds that from 2016 to 2021, those countries that face a higher risk of US sanctions increased the share of gold in their international reserves more than countries facing a lower risk of US sanctions.

Ferranti (2023) also explores whether it is sensible for a country that faces a modest risk of sanctions to diversify some of its central bank's portfolio out of US Treasuries and into cryptocurrency, specifically bitcoin.[28] (The cryptocurrency question is distinct from the question whether countries will issue Central Bank Digital Currencies that are used internationally.[29]) Somewhat surprisingly, he concludes that the answer is yes: Given that bitcoin is the asset that is the hardest for US authorities to block, one does not have to make optimistic assumptions about the future return to bitcoin to find that the possibility of sanctions gives bitcoin a place in some portfolios and gives it a fundamental long-run value.

5. Conclusion regarding the international currency system

[27] Arslanalp, Eichengreen and Simpson-Bell (2023).

[28] Also, Smales (2019) and Aysan et al (2019).

[29] CBDCs, if successful, would be merely another technological step akin to -- but probably less important than -- the laying of the first successful trans-Atlantic cable in 1865, which allowed the real-time trading of dollars for pounds ("cable"). CBDCs would not eliminate the need for an international vehicle currency, a role now played by the dollar. Eichengreen (2021).

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The U.S. currency has withstood repeated blows over the last five decades, most of them self-inflicted. An example is the danger that repeated standoffs over the debt ceiling between the two political parties will eventually force the US Treasury to default at least partially on its obligations.

So far, there is still little sign of the dollar losing its position as the leading international currency. Various measures show it still comfortably in the number one position. Strikingly, when a global shock raises perceptions of risk on the part of financial markets, investors still rush to the US dollar as the safe haven currency. This is true even when the shock originates in the United States, as was the case with the 2008 Global Financial Crisis.

The explanation for the dollar's staying power is easily identified: Lack of an alternative. The euro remains wounded from the 2010 crisis among its periphery members and there is a paucity of highly rated government bonds issued in the currency. The economies of Japan, the United Kingdom, and Switzerland are not big enough to sustain the number one role. China is big enough, but still lacks financial markets that are sufficiently deep, open and liquid. With respect to the store-of-value function of an international reserve asset, the recent resuscitation of gold could well become more important in the future. Even bitcoin could conceivably join the roster. But these two assets cannot fulfill the functions of a unit of account or a means of payments, at least not as capably as the dollar.

Let us keep in mind the distinction between *an* international currency and the *leading* international currency. It is normal for an important economy like the eurozone or China to conduct some of its trade in its own currency, rather than entirely in dollars. It is even normal for such a currency to be used in some transactions between other pairs of countries in its region. This does not make it a plausible candidate to supplant the dollar as number one international currency.

Perhaps the need to balance network externalities against the danger of abuse of exorbitant privilege can give rise to an equilibrium in which there is a handful of international currencies of equal size. There may be an a priori logic supporting the number three (dollar, euro, and RMB). If there is only one premier international currency in the system, its government has a strong incentive to run deficits and profit from the international seigniorage. But if there are three currencies, there is a check on the seigniorage. Every time that two of them are tempted to collusively abuse the exorbitant privilege, the third government can keep them honest by exercising greater monetary discipline, thereby offering a higher rate of return on its currency and attracting holders away from the first two.

But better suited to the data than the triumvirate would be an equilibrium in which the dollar has a substantially greater role than the euro, the euro has a substantially greater role than the third-place currency, and so on, as in Zipf's Law.[30] If the dollar can withstand the

[30] Chau, Ilzetski and Rogoff (2022).

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inflation of the Vietnam War era, the Nixon shocks of 1971-73, the 2007-08 sub-prime mortgage crisis, the 2017-2020 American loss of interest in global leadership, and the blowback from the 2022 sanctions against Russia, perhaps it can also withstand partisan politics that threaten a downgrading of US government debt. A good guess is that, even with the dollar slowly losing market share to others, it will remain in the lead.

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