International Macroeconomics

Equilibrium of the Euro-Dollar Exchange Rate: A Long-Term Perspective

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Executive summary

In estimating the equilibrium exchange rate of the euro-dollar (EUR/USD), we adopt a holistic approach, distinct from the more traditional methodology based solely on the US-Euro area productivity differentials, which currently suggests an equilibrium rate of 1.20 USD per euro. Our approach consists of two key phases:

1. Decomposing the EUR/USD exchange rate into two distinct components: the strength of the U.S. dollar and the strength of the euro, which allow us to determine whether movements in the exchange rate are driven by USD strength, euro weakness, or a combination of both.

2. Identifying the key drivers of those dollar and euro strengths.

For the U.S. dollar, financial markets play a dominant role, with the Global Financial Conditions Index (GFCI) and Federal Reserve monetary policy tightening accounting for most of its current strength.

For the euro, the most significant factor is diminished global demand as a reserve currency, which reflects a weakened position in this realm.

Findings and Implications

Our analysis indicates that the EUR/USD exchange rate began 2025 misaligned, primarily due to an overvaluation of the U.S. dollar rather than weakness in the euro. The GFCI—a measure of global liquidity and risk appetite—explains a significant share of that overvaluation. Despite high liquidity in advanced economies, the GFCI illustrates a gradual decline in global financial conditions since 2015 that can only be explained by a broad set of interrelated trends, including the Federal Reserve's rate hikes, China´s slowdown, and a drop in global cross-regional investment inflows to emerging markets. This has been occurring as financial market fragmentation continues to reshape global capital flows.

This approach also allows us to build scenarios according to the expected evolution of the explanatory variables.

Alternative Equilibrium Exchange Rate Scenarios

- **Central Scenario (1.20 USD per euro):** If global financial conditions normalize, the equilibrium exchange rate would revert to 1.20 USD per euro—aligning with estimates derived from productivity-based models.
- **Prolonged Subdued Financial Conditions (1.10 USD per euro):** If today's subdued global financial conditions persist, driven by heightened geopolitical risks and economic uncertainty, the dollar would remain strong, keeping the equilibrium exchange rate closer to 1.10 USD per euro.
- **Escalating Trade Tensions (1.05 USD per euro):** If, in addition to prolonged subdued financial conditions, trade tensions escalate further, the U.S. dollar would strengthen even more, leading to an equilibrium exchange rate of 1.05 USD per euro.

Introduction

The persistent strength of the U.S. dollar against the euro has led some to interpret it as a structural shift, driven by a widening U.S.-Euro area productivity gap. Some even argue that this trend suggests a new equilibrium exchange rate approaching parity. However, the relationship between productivity differentials and real exchange rates is far from straightforward. It relies on strong theoretical assumptions, particularly regarding the elasticities of tradable versus non-tradable goods and the sectoral distribution of productivity gains. Accounting for these complexities, our previous productivity-based approach estimated an equilibrium exchange rate closer to 1.20 USD per euro in real terms. However, the euro has persistently been more depreciated than what the model suggests. Why can this be?

There are two fundamental limitations to this productivity-based view. First, its underlying assumptions are increasingly difficult to assess, particularly in distinguishing tradable from non-tradable goods. For example, services have traditionally been classified as non-tradables, but in today's digital economy, many services—software, consulting, financial services, and even education—are now globally traded. Second, this framework focuses solely on structural changes in trade, excluding the possibility of financial channels influencing equilibrium exchange rates. This omission is critical, especially for the U.S. dollar and the euro, which are both global reserve currencies and serve as gatekeepers of international financial assets.

That said, we also reject the simplistic financial approach that concludes the best estimate of the equilibrium exchange rate is simply its current level. This "random walk" view relies on highly unrealistic theoretical assumptions, including rational expectations and perfectly efficient, complete financial markets—all of which have been empirically challenged. Instead, in this note we take a more strategic approach, breaking down the USD/EUR exchange rate into separate dollar and euro dynamics and analyzing each currency independently through both commercial and financial channels. This comprehensive perspective reflects an effort to capture the multidimensional nature of equilibrium exchange rates, recognizing that their determination is shaped not only by trade dynamics, under which equilibrium serves to correct current account imbalances as emphasized in classical economic literature, but also by financial forces, which have gained increasing prominence in academic research.

The literature on exchange rate determination is rich and diverse, offering complementary insights from different theoretical traditions. Mundell (1991) provides a particularly clear and structured exposition of this complexity, outlining sixteen different theoretical approaches, each emphasizing one of the three key external markets relevant to any monetary jurisdiction:

1. The market for goods and services (current account) – where exchange rate movements are linked to trade flows, purchasing power parity (PPP), and trade balance adjustments.
2. The market for securities (capital account) – where capital flows and asset market integration influence exchange rate dynamics.
3. The market for liquidity (balance of payments) – where monetary policy can have a structural impact on real exchange rates, especially for global reserves currencies such as the euro and the US dollar.

A key insight from Mundell's analysis was that floating exchange rates do not always correct trade imbalances, as financial market forces—especially speculative capital flows—often override traditional adjustment mechanisms. Due to these financial market dynamics, Mundell argued that exchange rates behave much like participants in a Keynesian beauty contest[1], where movements are driven less by fundamental values and more by what market

[1] This analogy comes from John Maynard Keynes' famous "beauty contest" thought experiment, described in The General Theory of Employment, Interest, and Money (1936). Keynes compared stock picking to a newspaper contest in which participants had to select the most attractive faces—not according to their own

participants expect others to believe about future exchange rate levels. A perspective that was aligned with Rogoff's (1983) seminal finding that no short-term prediction model outperforms a simple random walk in forecasting exchange rates. The dominance of financial markets, investor expectations, and capital mobility create short-term exchange rate volatility that is largely disconnected from macroeconomic fundamentals.

In the decades since these findings, extensive research has sought to better understand the financial aspects of exchange rate determination. Building on the ideas Mundell illuminated, a significant shift in the literature has been toward the role of financial markets and global capital flows, particularly in the dollar-dominated international system. Obstfeld (2020) emphasizes how U.S. monetary policy spillovers shape global capital flows and exchange rates, reinforcing the idea that exchange rates are increasingly driven by liquidity conditions rather than trade fundamentals. Similarly, Krishnamurthy et al. (2024) introduce the concept of the convenience yield on U.S. dollar-denominated assets, showing that global investors' demand for safe dollar assets distorts equilibrium exchange rates, explaining why the dollar remains persistently overvalued despite large U.S. current account deficits.

Other studies also reinforce the financial dimension of exchange rates. Clarida (2018) links bond yield differentials and risk premia to exchange rate fluctuations, while Isard (2007) critiques traditional equilibrium models, arguing that capital flows dominate trade fundamentals in shaping exchange rates. Itskhoki & Mukhin (2017, 2019) develop general equilibrium models that explain exchange rate disconnect, showing how financial frictions, segmented markets, and monetary expectations contribute to potentially persistent deviations from fundamentals.

However, focusing exclusively on financial channels provides an incomplete view of equilibrium exchange rates. Rogoff (1996) demonstrates that purchasing power parity (PPP) fundamentals exert influence over the long run, typically taking 3 to 5 years to correct misalignments. This delay in equilibrium adjustment, known as the PPP puzzle, underscores the limitations of traditional macroeconomic models for short-term exchange rate forecasting while also reaffirming their relevance for understanding long-term exchange rate dynamics.[2]

In this note we first present our approach for disentangling dollar and euro dynamics. Next, we analyze the key determinants, beginning with the U.S. dollar followed by the euro. We then apply this framework to estimate the equilibrium real exchange rate under alternative scenarios. This is followed by a discussion on the distinction between nominal and real exchange rates, which becomes crucial if inflation in the U.S. and the Euro area fails to converge. Finally, we conclude with an exploration of the implications and remaining open questions.

preferences, but based on what they believe others will find attractive. This creates a second-order guessing game, where rational players base their choices on expectations of collective sentiment rather than intrinsic value. Keynes used this to explain speculative behavior in financial markets, where prices are shaped by market psychology and herd dynamics rather than pure fundamentals. For example, Bossone (2021) extends this logic, arguing that exchange rates primarily reflect market perceptions of policy credibility

[2] While recent research has increasingly focused on financial market forces, traditional equilibrium models still provide valuable insights into medium-term exchange rate dynamics. Ca' Zorzi et al. (2021) offer a systematic assessment of both Purchasing Power Parity (PPP) and the Macroeconomic Balance (MB) model. PPP remains a key long-term benchmark, particularly when its predictive power is enhanced by incorporating economic fundamentals such as GDP per capita, the Balassa-Samuelson effect, net foreign assets, and terms of trade. However, estimates derived from the MB approach, which relies on the premise that exchange rates adjust to achieve external balance, often fail to provide strong explanatory power.

Decomposing the exchange rate into dollar and euro effects

As discussed above, the euro-dollar exchange rate serves as a vital benchmark in global financial markets, reflecting a complex interplay of global commercial, economic, financial, and geopolitical forces. This report delves into the structural equilibrium of this exchange rate by systematically dissecting its components and exploring future long-term trajectories.

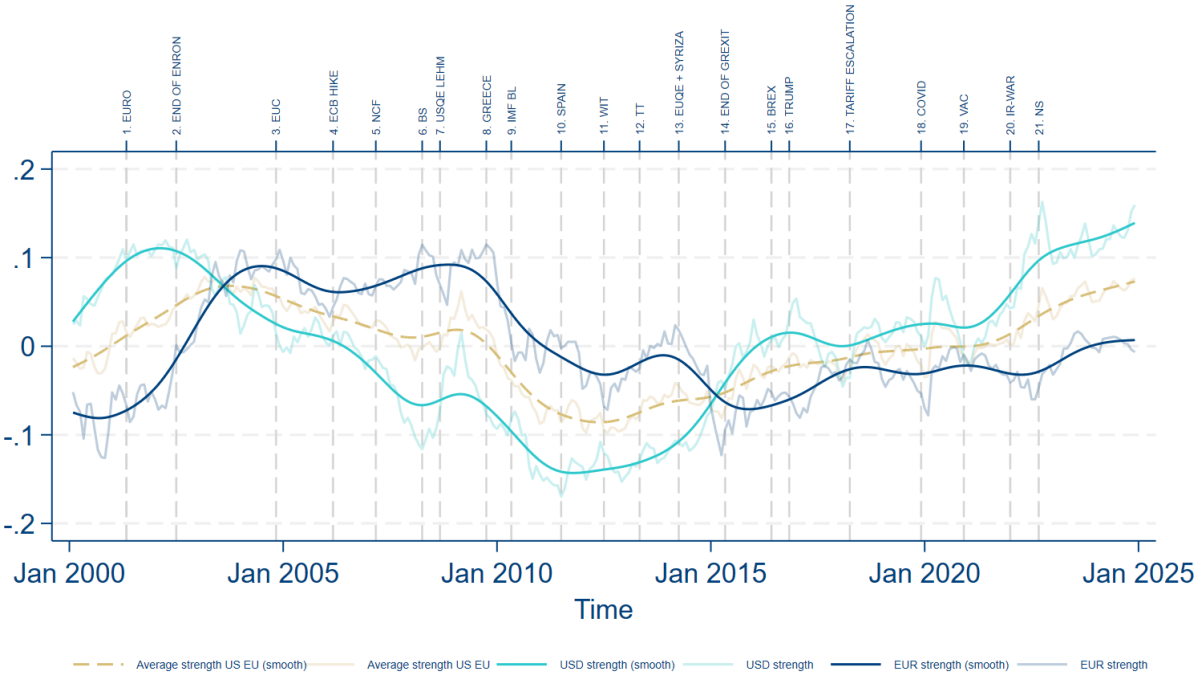
Our methodology emphasizes the analysis of the exchange rate in real terms. We first decompose the rate into two major components: the strength of the dollar on one side and the strength of the euro on the other. Each component is then scrutinized to uncover the factors that shape its dynamics.

