



When Did the Dollar's Reserve Share Fall? Valuation Effects and the Timing of Reserve Reallocation, 2000–2026

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Abstract

Claims about de-dollarization draw their evidence from three international functions of a currency, unit of account, medium of exchange and store of value, which rest on different mechanisms and need not move together. This paper separates them and asks in which capacity the dollar's position has changed, when, and how the quantity of dollar assets the world holds has moved relative to the price it pays to hold them. The invoicing and settlement legs use published indicators. The store-of-value leg extends the constant-currency revaluation of Arslanalp et al. (2022) by seventeen quarters, to 2026Q1, on the revised IMF COFER series with quarter-end FRED exchange rates, computed on 2000Q1, 2021Q4 and moving quarter-on-quarter bases. The adjustment is partial: four of the seven reported currencies are revalued. The indicators show continuing prominence in the first two. In the third, the dollar's share of reserves falls 13.67 percentage points across the window and 13.89 at constant 2000Q1 rates, so valuation has masked the decline rather than produced it. The published series nonetheless mistimes it. The gap between the two series is positive in every quarter from 2002Q4 to 2016Q3: the published share fell from 2002 to 2008 while the constant-currency share rose, and stayed flat from 2008 to 2014 while the constant-currency share fell. Quarter by quarter, the valuation effect exceeds the entire published change in 64 of 104 quarters. Readers of COFER should treat a quarterly change in the published share as evidence about the exchange rate until valuation is removed.

Keywords: de-dollarization; reserve currency composition; official foreign exchange reserves; valuation effects; convenience yield; exorbitant privilege

Introduction

De-dollarization names one phenomenon, but the evidence offered for it comes from three places. A currency serves internationally as the unit of account in which trade is invoiced, the medium of exchange in which transactions are settled, and the store of value in which official and private wealth is held (Cohen, 1971; Krugman, 1980). The first two rest on coordination, so they hold until many participants move at once (Krugman, 1980; Portes & Rey, 1998); a reserve portfolio can be adjusted by one institution alone. This paper therefore asks three narrower questions. In which capacity has the dollar's position changed? When within 2000 to 2026 did the change occur? And how has the quantity of dollar assets the world holds moved relative to the price it pays to hold them? The first is answered for invoicing and settlement from published indicators and for reserves from the paper's own calculation; the second from that calculation alone; the third by setting the calculation beside a published price series, as a juxtaposition and not a test. The premise that the three functions can be evidenced separately is not uncontested, and the Literature Review answers the strongest argument against it before the evidence is presented.

Within their documented coverage the aggregate indicators of turnover, invoicing and payment messaging show no erosion in the first two capacities. The capacity in which something has moved is the third, and it is measured by a series that cannot bear the weight placed on it. The dollar's share of foreign exchange reserves in the International Monetary Fund's Currency Composition of Official Foreign Exchange Reserves database stood at 70.80 percent in 2000Q1 and 57.13 percent in 2026Q1. The series is reported in current U.S. dollars, so a non-dollar amount changes when the exchange rate moves as well as when the holding does, and a quarter of dollar appreciation lifts the reported share even if no institution has bought or sold anything.

Arslanalp et al. (2022) separate the two for 1999 to 2021 by revaluing holdings at constant exchange rates and find that the decline survives revaluation. Their window closes before the events most often offered as evidence of reversal, the immobilisation of Russian reserves in 2022 and the dollar's appreciation since, and a full-period result establishes that a decline is real without establishing when it happened. This paper extends the revaluation by seventeen quarters on the Fund's revised series, on three bases: 2000Q1 for the cumulative view, 2021Q4 so the extension can be read against their endpoint, and a moving quarter-on-quarter base that isolates valuation within a single quarter. The adjustment is partial, since only the four currencies reported separately throughout the window are revalued, and it is the paper's only original calculation.

Three results follow. The decline survives revaluation and is slightly larger at constant rates. For fourteen years, however, the two series moved apart: the gap between them is positive in every quarter from 2002Q4 to 2016Q3, because the

published share fell from 2002 to 2008 while composition at constant rates moved toward the dollar, and stayed flat from 2008 to 2014 while composition moved away. Quarter by quarter, valuation exceeds the entire published change in 64 of 104 quarters. Set beside the finding of Du et al. (2026) that the Treasury convenience yield turned negative in 2012, the constant-currency share moved little for about four years after that turn and then fell; the paper reports the two series side by side and claims no more.

Literature Review

The literature since Cohen (1971) and Krugman (1980) distinguishes the three functions, and public discussion treats them as one trend. They are not independent, and the strongest statement of their connection is the direct counterargument to this paper's premise. Gopinath and Stein (2021) show that the functions reinforce one another: dollar invoicing makes firms and their banks want safe dollar claims to hedge those obligations, which lowers the return the world demands on dollar assets and makes dollar invoicing cheaper in turn. Complementarity is a reason to expect the flow functions to persist and private demand for dollar safe assets to be anchored by them. It is not a reason to expect the official reserve share to move in step with invoicing shares, because a reserve portfolio is adjusted by one institution at a time while invoicing and settlement conventions change only in concert. The premise adopted here is the narrower one, that the functions can move at different speeds and are evidenced by different series; complementarity is what makes stable flow functions beside a slowly diffusing portfolio share coherent rather than contradictory.

