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NEWSLETTER FOR **CENTRAL BANKS**

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Amundi ASSET MANAGEMENT

Building together smart solutions to face a challenging environment

Francesca CICERI
Head of Institutional Clients Coverage

Vlada SAVCENKO
Global Relationship Manager, Sovereign Clients

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Dear Client,

Welcome to **the second edition** of Amundi's Newsletter for Central Banks, a publication specifically designed for you by Amundi experts.

In an environment marked by macroeconomic and geopolitical complexities, our in-house specialists come together to share their views on global policy and investment themes important to Central Banks worldwide.

In this edition, we dive into the rising debt burden in the United States, analyse the complexities of US exceptionalism's impact on the US Dollar, and explore the evolution of climate indices and what this means for central banks' portfolio allocations.

We hope that this edition will match your expectations and, please, share your thoughts with us !

Contact us at sovereign@amundi.com

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Watch the playback of our latest Executive programme on responsible investment.

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CENTRAL BANKING AWARDS 2024

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Mahmood PRADHAN
Head of Global Macro Economics, Amundi Investment Institute

Tristan PERRIER
Macroeconomist and Investment Insights, Amundi Investment Institute

Can the US sustain a rising debt burden?

A Rising Trajectory

US federal government debt is on a rising trajectory. It is estimated that debt held by the public could increase from just under 100 percent of GDP today to more than 170 percent in 30 years[1]. Can this be financed, and at what cost?

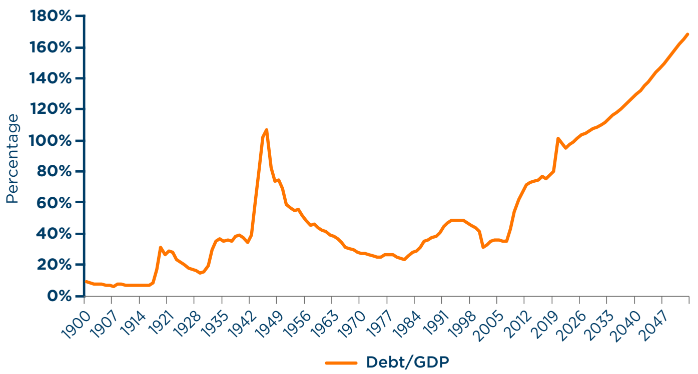
The USD's privileged reserve currency status and the United States' dominant share of global capital markets will ensure the US Treasury retains market access, but the end of the low interest rate period will entail costs. Higher real interest rates will raise the share of tax revenue taken up by debt service, high fiscal deficits may keep inflation high, and, more importantly, high debt and deficits could also reduce growth.

Unlike the post-WWII era, current projections do not indicate a future of much stronger growth that could reduce debt as a proportion of GDP. Even if the debt burden can be sustained, it would be prudent to guard against the risks of an adverse outcome.

With no indications that either political party is willing to entertain the necessary fiscal adjustment, rating agencies have periodically taken note[2]. In an election year, it is not expected that either party will be willing to discuss long term policy adjustments necessary to limit the increase in debt.

Over time, investors should expect a higher term premium in US debt markets than what has been experienced in the last ten to fifteen years, marking the end of the era of low borrowing costs for the US government.

Figure 1: US Debt Held by the Public/GDP Ratio



Source: CBO, BEA, measuringworth.com, Amundi Investment Institute.

Debt Sustainability: Deficits, Growth, and Interest Costs

A country can sustainably finance its debt if its debt-to-GDP ratio is projected to stabilize at a manageable level over the medium to long term, without straining its public finances or severely limiting public revenue for discretionary expenditure and for expenditure on committed programs (such as social security, pension provision, healthcare, and defence).

The room for public expenditure depends on how much of its tax revenue is taken up by the cost of servicing its debt (interest/revenue) and, relatedly, debt service as a share of GDP (interest/GDP). Additionally, if deficits and the debt burden increase interest rates and market expectations of future interest rates, this could also curtail (crowd out) private investment and thereby reduce future growth.

Part of the debt can be monetized in some circumstances, such as the long period of Federal Reserve asset purchases after the Global Financial Crisis. However, this is not a feasible or particularly effective option when inflation is not unusually low. Its inflationary consequences could risk simultaneously raising long-term interest rates and the government's debt service costs.

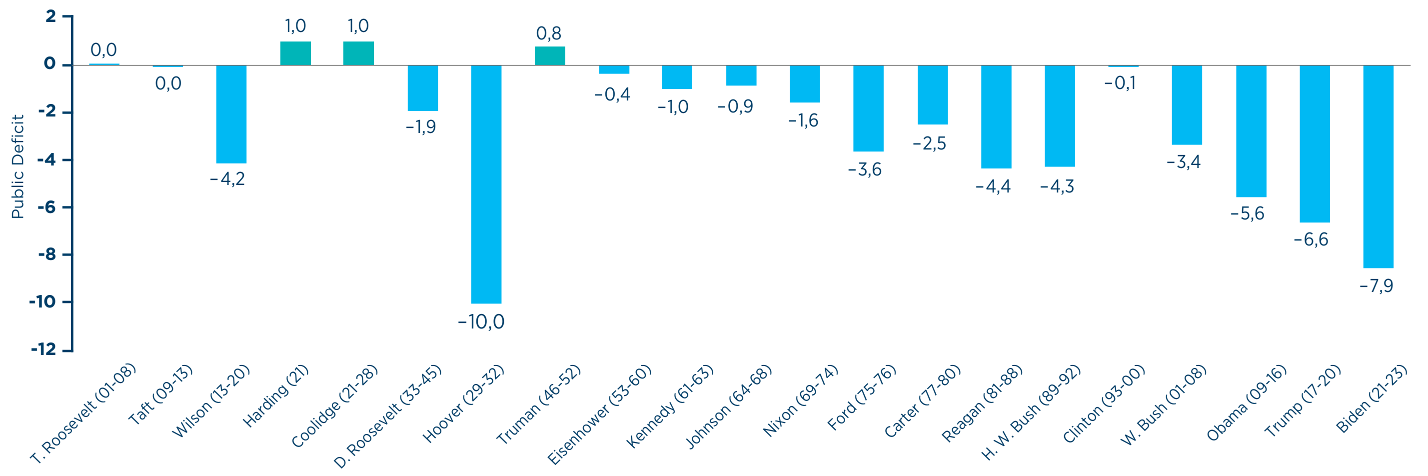
1. US public debt amounts mentioned in this note are amounts of US federal debt held by the public. This excludes holdings by the federal government of its own debt and is the metric on which the public debate and the economic profession usually focus. In its February 2024 Budget and Economic outlook, the Congressional Budget Office projects debt held by the public to reach 172% of GDP in 2054.from 97% in 2023.