The ***strength* of the USD** is defined as the inverse of the real effective exchange rate (REER[3]) of the US dollar relative to its trading partners excluding the eurozone. Analogously, *the* ***strength of the euro*** is defined relative to the eurozone's trading partners excluding the US. These measures are constructed using BIS estimates of REER for the US and eurozone, along with the associated weights for their respective trading partners.

Those weights have significantly changed over the past 25 years as can be observed in Table A1 (Annex A), where the weight of China as a trading partner has risen by 15 pp for both the US and the Euro Area (EA). The increase in China's weight came at the expense of a reduction in the relative weight of some major trading partners for both the US and the EA: Canada, UK and Japan for the US, and the US, Japan and UK for the EA. While the relative weight of the US fell significantly for the EA (from 20 to 14%), the inverse was not true with the weight of the EA remaining at around 18% for the US - a reflection of an EA that raised its trade (and net exports!) significantly more than the US in that period.

[3] The real exchange rate is defined in economic terms as *the price of foreign currency* (i.e., the exchange rate of the euro relative to the USD is the reciprocal of the value commonly expressed in today's media). Additionally, all indices and levels in the report are expressed in logarithm to facilitate calculations and interpretation.

Figure 1. **STRENGTH OF US DOLLAR AND EURO** (INDICES, SMOOTHED* AND DE-MEANED IN SAMPLED PERIOD)



* Monthly data smoothed through an HP filter with lambda 1600.
Source: BBVA Research based on data from the Bank for International Settlements (BIS). Strength indices refer to the real effective exchange rates for the US and the EZ excluding each other's participation among their respective trading partners.

Figure 1 illustrates the evolution of both components together with vertical dashed lines pinpointing major events that, upon inspection, influenced the euro-dollar exchange rate over the past quarter century (Table A2 in the Annex A provides a more detailed description of each of those events). For the euro (blue curve in Figure 1), a marked strengthening occurred in the early 2000s, starting with the ECB's clear signaling as an orthodox central bank (early 2001) and ending with the national referenda contesting a European constitution (late 2004). It then plateaued between 2005 and 2010 before the onset of the eurozone debt crisis. During that crisis, the euro weakened sharply amidst concerns over the currency's viability. However, the euro stabilized around a new level after 2015 (as Syriza abided by the Troika), which suggests a new equilibrium level shaped by the aforementioned structural shifts.

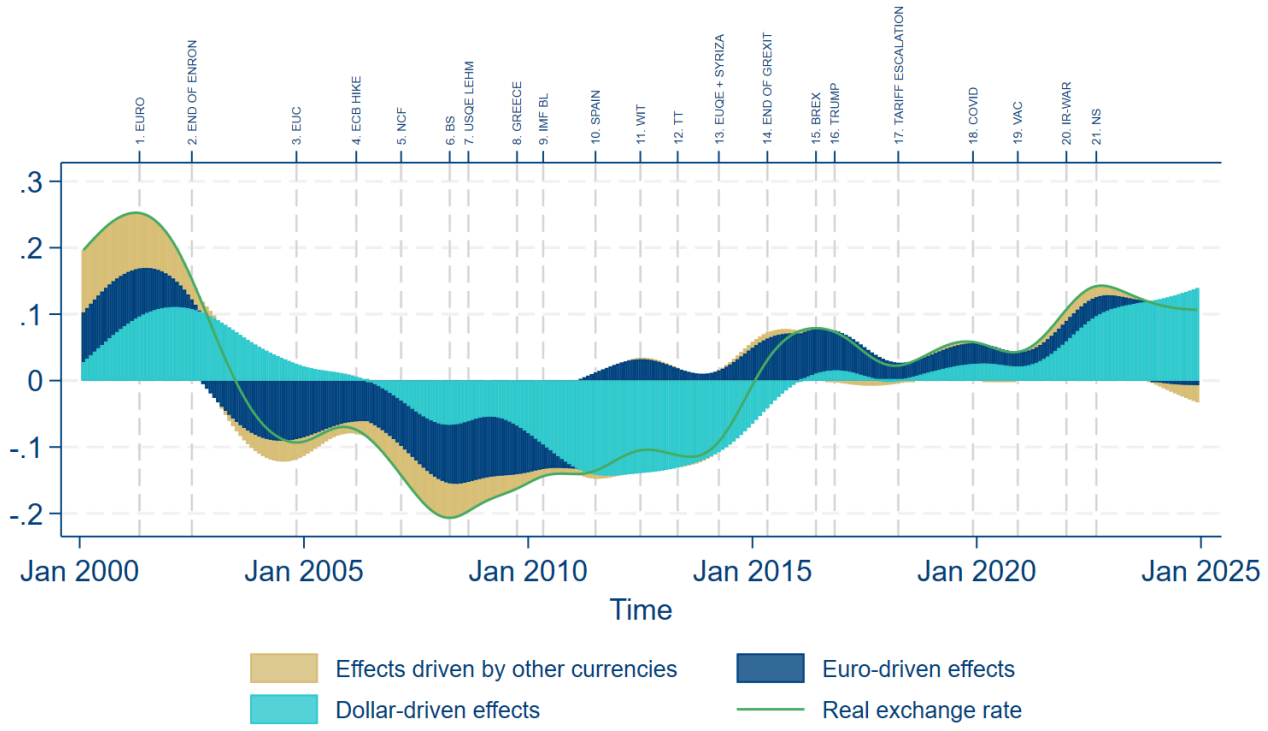
In contrast, the dollar's trajectory followed a distinct cyclical pattern (turquoise curve in Figure 1). The dollar began the century strong but started to weaken as global risk aversion gradually eased following an extended period of financial turbulence that began with the Long Term Capital Management (LTCM) crisis in the late 1990s, followed by the Russian crisis, the dot-com bubble, and the Enron scandal. It reached a trough during the European debt crisis in 2011–2012 but has since been on a strengthening streak that, after Covid, broke records for this century. This overall dynamic underscores the cyclical nature of the dollar's movements since 1980 highlighted in Obstfeld (2020) and illustrated in Figure 3 graph B.

The exchange rate of the euro can be easily recovered from these constructed components of euro and dollar strength. Due to no-arbitrage opportunities in the global foreign exchange markets, we obtain:

$$\varepsilon_{EURO} = S_{USD} - S_{EURO} + \varepsilon_{PARTNERS,} \quad \text{(eq. 1)}$$

where ε_{EURO} refers to (the logarithm of) the euro real exchange rate (defined as the price in euros per one USD), S_{USD} and S_{EURO} are the strengths of the USD and the EUR defined above, while and $\varepsilon_{PARTNERS}$ refers to the exchange rate of eurozone partners vis a vis US partners. In simple terms, the euro depreciates (reflected in a higher euro-dollar exchange rate) due to one of three factors: a strengthening of the dollar (vs trading partners ex euro), a weakening of the euro (vs trading partners ex-US), or a relative weakening of the EU's trading partners compared to those of the US.

Figure 2. **EURO-DOLLAR DECOMPOSITION IN USD-EUR STRENGTHS** (IN LOGS AND DE-MEANED)



Source: BBVA Research based on data from the Bank for International Settlements (BIS).

Figure 2 illustrates the decomposition of the euro-dollar exchange rate into the three components of Equation 1. The green line represents the real exchange rate, where values above zero (above average) indicate a real appreciation of the U.S. dollar and values below zero (below average) indicate a real appreciation of the euro. These movements can be then attributed to a combination of:

1. Dollar-driven effects (turquoise area), which push the exchange rate up when the dollar strengthens and down when it weakens.
2. Euro-driven effects (dark blue area), which contribute to pushing the exchange rate up when the euro weakens and down when it strengthens.
3. The relative strength of eurozone and U.S. trading partners (yellow area), which has remained largely stable and thus has played a limited role in driving exchange rate fluctuations over time.

Assuming the narrative above (in which the euro is at equilibrium as it has been driven by structural shifts while the dollar's strength follows cyclical dynamics), the equilibrium exchange rate aligns with the average level observed over the 25 years under study (represented as 0 in the graph, as variables are demeaned). As of December 2024, the graph indicates that the USD was about 14% overvalued relative to its equilibrium level (under the assumption of cyclicality, this equilibrium should align with its historical average). Meanwhile, the euro, having undergone structural shifts, had coincidentally stabilized near its own historical average.

Determinants of dollar strength

To examine underlying structural trends, we analyze several potential factors sustaining the strength of the USD and the EUR. A detailed assessment of various competing influences reveals that USD strength is primarily driven by its dominant role in the capital and liquidity markets. This is no surprise: as the hegemonic global currency since WWII, the USD has consistently remained the preferred global reserve currency and the primary denomination for major global safe-haven assets. More specifically, we identify four key variables that explain the medium-term dynamics of USD strength:

- **Within the Securities Market** (reflected in the capital account): Two key variables explaining the dollar strength are the two-year interest rates[4], and the Global Financial Cycle Index (GFCI) developed by Hélène Rey and Agrippino (2019)[5]. The two-year interest rate is a measure of the return to capital in the US, while the GFCI is a comprehensive measure of global liquidity, capital flows, and financial market risk appetite. Constructed using a dynamic factor model, it aggregates key indicators such as credit spreads, equity volatility, cross-border capital flows, and risk premia, identifying common financial trends across the globe. And as documented also by Obstfeld (2020), this index illustrates that global financial conditions have followed a recurring cyclical pattern since the 1980s, largely shaped by shifts in global liquidity and risk sentiment. Periods of financial easing, such as those following the Volcker disinflation and the 2008 financial crisis, have coincided with greater capital mobility and increased cross-border flows. Conversely, episodes of monetary tightening, including the Fed rate hikes in the 1980s, the taper tantrum of 2013, and the post-2022 liquidity contraction, have led to capital retrenchment and heightened financial stress, particularly in economies with greater external vulnerabilities.