Unit of Account

Under producer currency pricing exporters set prices in their own currency (Obstfeld & Rogoff, 1995); under local currency pricing, in the buyer's (Betts & Devereux, 2000). Both imply invoicing shares proportional to trade shares. The dominant currency paradigm rejects both (Gopinath et al., 2020; Gopinath & Itskhoki, 2022): most trade is invoiced in a few vehicle currencies, chiefly the dollar, whether or not the United States is party to it. The evidence is the invoicing dataset of Boz et al. (2022), extended by Boz et al. (2025) to 132 countries over 1990 to 2023. That sample excludes the United States, is weighted by export values, and covers about three quarters of world exports after interpolation. About 40 percent of global exports are invoiced in dollars against roughly 10 percent destined for the United States, while the euro's share is about equal to the share of exports destined for the euro area (European Central Bank, 2025). A high share is not a stable one; the stability claim rests on Boz et al. (2025), which finds no significant shift in the dollar or euro share globally over 2020 to 2023. Because the invoicing currency governs price adjustment, with pass-through into import prices from the dollar exchange rate high at horizons of one and two years and pass-through from the bilateral rate low (Gopinath et al., 2020), invoicing shares describe the pricing architecture of

world trade rather than the weight of the American economy, and their stability through 2023 is the first leg of the argument.

Medium of Exchange

The second function concerns the currency in which a transaction is settled, which need not be the one in which it was priced; a vehicle currency is useful because others already use it (Krugman, 1980; Portes & Rey, 1998). Evidence here must keep five things apart: denomination, turnover, messaging, clearing and final settlement. The Bank for International Settlements (2025) reports the dollar on one side of 89.2 percent of foreign exchange turnover in April 2025, against 88.4 percent in April 2022; because both sides of every transaction are counted the shares sum to 200 percent, so the figure describes the dollar's place in the exchange of currencies, not the proportion of trade settled in dollars. The Swift Global Currency Tracker records the dollar in more than half of the value of customer and institutional payment messages (Swift, 2026), and a message carries the currency of the instruction, not the place of final settlement. Clearing and final settlement have no comparable series; commentary that most transactions on China's Cross-Border Interbank Payment System still use Swift messaging (Poenisch, 2025) describes dependence on messaging, which a renminbi payment can use without being settled in dollars, and is cited as commentary only. Over the 2022 to 2025 interval the turnover survey covers, the dollar's share rose slightly; the messaging figure is a single recent observation and carries no trend. The series do not measure the share of trade finally settled in dollars, and the second leg of the argument is stated at that strength.

Store of Value

Eichengreen (2011) uses exorbitant privilege for the discount the United States enjoys because demand for safe, liquid dollar assets is largely insensitive to yield (see also Gourinchas & Rey, 2007), and Prasad (2014) uses the dollar trap for the absence of scalable alternatives. On the price side, Krishnamurthy and Vissing-Jorgensen (2012) measure the convenience yield paid for the safety and liquidity of Treasuries, and Jiang et al. (2021) tie foreign demand for dollar safe assets to the dollar exchange rate. Du, Im and Schreger (2018) find that the premium specific to Treasuries relative to other G10 government bonds turned negative, and Du et al. (2026) date the turn to 2012, the median five-year premium averaging -7 basis points over 2012 to 2020 and -26 basis points from 2021 onward, while the convenience of the dollar itself, measured from covered interest parity deviations, has stayed positive (Du, Tepper, & Verdelhan, 2018). Those authors attribute the divergence to Treasury supply and post-2008 constraints on bank balance sheets; that is their interpretation and is reported as such.

On the quantity side, Arslanalp et al. (2022) report, on the pre-revision allocated series, the dollar's share falling from 71 percent in 1999 to 59 percent in 2021, a

stealth erosion into nontraditional currencies rather than the traditional alternatives. Gold is a separate matter: official gold holdings have risen (Arslanalp et al., 2023), but gold lies outside the COFER denominator and cannot say where the dollar's share of foreign exchange reserves went. The decline is also contested: Setser (2023, 2026) argues that official statistics overstate de-dollarization because states such as China have moved foreign-currency assets off the central bank's balance sheet. The paper's conceptual claim is that the store-of-value function is decoupling internally, holders keeping dollar assets while the privileged price once attached to U.S. sovereign debt erodes, and what it adds is the quantity series with dates attached.

Methodology

The revaluation below is the paper's only original calculation; the other two functions rest on published indicators used as their compilers report them. Its estimand is the change in the aggregate currency composition of reserves after selected exchange rate movements are removed. It is not an estimate of purchases, sales or changes in preference by any reserve manager, and is not used as one: a share can move because holdings were rebalanced, because holders with different compositions accumulated at different rates, or because securities changed in price, and the adjustment removes exchange rate movement for four currencies and leaves everything else in place.

Data Sources

Reserve composition comes from the International Monetary Fund's Currency Composition of Official Foreign Exchange Reserves database (International Monetary Fund, n.d.; version 7.0.1, retrieved 31 August and 9 September 2026 with identical values). From the 2025Q3 release the Fund publishes no unallocated component: the composition of non-reporting holders is imputed by Fund staff, the published shares are shares of total foreign exchange reserves, and the history is revised on that basis back to 2000Q1 (Kwende & Nephew, 2025). Earlier quarters remain on the previous construct and are not comparable: across the 1999Q4–2000Q1 seam the reported total rises 30.6 percent, against a largest quarterly change of 9.1 percent elsewhere in the window, the residual basket doubles from 22.0 to 46.0 billion dollars, and the dollar share moves from 71.01 to 70.80 percent. The sample therefore begins at 2000Q1, the first quarter of the revised history, and runs to 2026Q1: 105 quarters. Holdings are reported in millions of current U.S. dollars for the euro, yen, pound sterling, Swiss franc, Canadian dollar, Australian dollar, renminbi, other currencies, and the U.S. dollar; separate amounts for the Canadian and Australian dollars begin in 2012Q4 and for the renminbi in 2016Q4, before which each sits inside the other-currencies line. The Fund's published percentage shares are the headline series and are used unmodified.

