International Currency: Myths and Realities[1]

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The commentariat is abuzz about changes to the international monetary system and challenges to the dollar's role as the dominant international currency. Of course, critics of dollar dominance are *always* predicting that change is at hand, since they assume that the status quo is unsustainable. Almost 20 years ago, in 2004, *The Economist's* financial columnist Buttonwood, citing chronic U.S. current account deficits, warned that "the game that has been played since the collapse of the Bretton Woods system in the early 1970s is drawing to a close. The dollar's status as the world's reserve currency – its preferred store of value, if you will – is gradually coming to an end."[2] In the 1960s and 1970s it was widely predicted that the collapse of the Bretton Woods system of fixed parities, under which other countries pegged to the dollar, would cause the greenback to lose its "exorbitant privilege."[3] Robert Triffin, predicting an overhang of U.S. foreign dollar liabilities, warned of this eventuality already as long as two decades earlier (Triffin, 1947). The latest incarnation cites "unprecedented" and "arbitrary"

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[2] The quote is from *Economist* (2004).
[3] As Valery Giscard d'Estaing put it in 1965. A famous exponent of dollar pessimism at this stage is Rueff (1971).

U.S. weaponization of the dollar (the decision, taken in response to Russia's invasion of Ukraine, to freeze the dollar reserves of the Central Bank of Russia and deny the country access to SWIFT and the U.S. banking system) and the rise of alternatives built on new technology, such as the e-CNY (China's digital renminbi).[4]

Yet, on many dimensions – its share of global foreign-exchange transactions, its share of global trade invoicing, as a currency of denomination for international bonds and bank loans – the dollar's dominance is undiminished.[5] Its position is effectively locked in, theorists tell us, by the network effects flowing from a large installed base of users.[6] Because other economic agents use dollars, it rewards no one to use an alternative. Its position is further cemented by complementarities and synergies between its different functions.[7] That the dollar is the dominant invoicing and payment currency makes it the dominant currency for cross-border bank borrowing and lending, since banks need to access dollars in order to advance funds to their nonbank clients importing merchandise from abroad. Because commercial banks borrow dollars in order to make them available to their clients, central banks hold dollar reserves in order to act as dollar lenders of last resort to those banks and markets. Because central banks have reserves of dollar liquidity, banks, firms and borrowers in turn are encouraged to incur liabilities in the currency.

Economists predicting the imminent demise of dollar dominance, these theories suggest, are the profession's equivalent of Didi and Gogo.[8] Yet the observation that dominant international curren-

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[4] See Wigglesworth (2022) for an illustration. To be precise, the decision to freeze Russian foreign exchange reserves held in foreign financial centers was taken not just by the United States but by a broad group of like-minded countries, as were the steps taken to exclude Russia from doing business with foreign banks.

[5] Although those shares fluctuate somewhat over time as a function of fluctuations in the dollar exchange rate and associated valuation effects. A contrary view is Dooley, Folkerts Landau and Garber (2022).

[6] Influential models include Krugman (1980) and Matsuyama, Kiyotaki and Matsui (1993).

[7] Here well-known models include Farhi and Maggiori (2018) and Gopinath and Stein (2021).

[8] These being the nicknames of the lead characters, Vladimir and Estragon, in Beckett's *Waiting for Godot*.

cies have risen and fallen – that they have appeared and disappeared in the past – rests uneasily within these theoretical frameworks. It suggests that, just maybe, our Didi and Gogo are not so silly to wait.

Lessons from History

Evidently, both theory and futurism are imperfect guides to the evolution of international currency status. This makes it tempting, not least for this audience, to look to history. Much has been written on this subject, of course. (I plead guilty.) Much of that writing, however, focuses on relatively recent 19th and 20th century history. (I plead guilty again.) This makes it hard to know how far this history generalizes. Those who utilize historical analogies as a way helping to inform policy choices and understand current events emphasize the need to consider a portfolio of historical analogies, synthesizing their implications and testing individual analogies for their fitness to current circumstances.[9] It is worth doing just this when considering the prospects for the dollar as an international currency.

Considering a portfolio of analogies drawn from the long sweep of history suggests two conclusions. First, widespread international use of a national currency often persists long after the country of issuance is no longer a dominant global commercial and financial power. Historical precedents point to very long periods of currency hegemony that extend beyond the commercial and financial preeminence of the issuing economy. Most if not all of these episodes ended with major wars, military collapse or other natural or political disasters with adverse financial consequences. By the standards of this history, the dollar has been dominant for only a relatively short period. Rather than tottering in old age, it is still in the prime of its international financial life – barring a catastrophic war or act of political self-destruction.

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[9] This is an emphasis in the political science literature where past interstate conflicts are often invoked as analogous to current conflicts. Classics here include May (1973), Neustadt and May (1986) and Khong (1992).

Second, dominant international currencies overlap. Contrary to the theoretical models of network effects and functional synergies suggesting that international currency status is a natural monopoly, and contrary to stylized historical accounts suggesting that competition for such status is a winner-take-all game, incumbent international currencies and their eventual successors have often coexisted for extended periods. Sometimes they have dominated in different regions or collections of economies. Sometimes they have dominated different economic and financial functions. But the relevant history is hard to reconcile with stylized natural-monopoly and winner-take-all stories. Even if the rise of the Chinese economy and the desire of some governments and central banks to lessen their dependence on the dollar post-Russian sanctions enhance the international role of the renminbi (an assumption I will question below), it does not follow that this necessarily sounds the death knell of the global dollar.