  A gradual but persistent decline in the GFCI since 2015 has been driven not only by gradually tightening global liquidity but also by China's economic slowdown and tighter capital controls, which have curtailed global credit expansion, especially to emerging markets. Additionally, cross-border investment flows weakened, particularly after the escalation of the U.S.-China trade war in 2018, increasing uncertainty and financial fragmentation. By 2020, the COVID-19 crisis initially triggered a liquidity surge, but post-pandemic monetary tightening, led by aggressive Fed rate hikes from 2022 onward, has gradually tapered this surge.

  Structural shifts, including deglobalization, protectionist trade policies, and heightened geopolitical risks, have further reinforced the downward trend. Despite pockets of liquidity in developed markets, capital mobility remains constrained, leaving global financial conditions, according to this index, at historically low levels.

- Since GFCI data extends only until 2019, we extend it using BBVA's Financial Tension Indicator, which closely (negatively) correlates with it.

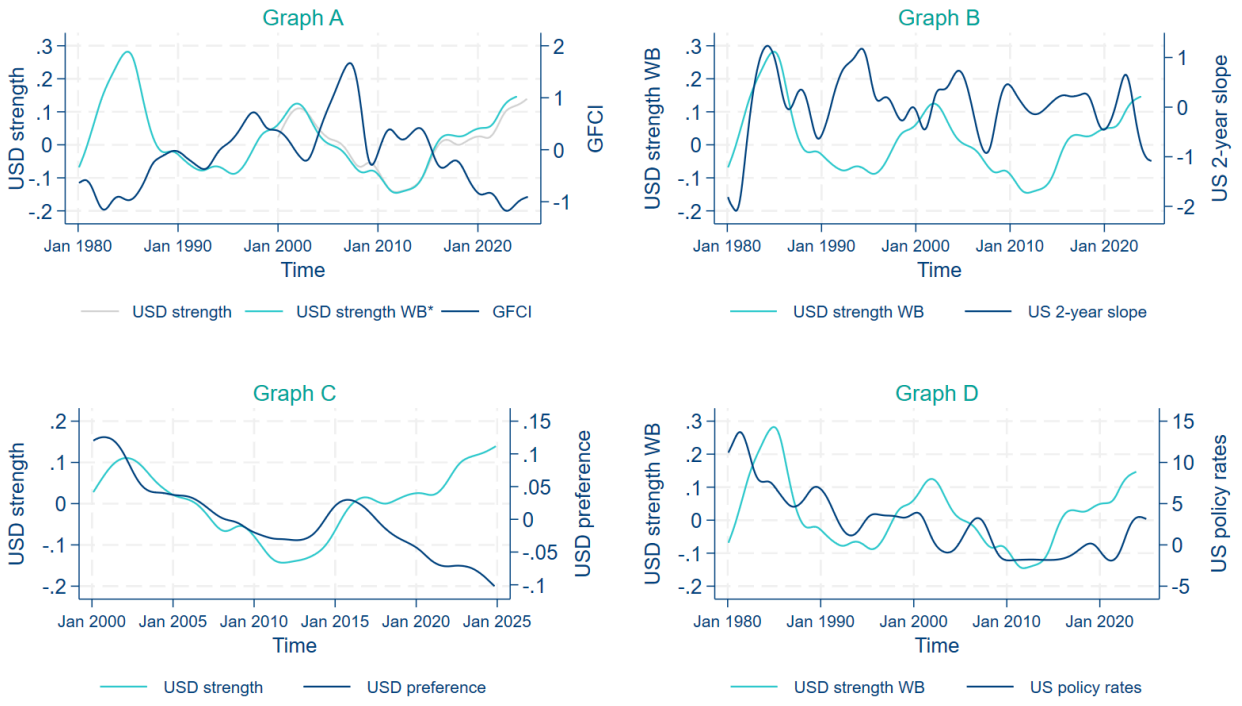
[4] Measured as the spread/slope with respect to short-term policy rates - and thus can be interpreted as a real variable under the assumption of inflation hysteresis (no change in the expected inflation curve in the short-medium term).
[5] Since GFCI data extends only until 2019, we extend it using BBVA's Financial Tension Indicator, which closely(negatively) correlates with it.

- **Within the Liquidity Market** (reflected in the balance of payments account): Two significant drivers linked to this market are policy rates (cost of liquidity) and the status of the U.S. dollar as reserve currency, as reflected in COFER[6] data from the IMF. An extensive body of literature has explored the "exorbitant privilege" of the U.S. dollar as the global reserve currency. Metrics associated with the convenience yield of dollar-denominated assets provide valuable insights into the unique dynamics of the U.S. dollar (e.g., Jiang, Krishnamurthy and Lustig, 2022) that need to be monitored. Unfortunately, these metrics rely on financial instruments of relatively recent origin, limiting their applicability for analyzing the long-term period under study.

We opted for not selecting any support variables from the goods and services market, as they all showed strong evidence of inverse causality associated with the fact that the USD is the currency used to set prices across many internationally traded goods, inverse causality that has proven hard to instrumentalize. But we feel comfortable disregarding such a market due to the USD's most important role as the hegemonic currency in global capital and liquidity markets and under Walras' Law, by which one can leave out one of the aforementioned three markets in the pursuit of identifying structural equilibrium.

Figure 3 shows the evolution of each of the four aforementioned selected variables vis-à-vis the strength of the USD. For three of the four corresponding charts, it is possible to extend the series back to 1980.[7] In particular, chart A illustrates the "USD cycle" and its correlation with the GFCI

Figure 3. **USD STRENGTH AND ITS EXPLANATORY FACTORS**



*USD strength WB is based on data on exchange rates and country weights from the World Bank and does not exclude the Euro Area.
Source: Agrippino and Rey (2019), and BBVA Research based on World Bank, BIS, FRED, Federal Reserve Bank of New York, and COFER (IMF).

[6] We use the proportion of USD denominated reserves relative to the total international reserves held by the 149 reporting central banks in the COFER dataset.
[7] Due to limitations in Europe-specific trade data before 1995, the US strength index cannot be fully constructed before that date and is extended using the overall real effective exchange rate of the USD. This extension is reasonable, given the eurozone's weight among US trading partners is less than 20%, and as shown in Graph A, there is a strong correlation of 0.98 between the REER and the strength of the US dollar since 2000.

The first column of Table 1 presents our final estimates from regressing the real strength of the USD on the four selected variables over the period from January 2000 to December 2024. Figure 4 illustrates the associated decomposition over this period. In that figure, all four regressors are demeaned, meaning the resulting sum represents the strength of the USD relative to its historical average. We can interpret the graph as decomposing exchange rate variations around a benchmark equilibrium (the historical average), which can be justified under the assumption that all regressors exhibit cyclicality with no long-term trend.

Table 1. **REGRESSION ANALYSIS OF USD STRENGTH**

	US dollar strength in different periods					
	(1) 2000-2025	(2) 2000-2008	(3) 2000-2008 only USD preference & GFCycle	(4) 2008-2025	(5) 2000-2025 without USD preference	(6) 1980-2025 without USD preference*
US rates	0.830***	-0.935***		0.502***	0.937***	0.205***
USD preference	0.234***	1.393***	0.328***	0.444***		
2-year spread	0.314***	-0.0792		0.0361	0.433***	0.199***
GFCycle	-0.715***	0.501***	-0.494***	-1.249***	-0.603***	-0.582***
_cons	-3.90e-08	-0.731***	0.512***	-0.355***	9.29e-09	-0.214***
N	300	104	104	196	300	528
adj. R^2	0.799	0.875	0.790	0.961	0.769	0.435

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

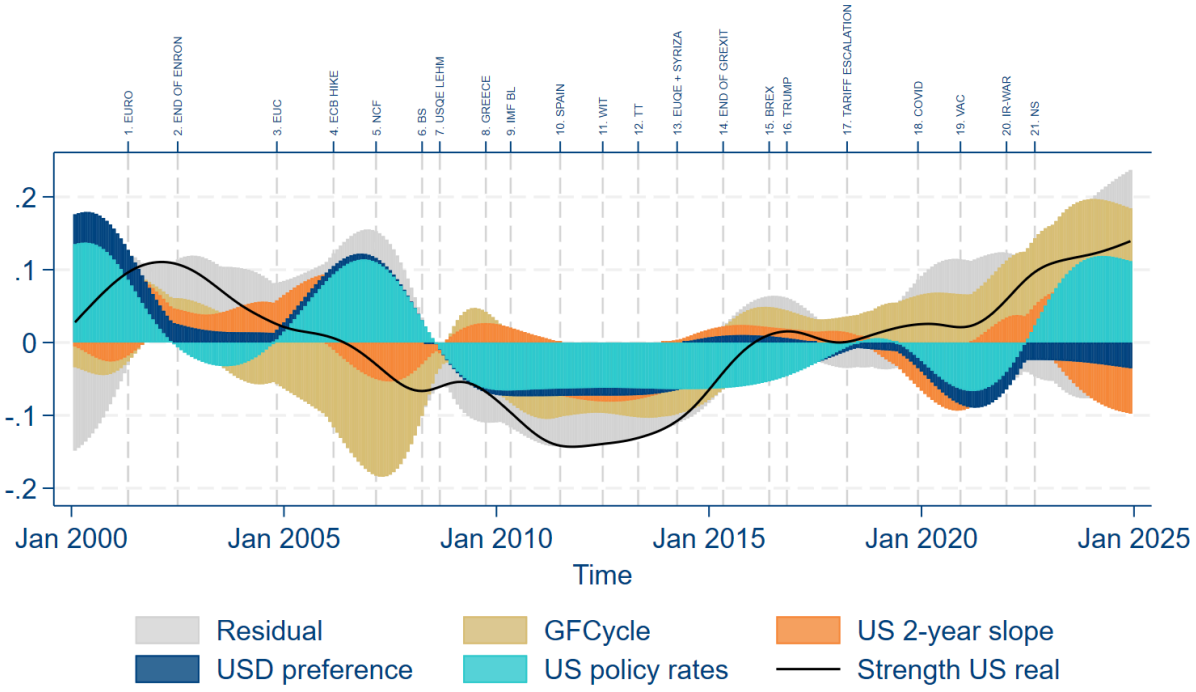
Source: Agrippino and Rey (2019), and BBVA Research based on World Bank, BIS, FRED, Federal Reserve Bank of New York, and COFER (IMF).