Exchange rates are quarter-end observations of seven daily FRED series: DEXUSEU, DEXUSUK and DEXUSAL, quoted as U.S. dollars per unit of foreign currency, and DEXJPUS, DEXSZUS, DEXCAUS and DEXCHUS, quoted as units per U.S. dollar (Board of Governors of the Federal Reserve System, n.d.-a to n.d.-g), taking the last trading day where the quarter-end carries no observation.

Invoicing shares come from the datasets of Boz et al. (2022, 2025); turnover and messaging figures from the Bank for International Settlements (2025) Triennial Survey and the August 2026 Swift Global Currency Tracker (Swift, 2026), used as published.

Constant-Currency Revaluation

The procedure follows Arslanalp et al. (2022). COFER converts every holding into current U.S. dollars, so a reported non-dollar amount changes when either the holding or the exchange rate moves; revaluation removes the second channel for the currencies to which it is applied.

Let $A(i, t)$ denote the reported holding of currency i in quarter t , in millions of current U.S. dollars, $E(i, t)$ its exchange rate in that quarter, and b the base quarter. M is the revalued set, and $R(t)$ is the residual, defined as the sum of the reported amounts of every non-dollar currency outside M , including the other-currencies line. A prime marks a revalued quantity. The two quotation conventions require different arithmetic:

$$A'(i, t) = [A(i, t) \div E(i, t)] \times E(i, b) \text{ for } i \text{ quoted in dollars per unit (1)}$$

$$A'(i, t) = A(i, t) \times [E(i, t) \div E(i, b)] \text{ for } i \text{ quoted in units per dollar (2)}$$

Revaluation changes the non-dollar holdings and therefore the total against which shares are measured, so that total is recomputed rather than carried over from the published one:

$$T'(t) = A(\text{USD}, t) + \sum A'(i, t) + R(t), i \in M \text{ (3)}$$

Dollar holdings are unaffected by construction, so the constant-currency dollar share is

$$S'(t) = [A(\text{USD}, t) \div T'(t)] \times 100 \text{ (4)}$$

On a moving base, with the immediately preceding quarter as b , the valuation effect in quarter t is the published share $S(t)$ less the constant-currency share,

$$V(t) = S(t) - S'(t), b = t - 1 \text{ (5)}$$

and the published quarterly change decomposes by identity into that valuation component and a remainder:

$$S(t) - S(t-1) = V(t) + [S'(t) - S(t-1)] \text{ (6)}$$

The remainder is called the adjusted change in share below, and not reallocation, because it still contains accumulation at differing rates across holders, security price movements, and exchange rate movements within the residual.

The main series revalues the four currencies reported separately throughout the window, $M = \{\text{EUR, JPY, GBP, CHF}\}$, and is called the partial constant-currency series. It is computed on two fixed bases, 2000Q1 for cumulative change across the full window and 2021Q4, the terminal quarter of Arslanalp et al. (2022), against which the extension of their window can be read. $R(t)$ then holds the Canadian and Australian dollars, the renminbi and other currencies at nominal values; its category definition is fixed, its weights are not, and it grows from 2.55 percent of reserves in 2000Q1 to 12.75 percent in 2026Q1.

A currency cannot be revalued from a fixed base before its amount is reported, so widening M on the 2000Q1 base would treat the same holdings differently before and after a reporting change. Two further series avoid this. On the moving base every comparison is between adjacent quarters, so a currency joins M from the quarter after it is first reported without discontinuity; a seven-currency moving-base series is computed on this basis. On fixed bases the set is widened only over windows in which every included currency is reported throughout: a six-currency series on a 2014Q4 base and a seven-currency series on a 2016Q4 base establish the direction of the residual bias in the recent period. No series changes the treatment of a currency part-way through. Revaluing the residual across the whole window would require currency level amounts for its components before 2012Q4, which the source does not publish, and for the nontraditional component it does not publish at any date.

Verification

Four checks were applied. First, an identity in every quarter: the dollar amount divided by the sum of all nine reported amounts reproduces the published dollar share in all 105 quarters, with a largest deviation of 1.9×10^{-6} percentage points, the rounding of a series published at single precision. Second, a base-quarter identity: in the base quarter, and in the moving-base series in each currency's first reported quarter, the revalued amount equals the reported amount exactly, so no currency enters a series with a step. Third, a dual implementation: at the check quarters the share computed by spreadsheet formula and by script agrees to within 10^{-14} points. Fourth, because a residual that absorbs newly disclosed currencies cannot jump by construction, what is tested at the reporting changes is the continuity of the COFER total, which grows 1.5 percent at 2012Q4 and falls 2.5 percent at 2016Q4, inside the range of quarterly movements elsewhere in the window.