Definitions and Distinctions

Before proceeding, it is important to define what is meant by international money. One definition proceeds in parallel with the definition of national monies: an international money is a financial claim used as a unit of account, means of payment, and store of value in connection with international or cross-border transactions. The dollar qualifies as such because it is the unit in which oil and other commodities are priced and in which the bulk of global merchandise transactions are invoiced. It is the dominant settlement currency in which payments are made, generally through the international interbank market. And it is the principal unit in which foreign portfolio investment stocks and central bank reserves are denominated. A second definition emphasizes not the currency's functions but its markets: an international currency is used for cross-border transactions in commodity markets, merchandise markets, interbank markets, bond markets, and foreign exchange markets. The European

Central Bank, in its annual reports on the international role of the euro, proceeds in this second way.

Two additional not so sharp distinctions are useful at this point. The first is between international and cross-border transactions, the second between international currencies and international financial centers. Contributors to the literature on international currencies often remark on the use of a single currency in far-flung cities, provinces and colonial dependencies of an empire (Roman Empire, British Empire, or other empire of your choosing). But this is not *international* use of a currency strictly speaking; it is a distinct phenomenon insofar as residents outside the issuing jurisdiction are compelled by the imperial power to pay taxes in the currency or to otherwise use it, as opposed to choosing to do so. But insofar as the use of that currency in transactions across an empire's internal borders reduces transactions costs and fosters economic and financial integration of geographically distant regions, it may be appropriate to think of it as the *functional* equivalent of an international currency.

Similarly, international currencies and international financial centers are different, though related. Financial centers are places where agglomerations of agents engaged in financial transactions give rise to thick-market externalities and high levels of liquidity, thereby minimizing bid-ask spreads and other transactions costs. They are where well-developed institutions – both self-regulating institutions organized by market participants and legal institutions put in place by governments – limit the costs of enforcing contracts, further enhancing financial market efficiency. A separate historical literature traces the rise and fall of such centers.[10] Contributors observe that international financial center status is important for international currency status: a currency will be more attractive for international use when the issuing country is home to a large and liquid market in which that currency is easily traded, stored and hedged. Reciprocally, widespread use of a currency in international

[10] Notable contributions include Kindleberger (1974), Cassis (2006) and Fratianni (2007).

transactions may encourage foreigners as well as residents to transact in the issuing country, stimulating the growth of its financial center.

But the two phenomena do not always go together. Thus, the rebirth of London as a financial center in the final decades of the 20th century occurred in a period when the sterling was in decline as an international and reserve currency and an increasing share of transactions there were denominated not in sterling but in U.S. dollars.[11] So it will be important to keep these distinctions and relationships in mind as we proceed to the history.

Beginning at the Beginning

Greece is my first case, because Greek city states invented coined money. Their coins were used mainly in regions under Greek and Phoenician control around the Mediterranean and Black Sea. Their circulation was supported by the financial services of private bankers and temples that were important for underwriting long-distance trade.[12] Hoards found in the Persian (Achaemenid) Empire have been dated to very soon after the first Greek silver coins were struck.[13] But known hoards are few, suggesting that the use of Greek coins as a means of payment for trade and store of value outside the proper Greek territory was limited (Kagan, 2007).

Both commerce and banking developed further by the time of the Romans, who traded with Arabia, India and China. Coins stamped by Roman mints circulated both within the Empire and beyond. Within the Empire, they were used by the state to pay wages and pensions for soldiers, salaries for officials, purchases of food and equipment, expenditures on public works, gifts and donations, and military and political payments to allies (Howgego, 1994). They were

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[11] On the growth of this Eurodollar market, see Schenk (1998) and Battilossi (2010).

[12] This was further facilitated by the construction of specialized merchant ships and establishment of permanent trading posts around the Mediterranean (Millett, 1991).

[13] An especially notable hoard was found in Kabul in the 1930s.

used to settle trade: Roman coins found in India were received in payment for sales of spices, ivory, pearls, semi-precious stones, and silk, insofar as this was incompletely offset by Rome's own exports of cloth, metals and foodstuffs. Roman silver and bronze coins also circulated in Northern Europe. Strikingly, hoards of these Roman coins far outnumber early medieval issues, indicating the Empire's considerable international reach.

India aside, archeologists question whether most of these coins moved in connection with trade and investment, the standard functions facilitated by international money.[14] This may be true for low-value bronze coins perhaps, but more valuable silver denarii were used primarily for tribute payments to leaders of the so-called Barbarian tribes on the northern borders of the Roman Empire. Archeologists suggest that once received these coins were not used for commercial transactions but rather for payment of ransoms, blood money, dowries and heirlooms. In addition, they may have been used for ornamental purposes. Only in unusual circumstances were they used in Northern Europe for regular commercial exchange. In the 4th century, the decline and fall of the denarius coincided with the collapse of the Roman Empire, in what has been a recurring pattern throughout history.

A third candidate for an early international currency is the gold solidus or bezant of Byzantium.[15] The medieval historian Robert Lopez famously referred to this as "the dollar of the Middle Ages" in an article bearing that name (Lopez, 1951). Starting in the 5th century, the solidus circulated everywhere from England to India, even more widely than its Western Roman predecessor. It was backed by a stable if more geographically compact regime that participated extensively in international trade. It crowded out all other gold coins

[14] See for example Bursche (2002). Now that we have moved from abstractions to actual history, it is important to define and clarify terms. Here and in what follows I am using "currency," "money" and "coinage" interchangeably to indicate the Oxford Languages definition of currency, namely a system of money in general use, as opposed to a paper form of money. On the history of the latter see Eichengreen (2022a).

[15] Solidus for *solid* gold coin, bezant for Byzantium.

used in high value transactions, which by the 9th century Western European states had stopped emitting. Remarkably, its weight and fineness remained stable for 600 years. Even when its weight was reduced thereafter, its fineness remained unchanged, so it was still used in large-value transactions (e.g. long-distance trade), since coins used for these purposes could be weighed rather than counted. Byzantine emperors (whose visage adorned their coins) understood the value of their exorbitant privilege and went the extra mile to maintain it. Other issuers found it hard to compete, even when they sought to masquerade by placing on their coins a portrait of the Byzantine emperor.