2. In July 2023, Fitch downgraded US public debt from AAA to AA+. In November 2023, Moody's cut its outlook, from stable to negative, on the last AAA rating enjoyed by the US at one of the three main agencies.

The Long-Term Fiscal Dilemma for the US

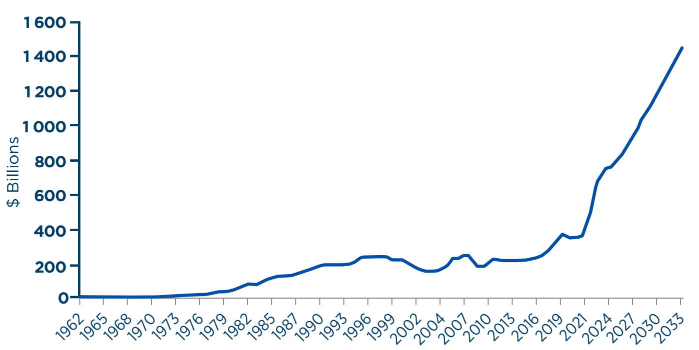
The non-partisan US Congressional Budget Office (CBO), known for its objective economic analyses, provides long-term projections for deficits and debt based on current policies, including announced future policies. Due to the absence of any significant fiscal commitments by either party to address this issue, the CBO projects a continuous **multi-decade rise in debt-to-GDP ratio – from just below 100 percent today to more than 170 percent by 2054.** Recent revisions reflect increased deficits due to tax cuts under the previous administration and policy responses to the pandemic, including the associated lockdowns.

Figure 2: Average Deficits Under Each Administration (% of GDP)



Source: Statista, CBO, Amundi Investment Institute 2 February 2024.

Figure 3: Interest Paid on US Federal Debt Held by the Public



Source: Statista, CBO, Amundi Investment Institute 2 February 2024.

The ratio of interest costs to revenue is projected to increase from 15 percent to 31 percent, while interest costs as a proportion of GDP will rise from 2.4 percent to close to 6 percent by the 2045-2054 period.

The reason for these large increases in debt metrics is largely due to political unwillingness to reduce the government's primary fiscal deficit, which the CBO sees as remaining around 3 percent of GDP.

For US debt to be deemed sustainable in the long term, it would necessitate implausibly high increases in potential growth, dependent on similarly unlikely surges in productivity growth, or even more implausibly, perpetually low levels of real interest rates on a secular basis.

Perpetually large deficits and rising debt levels are extremely unlikely to be consistent with sustained low borrowing costs for the US government.

Despite these concerns, external demand for US debt and US assets remains high, largely due to the pivotal role of US Treasuries in the global financial system, acting as the largest safe asset and largest collateral asset backing global financial transactions, coupled with the US's relative growth performance.

However, it would be imprudent to ignore the potential for these unprecedented increases in debt to necessitate fiscal adjustments, potentially leading to reduced US growth, as many experts argue.

What Gives? Fiscal Adjustment Inevitable

Ruling out the unlikely scenario where growth consistently exceeds interest rates – the 'goldilocks' scenario – the US cannot grow out of its debt dilemma. This implies that fiscal adjustment is inevitable at some stage, ultimately necessitating difficult choices, even though they currently might seem politically unpalatable.

Various adjustment scenarios are conceivable, each balancing expenditure reductions and tax increases based on what is politically feasible, and importantly, how much time and space markets permit.

It is possible that the adjustment could be gradual, extended over a long period, with markets remaining patient as long as there is some political effort to implement measures that would change the long term-debt projection. However, not all viewpoints are as optimistic.

With Social Security and major healthcare spending already comprising a very large share of mandatory public spending, and set to rise further due to ageing (rising c.11% in 2023 to more than 14% in 2045-2054, according to the CBO), it is inevitable that adjustment will need to include both tax increases and expenditure reductions, likely including raising the retirement age.

With regard to discretionary spending (6.4% of GDP in 2023), defence spending (3.3%) accounts for a large share, and in the current geopolitical environment it is difficult to see room for any sizeable reduction.

US Fiscal Adjustment: Gradual or Abrupt?

In principle one can imagine many scenarios of how this might play out. To highlight the potential market impact, we consider two plausible paths toward debt sustainability:

1. **Gradual Fiscal Consolidation** – The trigger in this case would be progressively higher yields over several years, due to rising supply and domestic political pressures on fiscal trade-offs. Higher yields would crowd out more of the fiscal space available for major discretionary and non-discretionary spending programs. At the same time, rating agencies would continue to downgrade US public debt, to the point that this would become an adverse factor for global fund managers, unlike previous downgrades.

   Due to this unpalatable combination, fiscal consolidation would assume more urgency in the political domain and there would be more public acceptance of necessary adjustment.

2. **Forced Abrupt Adjustment** – In this scenario, the US would go through a combination of events that would force deficit-reducing fiscal measures. The trigger here could stem from any number of sources:

   - Investors might suddenly lose confidence, primarily due to significant deterioration in the debt outlook, or other fiscal-related events such as continuing political impasse on debt ceiling negotiations, frequent government shutdowns, and related disruptions to market functioning.
   - Markets might lose confidence in US debt due to concerns about the nation's global leadership role, and its fiscal ability to deal with adverse geopolitical events.
   - Additionally, a shock similar to the recent pandemic, or major supply chain disruptions that lead to a significant economic downturn would call for a large fiscal response, inevitably increasing the deficit and debt. With a higher initial level of debt, such a fiscal response would only be feasible if markets are reassured of sufficient longer term fiscal adjustment underway.