Limitations

Four limitations follow. First, the partial constant-currency series is a counterfactual, not a measurement: it reports what the dollar's share would have been had four

exchange rates not moved from the base quarter, and it is read together with the headline series throughout. Second, the adjustment is partial in two senses: exchange rate movement is removed for four currencies only, with the residual carried at nominal values, and holding an exchange rate fixed does nothing to changes in the prices of the securities held in that currency, which remain in both series. Third, the direction of the residual bias is not fixed. Where the residual currencies appreciate against the dollar, carrying them at nominal values inflates the revalued total and understates the constant-currency dollar share; where they depreciate, it overstates it. Which applies is established empirically below for the recent period, where the residual is largest. Fourth, the design is aggregate: a share computed across all holders moves when holders with different compositions accumulate at different rates, even if no institution rebalances, and the series cannot separate that from a change of composition within holders. Coverage is a limitation of a different kind from before: there is no unallocated component, but the composition of non-reporting holders is imputed, and official foreign-currency assets held outside the central bank's balance sheet fall outside the series.

Data and Results

Across the full window the published dollar share falls 13.67 percentage points, from 70.80 percent in 2000Q1 to 57.13 in 2026Q1; at 2000Q1 exchange rates it falls 13.89 points, to 56.91. Over twenty-six years exchange rate movement masks 0.22 points of the decline and produces none of it. That is the smaller result; the larger concerns how the two series relate inside the window, and it comes first.

The Published and Constant-Currency Series Moved Apart for Fourteen Years

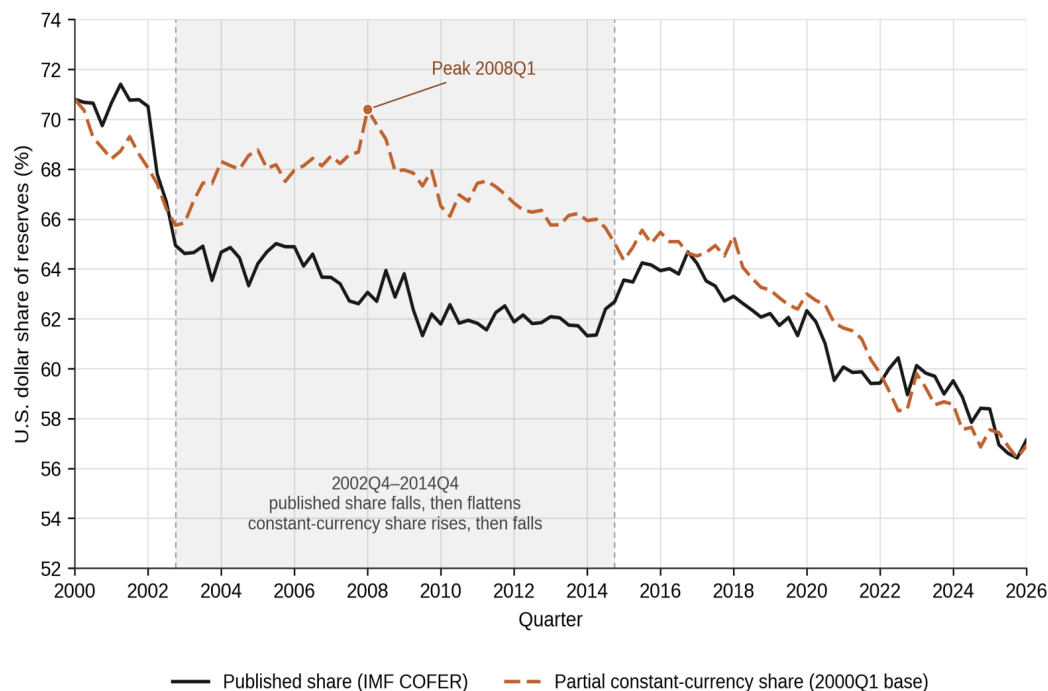
Figure 1 plots the two series and Figure 2 the gap between them, the partial constant-currency share minus the published share. The gap is negative until 2002, reaching -2.68 points in 2001Q2, then positive in every one of the 56 quarters from 2002Q4 to 2016Q3. From 2002Q4 the published share fell, from 64.94 to 63.06 percent by 2008Q1, while the constant-currency share rose 4.65 points to 70.39 percent, within 0.41 points of its 2000Q1 level; the gap at that point is 7.34 points. From 2008Q1 the published share was nearly flat, moving 0.37 points to 62.68 percent by 2014Q4, while the constant-currency share fell 5.36 points to 65.03. Across those fourteen years the two series moved first in opposite directions and then at very different speeds: the headline fall from 2002 to 2008 was exchange rate movement over a composition shifting toward the dollar, the headline plateau from 2008 to 2014 exchange rate movement over a composition shifting away from it. 2008Q1 is not a chosen boundary but the maximum of the constant-currency series within the window. 2002Q4 is a phase boundary set on the external grounds given in Table 1, and it is also the minimum of that series before 2008.

After 2015 the two series converge. The gap narrows to 0.79 points by 2015Q1, and from 2016Q4 it changes sign five times, at 2016Q4, 2017Q1, 2022Q2, 2025Q2 and

2025Q4, reaching -2.12 points in 2022Q3 and -0.22 in 2026Q1. A small cumulative gap at particular dates does not imply small quarterly valuation effects; the quarterly series below shows they are not.