Carlo Cipolla (1956) later qualified Lopez's point, conceding that the gold solidus dominated in the first half of the period (5th to 7th century), but insisting that from the late 7th century on it shared the international stage with the new Moslem gold dinar.[16] The two coins differed from one another in weight and fineness and in whether or not the coin was stamped with a cross. The dinar was the dominant unit in Moslem lands, the solidus in Christendom. This resembles the situation of the 1920s, when the dollar and sterling dominated in different parts of the world.[17] It casts doubt on the overwhelming power of network effects in this early period.

The decline of the solidus coincided with the decline of Byzantium. Once Constantinople was conquered by the Crusaders in 1204, the empire was reduced to no more than a third of its previous size. Military expenses forced successive emperors to debase the solidus, opening the door to the Italian city states (Kaplanis, 2003). Seeking alternatives for their expanding trade, first Genoa and then Florence and Venice issued gold units, which starting in the early 13th century rivaled and supplanted the solidus in international trade. Again, these were high-value trade coins used primarily in transactions

[16] The dinar was issued by Abd al-Malik starting in 696.

[17] One can say something similar about the late 19th century, when the pound, French franc and German mark all had their respective geographical domains (Eichengreen and Flandreau, 1996).

across political borders. They were produced at a standard weight and fineness, and issued by merchant-dominated republics that prioritized the monetary stability required for trade over seignorage for the state.[18] The trade in question was extensive: that of Florence extended to fairs throughout Europe, and in the cases of Genoa and Venice it encompassed trade throughout the Mediterranean, the Levant, Anatolia and the Black Sea.[19] Use of their monies was supported by financial developments such as the great banking families with their extensive networks, the practice of keeping books in a single currency, the invention of double-entry bookkeeping, development of the bill of exchange, and the establishment of public banks such as the Banco della Piazza di Rialto that operated as clearinghouses for bills.[20] Bills of exchange denominated in ducats or florin were expressly designed, as their name implies, to facilitate exchange or trade, including long-distance trade.

Cipolla describes how Florentine finance dominated from the middle of the 13th century to the end of the 14th, after which it was overtaken by Venice. The decline of the florin mirrored the decline of Florence and bore more than a passing resemblance to the experience of Britain and the sterling after World War II. The Florentine wool industry found it increasingly difficult to compete with the higher quality wool of the Low Countries and England. Labor militancy discouraged investment, as unskilled and semiskilled wool-cloth workers rose up against merchant- and skilled worker-dominated guilds. The Bardi and Peruzzi looked abroad for higher yielding investments and were bankrupted by the default of Edward III of England.[21] Military expenses and misadventures (the attempt to conquer

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[18] Actually there was an overlap between the two, given the role of the state in establishing and protecting trade routes on land and sea.

[19] There was in practice a larger overlap than this simple geographic taxonomy suggests. See van der Wee (1995), p.146 and passim.

[20] In addition, these banks made markets in bonds issued by the state, which could then be posted as collateral for still other financial transactions; see Eichengreen, El-Ganainy, Esteves and Mitchener (2021).

[21] Hunt (1990) questions whether the failure of the Bardi and Peruzzi was really independent of the two aforementioned factors (declining wool industry competitiveness

Lucca) led to debasements, not unlike the serial devaluations of sterling after 1948 – can you say "1956 Suez Crisis"?

New World Silver Invasion

Ultimately the currencies of the Italian city states were overwhelmed by silver from the New World.[22] The coins of small Italian city states were swamped by the avalanche of Spanish coins. But even if numerically dominated by more abundant Spanish coins, Venetian and Genoese ducats continued to be used in trade well into the 16th century, since their basis in gold made them more convenient for large-value transactions than silver coins. Venice and Genoa remained significant maritime commercial powers, creating a natural habitat for their currencies. Nor was the Italian unit entirely crowded out of international finance. Even after the decline of Florence, both Venice and Genoa remained important lenders, to Philip II of Spain for example. Their loans to Philip in the second half of the 16th century were denominated in ducats (Drelichman and Voth, 2014). This practice persisted into the 17th century – that is, long after Venice and Genoa had been overtaken by larger seafaring commercial powers. Note how this picture of both Spanish and Italian units simultaneously playing international currency roles – Spanish money disproportionately in international trade, Italian money in international finance – resembles the multipolar international monetary world sometimes envisaged for the future. It cuts against the presumption that international currency status is a natural monopoly or winner-take-all game.

The wide international circulation of Spanish silver coins reflected Spain's rise as a commercial and political power. With convergence of the Hapsburg royal lines, the Spanish Empire came to

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and growing labor unrest). He argues that loans to Edward III were considerably smaller than suggested by earlier historians and that problems with domestic loans were in fact at the root of the two houses' bankruptcies.

[22] Along with silver discovered in Germany, Austria and Bohemia starting in the 1470s.

encompass Castile, Granada, the Low Countries, Burgundy, Sardinia, Sicily, Naples, the Holy Roman Empire, and various overseas possessions.[23] Although Spain was the European port of arrival for most New World silver, much was passed on to the Netherlands, which functioned as an entrepôt for goods sourced around the world and where Spain had military expenses, and to Genoa, which provided banking and naval services to the Spanish crown. The heyday of the silver invasion was 1530-1650, after which New World specie exports went into decline. But Spanish silver coins remained an important international money long thereafter. Ferdinand and Isabella first reformed the monetary system at the end of the 15th century, discontinuing other coins in favor of the famous 8-reales coin, with its standard weight, purity and denomination. Philip IV promoted wider use of the real when in 1728-30 he took control of the mints to create the peso (or "pillar dollar," so named because the coins bore a representation of the Hercules Pillars of the Gibraltar strait), with its milled edges to discourage counterfeiting and clipping.