It is evident from Figure 4 that its previously identified cyclicality is closely tied to that of the Global Financial Conditions Index (GFCI), which proves both statistically and economically significant. By the end of the sample (December 2024), the (depressed) Global Financial Conditions Index (GFCI) accounted for approximately 9 of the 14 percentage points (pp) of overappreciation of the dollar with respect to this benchmark equilibrium. While the Fed's tight monetary policy explained up to 13pp of the dollar's overappreciation. On the flip side, ongoing low two-year interest rates were contributing to a 8 pp underappreciation of the USD, while the lower-than-historical preference for the USD as a reserve currency among central banks was driving an additional 3 pp underappreciation. A residual of 3 pp overappreciation completes the decomposition of the total 14% overappreciation of the USD, as defined in earlier analyses.

When splitting the sample into the periods before and after the Global Financial Crisis (GFC), a clear "structural change" emerges regarding the impacts of policy rates and the return to capital. Before the GFC, reverse causation characterized these dynamics: monetary policy and capital returns responded to an increasingly strong dollar, bolstered by external forces. Chief among these were the rising global demand for liquidity and safe assets, fueled by China's export-led growth strategy, which created persistent upward pressure on the dollar. Simultaneously, the global supply of eurodollars undermined the Federal Reserve's monetary policy, diluting its influence over domestic financial conditions. This period reflected a more interconnected global economy and what Alan Greenspan famously referred to as the "conundrum." In contrast, following the GFC, U.S. monetary policy took a more proactive role, becoming the primary driver of financial markets. Meanwhile, the two other variables—the global

financial cycle and the USD's role as the preferred international reserve currency—remained consistent and robust determinants of exchange rate movements throughout the entire quarter-century.

Figure 4. **USD STRENGTH DECOMPOSITION**



Source: Agrippino and Rey (2019), and BBVA Research based on World Bank, BIS, FRED, Federal Reserve Bank of New York, and COFER (IMF).

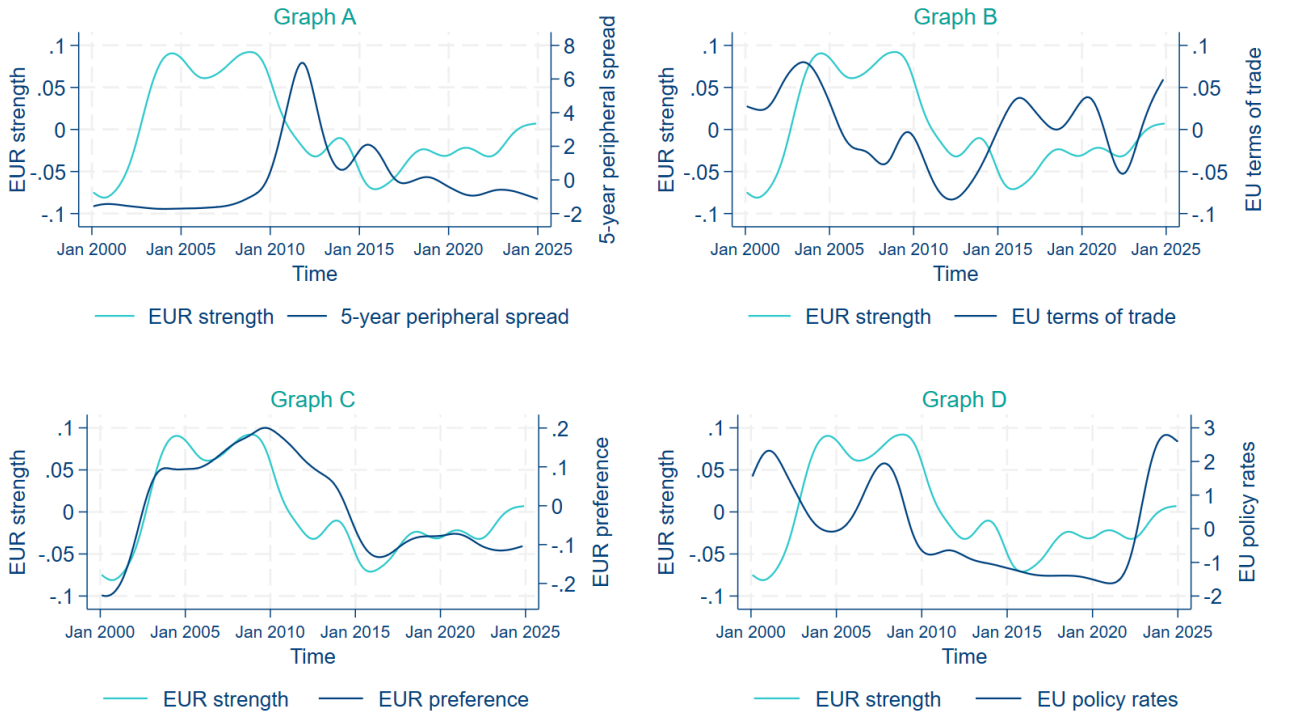
Determinants of the euro strength

Analogously, when analyzing the factors supporting the strength of the euro, we identified the following four variables as key determinants:

- **Within the goods and services market:** Terms of trade emerge as the significant reference variable.
- **Within the securities market:** Two-year rates and the peripheral spread are the primary contributors.
- **Within the liquidity market:** The ECB policy rate and the preference for the euro as a reserve currency.

Figure 5 illustrates the evolution of each of these four factors relative to the strength of the euro, while the first column of Table 2 presents the final regression results.

Figure 5. **EUR STRENGTH AND ITS SUPPORT FACTORS**



Source: European Central Bank and BBVA Research based on data from Bank for International Settlements, Deutsche Bundesbank, Banco de España, Banca d'Italia, Bank of Greece, Eurostat, US Bureau of Labor Statistics, COFER (IMF).

Looking at the associated decomposition in Figure 6, the most economically significant regressor for the euro is its status as a reserve currency—a role that expanded significantly in the first decade of the 21st century, declined during the European debt crisis, and has since stabilized. Additionally, the risk of a euro breakup during the debt crisis further contributed to its fluctuations, as reflected in the sizable impact of peripheral spreads during that period. Interestingly, despite their high statistical significance, both policy rates and terms of trade have had a relatively low economic impact on the euro's structural strength[8]. By the end of the sample (December 2024), the euro's weaker-than-average status as a reserve currency contributed to a 5 percentage point (pp) depreciation relative to the benchmark, while other regressors remained close to their historical averages. However, this effect was partially offset by unexplained factors in the residual, resulting in a net depreciation of 1pp relative to the benchmark.

[8] In particular, the low economic impact of terms of trade is likely due to the fact that, in this structural analysis, all variables are smoothed and terms-of-trade shocks in recent years have been relatively short-lived.

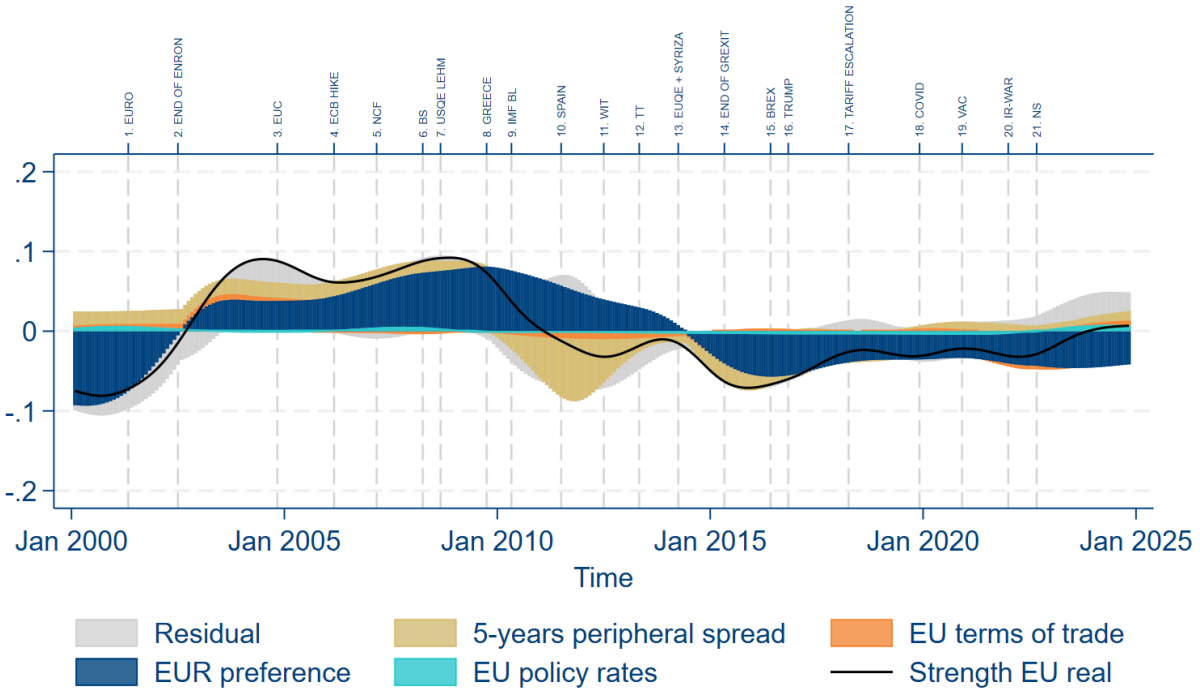
Table 2. **REGRESSION ANALYSIS OF EUR STRENGTH**

	Euro strength in different periods				
	(1) 2002-2025	(2) 2002-2008	(3) 2002-2008 only EU rates & EUR preference	(4) 2002-2008 only EUR preference	(5) 2008-2025
EU rates	0.157***	-0.567***	-0.510***		0.252***
EUR preference	0.858***	1.308***	1.335***	1.259***	0.811***
EU terms of trade	0.0680**	-0.00592			0.0857***
5-year peripheral spread	-0.421***	0.604			-0.386***
_cons	0.0500**	0.948*	0.416***	0.169*	0.0905***
N	275	80	80	80	195
adj. R^2	0.922	0.946	0.946	0.788	0.959

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Source: European Central Bank and BBVA Research based on data from Bank for International Settlements, Deutsche Bundesbank, Banco de España, Banca d'Italia, Bank of Greece, Eurostat, US Bureau of Labor Statistics, COFER (IMF).