Figure 1

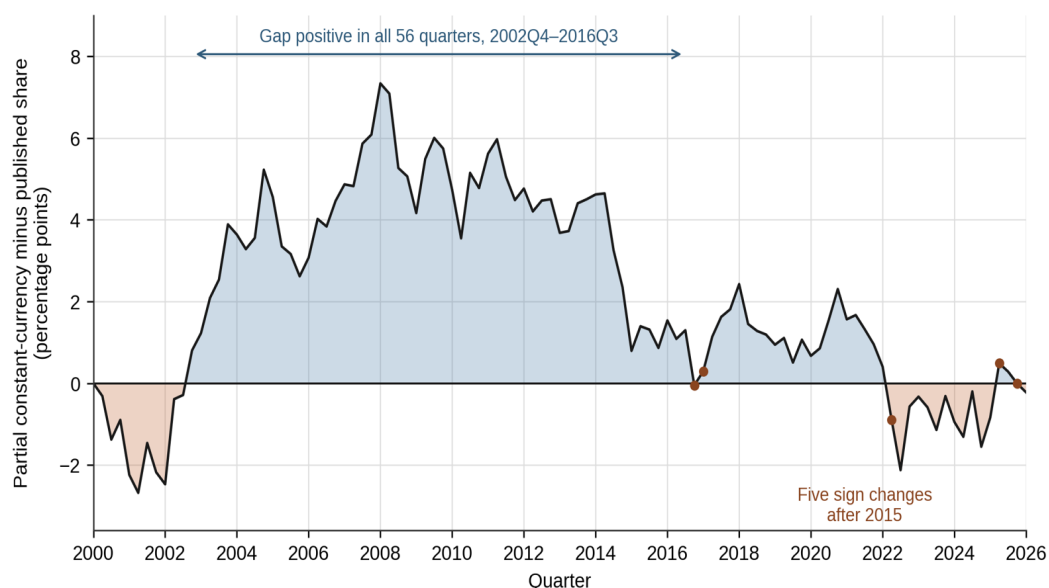
Published and Partial Constant-Currency U.S. Dollar Reserve Shares, 2000Q1–2026Q1



Note. Author’s calculations from IMF COFER amounts and quarter-end FRED exchange rates. The partial constant-currency series holds euro, yen, sterling and Swiss franc exchange rates at 2000Q1 values and carries the remaining currencies at nominal values. Shaded interval, 2002Q4–2014Q4; marked point, the maximum of the constant-currency series. On a 2021Q4 base the published share falls 2.27 points and the constant-currency share 3.28 to 2026Q1, so the result does not depend on the base quarter.

Figure 2

Gap Between the Partial Constant-Currency and Published U.S. Dollar Reserve Shares, 2000Q1–2026Q1



Note. Partial constant-currency share minus published share, percentage points, 2000Q1 base; positive values mean the dollar share at 2000Q1 rates would have exceeded the published share. The sign is the reverse of the workbook column USD_DIFFERENCE.

The Decline Survives Partial Constant-Currency Revaluation

The full-window result is a direct test of the claim that de-dollarization is a statistical illusion. If the observed decline were produced by dollar appreciation shrinking the reported value of non-dollar reserves, removing exchange rate movement should remove the decline. It does not: on the 2000Q1 base the adjusted fall of 13.89 points exceeds the published fall of 13.67. Nor does the result depend on the base quarter: on the 2021Q4 base, the terminal quarter of Arslanalp et al. (2022), the published share falls 2.27 points to 2026Q1 while the partial constant-currency share falls 3.28. Their decline survives revaluation through 2021Q4; here it survives seventeen further quarters, through the dollar's post-2022 appreciation.

Leaving the residual unrevalued does not produce the result either. The residual currencies weakened against the dollar after 2014Q4, so carrying them at nominal values understates the residual, lowers the revalued total and raises the constant-currency dollar share; the four-currency series therefore understates the recent decline. The direction is demonstrated rather than assumed: on a 2014Q4 base the four-currency share falls 7.51 points to 2026Q1 and the six-currency share, adding the Canadian and Australian dollars, falls 7.99; on a 2016Q4 base the four-currency share falls 7.52 and the seven-currency share, adding the renminbi, falls 7.64. Widening the revalued set enlarges the measured decline in both cases, so the four-

currency figure for the recent period is a lower bound, and the objection that the omitted currencies flatter it runs the other way. No such comparison is possible for the middle of the window, where the residual currencies are not reported separately; their exchange rates are, and over that stretch all three appreciated against the dollar: the Australian dollar from 0.5625 to 0.8173 U.S. dollars, the Canadian dollar from 1.58 to 1.16 per U.S. dollar and the renminbi from 8.28 to 6.20 per U.S. dollar between 2002Q4 and 2014Q4. The bias therefore reverses there and the small middle-phase change in Table 1 is, if anything, overstated.

Revaluation Relocates the Decline in Time

Table 1 reports the same series as descriptive arithmetic over three phases separated at 2002Q4 and 2014Q4, quarters corresponding to the completion of the euro's introduction and the onset of the 2014–2016 dollar appreciation. The published series loses 5.86 points in the first phase, 2.26 in the second and 5.55 in the third; the partial constant-currency series loses 5.05, 0.71 and 8.12. Revaluation moves the decline out of the middle of the window and into its ends, above all the final eleven years, carrying 58 percent of the constant-rate fall against 41 percent of the published one.

The magnitudes depend on where the phases are cut and the ordering does not. Panel B moves both boundaries by four and eight quarters in each direction; under every variant the final phase is the largest of the three, carrying between 56 and 68 percent of the full-window decline. The first-phase figure is the unstable one, because the constant-currency series has a turning point inside that interval, and a phase containing a turning point cannot have a stable decomposition. The phases are reported for comparison with earlier work; the finding is the shape. No breakpoint estimation was undertaken. A formal procedure would impose assumptions about trend and serial dependence that the rest of the design avoids, and the argument rests on the continuous series rather than on the phases.

