A New Dollar Smile: Where Next for the U.S. Dollar?

Our analysis shows the U.S. dollar is at risk of weakening.

January 2023

KEY INSIGHTS

- After multi-year strength, our analysis suggests that the U.S. dollar is at a high risk of depreciating at the current juncture.
- The change in (or momentum of) economic growth and real rates has had a particularly outsized impact when the U.S. dollar reached extremes.
- We highlight how forward U.S. dollar returns tend to become more sensitive to economic growth and real interest rate factors as the dollar becomes more expensive.

Camila Henao Arbeláez
Senior Multi-Asset Solutions Analyst

Chris Faulkner-MacDonagh
Portfolio Manager, Multi-Asset

Quentin Fitzsimmons
Portfolio Manager, Fixed Income

Andrew Keirle
Portfolio Manager, Fixed Income

Steve Bartolini
Portfolio Manager, Fixed Income

The T. Rowe Price U.S. Dollar (TRP USD) Index

Introduction: The TRP USD index (see pull-out box below) has appreciated sharply since the lows of the coronavirus pandemic, thanks to exceptional U.S. policies and robust economic growth. In the past 18 months, the index has appreciated by 26%,[1] continuing a strengthening trend in the U.S. currency evident since 2014 (Figure 1). This appreciation coincided with the commencement, and subsequent acceleration, of the U.S. monetary tightening cycle; faster U.S. economic growth compared with other advanced economies; and a period of global de-risking in which U.S. exceptionalism was the norm, and the dollar was the go-to safe-haven asset.

As a result of this decade-long appreciation, the TRP USD index has reached historically high levels, raising questions as to whether the U.S. dollar may be vulnerable to a possible rapid reversal.

In this note, we explore the key drivers of forward[2] U.S. dollar returns, focusing on those periods which have seen extreme dollar returns.

Four Key Factors Driving U.S. Dollar Returns

Principally, we examine the role of four key factors in driving US dollar returns by measuring subsequent 12 month U.S. dollar returns following varying environments in the past, namely:

- **Relative U.S. growth:** the difference between U.S. economic growth[3] and the growth of other G-10 economies

[1] Cumulative return of the TRP USD index since May 18, 2021 (pandemic lows), to November 3, 2022 (the most recent peak). **Past performance is not a reliable indicator of future performance.**
[2] Forward return is the subsequent return to a certain event/s, but based on past returns. In this instance, we focus on the historical subsequent U.S. dollar returns during times of high economic growth and high real interest rates.
[3] The growth estimates are a daily measure of activity from DeepMacro, LLC, which produces a high-frequency, point-in-time "nowcast" of economic activity across over 30 countries. See www.deepmacro.com for more details.

The T. Rowe Price U.S. Dollar Index

Created in 2020, this proprietary index is formed by taking an equally weighted basket of daily returns from a hypothetical portfolio that is long the U.S. dollar versus the other G-10 currencies, namely: the Australian dollar, British pound, Canadian dollar, euro (Deutsche mark, pre-1993), Japanese yen, New Zealand dollar, Norwegian krone, Swedish krona, and Swiss franc. When needed, the index uses the interest rate differential of three-month interbank rates to create an approximate carry return index for each currency pair.