Figure 6. **EUR STRENGTH DECOMPOSITION**



Source: European Central Bank and BBVA Research based on data from Bank for International Settlements, Deutsche Bundesbank, Banco de España, Banca d'Italia, Bank of Greece, Eurostat, US Bureau of Labor Statistics, COFER (IMF).

Table 2 also highlights the limited robustness of the results when partitioning the sample into two periods: before and after the Global Financial Crisis (GFC). Before the crisis, the euro's strength was primarily driven by its rising potential as a reserve currency, together with a (hawkish) monetary policy. But after the crisis, two additional factors have also significantly contributed to explain the since-then falling strength of the euro: peripheral spreads (as a proxy of the risk of euro breakup during the European debt crisis) and, more recently, terms of trade (yet with quite low economic significance as appreciated in Figure 6).

Following the approach outlined above, Table 3 decomposes the misalignments at the endpoint of the series (December 2024 when the euro was at 1.06 dollars, 3pp below its smoothed trend). Specifically, it estimates the contribution of all factors within each of the three major external markets under the benchmark assumption that all follow cyclical patterns. This framework allows us to quantify the influence of each external market—goods and services, securities, and liquidity—on the observed deviations from the benchmark equilibrium equal to the historical averages of 1.20 USD per euro.

Table 3. **DOLLAR AND EURO MISALIGNMENTS DISAGGREGATED BY KEY COMPONENTS**
(STRENGTH (+) WEAKNESS (-) RELATIVE TO BENCHMARK EQUILIBRIA* FOR EACH CURRENCY, IN PP DEC 2024)

MARKET	Factors	US dollar (strength/weakness) %	Euro (strength/weakness) %	USD over-appreciation %
Total Misalignment		14	1	13
Balance of payments components	Policy rates	11	1	10
	Reserve status	-3	-4	1
	Peripheral spread		1	-1
Current account components	Terms of trade		1	-1
Capital account components	Global Financial Cycle	7		7
	2yrs spread	-6		-6
Residual		5	2	3

*Benchmark level is defined as the historical average of each component since the start of the century, based on the assumption that each follows a cyclical pattern.

Estimates of equilibrium exchange rate: three major scenarios

When assessing possible future scenarios for the strength of the dollar, the euro, and their exchange rate, we explore different settings based on the potential behavior of the selected regressor. More specifically, these scenarios consider whether such variables are actually cyclical and should revert to their respective historical averages.

In **Scenario 1**, we assume that the reserve currency status of both the U.S. dollar and the euro follows structural rather than cyclical trends (Figure 7), meaning that neither currency is expected to revert to its historical average over time. Under this assumption, the three percentage points (pp) of USD underappreciation identified in Table 3 would persist, bringing the total overappreciation of the USD from 14pp to 17pp by December 2024. And for the euro, applying the same logic, we treat the four pp of underappreciation linked to its declining role as a reserve currency as a permanent shift rather than a cyclical fluctuation. This adjustment raises the euro's net overappreciation from 1pp to 5pp by December 2024.

Table 4 presents these revised misalignments for both currencies under this scenario. While both the euro and the dollar would be more overappreciated than in the benchmark scenario, the misalignment gap between them barely narrows from 13pp to 12pp. As a result, **the estimated equilibrium exchange rate remains in the ballpark of 1.20 USD per euro.**

Table 4. **MISALLIGMENTS RELATIVE TO THREE KEY SCENARIOS FOR THE EQUILIBRIUM LEVEL OF THE EURUSD**

	US dollar (strength/weakness) %	Euro (strength/weakness) %	EURUSD misalligment in Dec24 (at 1.06) + overvalue / - undervalue %	Implied Equilibrium USD/EUR**
Benchmark scenario: All factors underpinning the exchange rate are taken as cyclical - implying an estimated equilibrium equal to the average exchange rate over the sample period.	14	1	13	1.20
Scenario 1: The reserve status and global importance of the U.S. dollar and the euro are anchored in structural factors that exhibit no discernible trend of change moving forward.	17	5	12	1.19
Scenario 2: Building on the assumptions of Scenario 1, while also assuming a prolonged stagnation of the global financial cycle, with no foreseeable signs of recovery.	10	5	5	1.11
Scenario 3: Building on the assumptions of Scenario 2, while also accounting for the permanent impact of ongoing tariff escalations.*	6	6	0	1.06

*Assuming a permanent impact on EUR/USD similar to the 4% unexplained appreciation observed during the U.S.-China tariff escalation in Trump's first administration.
**The USD/EUR exchange rate was 1.06 at the end of 2024. A reference value that persists when discounting small deviations of exchange rate relative to its trend and the expectedly transitory effects driven by currencies of trading partners.
Source: BBVA Research.

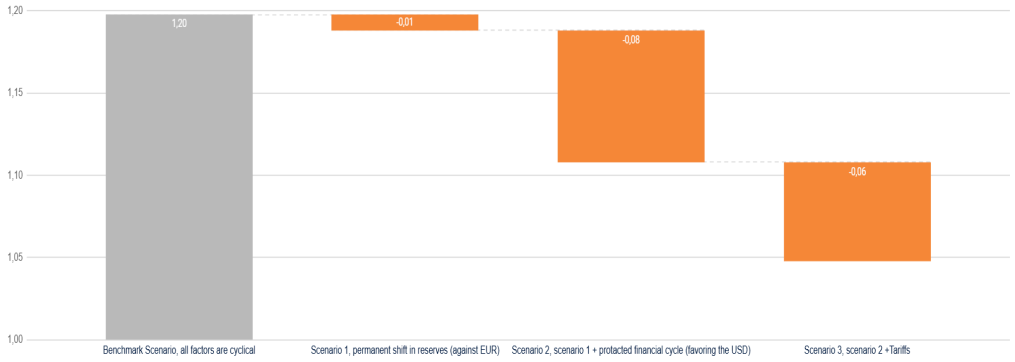
Scenario 2 builds on the assumptions of Scenario 1, with the additional premise that the Global Financial Conditions Index (GFCI) will remain at its current low levels rather than reverting to historical norms. This scenario reflects persistent geopolitical tensions and heightened global uncertainty, leading to a prolonged period of weak global financial conditions.

Under these assumptions, the higher equilibrium value of the USD suggests that, as of December 2024, the dollar's actual overvaluation would be reduced from 17pp to 10pp, as tighter financial conditions continue to support demand for safe-haven assets. For the euro, a prolonged trough in the GFCI would not significantly affect its valuation, meaning its overappreciation would remain at 5pp, unchanged from Scenario 1. As a result, the misalignment gap between the dollar and the euro would narrow to just 5pp, **implying an equilibrium exchange rate in the ballpark of 1.10 USD per euro.**

Scenario 3 builds on the assumptions of Scenario 2, adding the potential impact of Trump's tariffs, under the assumption that they will have a similar effect to those observed during his first administration (see Annex B). In this scenario, the USD receives a structural boost of 4pp, reflecting the direct impact of trade tensions, in addition to any effects transmitted through other factors considered in the analysis.. As a result, by December 2024, the dollar's overvaluation would be further reduced from 10pp in Scenario 2 to just 6pp.

For the euro, trade disruptions stemming from tariff escalations would exert a slight appreciation force, increasing its overappreciation from 5pp in Scenario 2 to 6pp by December 2024. As a consequence, the misalignment gap between the dollar and the euro falls to zero, **leading to a lower implied equilibrium exchange rate in the ballpark of 1.05 USD per euro.**

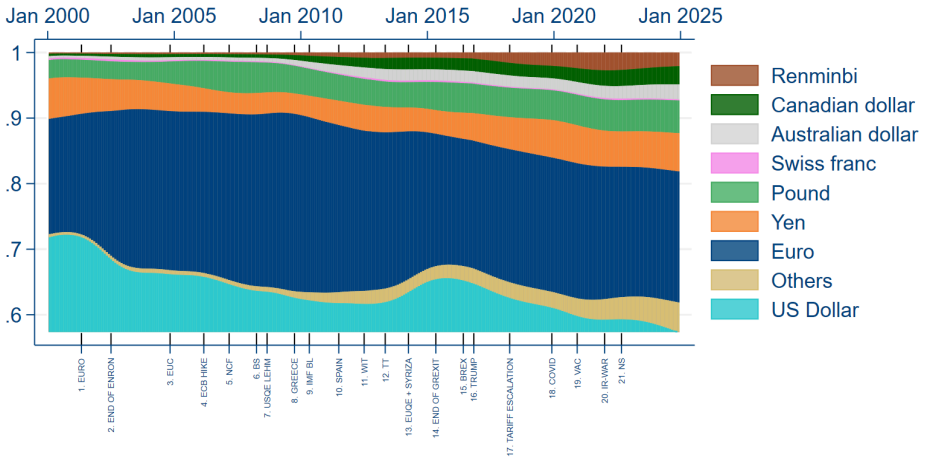
Figure 6. **KEY SCENARIOS FOR THE EQUILIBRIUM LEVEL OF THE EURUSD**
UNDER DIFFERENT ASSUMPTIONS ABOUT THE NATURE OF THE CURRENT MISALIGNMENTS



Source: BBVA Research.

Combining the strengths of both currencies for each scenario yields the values for equilibrium exchange rate in the last column of Table 3, where the euro-dollar of equilibrium covers a range between 1.05 and 1.20 depending on the scenario selected. We assume that there is no structural dynamic justifying a reversion in central banks' preference for more dollars (look at trends in figure 8). Additionally, assuming that Trump's tariffs may have a long but not permanent impact, our focus is on scenarios 1 and 2, with equilibrium exchange rates of 1.20 and 1.10, respectively - the choice between them hinging on whether the financial cycle will revert to its historical average or whether ongoing financial uncertainty and disruptions to international flow infrastructure will persist.