Table 1

Decomposition of the Change in the U.S. Dollar's Share of Reserves, 2000Q1–2026Q1

Period	Quarters	Published share (Δ pp)	Partial constant-currency share (Δ pp)	Difference (pp)
<i>Panel A. Decomposition, boundaries at 2002Q4 and 2014Q4</i>				
2000Q1–2002Q4	11	–5.86	–5.05	+0.80
2002Q4–2014Q4	48	–2.26	–0.71	+1.54
2014Q4–2026Q1	45	–5.55	–8.12	–2.57
Full window, 2000Q1–2026Q1	104	–13.67	–13.89	–0.22
<i>Panel B. Sensitivity of the partial constant-currency phase changes to boundary placement (Δ pp)</i>				
Boundaries	Shift (quarters)	Phase 1	Phase 2	Phase 3
2002Q4 / 2014Q4 (baseline)	0	–5.05	–0.71	–8.12
2001Q4 / 2013Q4	–4	–2.19	–2.39	–9.31
2000Q4 / 2012Q4	–8	–1.95	–2.50	–9.44
2003Q4 / 2015Q4	+4	–3.38	–2.40	–8.11
2004Q4 / 2016Q4	+8	–2.25	–3.92	–7.72

Note. Published share is the IMF COFER dollar share. The partial constant-currency share revalues euro, yen, sterling and Swiss franc holdings at 2000Q1 exchange rates and carries the remaining currencies at nominal values. Δ pp is the change in percentage points over the period, Quarters the number of quarterly intervals it spans, and Difference the partial constant-currency change minus the published change, positive where revaluation reduces the measured decline. Endpoint levels (published; partial constant-currency): 2000Q1, 70.80; 70.80. 2002Q4, 64.94; 65.74.

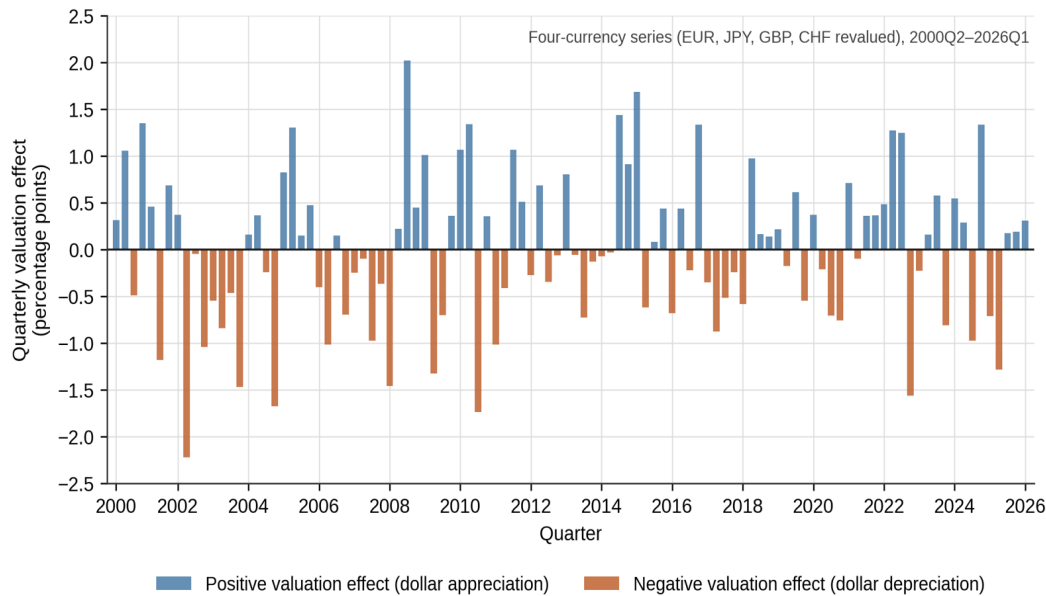
2014Q4, 62.68; 65.03. 2026Q1, 57.13; 56.91. The 2002Q4 and 2014Q4 boundaries correspond to the completion of the euro's introduction and the onset of the 2014–2016 dollar appreciation. Panel B moves both boundaries together by the number of quarters shown. Under every variant the final phase is the largest of the three and carries between 56 and 68 percent of the full-window decline; the magnitudes move considerably and this ordering does not. The first-phase magnitudes are unstable because the series has a turning point inside the interval: it falls to 65.74 at 2002Q4, its minimum before 2008, and recovers to 68.55 by 2004Q4, so the baseline boundary sits at the minimum and every other cut stops short of it or runs past it into the rebound. Holding the second boundary at 2014Q4 and moving only the first to 2001Q4 or 2003Q4 gives middle-phase changes of –3.58 and –2.39, so the middle-phase result does not depend on which boundary moves.

The Magnitude and Variability of the Quarterly Valuation Effect

Figure 3 plots $V(t)$ from equation 5 for the 104 quarters from 2000Q2 to 2026Q1. The four-currency effect averages 0.00 percentage points, a small sample mean of this component and nothing more. Its standard deviation is 0.82 points and its mean absolute size 0.66, ranging from –2.22 points in 2002Q2 to +2.02 in 2008Q3. In 64 of the 104 quarters, 61.5 percent, the valuation effect is larger in absolute value than the entire published quarterly change it sits inside. Valuation need not be the sole driver for this to hold, since the component exceeds the net change whenever it and the adjusted change pull in opposite directions; it does mean the published quarterly movement is routinely smaller than the exchange rate component within it. Revaluing all seven currencies raises the mean absolute effect to 0.70 points and the standard deviation to 0.87, with the same 64 quarters exceeding the published change: the omitted currencies reduce the four-currency figure rather than flatter it.