Spanish silver continued to dominate in Spain's overseas possessions as late as the 18th century.[24] It circulated throughout Europe, which ran trade surpluses with Spain and took silver in return. It reached China via the Philippines, brought there by Spanish sailors aboard the famous Manila galleon and by the Dutch East India Company (more on which below). It was used in England's North American colonies (at least in its most southern North American colonies) alongside commodity monies, tobacco warehouse receipts and "country pay," none of which were of much value in cross-border transactions. It was arguably the first truly global currency.[25]

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[23] After 1580 it encompassed Portugal and its overseas possessions as well.

[24] It was, in McCusker's (1978, p. 7) words, "the premier coin of the Atlantic world in the seventeenth and eighteenth centuries." Spooner (1972) emphasizes its widespread use beyond the Atlantic world, in Russia, Arabia, India and Sumatra, among other places.

[25] It was used after independence in the new United States, where it remained legal tender until 1857. See Martin (1977). This required distinguishing the unit of account (pounds and shillings before independence, dollars and cents thereafter) from the means of payment, international payment in particular, and developing conventions

Not all Spanish-American silver was coined. Private owners and licensed silver merchants may have been required to bring their silver to Castile's mints for coining, but smuggling provided a workaround. In addition, silver taken by the Crown itself in dues and taxes was not all coined. Some was used to pay the Crown's foreign creditors, who then used it to settle other transactions.[26] Medium-sized transactions could be settled with Spanish silver coins. Small transactions required "pieces of eight," pizza-slice-shaped slivers into which 8-reales coins were chopped. Large value transactions were settled with coins packed in casks or chests but also in bullion (ingots whose purity was attested to by the stamp of the Spanish crown).[27]

The prevalence of Spanish coins in international transactions long after Spain was overtaken commercially by the Netherlands and Britain anticipates a point in the literatures on the guilder and sterling (see below): an international currency, once established, often outlives the commercial dominance of the issuer. The same was true, as we have seen, of the Italian ducat before it. The Spanish case is distinctive in that the prevalence of its currency never rested mainly on the commercial dominance of the issuer. Rather, it rested on the exceptional fecundity of Spain's silver mines. Of course, there is the argument that, had Spain developed commercially, financially and industrially at the same pace as the Netherlands and England, Spanish silver would have retained its international role for even longer than it was actually the case.[28] This counterfactual may not

for translating the latter into the former. Irigoin (2009a) is an account of how this Spanish coin came to be imported into the United States.

[26] Hamilton (1934), p. 27.

[27] On the importance of the latter in Asia see Chaudhuri (1985) and Gaastra (1986). Irigoin (2009a) shows that Chinese imports of Spanish silver predominantly took the form of bullion prior to the end of the 18th century and Spanish coins thereafter, when the United States became the principal intermediary shipping Spanish New World coins to China. The demand for "Spanish-style" silver coins from China declined after the first quarter of the 19th century, once Spain's Latin American colonies gained their independence and the new republics each began minting their own distinctive national coins, leading to a confusing proliferation of issuance. On this, see Irigoin (2009b).

[28] For an introduction to the literature on Spanish relative decline in this particular context, see Alvarez-Nogal (2014).

be free of its own internal contradictions, however: Charotti, Palma and dos Santos (2022) argue that the "Dutch disease" caused by New World silver was at the root of Spain's relative decline.

Dutch Disease

This reference to Dutch disease brings us to the Netherlands, whose currency, the guilder or florin, rivaled Spanish silver as the leading international currency from the mid-17th through late-18th centuries. Whereas Spanish international finance mainly took the form of coins and bullion, its Dutch equivalent was securitized (though there also was a role for heavy gold coins as a vehicle for international trade, as we are about to see). The rise of the guilder was predicated on the prior expansion of Dutch commerce and trade. This in turn was a function of the reorientation of economic activity from the Mediterranean to the Atlantic, the development of the fluyt with its elongated profile, three masts and large hold beneath a single deck, and government support which provided seaborne security and minimized duties at Dutch ports. Long voyages by large ships required credit, spurring financial innovations that enhanced the international role of the guilder. Inflation was minimized. As in the Italian city states, merchants dominated, and merchants valued currency stability over seignorage. The economy's prominence in international trade and the currency's prominence in international finance thus fit together, as suggested by modern models of international currency status.[29]

Putting it this way lends a sense of inevitability to the story, as historical accounts (and theoretical models) tend to do.[30] But, in fact,

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[29] Again, see the articles of Farhi and Maggiori (2018) and Gopinath and Stein (2021) referred to at the beginning of this paper.

[30] In addition, the Dutch case is relatively well documented and thoroughly studied. Parallels between the Dutch financial system and modern systems (see below) mean that it has been the subject of disproportionate attention. This has led some commentators to assert that the florin overtook the Spanish dollar or peso as the leading international currency in the 18th century, where in fact Spanish coins probably remained equally important (as suggested earlier).

the guilder had to overcome serious obstacles, notably the fragmentation of the polity and attendant monetary confusion. The decentralized Dutch provinces had 14 active mints and a heterogeneous stock of domestic and foreign circulating coins. The mints provided silver Rijksdaalder used in domestic trade and heavy gold dukaat used as trade coins.[31] In fact, different regional mints produced three different trade coins: the *leeuwendaalder* for trade with the Levant, the *dukaat* or *rixdaalder* for trade with the Baltic, and the *rijder* or *ducaton* for trade with the Far East.[32] This suggests that the Dutch were tailoring their minting policies to foreign requirements as a way of fostering foreign demand and the utility of their trade coins. At this early stage, at the beginning of the 17th century, it is perhaps less appropriate to speak of the Dutch guilder or florin as an international currency than as a collection of international currencies.