Figure 7. **RESERVE PREFERENCES**
(FRACTION OF INTERNATIONAL RESERVES DENOMINATED IN EACH OF THE MAJOR CURRENCIES)



Source: BBVA Research based on data from COFER (IMF)

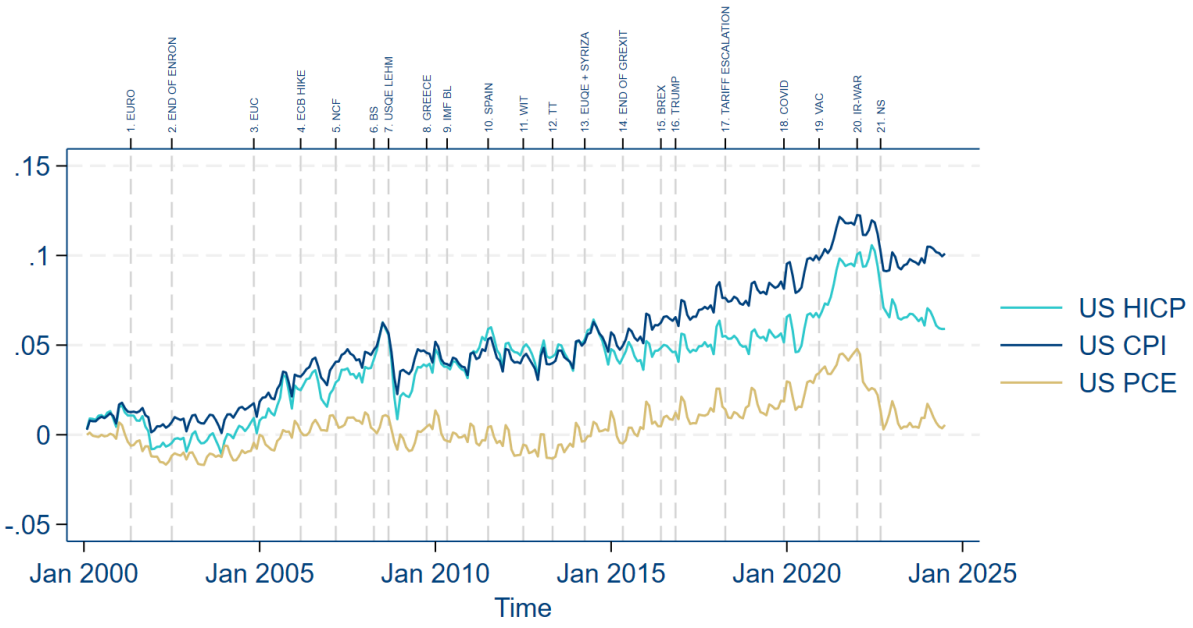
Real vs Nominal equilibrium exchange rate

Real exchange rates serve to adjust nominal exchange rates for inflationary differences between two monetary areas, ensuring a more accurate comparison of their relative purchasing power. Inflation measurement methodologies, however, can vary significantly between countries, which may lead to discrepancies in these calculations. In the case of the United States, the Federal Reserve has addressed this issue by creating a harmonized inflation metric (HICP) that aligns with the methodology used in the Eurozone. This metric ensures consistency and comparability when analyzing inflation-adjusted data for these two monetary areas and should be the one selected for real exchange rate corrections (Figure 8).

Using this harmonized approach, it becomes evident that despite both the Eurozone and the United States sharing an inflation target of 2%, a persistent inflation gap exists. On average, U.S. inflation has exceeded Eurozone inflation by approximately 0.3% per year throughout the 21st century. While seemingly small, this difference accumulates over time, implying that if this gap persists, the euro would nominally appreciate above the selected real equilibrium level by 1% every three years.

Our forecast projects that this inflation gap will widen to 0.5% in the foreseeable future, suggesting a slightly steeper nominal appreciation trend. Under this assumption, the nominal euro-dollar exchange rate in 10 years would reach approximately 1.25 in Scenario 1, 1.15 in Scenario 2, and 1.10 in Scenario 3.

Figure 9. **INFLATIONARY GAPS OF US WITH RESPECT TO EU**
(US INFLATION INDICES VS EU HCPI, GAP IN LOGS)



Source: Eurostat, Bureau of Labor Statistics, Bank for International Settlements, Bureau of Economic Analysis.

Conclusions

The analysis highlights that financial markets—capital and liquidity—are pivotal and sufficient for understanding the U.S. dollar, whereas the euro's dynamics are shaped by all three external markets, including goods and services. More importantly, it identifies potential structural shifts, such as the diminishing role of the euro as a reserve currency and the prolonged weakness in the global financial cycle, as key constraints on the reversion of today's overly strong U.S. dollar relative to the euro.

Assuming no reversion in central banks' current preferences for reserve currencies, the primary determinant of the real equilibrium euro-dollar exchange rate depends on whether the current global financial malaise persists. This distinction leads to two main scenarios: an equilibrium exchange rate of approximately 1.20 USD per euro if global financial conditions recover, or around 1.10 USD per euro if weak financial conditions persist. Furthermore, in a scenario where subdued financial conditions persist alongside escalating tariffs, the equilibrium exchange rate would decline further to 1.05 USD per euro, reflecting the combined impact of weaker capital flows and trade disruptions.

Regardless of the scenario and the corresponding equilibrium exchange rate, the euro is expected to nominally appreciate above its real equilibrium level by 1% every two years due to a projected widening of the inflationary gap between the two economies.

This framework complements previous BBVA Research analyses, which highlighted EU and U.S. productivity differentials as pivotal influences on the euro-dollar exchange rate and pointed to a nominal equilibrium exchange rate of 1.20 dollars per euro.[9]

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Annex A

Table A1. **TRADE WEIGHTS OF MAIN US AND EURO AREA TRADING PARTNERS BETWEEN 2000 AND 2025**

	Weights on US trade	
	Jan 2000	Jan 2025
China	7.80%	23.00%
Euro Area	17.90%	17.50%
Mexico	12.90%	13.60%
Canada	17.61%	11.10%
Japan	13.80%	6.90%
South Korea	3.80%	3.70%
United Kingdom	4.60%	3.50%
Taiwan	2.30%	2.30%
India	2.30%	2.30%
Malaysia	2.00%	1.50%
Rest of the world	14.99%	14.60%

	Weights on Euro Area trade	
	Jan 2000	Jan 2025
EU non-euro	15.63%	20.54%
China	5.80%	19.00%
United States	20.00%	14.20%
United Kingdom	17.40%	9.20%
Japan	8.80%	2.40%
Switzerland	6.20%	5.30%
Türkiye	2.10%	3.00%
South Korea	2.40%	2.70%
Russia	1.69%	2.32%
India	1.18%	2.22%
Rest of the world	18.80%	19.12%

Source: BBVA Research based on data from the Bank for International Settlements (BIS).

Table A2. **EVENTS IDENTIFIED AS POTENTIAL INFLECTION POINTS IN EURO-USD DYNAMICS**

Timeline	Event	Description
May-2001	1. Euro strong start	The Euro gains acceptance as a global reserve currency due to orthodox stance of the ECB and the promise of a growing European Union.
July-2002	2. Enron resolution	The Sarbanes-Oxley Act reforms US corporate governance and introduces stricter auditing regulations to prevent Enron-type scandals.
November- 2004	3. EU Constitution	The EU sought to ratify a constitution to simplify decision-making processes within the bloc, encountering strong opposition.
March- 2006	4. ECB hikes	The European Central Bank (ECB) raised interest rates for the first time in two years to combat inflationary pressures fueled by rising oil prices
March-2007	5. New Century Financial	New Century Financial, a major subprime mortgage lender, filed for bankruptcy, kickstarting the US subprime housing crisis.
April-2008	6. Bear Stearns	Bear Stearns is allowed to collapse.
September-2008	7. Collapse of Lehman Brothers & US QE	Start of global financial crisis and US QE.
October-2009	8. Greek crisis	Greece's financial troubles came to light.
May-2010	9. IMF bail-out	The International Monetary Fund (IMF) intervened with a bailout package for Greece to prevent its default and stabilize the Eurozone.
July- 2011	10. Spain crisis	Spain faced a financial crisis leading to fears of contagion within the Eurozone.
July- 2012	11. Whatever It Takes	ECB President Mario Draghi declared "Whatever It Takes" to preserve the Euro.
May-2013	12. Taper Tantrum	The Federal Reserve announces plans to reduce its bond purchases, leading to a sharp spike in rates across financial markets.
April-2014	13. EU QE and Syriza	The European Central Bank (ECB) initiates quantitative easing while Greece's Syriza party campaigns on anti-austerity measures.
May-2015	14. End of Grexit	Greece reaches final agreement with its creditors preventing its exit from the Eurozone.
June-2016	15. Brexit	The United Kingdom votes to leave the European Union.
November-2016	16. Trump wins US elections	Donald Trump wins the U.S. presidential election.
April-2018	17. Tariff escalation	Trade tensions escalate between the U.S. and China.
December-2019	18. COVID-19 outbreak	The World Health Organization reports an outbreak of COVID-19 in Wuhan, China.
December-2020	19. Vaccine	Vaccines for COVID-19 are released globally.
January-2022	20. Interest rates hike & Ukraine War	The Fed signals raising interest rates amid rising inflation concerns and geopolitical tensions following Russia's invasion of Ukraine.
September-2022	21. Nord Stream	The Nord-Stream pipeline system is bombed.

Source: BBVA Research.

Table A3. **REGRESSION ANALYSIS OF USD STRENGTH, DIFFERENT COMBINATIONS BETWEEN 2000 AND 2008**

Different combinations for USD strength 2000-2008						
	(1)	(2)	(3)	(4)	(5)	(6)
	2000-2008	2000-2008	2000-2008	2000-2008	2000-2008	2000-2008
US rates	-0.459***	0.323**	0.136**			
USD preference	0.844***			0.634***	0.326***	
2-year spread		0.518***		0.283***		0.0481
GFCycle			-0.754***		-0.501***	-0.643***
_cons	-0.0169	0.253**	0.988***	-0.146**	0.558***	1.007***
N	104	104	104	104	104	104
adj. R^2	0.861	0.390	0.737	0.802	0.790	0.720

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Agrippino and Rey (2019), and BBVA Research based on World Bank, BIS, FRED, Federal Reserve Bank of New York, and COFER (IMF).

Table A4. **REGRESSION ANALYSIS OF USD STRENGTH, DIFFERENT COMBINATIONS BETWEEN 2008 AND 2025**

Different combinations for USD strength 2008-2025						
	(1)	(2)	(3)	(4)	(5)	(6)
	2008-2025	2008-2025	2008-2025	2008-2025	2008-2025	2008-2025
US rates	0.927***	1.226***	0.360***			
USD preference	-0.145			-0.837***	0.270***	
2-year spread		0.344***		-0.0927		-0.0915**
GFCycle			-1.092***		-1.509***	-1.333***
_cons	0.0604	0.246***	-0.578***	-0.683***	-0.766***	-0.825***
N	195	196	196	195	195	196
adj. R^2	0.602	0.652	0.924	0.280	0.894	0.884

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Agrippino and Rey (2019), and BBVA Research based on World Bank, BIS, FRED, Federal Reserve Bank of New York, and COFER (IMF).