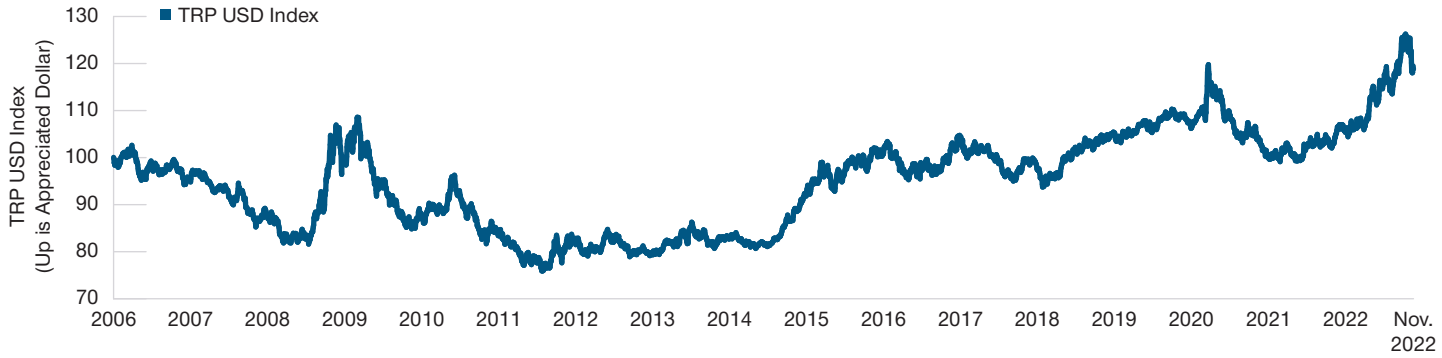
- **Relative U.S. growth momentum:** the three-month change in the U.S. relative growth factor (as described in the previous bullet)
- **Relative U.S. real interest rates:** the difference between U.S. real 10-year TIPS[4] rates and the 10-year real rates of the five other countries with long-established, inflation-linked bond markets (Australia, Canada, Germany, Japan, and the United Kingdom)
- **Relative U.S. real interest rate momentum:** the three-month change in the U.S. real rate factor (as described in the previous bullet)

From here, we quantify the past sensitivity of the U.S. dollar forward returns to these factors, concentrating particularly on extreme return environments. The key findings from our analysis are as follows:

Dollar returns and dollar index analysis: Currently, not only is the dollar expensive, but this has happened rapidly. Both on an index level basis and on a return basis, the current environment is at extremes compared with history. Figure 2 classifies the dollar index as well as the dollar one-year rolling returns into historical "buckets" or deciles—from low to high. Our index is at the eighth-highest (of 10) historical valuation decile, while on a return basis, it is at the ninth-highest dollar returns decile (Figure 2). Dollar returns moved fast too. They experienced a dramatic shift going from the lowest return environment to the highest in just 14 months[5] (Figure 2). Going forward, reversals could also occur rapidly.

TRP USD Index

(Fig. 1) The index has appreciated sharply since the pandemic lows

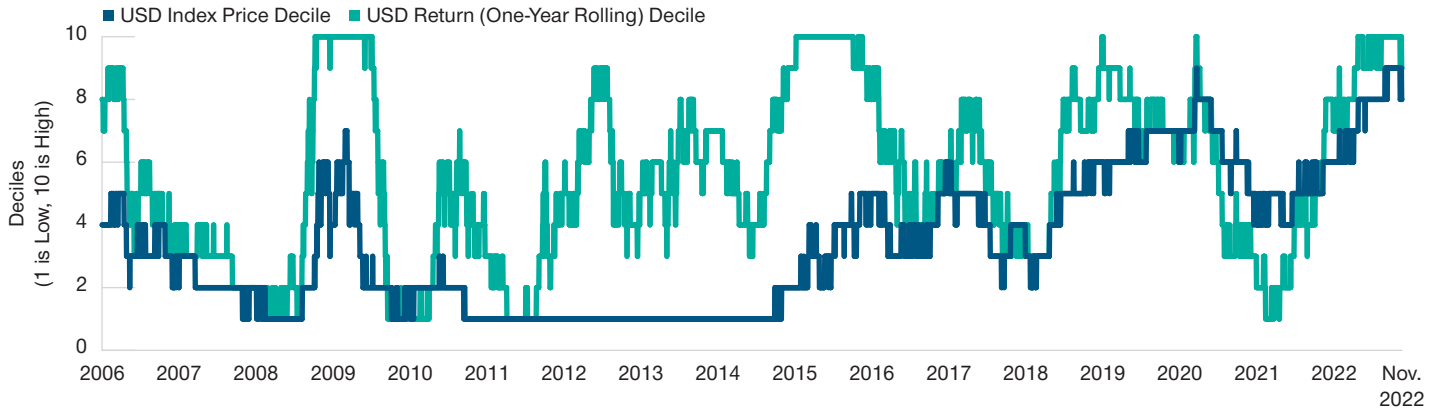


As of November 21, 2022.
Past performance is not a reliable indicator of future performance.
Source: J.P. Morgan/Haver Analytics; T. Rowe Price analysis (see Additional Disclosure).