Both scenarios imply inevitable fiscal adjustment. Higher yields that incentivize gradual adjustment would be more palatable for markets, whereas a sudden stop – the abrupt adjustment – would entail a substantial rise in yields and significant market disruptions that would entail material global spillovers. In either scenario, the Federal Reserve would likely be drawn in to stabilize markets. **However, beyond curtailing its current Quantitative Tightening (QT) program, launching another Quantitative Easing (QE) program may not be as effective in an environment of higher inflation and lower market confidence in US debt**.

Investment Implications

The timeline for when there might be a stronger willingness to begin fiscal adjustments, or when market pressures gradually increase to prompt some action is uncertain. At this stage, with inflation expected to decline and longer-term yields still above our assessment of fair value, the issue of debt sustainability is not a priority.

However, we believe the issue of debt sustainability will gradually become more prominent, especially in a longer-term time frame beyond 2030. By then, there should be some clarity on the political willingness to tackle fiscal adjustment and some of the social security and healthcare funding needs will assume more urgency.

In the short to medium term, we expect more technocratic pragmatism to deal with the political impasse: to accommodate market pressures, it is likely that the US Treasury will periodically pivot towards increased short-term funding through Treasury Bills (T Bills) and away from long-term bonds. Importantly, as we have argued elsewhere[3], with the rise in US debt issuance, the Federal Reserve is likely to scale back its QT program and maintain a balance sheet close to its current holdings of US treasuries.

Over the longer term, a higher supply of debt is expected to increase the term premium, as investors get more concerned about holding longer-term debt. This scenario should, in principle, also incentivize fiscal adjustment and avert a major 'debt crisis' or significant market disruption, though such an adverse outcome cannot be ruled out at this stage.

Our central case – that something has to give – also implies that US Treasuries will retain their status as a safe asset and their central role in global financial markets. However, the path to a more stable fiscal outlook for the US is expected to be significantly more volatile than what markets have witnessed over the last ten to fifteen years.

"The timeline for when there might be a stronger willingness to begin fiscal adjustments, or when market pressures gradually increase to prompt some action is uncertain. At this stage, with inflation expected to decline and longer-term yields still above our assessment of fair value, the issue of debt sustainability is not a priority."

3. See Central banks' endgame: A new policy paradigm. Themes in depth, Amundi, Mahmood Pradhan, Lorenzo Portelli, and Tristan Perrier, October 2023.

Laurent Crosnier
Global Head of FX, Amundi

Frederico Cesarini
Head of DM FX, Cross Asset Strategist, Amundi Investment Institute

Unlocking the benefits of US exceptionalism: what does it mean for the US Dollar?

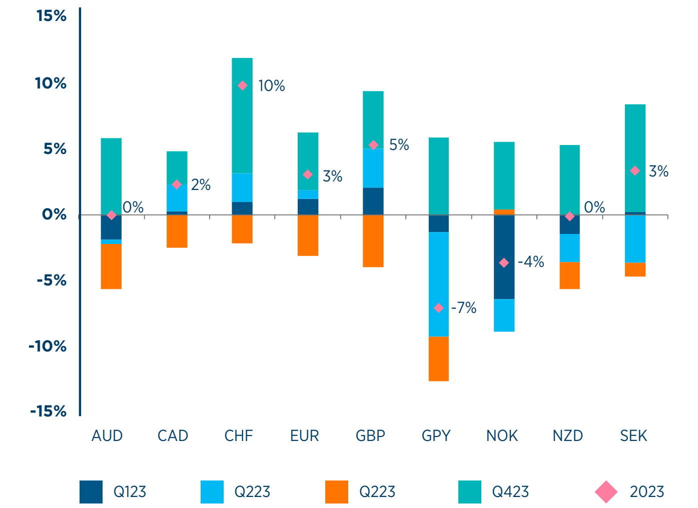
2023: the year of shifting narratives

2023 was a complex year for Foreign Exchange (FX) investors, with **several market narratives overlapping each other, and great uncertainty over the US Dollar**. The year started with concerns over the tight financial conditions and their potential implication for global growth. In this respect, the shutdown of Silicon Valley Bank (and the broader regional banks crisis) was the first misleading signal we encountered. Mainstream perception was that the US economy was entering a recession and that the Federal Reserve (Fed) was going to deliver huge amounts of insurance cuts to limit the negative externalities and prevent the spreading of the shock.

However, nothing could have proved further from the truth. **The Fed launched the new "Bank Term Funding Program" (BTFP)**, which served as a funding lifeline to ensure both depositors and creditors understood that banks had the liquidity they needed. Fiscal conditions became expansionary to a significant extent, excess savings and higher real disposable income supported consumption, and no cuts were delivered. Investors began reconsidering the investment case for the US Dollar, but it wasn't until the surge in oil prices and the consequent upside surprises on US inflation throughout the summer that we saw a sustained appreciation of the currency.

The US yield-curve bear-steepened as 10-Year rates approached 5%, signalling the need for the Fed to stay tighter for longer. Strong US growth was perceived as a risk to disinflation, leading to widespread consensus on USD long positions – a second misleading signal for the year. Investors underestimated the role that supply had in driving inflation and the strong growth/lower inflation wave in the fourth quarter of the year, combined with a dovish December Federal Open Market Committee (FOMC) meeting, drove another narrative shift. Speculative and real money investors capitulated on USD long positions, causing broad-based currency depreciation.

Figure 1 - G10 FX Spot performance through 2023



Source: Bloomberg, Amundi Investments Institute calculation, data as of December 29, 2023

From Goldilocks to US exceptionalism

The growth and inflation evidence from last year bodes well for G10 FX, reducing the risk of a hard-landing and leading to a more balanced Fed's reaction function. The Fed has been a key support for the Dollar since 2021 and as uncertainty over its future actions recedes, we could expect lower appetite for the USD. **As 2024 began though, three distinct factors suggested that the strong anticipation witnessed in Q4 of the previous year might not be sustainable**. Firstly, the Goldilocks state[1] had already been priced in, with the market far ahead of the FOMC's rate cut projections. Secondly, value emerged as the best performing factor in FX, often an anomaly before global growth expectations bottom-out. Lastly, US growth continued to surprise on the upside, prompting upside revisions for 2024, resulting in sizable US growth premium compared to most countries in G10.