A negative side effect, dealers complained, was that they had to keep track of a multitude of gold and silver coins (Israel, 1989). These costs provided impetus for another consequential financial innovation – the Bank of Amsterdam – established by the city fathers in 1609. Its customers deposited underweight coins from local mints and the Southern Netherlands, which the Bank in turn supplied to the major mints, which reminted them as standardized trade coins. Monetary reforms in 1622, 1659 and 1681 allowed for further standardization and eventually pushed light Southern Netherlands coin out of circulation. The 1681 reforms stabilized the gold content of the guilder, which had previously varied from trade coin to trade coin.[33] From this point, the advantages (network effects) of the widespread use of a standardized unit evidently dominated the appeal of different international currencies tailored to the needs of different international markets.

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[31] Minor local mints concentrated on the former, major mints on the latter. De Vries and van der Woude (1997), p. 82.

[32] Details are provided by Dehing and 'T Hart (1997).

[33] Which essentially remained unchanged until 1936, when the Netherlands became the last country to leave the gold standard.

In this way, the Dutch Republic became the principal supplier of trade coins used around the world. Precious metal imported from Spain and coins and bullion deposited by merchants at the Bank of Amsterdam provided the basis for this coinage. These coins were widely used in the Baltic (including in Russia), the Levant and Asia, with which the Republic ran deficits (Gaastra, 1986). Those deficits were not completely settled with Dutch coins: Spanish reals and unminted bullion from Spain accounted for about two-thirds of total metal shipments. In addition, in the 1700s the English used their trade surpluses with the Republic to acquire claims on Dutch banking houses and then used Dutch coins to make payments to the Baltics and Russia.[34] Again, this account lends a patina of inevitability to the rise of the guilder. But this should not be allowed to obscure the point that cementing its status took the better part of a century.

Cementing that status entailed more than simply standardizing the coinage. Trade coin was supplemented by financial claims that could be held as investments by foreigners as well as residents and that could be posted as collateral to secure, among other things, trade finance. An important financial innovation here was the formation of the Dutch East India Company (VOC) in 1602, structured in such a way that shares could be held and traded by foreigners.[35] A concurrent financial innovation, the Amsterdam Stock Exchange – arguably the first organized exchange – facilitated such trading by matching buyers and sellers, establishing rules of exchange, and adjudicating disputes.[36]

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[34] Further detail is in de Vries and van der Woude (1997), pp. 83-84.

[35] This was possible because control of the company rested with a board of directors appointed by the six participating cities and not with those (foreign and domestic) shareholders (Neal 2015, p.56). Neal draws a contrast with the Casa di San Giorgio, shares in which were closely held by Genoese merchant families only, which limited the use of its securities for investment and collateral purposes.

[36] A decade earlier the Amsterdam City Council had already passed a law designed to ensure that market trading was done in an orderly fashion, fixing trading hours, and establishing a code of conduct. Even earlier, in 1531 an exchange had been established in Antwerp as a venue for trading bills of exchange. Antwerp also pioneered the practice of endorsing bills of exchange, allowing them to be sold to third parties. Establishment of the Amsterdam Exchange was simply the culmination of that process.

Not only was the VOC the largest company in the world, but its share capital could be pledged by any merchant engaged in trade through one of the Republic's port cities and elsewhere.[37] The Dutch developed the *prolongatie*: the practice of granting advances against the collateral of securities, formally for a period of one month, in practice renewed serially.[38] The Netherlands became an increasingly important source of trade credit, as Antwerp and then Amsterdam adopted the principle of negotiability of bills of exchange – the principle that the rights of the originating creditor could be transferred to new holders of the bill (De Roover, 1953). Bills were bought, sold and traded by Amsterdam-based merchant banks that started as commodity brokers (hence the signifier "merchant"), then moved into providing credit to their counterparties, and eventually dealt in bills providing credit for unrelated transactions.

Meanwhile, the Bank of Amsterdam exercised a range of modern central banking functions: it operated a payments system, provided liquidity to the money market, engaged in open market operations, and lent to select counterparties. Building on the methods of Italian banks, it settled accounts multilaterally, smoothing and speeding payments. It allowed its customers to swap their coin for ledger money, paper receipts entitling them to repurchase that coin. It permitted those receipts or ledger money to be traded as separate assets (Quinn and Roberds, 2022). Ledger claims on the Bank of Amsterdam were widely accepted because the bank intervened in the market to stabilize their price against the Republic's now standardized trade coin (Quinn and Roberds, 2016; Frost, Shin and Wierts, 2020). In the course of the 17th century, "bank florin," as this ledger money was known, crowded out trade coin as the dominant vehicle for settling transactions in much of Western Europe and the Baltic.

The guilder's international status hinged importantly on this trio of financial innovations – tradable shares, a stock exchange, and a quasi-central bank operating a payments system and serving as liq-

[37] Neal (2015), pp. 55-62.
[38] Cassis (2006), p. 13.

uidity provider of last resort – together with a stable currency, a supportive government, and thriving overseas trade. This was the same constellation of factors that supported sterling's international currency status in the 19th century and the dollar's in the 20th. Wilson (1941) emphasizes the guilder's centrality in the network of foreign exchange transactions – that until 1763, for example, no exchange rate was quoted between London and St. Petersburg. Traders instead had to multiply the sterling/guilder rate by the guilder/ruble rate and go through the guilder and Amsterdam's credit facilities. The same was of course true of currency exchanges in the late 20th and early 21st centuries, many of which had to go through the dollar.[39]

The guilder's preeminence as an international currency in the 18th century outlived the Netherlands' preeminence as a trading power, just as the real's preeminence in the 17th century outlived the silver avalanche, and as sterling's preeminence in the late 19th and early 20th centuries would outlive British economic and commercial preeminence. As Dehing and 'T Hart (1997, p. 42) observe, "Dutch money was the key currency in many international transfers for most of the seventeenth and eighteenth centuries." It maintained that status despite the erosion of the Netherlands' commercial position starting in the late 17th century, owing to the establishment of direct commercial links between countries, which undermined the role of Amsterdam as an entrepôt center, and due to English competition. Dutch merchants redeployed their capital from trade finance to investment finance, underwriting sovereign loans to Austria, Sweden, Russia, Denmark, various German states, and even the newly independent United States of America (Veru, 2021).[40]

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[39] Thus, BIS survey data show that close to 90 percent of all currency trades involve the dollar as one leg of the transaction.