Table A5. **REGRESSION ANALYSIS OF EUR STRENGTH, DIFFERENT COMBINATIONS BETWEEN 2002 AND 2008**

Different combinations for Euro strength 2000-2008						
	(1) 2002-2008	(2) 2002-2008	(3) 2002-2008	(4) 2002-2008	(5) 2002-2008	(6) 2002-2008
EU rates	-0.491***	-0.947***	-0.883***			
EUR preference	1.325***			1.538***	1.393***	
EU terms of trade		-0.544***		0.215***		-0.367***
5-year peripheral spread			6.514***		-3.385***	-3.521*
_cons	0.455***	2.192***	6.471***	-0.205*	-2.400***	-1.161
N	80	80	80	80	80	80
adj. R^2	0.946	0.496	0.194	0.852	0.869	0.170

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: European Central Bank and BBVA Research based on data from Bank for International Settlements, Deutsche Bundesbank, Banco de España, Banca d'Italia, Bank of Greece, Eurostat, US Bureau of Labor Statistics, COFER (IMF).

Table A6. **REGRESSION ANALYSIS OF EUR STRENGTH, DIFFERENT COMBINATIONS BETWEEN 2008 AND 2025**

Different combinations for Euro strength 2008-2025						
	(1) 2008-2025	(2) 2008-2025	(3) 2008-2025	(4) 2008-2025	(5) 2008-2025	(6) 2008-2025
EU rates	0.351***	0.364***	0.331***			
EUR preference	0.550***			0.753***	0.810***	
EU terms of trade		-0.157**		0.339***		-0.338***
5-year peripheral spread			-0.0517		-0.479***	-0.304***
_cons	-0.0766*	-0.175***	-0.128*	-0.117**	-0.00212	-0.257***
N	195	195	196	195	195	195
adj. R^2	0.696	0.221	0.186	0.624	0.860	0.132

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: European Central Bank and BBVA Research based on data from Bank for International Settlements, Deutsche Bundesbank, Banco de España, Banca d'Italia, Bank of Greece, Eurostat, US Bureau of Labor Statistics, COFER (IMF)

ANNEX B: Trump Tariffs

An important consideration involves the potential impact of tariffs, particularly those being introduced by the Trump administration. While it is challenging to precisely quantify the effect of tariffs on the equilibrium exchange rate, an analysis of the period from early 2018 to early 2020 offers insights. This phase, marked by escalating tariffs between the U.S. and China, culminated in a trade deal in January 2020.

Figure 10. **DECOMPOSITION OF CHANGES IN DOLLAR STRENGTH DURING SELECTED PERIODS** (BASIS POINTS; STARTING TIME IDENTIFIED IN THE FIRST TWO COLUMNS AND ENDING TIME WHEN NEXT PERIOD STARTS

	Time	Real US strength	US policy rates	Dollar preference	US 2-year spread	Global financial cycle	Residual	USD/EUR
START	**2000m1**	705	-384	18	-196	201	1066	0.97
EURO	**2001m5**	156	-965	-163	428	251	605	0.90
END OF ENRON	**2002m7**	-814	18	-146	224	-703	-207	0.99
EUC	**2004m11**	-197	901	-18	-495	-513	-71	1.28
ECB HIKE	**2006m3**	-336	233	-57	-445	-301	234	1.28
NCF	**2007m3**	-403	-737	-66	148	536	-284	1.38
BS	**2008m4**	38	-409	-10	259	511	-314	1.48
USQE-LEHM	**2008m9**	-19	-601	-50	377	513	-258	1.46
GREECE	**2009m10**	-272	-44	-25	-49	-250	96	1.41
IMF BL	**2010m5**	-490	25	-28	-209	-248	-29	1.39
SPAIN	**2011m7**	7	11	-6	-103	146	-41	1.39
WIT	**2012m7**	76	-5	11	18	-83	135	1.35
TT	**2013m5**	214	-12	79	94	-99	153	1.36
EUQE + SYRIZA	**2014m4**	637	10	123	101	291	112	1.34
END OF GREXIT	**2015m5**	556	85	2	2	337	131	1.18
BREX	**2016m6**	65	68	-25	-1	-12	35	1.12
TRUMP	**2016m11**	-147	394	-129	24	-62	-374	1.13
TARIFF ESCALATION	**2018m4**	241	-84	-92	-430	448	399	1.19
COVID	**2019m12**	-32	-453	-76	157	35	305	1.16
VAC	**2020m12**	326	163	-41	449	97	-342	1.19
IR-WAR	**2022m1**	393	604	4	-7	157	-365	1.14
NS	**2022m9**	336	1049	-72	-919	-156	434	1.09
END	**2024m12**							1.06
MEDIAN		51	11	-27	10	66	65	
MEAN		47	-6	-35	-26	50	64	

Color label: blue for dollar weakness (contributing to euro strength) and red for dollar strength (contributing to euro weakness)
Source: BBVA Research

Figure 11. **DECOMPOSITION OF CHANGES IN EURO STRENGTH DURING SELECTED PERIODS** (BASIS POINTS; STARTING TIME IDENTIFIED IN THE FIRST TWO COLUMNS AND ENDING TIME WHEN NEXT PERIOD STARTS

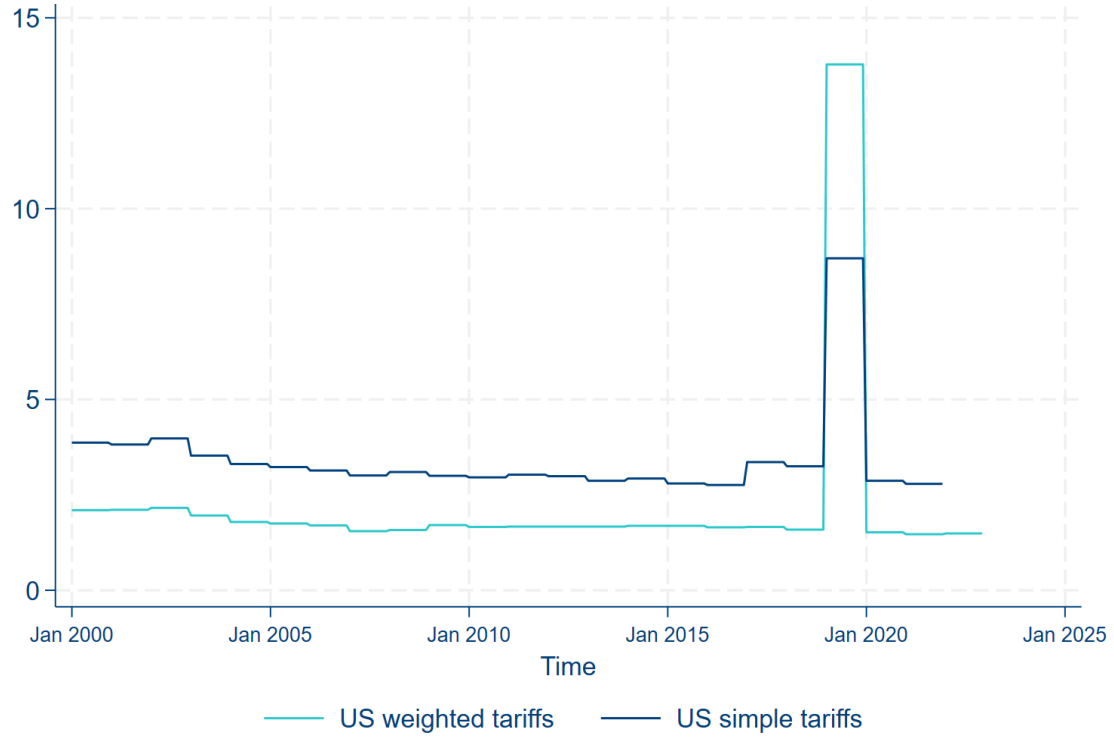
	Time	Real EU strength	EU policy rates	Euro preference	ToT EU	Peripheral spread	Residual	USD/EUR
START	**2000m1**	-9	32	186	3	-18	-230	0.97
EURO	**2001m5**	533	-34	670	40	16	-143	0.90
END OF ENRON	**2002m7**	1101	-47	482	-10	13	675	0.99
EUC	**2004m11**	-273	20	35	-40	-4	-287	1.28
ECB HIKE	**2006m3**	52	37	123	-7	-7	-101	1.28
NCF	**2007m3**	197	9	137	-14	-27	64	1.38
BS	**2008m4**	45	-15	36	2	-21	22	1.48
USQE-LEHM	**2008m9**	-141	-61	99	16	-97	-196	1.46
GREECE	**2009m10**	-346	-12	-39	-12	-176	-284	1.41
IMF BL	**2010m5**	-523	3	-183	-38	-552	-306	1.39
SPAIN	**2011m7**	-220	-5	-177	-10	120	-29	1.39
WIT	**2012m7**	114	-6	-101	7	385	213	1.35
TT	**2013m5**	73	-3	-202	18	116	260	1.36
EUQE + SYRIZA	**2014m4**	-472	-5	-445	32	-167	-54	1.34
END OF GREXIT	**2015m5**	-76	-5	-188	20	138	97	1.18
BREX	**2016m6**	63	-1	10	-3	100	57	1.12
TRUMP	**2016m11**	345	-1	162	-20	30	202	1.13
TARIFF ESCALATION	**2018m4**	-43	-3	45	19	74	-103	1.19
COVID	**2019m12**	94	-4	24	-2	61	76	1.16
VAC	**2020m12**	-85	12	-70	-45	-35	18	1.19
IR-WAR	**2022m1**	-3	39	-66	-9	-48	31	1.14
NS	**2022m9**	430	106	-43	64	20	302	1.09
END	**2024m12**							1.06
MEDIAN		21	-3	17	-2	4	20	
MEAN		39	3	22	1	-4	13	

Color label: blue for euro strength and red for euro weakness.

Source: BBVA Research

As detailed in Figure 9 and 10, the dollar trended up by approximately 2% during that period of escalating tariffs, while the euro trended down by 1%. The framework suggests that much of the observed dollar appreciation and euro depreciation during this period cannot be fully explained by structural factors alone, as significant residuals are observed. We attribute those residuals to the tariff escalation, which heightened trade tensions and influenced market perceptions. Taking notice that those effects are likely transitory, as evidenced by the declining importance of tariffs in the post-2020 period. Figure 11 highlights how weighted tariffs on U.S. imports fell significantly, largely due to trade diversion and substitution effects as markets reacted and accommodated to higher tariffs.