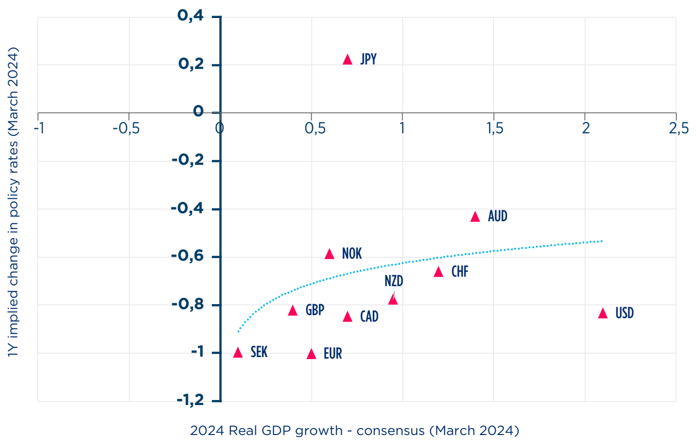
The first two elements now appear better balanced, with interest rates expectations aligning closer to the Fed's projections and the USD strengthening across the board year-to-date. **However, it's the third factor that makes the USD attractive relative to its peers**. The last time we witnessed such diverging trajectories in growth expectations was in 2021, the best expression of USD exceptionalism, due to faster and stronger post-pandemic reopening relative to other economies. At that time, the market had to reassess relative terminal rates in favour of the US, in turn supporting the currency.

The next paragraph will explain the reasons why we are not expecting a similar USD pattern in 2024. However, as the market continues to disregard relative growth and inflation numbers by pricing in a synchronized cut cycle, we see reasons for USD strength to continue in the short-term. A hypothesis which is confirmed by our regimes-based analysis.

Figure 2 - 2024 consensus real GDP growth & revisions since June 2023

Source: Bloomberg, Amundi Investment Institute calculation. Data as of March 2024

Figure 3 - 2024 Real GDP expectations vs 1Y implied change in policy rates



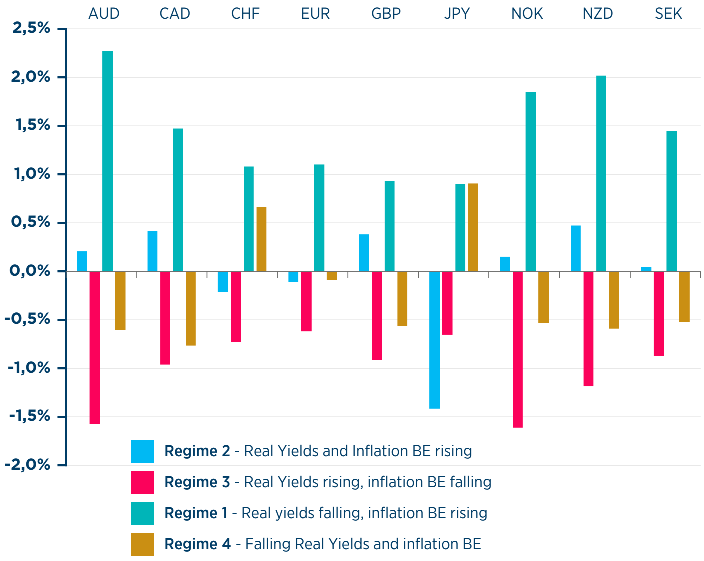
1. A Goldilocks economy refers to an ideal state for an economy whereby the economy is not expanding or contracting by too much.

In our framework, we pay attention to the movements in US real rates and US inflation expectations to derive a cyclical investment clock and assess in which direction (and against which pair) the USD may move. Peak monetary tightening suggests that the worst may be behind us, as the USD typically demonstrates unilateral strength when the Fed tightens policy at the expense of growth, as seen in 2022 (see Regime 2 in the chart). However, there is no clear scenario in which the USD substantially sells-off, except for the one in which the Fed intervenes and injects liquidity into the system to stimulate the economy (see Regime 1 in the chart).

The progress in inflation suggests that the Fed is becoming increasingly balanced in fulfilling its dual mandate. However, the strength of the US economy, the recent reacceleration in services prices and the still elevated inflation expectations suggest **we will have to wait more for an aggressive rate-cuts cycle**.

Moreover, despite knowing what the Fed can do should the economy deteriorate further (the Fed put is live since December 2023), the positive asymmetry that the USD exhibits when growth capitulates highlights **limited space for USD correction in the short-term** (see Regime 4 in the chart).

Figure 4 - G10 FX monthly median returns in different US rates regimes (real yields and inflation break-evens)



Source: Bloomberg, Amundi Investment Institute calculation. Data as of March 2024

2024 is not 2021: Limits to USD strength into the Fed cut cycle

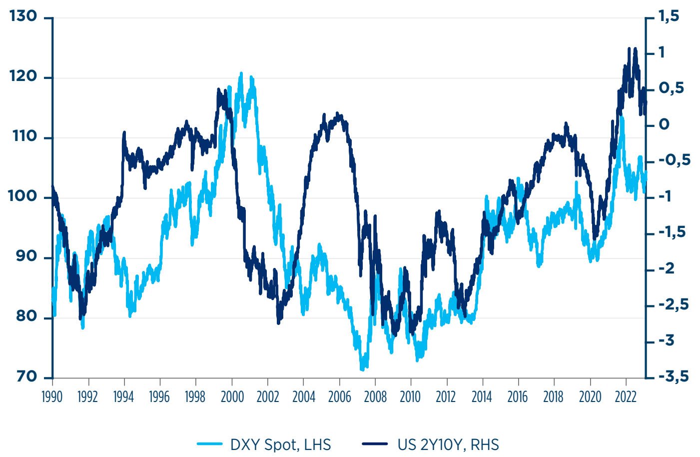
US data in 2024 has led to further upside revisions for US growth and continues to fuel the narrative over USD exceptionalism. The USD has benefitted as a result. However, given the similarities with 2021, the question that now arises is whether a similar pattern may repeat itself in 2024. According to our analysis, 2024 is not 2021 as, despite the strength in the US economy relative to peers, **there are important differences today compared to that time**.