[40] Many of these loans, such as 1780s loans to the United States, were denominated in guilders, indicative of the currency's continuing international currency status, although Dutch investors also purchased some bonds denominated in foreign currencies, notably those of the English government. Wilson (1941) argues that Dutch foreign lending did little to create overseas markets for the country's exports – the explicit comparison being with 19th century Britain – partly because of their destination, partly because the Netherlands was only modestly industrialized. This would have accelerated the economy's commercial decline and, ultimately, the guilder's loss of international currency status.

The guilder's international status might have persisted for still longer if not for the succession of catastrophic wars with the British. The fourth war in 1781 led the Bank of Amsterdam to conduct extensive open market purchases of securities and to extend large loans to the government-sponsored VOC, whose business was disrupted by hostilities. These operations illustrated how credibility could be destroyed in a stroke. Over the next two years, the guilder depreciated sharply, eroding its hard-won previously built credibility. In 1789-90 the French Revolution then further undermined confidence, placed additional pressure on the Bank to engage in policy lending (this time to the City of Amsterdam), led to further outflows, and culminated in the currency's collapse.[41] By the time the French army occupied Amsterdam in 1795 and the VOC was wound down, the guilder's global dominance was gone.[42] Dutch investors in the 19th century would continue to invest abroad, but through foreign financial centers as much as Amsterdam, and in foreign-currency rather than guilder-denominated bonds.

Sterling's Rise and Fall

Sterling's assumption of the guilder's mantle was both abrupt and the culmination of a lengthy process. Until the final two decades of the 18th century, the currency had played little international role. British importers and exporters relied on Amsterdam and the guilder for trade credit. Unlike the Dutch, British bankers had little experience in underwriting foreign loans.[43] The shift from the guilder to sterling in the 1780s and 1790s was abrupt for the same reasons the shift from sterling to the dollar in the 1910s and 1920s was abrupt. Extension of credit by the incumbent financial center was interrupted by the exigencies of war, first the fourth Anglo-Dutch War and then the wars of the Revolution. Being protected

[41] Quinn and Roberds (2016) tell this story in detail.
[42] Liquidation of the Bank of Amsterdam then followed in 1820.
[43] These points are documented and elaborated by Cassis (2006), pp. 18-20.

from Napoleon by Britain's island status, London was in a position to take up the slack, just as New York, insulated from the German military during World War I by the Atlantic Ocean, was able to step into the role vacated by London.

The 17th and 18th centuries had already seen the development of a market in inland bills of exchange – bills drawn in connection with domestic transactions – increasingly centered on London (Kerridge 1988). These bills were accepted by merchant banks, which (as in the Dutch case) grew out of merchant houses engaged in commodity trade and already knowledgeable about the creditworthiness of their foreign customers. Once Amsterdam went offline, London-based merchant houses specialized in overseas trade were compelled to provide trade credit to their customers in order for that trade to survive. Practices developed for the market in inland bills provided a ready template. Henry Thornton concluded that already in 1802 London had established itself as the leading source of trade credit for Europe "and, indeed, of the whole world."[44]

As the market developed, this business of transacting in bills of exchange migrated from merchant banks to bill brokers, alternatively known as discount houses, who specialized in pricing and trading this instrument. And when strains developed in the market for trade credit, London possessed a liquidity provider of last resort, the Bank of England, to buy bills directly from dealers. Revealingly, the Bank's discounts of bills rose especially strongly in the first decade of the 19th century, precisely the time when the London market in trade acceptances emerged.[45]

From accepting bills of exchange drawn abroad, it took a small step for the same internationally oriented merchant banks to underwrite foreign loans. The market leader, Baring Brothers, is a prominent example of a merchant bank that began by accepting foreign bills of exchange and then moved to underwriting foreign loans. Foreign bankers with existing mercantile and financial connections

[44] Cited in Cassis (2006), p. 19.
[45] Data and discussion are in Sissoko (2019).

abroad similarly set up shop in London. J.F. Schröder & Co., a merchant firm originally specialized in the sugar trade with the Americas, was established in 1800, and quickly moved into underwriting foreign loans. N.M. Rothschild & Son was established in 1811 and overtook Barings as the leading underwriter.

This internationalization of banking was vital to London's rise, just as the internationalization of banking would be important for New York in the 1910s and 1920s.[46] Partly as a result of its activities, Britain's share in the stock of total foreign investments had already risen to match that of the Netherlands in the first half of the 1820s (Bairoch, 1976). And this stock of foreign investments was almost entirely denominated in sterling.

Two conflicting pictures have been painted of the subsequent century. In one, sterling dominated the period. In the other, it shared its international role with the French franc and German mark. A plausible reconciliation distinguishes different parts of the century. Before 1870 or 1880, sterling reigned supreme. It was the dominant currency of denomination for bills of exchange generated in the course of international transactions. It was the dominant currency of denomination for international bonds. Markets in analogous instruments denominated in other currencies, where they existed, lacked scale and liquidity.