Figure 12. **US TARIFFS ON IMPORTS** (% AVERAGE EFFECTIVE TARIFFS)

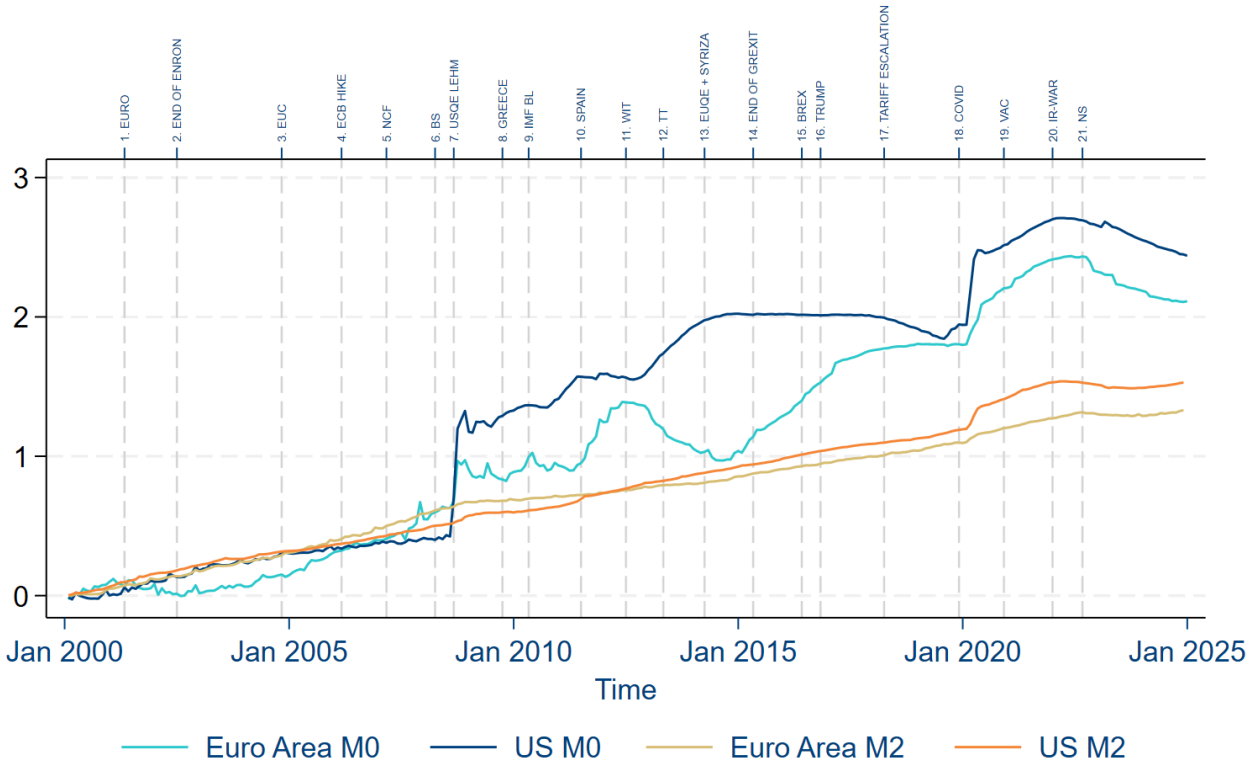


Source: World Development Indicators (World Bank).

ANNEX C: Money Supply

A critical factor is the role of monetary policy, particularly the impact of quantitative easing (QE) in both the U.S. and Eurozone. While QE significantly increased base money (M0), its effect on broader money supply measures (M2) was muted, as shown in Figure 12. This was largely due to the cushioning effect of increased bank reserves and a declining money multiplier. Consequently, the trends in M2 remained largely unchanged.

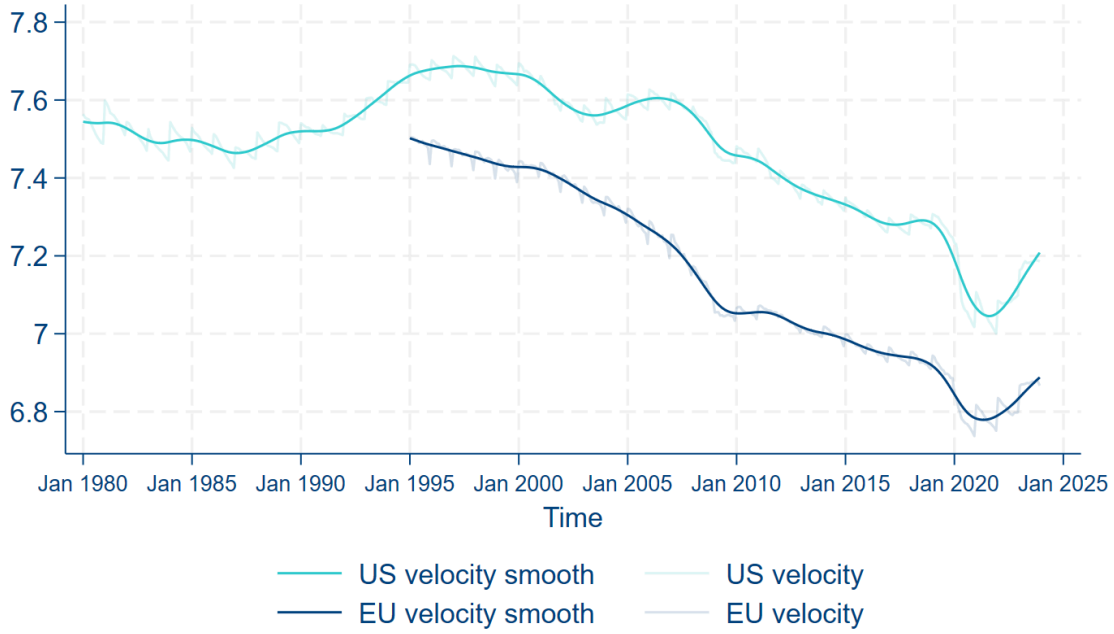
Figure 13. **MONEY SUPPLY** (LOGS, BASE 0 IN JAN 2000)



Source: European Central Bank & Federal Reserve Board

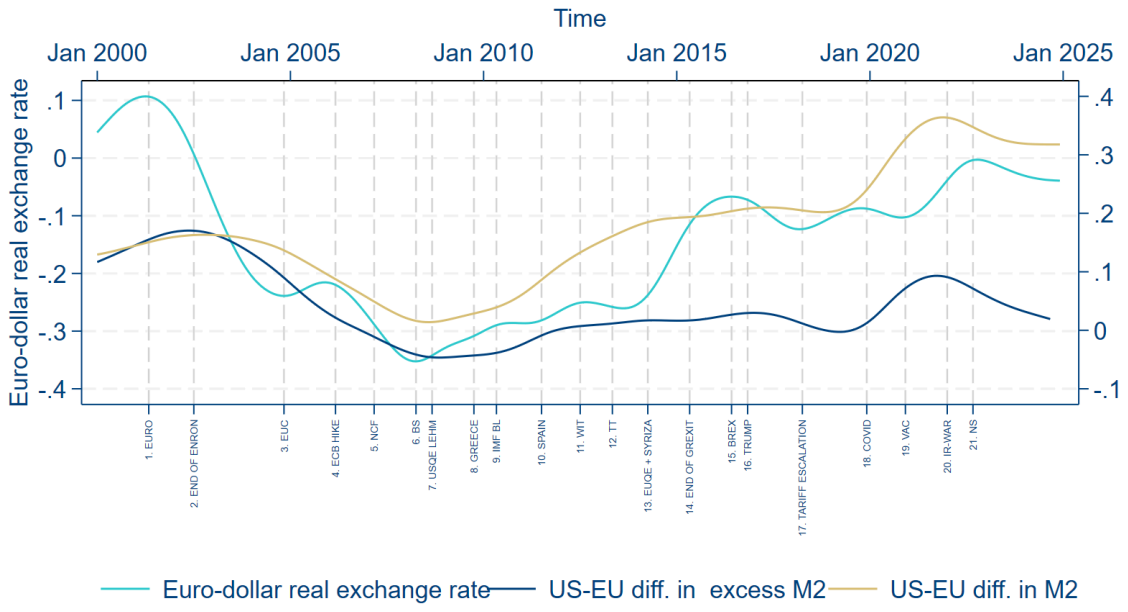
A critical factor in the analysis is the role of monetary policy, particularly the impact of quantitative easing (QE) in both the U.S. and the Eurozone. While QE significantly increased base money (M0), its effect on broader money supply measures (M2) was limited, as shown in Figure 12. This muted impact can largely be attributed to the buffering effect of increased bank reserves and a declining money multiplier. As a result, trends in M2 remained relatively stable. However, the velocity of money—defined as the ratio of nominal GDP to M2—exhibited a notable and sustained decline during this period, as illustrated in Figure 13. This decline represents a structural shift away from the relatively constant velocity observed throughout the 20th century until the mid-1990s. Possible explanations include technological advancements that reduce reliance on cash transactions, the transition to a service-oriented economy with less frequent payments, the rapid expansion of liquidity-hungry financial markets outpacing the goods and services sectors, and other macroeconomic factors.

Figure 14. **MONEY VELOCITY** (LOGS, 1980-2024)



Source: BBVA Research based on ECB and Fed database.

Figure 15. **EXCESS MONEY SUPPLY AND EXCHANGE RATE** (2000-2024)



Source: BBVA Research.

This structural change in velocity carries significant implications for monetary policy. Notably, changes in excess money supply (conveniently defined here as the inverse of the velocity of money) may no longer translate into proportional changes in inflation. Consequently, the policy interest rate has emerged as a more reliable indicator for assessing the opportunity cost of money, which is why it was used as a key metric in this study.

An important contributor to the excess supply of dollars may be the eurodollar market, which played a crucial role in the buildup to the financial crises. Interestingly, Figure 13 reveals that the trend of declining velocity and excess money supply is not exclusive to the U.S. dollar but is also mirrored by the euro. This observation does not diminish the value of further studies on the eurodollar market, which could provide critical insights into global monetary dynamics. Nor does it suggest that money supply is irrelevant to exchange rate movements. On the contrary, while the euro and dollar share similar trends in excess supply, the gap between these supplies (as defined above) explains a significant portion of the euro-dollar exchange rate dynamics. A phenomenon that merits further analysis to better understand its broader implications for exchange rate behavior and global monetary policy.

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