1) Inflation has peaked. Back in 2021, the market was reluctant to believe a rapid hikes cycle was in the cards, thinking that rising inflation was temporary. When the Fed turned hawkish in June 2021, investors were taken by surprise. However, the situation in 2024 is different. While US inflation is still trending above the Fed target, its momentum has peaked, US inflation surprises are negligible relative to that time and the rapid surge in interest expenses over income growth suggest a negative asymmetry from here.

2) The next move from the Fed will be a cut, not a hike. The robust US economy has left the market uncertain about the extent and timing of the potential rate cuts, yet this uncertainty is less concerning compared to 2021. US rates volatility is high from historical standards and the US yield-curve inverted since almost two years now. Any decompression from here could curb USD gains.

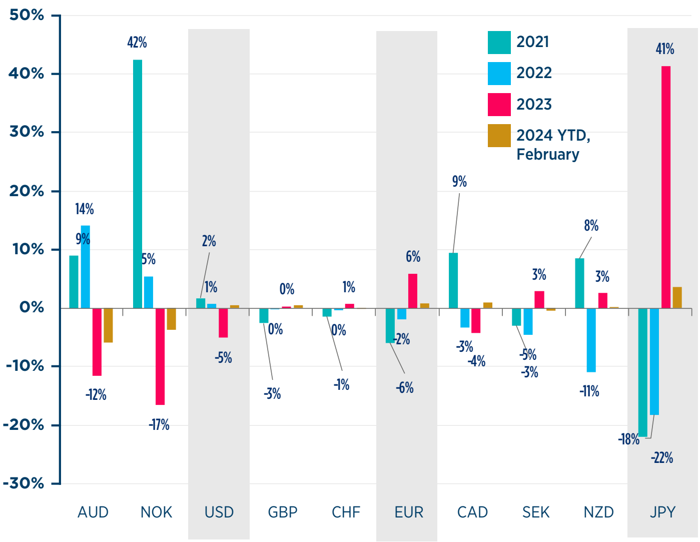
3) USD relative fair valuation started correcting lower since the second half of 2022. Since the global reopening, commodities-importing countries faced negative Terms of Trade shocks and steep increases in production costs. This is particularly evident in the Eurozone, where the Producer Price Index (PPI) reached 31% YoY a month before the Ukraine invasion. As FX reflect relative dynamics, this propelled USD valuation higher since 2021 and supported the currency. However, the substantial decline in energy prices (since August 2022) and the positive Terms of Trades shock experienced by commodities importing countries through 2023 suggest a lower USD valuation in 2024.

Figure 5 - 2Y10Y started surging in 2021, it should come back in 2024 as the Fed approaches its first cut for the cycle



Source: Bloomberg, Citibank, Amundi Investment Institute calculation. Data as of February 2024

Figure 6 - Commodities Terms of Trades are in different shape vs 2021 (commodities importers are experiencing a positive shock since 2023)



Source: Bloomberg, Citibank, Amundi Investment Institute calculation. Data as of February 2024

All in all, the strength of the US economy compared to its peers supports the USD in the short-term. However, unlike 2021, reduced uncertainty over the Fed and the wider USD premium over fair valuation suggest a different trajectory for 2024. We expect the USD to peak ahead of the Fed cut cycle and to gradually weaken the more the US yield curve bull-steepens. High macroeconomic volatility and a fragile geopolitical backdrop, on the other hand, prevent bold directional convictions. **In this respect, the US elections represent the main risk event on the agenda**. In a Trump 2.0 scenario, trade, defence and fiscal policies may all eventually provide support for the USD, despite, we believe, to lesser extent than Trump 1.0. That is at least the case for fiscal policies (where there is less space for transformative actions relative to 2016), which leave to trade and tariffs the dominant channels of FX risk-premium this time. This is the area where the President has more jurisdiction and where the USD has more to gain, in our view. **In a scenario with higher US tariffs, the world economy could be hit harder than the US, and the risks of further inflation reacceleration could make it unclear whether monetary easing may be appropriate**. For a weaker USD, we need the Fed to remove its tightening bias. Any more prudent approach may further delay the USD correction, in our view.

Insights from portfolio management

Our constructive views and positioning on the dollar are determined by 3 main factors:

1) Macro factors

2) Portfolio construction considerations

3) Structural trends on the dollar

1 Macro factors

No landing so far: A strong US Economy

In Q4 2023, growth hit 3.2%, fuelled by robust private consumption and job market strength. Latest NFPs[2] and GDP shifted Fed funds pricing from 6 to 3 cuts for 2024. March's Fed SEP[3] release, particularly revisions to core PCE[4], could trigger a repricing in the Fed dots. Inflation, though trending downwards, has remained stickier than anticipated by markets.

A less sensitive economy to interest rates

Monetary policy tightening lags longer this time due to historically low interest expenses for US non-financial companies, at a 20-year low. Companies previously raised debt at low rates and are now investing cash in money market instruments, benefitting from the inverted US yield curve.

Carry Trade

The dollar is benefitting from a yield advantage against the G7 currencies, with the highest real yield close to 2% for the 10-year maturity. The DXY[5] performance is highly correlated to the yield differential against the other currencies.

Impact of US elections

The elephant in the room for 2024 are the US elections in November. The probability of Trump winning the US Presidency is gaining momentum. Although it seems hazardous to forecast the impact of Trump's re-election on the dollar, his victory would support the dollar given the potential adverse impacts on other currencies like the CNY, Mexican pesos and the Euro.