This picture then changed in the final decades of the 19th century. France and Germany underwent significant industrialization and began closing the per capita income gap. They developed financially, with the emergence of banks such as Deutsche Bank and Credit Lyonnais, and the growth of the Paris and Berlin bourses (Hautcoeur and Riva 2010, Lehmann-Hasemeyer and Streb, 2016). They went onto the gold standard, emulating a step taken by Britain a half century earlier, thereby enhancing the stability of claims denominated

[46] Though in the latter case what mattered was the newfound ability of U.S. banks to branch abroad, as opposed to the ability of foreign banks to operate in the United States. The internationalization of banking was again central to the rebirth of London as an international financial center after World War II (Eichengreen, 2022b).

in their currencies. Politically, Germany unified. France put the turbulence of the Paris Commune behind it.

The international currency landscape in the 30 or so years leading up to World War I consequently looked different from what had been before. The market in international bonds was split between the sterling, the franc and the mark.[47] The foreign exchange reserves of central banks were split along similar lines (Lindert, 1969). An expanding network of foreign exchange quotations and transactions developed around three centers: London, Paris and Berlin (Flandreau and Jobst, 2005). In terms of actual foreign exchange market turnover, Paris and Berlin fully overtook London (Eichengreen, 2022b). Only in trade credit, where the sterling's international ascendency started, did the currency remain overwhelmingly dominant.[48]

It is interesting to ask how long this situation would have persisted had World War I not intervened. Britain's share of total foreign investments had continued to fall between 1885 and 1914, largely at the expense of these late industrializers. The share of sterling in the foreign exchange reserves of central banks and other official institutions similarly fell from 63 percent in 1899 to 48 percent in 1913.[49] It is plausible that these trends would have continued absent the war, as late industrializers continued to close the per capita income gap. If so, the more multipolar, less sterling-centric world that developed quickly after World War I would have emerged anyway, albeit perhaps more slowly.

[47] Esteves (2014) assembles comparable data for the three countries and currencies, showing that circa 1885 Britain accounted for 46 percent of total foreign investment, France 19 percent, and Germany 12 percent. Using different sources, Bersch and Kaminsky (2008) reach similar conclusions.

[48] Even when, say, a German bank established branches in Brazil in order to provide trade credit to coffee exporters and free the corresponding German importers from their reliance on British banks, their trade credit was still denominated in sterling (Kisling, 2019).

[49] Lindert (1969), Table 2. This is the share of sterling in the sum of foreign assets held in sterling, francs, marks and other currencies, disregarding in both years the "unallocated" share whose currency denomination is not known.

The Dollar and its Discontents

In addition, already before the war, in 1910-1913, the United States had put in place reforms destined to create an international role for the dollar. (1910 was when the pivotal meeting of financial leaders took place at Jekyll Island, Georgia, and 1913 was when the Federal Reserve was created.) The Federal Reserve Act abolished legal restrictions preventing national banks from accepting bills. It allowed those banks to branch abroad for the first time in order to solicit foreign business. It empowered the Federal Reserve System to provide liquidity to the nascent dollar acceptance market. Indeed, nurturing that market was a key motivation of the founders of the Fed (Broz, 1997; Federer, 2003). It had been the personal project of Paul Warburg, one of the financiers present at Jekyll Island, who had first-hand experience with European acceptance markets (through his family connections with the firm M.M. Warburg in Hamburg).[50] The Fed ramped up its support for the market once the war caused British acceptance houses to postpone payment of bills coming due, that postponement casting doubt over the liquidity of the London market. But there is little question that the Fed would have moved in this direction anyway, and that a wider international role for the dollar would have contributed to an eventual erosion of the sterling's market share even in the absence of hostilities.

By the early 1920s the value of dollar acceptances matched that of sterling acceptances, as documented in Eichengreen, Mehl and Chitu (2018). Federer (2003) attributes this rapid growth to Federal Reserve intervention, which stabilized interest rates on acceptances and encouraged market entry, along with the role of the American Acceptance Council (another Paul Warburg innovation) in providing the public good of information. Large U.S. banks that dominated the market in dollar acceptances then moved into underwriting foreign loans.[51] By 1920, the share of global foreign public debt denominated

[50] And who had written extensively on the subject (viz. Warburg, 1910).
[51] Just as English acceptance houses had done before them. Accominotti (2019) empha-

in dollars had risen to where it was second only to the share in sterling. When Commonwealth countries are excluded, dollar-denominated debt actually exceeded sterling-denominated debt for portions of the 1920s.[52] Seeing firms utilizing dollar trade credit and issuing dollar bonds, central banks accumulated dollar reserves to the point that by the mid-1920s the dollar overtook sterling as the leading reserve currency. Seen this way, the 1920s experience proves that changes in international currency status can occur quickly. This history is at odds with the presumption that first-mover advantage erodes only very slowly. That being said, the dollar's rapid rise did not destroy sterling's international role.

In fact, the dollar's newly-established international role rested on shaky ground. The value of dollar acceptances, dollar bond issuance and dollar reserves all collapsed after 1929. This decline had multiple causes, from the decline in economic activity to trade protection and generalized financial stress. But the case of acceptances is revealing. The aforementioned factors should have affected dollar and sterling acceptances equally. Indeed, the value of acceptances denominated in the two currencies remained roughly equal and moved almost exactly in parallel through 1931. After that, however, the value of dollar acceptances fell further, to less than half the level of sterling acceptances.[53]

The explanation for this post-1931 divergence lies in the refusal of the Federal Reserve Banks to purchase and rediscount frozen acceptances, on the grounds that the real-bills doctrine permitted them to deal only in self-liquidating paper (Adam 2020). Commercial banks were now required to gather and provide additional information about the liquidity of the paper they accepted, and many chose

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sizes how a handful of large, mainly New York-based banks, dominated the market in dollar trade credit, whereas the analogous London market was dominated by small, specialized merchant banks and acceptance houses.

[52] Again, figures here are from Eichengreen, Mehl and Chitu (2018).