Figure 3

Quarter-on-Quarter Valuation Effect on the U.S. Dollar Reserve Share, 2000Q2–2026Q1



Note. Bars show $V(t)$ from equation 5, the published dollar share minus the share at the preceding quarter's exchange rates, for the four-currency series (euro, yen, sterling and Swiss franc revalued); positive values mean dollar appreciation raised the published share. The seven-currency series, adding the Canadian and Australian dollars and the renminbi, has a mean absolute effect of 0.70 points against 0.66 here.

The most recent observation shows the stakes. In 2026Q1 the published dollar share rises 0.71 percentage points, from 56.42 to 57.13 percent, a movement read as evidence that de-dollarization has stalled. On the moving base the share stands at 56.82 percent, so by equation 6 the quarter decomposes into a valuation component of 0.31 points and an adjusted change in share of 0.40, making 44 percent of its size exchange rate movement; on the seven-currency series the split is 0.29 and 0.42, or 41 percent. The direction of the quarter survives revaluation, and the adjusted change is not, on this design, a measure of purchases. Every result in this section rests on a partial counterfactual in which four exchange rates are held fixed while security prices and the residual basket are not, and each is read alongside the headline series rather than in place of it. No confidence intervals or effect sizes are reported, because the decomposition is arithmetic applied to a published series rather than an estimate from a sample.

Discussion

Read over the same interval, the three functions did not move together. Between 2021Q4 and 2026Q1 the dollar's share of reserves fell 2.27 percentage points as published and 3.28 at 2021Q4 rates; between April 2022 and April 2025 its share of

turnover rose from 88.4 to 89.2 percent (Bank for International Settlements, 2025); and over 2020 to 2023 its share of export invoicing showed no significant shift (Boz et al., 2025). The theory anticipates the asymmetry: invoicing and vehicle status change only in concert, while reserve composition is less tightly bound, though not free of it, since reserves are held partly for intervention and their usefulness depends on market depth.

Locating the Result Against Existing Estimates

The comparison with Arslanalp et al. (2022) runs on four dimensions. Their series is the pre-revision allocated share, ending in 2021; this one is the revised, fully imputed share, ending in 2026Q1, so the denominators differ and levels are not directly comparable. Their adjustment is a buy-and-hold counterfactual across the reserve currencies, computed with and without interest returns; this one holds four exchange rates fixed. Their country-level regressions attribute the movement to determinants and test for rebalancing; this design has no controls and attributes nothing, so their evidence for active diversification does not transfer to it. Where the two overlap, the decline survives revaluation in both. The difference lies inside the window and concerns shape, not rate, since nothing in a full-period decline implies a constant one: the extended series shows the constant-currency share returning to within 0.41 points of its 2000Q1 level at its 2008Q1 maximum, and a decline concentrated after 2014 under every placement of the phase boundaries. Candidate conditions sit at the relevant dates and are named without citation or evidence, since the design tests none of them: the euro's introduction and depreciation, the 2014 to 2016 dollar appreciation, renminbi entry to the Special Drawing Rights basket, and the immobilisation of Russian reserves in 2022. Concentration in phases establishes neither mechanism nor reversibility nor the absence of a trend, and none is inferred.

One qualification governs the comparison. Holding rates fixed does not isolate what any reserve manager chose: holders with different compositions accumulating at different rates move an aggregate share when no institution rebalances, and the middle of the window spans the fastest reserve accumulation in the sample, with quarterly growth in the COFER total reaching 9.1 percent in 2004Q1 (author's calculation), so the middle-phase result is consistent both with composition that changed little and with offsetting movements masked by the growth of the holders who moved least. Country-level data would separate them, and their absence limits Arslanalp et al. (2022) in mirror image: their destination currencies sit in the residual carried here at nominal values, so their instrument sees where the money went and this one when the share moved.

Reading the Headline Series

The small average and the large amplitude of the quarterly valuation effect are one fact at two frequencies. Over twenty-six years valuation masks 0.22 points of a 13.67-point decline, because appreciations and depreciations cancel; within a

quarter nothing cancels, so the effect exceeds the entire published change in 64 of 104 quarters and 0.31 of the 0.71-point rise in 2026Q1 is exchange rate movement. Long-horizon claims are comparatively safe from valuation; quarterly ones are not, and the commentary operates quarterly. The cumulative gap is a different quantity. The constant-currency line sits 7.34 points above the published line in 2008Q1, 0.79 above by 2015Q1, and after 2016Q4 crosses it five times. A small cumulative gap at a date means only that exchange rate movements since the base quarter have roughly cancelled by then; it does not mean that recent published changes record composition faithfully, since the quarterly distortions in the recent period are as large as ever. Setser (2026) argues the other way, that COFER overstates de-dollarization because states such as China hold foreign-currency assets off the central bank balance sheet. For the level both arguments point one way, since unrecorded dollar holdings imply a true dollar position above the measured one; for the trend the question is whether those holdings grew faster than reported reserves, in which case part of the movement identified here is displacement into unrecorded accounts rather than exit from the dollar, and COFER cannot settle it.