2. Non-Farm Payrolls - 3. Summary of Economic projections - 4. Personal Consumption Expenditures Price Index - 5. US Dollar index

2 Portfolio construction considerations

The "Dollar Smile" theory

The USD works both when risk-sentiment is supported by strong US growth (as appetite for US assets rise, relative to the ones abroad) and when risk-sentiment capitulates (acting as safe heaven).

Correlation

The USD tends to have a negative correlation with risky assets. This key feature of the dollar is critical for asset allocation portfolios with an equity bias. Adding dollar exposure in such portfolios is a good means to reduce volatility, potential drawdowns, and generally provide some extra carry.

Seasonality

The USD exhibits some performance seasonality which is linked to investors and corporates behaviour on the Forex market looking to hedge or manage their currency exposure. Such patterns could be exploited to adjust the currencies exposure accordingly and therefore improve the risk/return profile of portfolios.

3 Structural trends

In a world dominated by increasing geopolitical risks, persistent and elevated inflation, and substantial shifts in monetary policies, some structural trends shape the way FX reserves were allocated.

De-dollarization trend

It is one of the recurring themes in the Forex market which is related to the evolution of the geopolitical situation, a more multipolar world and the search for alternatives to the USD. Nevertheless, the USD remains by far the most held currency among central banks with a share above 58% of their FX reserves[5]. Since 2010, its share has declined at a low pace of 4% until 2022, from 62.2% to 58.4%. The Euro currency followed a similar trend with a decline of 5% during the same period from 25.7% to 20.5%.

Moreover, despite the discussions regarding China and its willingness to extend the Renminbi usage in global trades, since its inclusion in the Special Drawing Rights (SDR) basket in 2016, it grew only from above 1% to a mere 2.7% at the end of 2022.

Increase in gold holdings in central bank reserves

Since the Global Financial Crisis, gold holdings from central banks has increased significantly, providing a safe haven during a volatile period, providing liquidity and allowing to avoid imposed sanctions on central banks' FX reserves. According to IMF data, gold reserves have increased by $20Bn in Q3 2022, and 2023 has seen a similar trend which has pushed the Gold ounce to its highest level, at 2200$ as of March 2024.

Gold is perceived as a safe haven in periods of high uncertainty and as a hedge against inflation. This diversification to Gold has thus particularly increased in central banks reserves since the Ukraine-Russia war.

5. Currency Composition of Official Foreign Exchange Reserves (COFER), International Financial Statistics (IFS)

Francois Millet
Head of Climate and Thematic Business Development
Amundi ETF, Indexing and Smart Beta

Frederic Hoogveld
Head of Investment Specialists & Market Strategy
Amundi ETF, Indexing and Smart Beta

Climate Benchmarks: A compass for Central Banks on their Net Zero journey

A brief history of climate indices

Climate indices have come a long way since their inception in the early 2010s. The first generation of climate indices, such as **MSCI Low Carbon Leaders** and **Euronext Low Carbon indices**, focused on reducing the carbon emission intensity versus the underlying parent index. However, they were limited in scope and essentially backward-looking, as they aimed to reduce reported carbon emissions. Additionally, they did not integrate the full value chain of carbon emissions.

The second generation of climate indices remedied some of these pitfalls by incorporating forward-looking assessments of companies' climate impact and risk, as well as covering scope 3 data.[1] While scope 3 emissions were and are still mostly estimated, their incorporation into the design of these indices led to a significant improvement in the overall monitoring and management of carbon and transition risk.

However, this second generation of climate indices did not explicitly integrate decarbonisation trajectories in line with global climate objectives, which became a growing concern for asset owners following the 2015 Paris Agreement and subsequent regulatory and political initiatives. This led to the development of a **new generation of climate indices, based on regulatory, proprietary or industry-driven "decarbonisation frameworks"**.

The third generation of climate indices are designed to embed decarbonisation trajectories that are in line with the Paris Agreement. The existing offering can be classified into three broad categories:

1

Regulatory-based decarbonisation framework: the European Commission has introduced the concepts of Climate Transition Benchmark (CTB) and Paris-Aligned Benchmark (PAB) through an amendment to the Benchmark Regulation (BMR[4]).

2

Proprietary index decarbonisation frameworks: some index providers have rolled-out Paris-Aligned indices based on a proprietary Paris alignment trajectory and methodology.

3

Finally, industry-backed decarbonisation initiatives proposed alternative frameworks: both the IIGCC[2] and the NZAOA[3] have been working on an industry decarbonisation framework to address the identified weaknesses of the CTBs and PABs, as well as to offer a competing, non-regulation based decarbonisation framework.

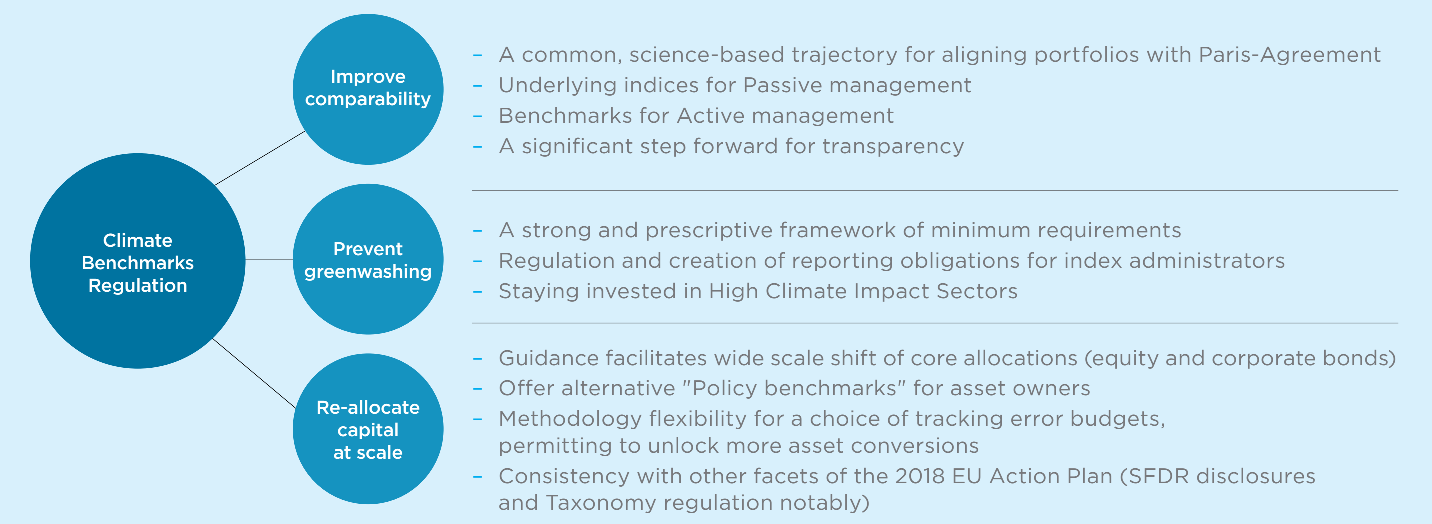
1. Scope 3 emissions encompass indirect emissions that occur in the upstream and downstream activities of an organisation.
2. The Institutional Investors Group on Climate Change.
3. The Net Zero Asset Owners Alliance.
4. The Benchmark regulation (2016/1011/EU) was amended by the Low Carbon regulation (2019/2089/EU) in Dec 2019. The Low Carbon regulation, followed by the three Delegated Regulations (RTS) 2020/1816, 2021/1817 and 2020/1818 (EU) introduced CTB and PAB indices in Dec 2020. The RTS are the now-called EU Climate Benchmarks Regulation.