[53] Data in Eichengreen, Mehl and Chitu (2018, p. 65) show 1933-4, not 1931-2, as the turning point. But the statistics there convert dollar acceptances into sterling at market exchange rates. Hence the U.S. share was inflated in 1931-2 by sterling depreciation and then elevated in 1933-4 by devaluation of the dollar.

to exit the market. The Fed's decision, taken on doctrinal grounds, was one aspect of its larger failure to act as a lender and liquidity provider of last resort in the Great Depression. It is a reminder of the importance of the central bank in backstopping an international currency.

I pass over the post-World War II period quickly, since this recent history is familiar. The dollar, as everyone knows, has been the dominant international currency since the war.[54] In the immediate postwar period, the U.S. was far-and-away the largest economy, with extensive international connections. It was the only large country with deep and liquid financial markets open to the rest of the world. And the dollar's role was not just supported by the scale and liquidity of U.S. financial markets; markets in dollar claims, such as the Eurodollar market, also sprang up outside the United States, reflecting network effects emanating from the large installed base of dollar users. Other countries, notably Germany and Japan, whose currencies might have supplemented the dollar, resisted this development, Germany because Deutschmark purchases might be inflationary and could erode export competitiveness, Japan on the grounds that yen purchases would interfere with its industrial policies.

The euro was supposed to change this: one of the express purposes of creating it was to free Europe from its dependence on the dollar (Ludlow, 1982). But the euro remains significantly behind the greenback in terms of foreign exchange reserves, currency of denomination for international debt and international loans, and foreign exchange turnover.[55] The European financial system being heavily bank based, there is a shortage of euro-denominated securities. More

[54] Sterling reserves nominally dominated dollar reserves for some years after the war, but those balances were blocked and had limited utility in international transactions (Avaro, 2020).

[55] See European Central Bank (2022). The one exception is as a global payment currency (as measured by messages sent through SWIFT), where the dollar and euro appear as coequals. However, many of these euro-denominated payments are between Euro Area countries. For comparability, one would have to add in dollar payments between the 50 U.S. states.

specifically, there is a shortage of AAA-rated public label securities of the sort that appeal to central bank reserve managers, only three Euro Area sovereigns (one of which is tiny Luxembourg) possessing AAA ratings. In addition, the weakness of European economies has forced ECB to hoover up many of their securities through its asset-purchase programs, leaving few available to the rest of the world.

Eventually, this could change. Capital markets union could increase the supply of securities. Governments could strengthen their finances. The ECB could exit the market. But it is sobering to recall that Europe has been attempting to move down this road, with only limited success, since the 1970s.

Implications for the Future

In closing, it is worth asking again whether recent developments could accelerate movement, if not toward the euro, then at least away from the dollar. The developments many observers have in mind are (1) U.S. weaponization of finance, (2) the rise of China and its efforts to internationalize the renminbi, and (3) new digital technologies, including but not limited to central bank digital currencies.

Weaponization refers to steps, taken in response to Russia's invasion of Ukraine, to freeze reserves of the Central Bank of Russia held in the United States, bar U.S. banks from doing business with most Russian entities, and prohibit Russia from sending messages related to cross-border interbank transactions through SWIFT. Undoubtedly, these measures will prompt other countries to contemplate the possibility that, at some point, they might be on the outs with the United States to explore alternatives. Suffice to think about the conflict between the U.S. and China over Taiwan, or between the U.S. and Iran over the latter's nuclear research.

But such countries can't turn to Europe and the euro, since Europe is on board with U.S. sanctions (at least in the case of Russia if not necessarily also Iran). They might contemplate using Russia's

System for Transfer of Financial Messages (SPFS), which transfers rubles among participants. However, only 400 banks and firms in just 12 countries participate in SPFS. They might contemplate participating in China's Cross-Border Interbank Payments System (CIPS), which has its own messaging technology and clears renminbi payments for domestic and foreign banks. But CIPS has only 10 percent of the participating banks compared to the main New York clearinghouse, CHIPS, and clears just 2 percent as many transactions by value. China and Russia have been developing these systems for years, and they are still very far from providing a meaningful alternative to CHIPS and the dollar. For countries other than Russia and China, exploring possible use of these alternatives is not the same as actually relying on them.

The Bank of Russia now plans to accelerate issuance of a digital ruble, connect all Russian banks to it by 2024, and establish its interoperability with the central bank digital currencies (CBDCs) of other "friendly" countries (Popowicz 2022). The People's Bank of China (PBOC) has already piloted its CBDC. For the time being, one must be resident in China in order to use it. But the PBOC is exploring how it might also be used abroad and might be rendered interoperable with other CBDCs. My view is that CBDCs are unlikely to transform the international currency and payments landscape. Existing platforms such as SWIFT are already exploring blockchains and related digital technologies. Wholesale cross-border transactions will have to satisfy Know-Your-Customer and Anti-Money-Laundering rules. Compliance will therefore require such transactions to go through banks (or through related entities regulated like banks). Banks already charge relatively low fees for wholesale transactions. And it is the decisions of nonfinancial and (especially) financial companies engaged in large-value transactions, not small retail transactions, that drive changes in the international payments landscape.

Other digital innovations are likely to be more important. Electronic trading platforms and automated market making and liquidity provision algorithms are gradually eroding the network effects and synergies supporting dollar dominance. They are making it eas-

ier and cheaper to trade and use currencies of smaller countries when engaged in cross-border transactions (Arslanalp, Eichengreen and Simpson-Bell 2022). This suggests a scenario of gradual movement away from the dollar in favor of the currencies of other countries. In a sense, this would not be unlike the gradual movement away from the pound sterling in the decades prior to 1913 (or away from the Italian currencies in the 17th century and the Dutch guilder at the end of the 18th). This orderly process is what we should hope for. The alternative of a breakdown in relations between the U.S. and China, leading to a sharp shift in the international monetary landscape like that starting in 1914, is a more dire scenario.

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