Timing the Two Sides of the Store-of-Value Function

Du et al. (2026) find that the median five-year Treasury convenience yield against G10 currencies turned negative in 2012 and declined further after 2021. The constant-currency share stood at 66.35 percent in 2012Q4, 4.45 points below its 2000Q1 level and 4.04 below its 2008Q1 maximum, so part of the quantity movement precedes the turn in the price. After the turn the share moved little for about four years, to 64.63 percent at 2016Q4, and then fell 7.72 points to 56.91 percent by 2026Q1. That is the juxtaposition with dates attached, of two independently constructed series and not a test of precedence; no lag has been estimated and nothing is predicted from it, since an inferential claim about lead and lag would require a time series method addressing trend, serial dependence and breakpoint uncertainty. On that reading the object that changed first is not the one being watched: the privilege Eichengreen (2011) describes concerns the terms on which dollar reserves are supplied as much as their quantity (Gourinchas & Rey, 2007), and the reserve share is a poor instrument for detecting its erosion, since for fourteen years it pointed the wrong way.

The traditional alternatives absorb about a quarter of the decline. On the 2000Q1 base the combined constant-currency share of the euro, yen, sterling and Swiss franc rises from 26.65 to 30.39 percent, 3.74 of the 13.89 points, and only the euro is flat, at 16.53 to 16.59 percent, euro area sovereign debt being fragmented across issuers of differing credit quality (de Kruijf, 2025). The remainder goes to the residual, the nontraditional currencies that Arslanalp et al. (2022) identify, while gold, whose official holdings have risen measured in ounces rather than dollars (Arslanalp et al., 2023), sits outside the denominator. The implication is a rule for reading the series: a quarterly change in the published share is not evidence about composition until

valuation is removed, and between 2002 and 2016 the cumulative series was evidence about the exchange rate instead.

Conclusions

The dollar's published share of foreign exchange reserves is the series on which the de-dollarization debate is conducted, and it is a poor instrument for the question asked of it. In which capacity has the dollar's position changed? The selected aggregate indicators show continuing dollar prominence within their documented coverage, and no more is claimed for them. The reserve share has fallen, by 13.67 percentage points as published and 13.89 at constant 2000Q1 rates, so the decline is not an artefact of exchange rates; revaluing the residual currencies where the data allow makes the recent decline larger, so the four-currency figure for that period is a lower bound. When did the change occur? Not where the published series places it: the gap between the constant-currency and published shares is positive in every quarter from 2002Q4 to 2016Q3, the concentration of the decline after 2014 holds under every placement of the phase boundaries, and quarter by quarter the valuation effect exceeds the entire published change in 64 of 104 quarters. How has the quantity moved relative to the price? The Treasury premium turned negative in 2012 (Du et al., 2026); the constant-currency share had already fallen 4.45 points by then, moved little for four years, and has fallen with the premium since. That is a juxtaposition, offered as such, and supports no statement about lead, lag or what comes next.

Three things the design cannot settle govern these claims. The series is aggregate, so a share can move when holders with different compositions accumulate at different rates, and only country-level data would separate that from reallocation. The residual cannot be revalued before 2012Q4, and its currencies appreciated against the dollar over the middle of the window, so the small middle-phase change is if anything overstated. The revised series imputes the composition of non-reporting holders, and official assets held outside central bank balance sheets fall outside it, so whether the decline is exit from the dollar or displacement into unrecorded accounts remains open. What remains is narrower than either side has claimed: the dollar's prominence in trade pricing and settlement holds within the coverage of the available indicators; its share of official portfolios has fallen by slightly more than the published series shows, concentrated after 2014, with the traditional alternatives absorbing about a quarter of it; and for fourteen years the series through which that decline is usually read recorded the exchange rate more faithfully than composition. The contribution is to carry a published revaluation exercise onto the revised vintage of the source series and seventeen quarters further, and to show that the decline it documents is misdated by the series through which it is usually read.

Declarations

Conflict of Interest Statement

The author declares no conflict of interest regarding the research, authorship, or publication of this article.

Data Availability Statement

All source series are publicly available: reserve amounts from the IMF Currency Composition of Official Foreign Exchange Reserves database and exchange rates from the Federal Reserve Bank of St. Louis FRED service, as detailed in the Methodology section. The reproducibility supplement, available from the corresponding author on request, consists of the five revaluation workbooks from which Table 1 and Figures 1 to 3 are generated, with frozen inputs, formulas and checks: New_2000Q1_Revalued (four currencies, 2000Q1 base), New_2021Q4_Revalued_v2 (four currencies, 2021Q4 base), New_QOQ_Revalued_v2 (four currencies, moving base), New_QOQ_Revalued_7CCY (seven currencies, moving base) and New_2016Q4_Revalued_7CCY (seven currencies, 2016Q4 base). The six-currency 2014Q4 comparison is computed from the inputs of the seven-currency moving-base workbook.

Declaration of Generative AI in Writing

During the preparation of this work, the author used generative AI tools (Claude, Gemini, and ChatGPT) in order to draft and revise prose, structure sections, and execute spreadsheet formulas and plots specified by the author. These tools were not used as a source of factual claims. All data were retrieved by the author from the primary sources named in the Methodology section, every citation was checked against the original publication, and all calculations were verified by the procedures set out in the Verification subsection, including a dual implementation and hand-checking against the underlying data. After using these tools, the author reviewed and edited the content as needed and takes full responsibility for the final publication content.

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