Main provisions of the EU CTB/PAB regulation

The EU Climate Benchmarks Regulation, supplementing the Benchmark Regulation, is one of the key regulations originating from the 2018 EU Action Plan on sustainable finance, aimed at reorienting capital flows towards sustainable investments.

For the first time, a regulation has recognized the power of indices to support the transition through investment, with the objective to improve comparability, prevent greenwashing and allow to re-allocate capital at scale.

Figure 1: The EU CTB/PAB Initiative: Creating a reference framework for 1.5°C alignment



Source: Amundi.

In order to qualify as a CTB or as a PAB, **a benchmark must comply with a number of minimum requirements**, including an initial carbon intensity reduction of respectively 30% (CTB) or 50% (PAB) compared to the parent index, as well as an annual 7% reduction of the carbon intensity. The main requirements of CTBs and PABs are described in the figure below.

Figure 2. CTB and PAB indices: ambitious decarbonization requirements

Minimum Requirements	EU Climate Transition Benchmark - CTB	EU Paris Aligned Benchmark - PAB
YoY self decarbonization	**-7% (IPCC requirement)**	
Carbon intensity reduction vs parent investable universe	**-30%**	**-50%**
Baseline exclusions	- Controversial weapons - Societal norms violators[5] - Tobacco - Companies that significantly harm one or more of the Taxonomy environmental objectives[6]	
Fossil fuel-related activity exclusions	**No**	**Yes**
Exposure to High Climate Impact Sectors[5]	At least collectively equal to parent investable universe (no underweight)	

Source: EU Technical Expert Group (TEG), September 2019. Final Report on Climate Benchmarks and Benchmarks' ESG Disclosures

Successes and challenges of the EU CTB/PAB regulation

The EU Benchmark Regulation (BMR) has successfully helped investors reduce their climate transition risks, allowing effective reductions in greenhouse gas (GHG) emissions that globally exceeded the minimum requirements of the regulation.

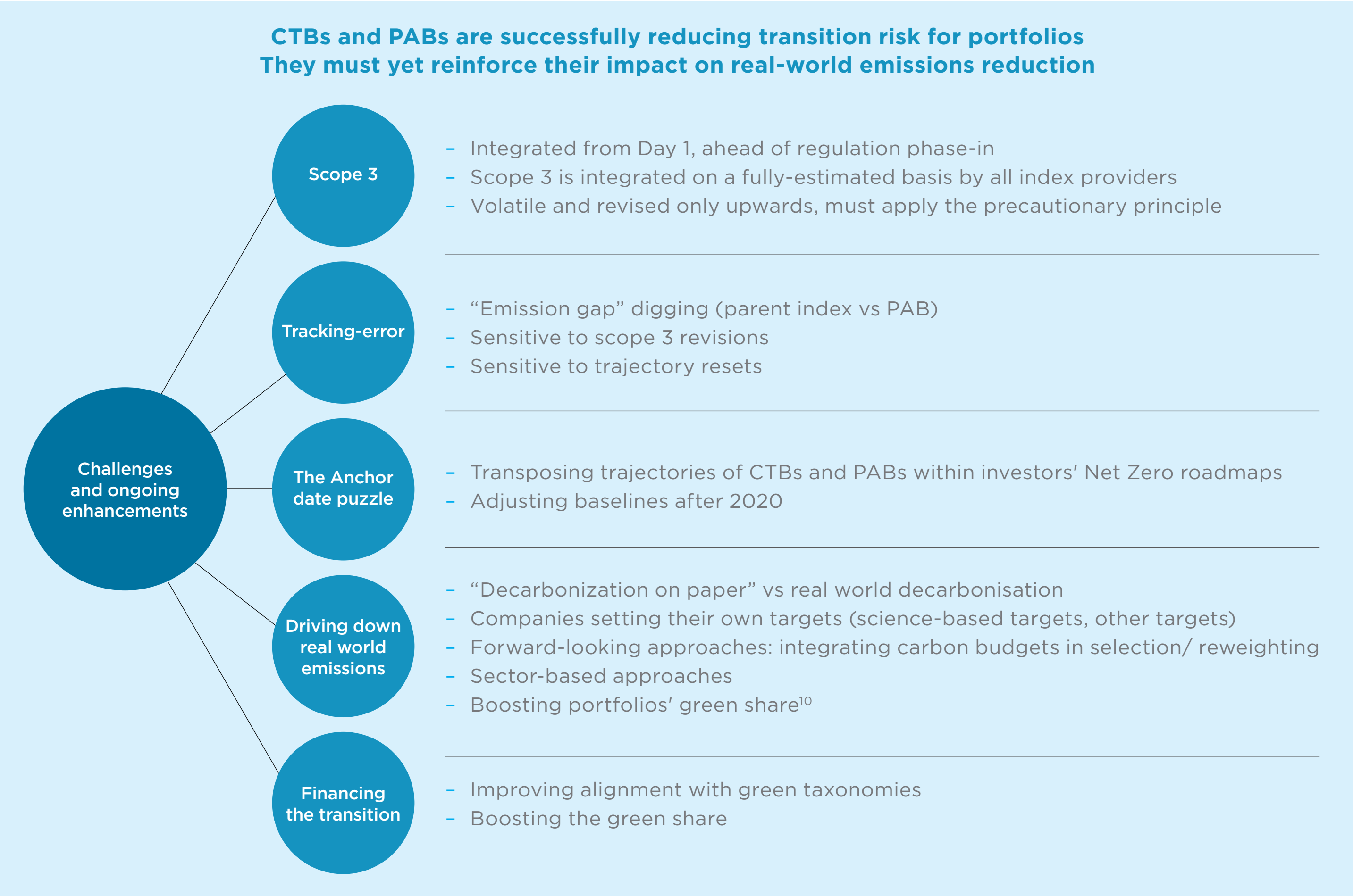
Flows to new CTB and PAB products, as well as flows to products created by conversions or enhancements of ESG products to ensure their eligibility to the CTB or PAB label, have been massive. This can be seen when looking at the cumulative new assets in listed products, which amounts to €154 billion at the end of December 2023.[8]

5. Societal norm violators: UN Global Compact and OECD Guidelines for Multinational Enterprises.
6. Environmental objectives as defined in Article 9 of regulation 2020/852/EU (EU Taxonomy regulation): climate change mitigation, climate change adaptation, sustainable use and protection of water and marine resources, transition to circular economy, pollution prevention and control, protection and restoration of biodiversity and ecosystems.
7. As defined under the European NACE sector classification system. Does not apply to Fixed Income Indices.
8. The product perimeter considered encompasses Equity and Fixed Income UCITS ETFs replicating:
- EU Paris Aligned Benchmarks (PABs) and EU Climate Transition Benchmarks (CTBs), Low Carbon benchmarks, Climate Action benchmarks, and other climate related benchmarks aiming at reducing GHG emissions,
- Hybrid products promoted as mixed ESG/Climate products, i.e. ESG or SRI products having received a full CTB or PAB overlay,
- Hybrid products promoted as ESG or SRI products with specific Low carbon/Carbon reduced/ Fossil fuel characteristics,
- Including actively managed ETFs, excluding thematic ETFs and green bond ETFs.

A key challenge for climate benchmarks is to succeed in driving greenhouse gas emissions reduction in the real economy. So far, indices have been efficient tools to reduce transition risk at the portfolio level. However as highlighted by the IIGCC[9], they must achieve a better balance between "decarbonising on paper" and "real world emissions reduction".

On the one hand, "decarbonisation on paper" consists in relying on index rebalancing (company deletions, additions and reweighting) to achieve the 7% decarbonization objective. On the other hand, "real world emissions reduction" consists in obtaining an organic decarbonisation of the portfolio from existing index components which have been selected with this aim. Overreliance on index rebalancing – or "decarbonization on paper" – leads to important sector biases and to a gradual decoupling from the real economy, without incentivizing individual companies within sectors to reduce their carbon footprint. As a response, **forward-looking alignment constraints have started to be included in indices in order to obtain a greater share of organic decarbonisation**. This is the case, for example, with the S&P Transition Pathway Model based on the Sectoral Decarbonisation Approach (SDA) recommended by the Science Based Target Initiative (SBTi), or with MSCI's Implied Temperature Rise or Cumulative Projected Emissions budgeting approach. Additionally, most CTB and PAB indices seek to enhance the weight of companies setting carbon targets, or boost the portfolio's green share[10]. Such approaches result in a higher contribution of the stock-picking effect within sectors, versus entire sub-sector shifts, allowing to better incentivize leading companies within each sector.

Figure 3. CTBs and PABs 2024: challenges and ongoing enhancements



Source: Amundi.

9. IIGCC, Enhancing the quality of Net zero benchmarks, 2023.
10. The green share is defined as the share of the portfolio invested in activities that contribute positively to climate mitigation and adaptation objectives.

Finally, potential enhancements to the CTB and PAB framework may be found in applying more granular pathways (regional or/and sectoral). Indeed, science-based standards are based on technological feasibility which favor regions with more technology and financial resources, whose energy-mix is already better aligned with climate goals. Under the principle of "common but differentiated responsibilities", regional pathways could thus be more meaningful and realistic than global pathways. Additionally, sectoral pathways could bring value as they would allow to better reward better performers in a given sector and in turn encourage real world emissions reduction.

In terms of usefulness for central banks, a **number of them in the Eurosystem have adopted either CTBs or PABs in order to accelerate the alignment of their non-monetary policy portfolios**. This has been the case for both equity and corporate bond allocations, investing either through ETFs or index funds. Outside of the Eurosystem, an example is one of the Nordic Central Bank's foreign asset portfolio, whose equities and corporate bonds holdings are all invested via PAB ETFs.

All Eurosystem central banks disclose climate-related information on their non-monetary policy portfolios. Their disclosure framework considers the recommendations of the TCFD, the PCAF (Partnership for Carbon Accounting Financials), and the NGFS (Network for Greening the Financial System). Several consider setting targets, including scope 3 when feasible. Carbon footprint targets according to these recommendation frameworks are easy to reconcile with climate benchmarks methodologies such as CTBs and PABs, which are built on Carbon Intensity metrics that are in fact similar.

Climate indices have a clear decarbonisation pathway from a fixed anchor date, offer a forward-looking view on carbon intensity levels over time and include scope 3 estimates. As a result, **the conversion of portfolios to rules-based CTB or PAB ETFs and index funds, can greatly facilitate target-setting and alignment to the Paris Agreement for central banks**.

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