[4] Treasury inflation protected securities.
[5] Dollar returns went from the 1st decile in March of 2021 to the 10th (highest) in May of 2022.

TRP USD Index and Dollar Return Deciles

(Fig. 2) Both index and returns are at historically extreme levels



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Source: J.P. Morgan/Haver Analytics; T. Rowe Price analysis (see Additional Disclosure).

Interestingly, periods during which the dollar became expensive coincided with high and accelerating return environments. Also, dollar return inflections led index return inflections.[6]

What are the Potential Implications for Markets?

- **Current U.S. Dollar appears prone to the downside:** In the current environment, the U.S. dollar has become increasingly reliant on continued upside surprises to growth and real rates—a difficult feat to continue achieving.
- **Dollar sensitivity or betas depend on regime:** The sensitivity or beta of dollar returns to growth and real rate factors depends on what dollar return environment we are in (i.e., dollar stronger/dollar weaker environments). Sensitivity to these factors were 2 to 30 times larger at extreme-dollar-return environments, than at the mean (see Figure 3 and 4 in next section).[7]
- **Rate of change matters:** Changes in relative growth momentum and relative real rates momentum had an outsized impact. When the dollar and dollar returns were at extremely high levels—or in the right tail, as is the case currently—these momentum factors have historically driven returns disproportionately for the next 12 months.

Dollar Drivers at the "Tails"—A New Dollar Smile[8]

Because the USD moves through various "strong" and "weak" dollar regimes, we have attempted to formally capture how returns have responded to changes in the key fundamental factors. Specifically, we use a regression technique known as a quantile regression, which allows us to split[9] the sample into return "regimes" and to capture how forward dollar returns have responded to changes in the factors across the dollar return distribution. What makes this analysis so insightful is that we can robustly analyze the behavior of returns at the tails (i.e., during extreme events) versus behavior during more "normal" environments (i.e., in the middle of the return distribution).

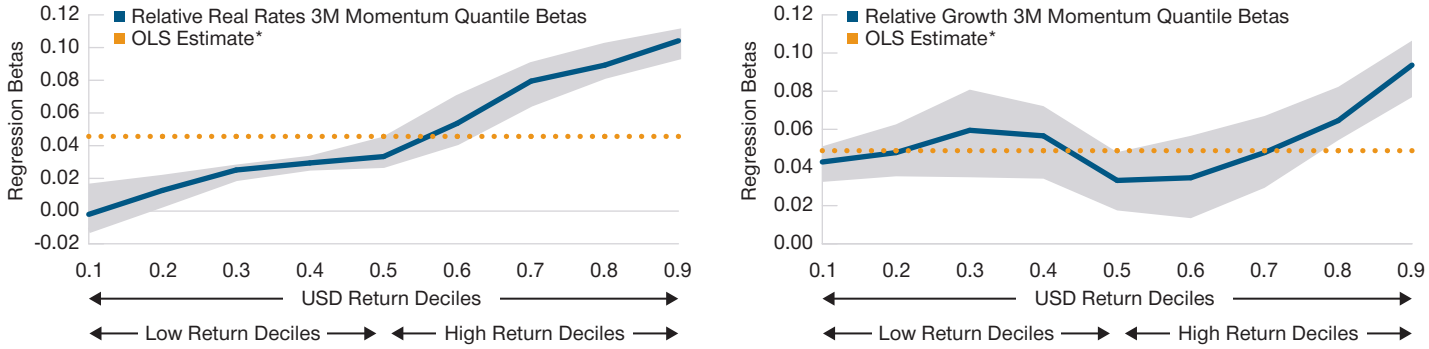
[6] The 12-month lag dollar return is statistically significant when regressed on the dollar index.
[7] Comparing betas at the 9th decile versus the beta at the mean of the distribution for each of the 4 factors.
[8] Empirical phenomenon of the U.S. dollar to be strong and appreciate (or increase in value) either when the U.S. economy underperforms or outperforms the rest of its peers.
[9] Technically, the sample isn't split, but more weight is assigned to observations of the corresponding decile.

Figures 3 and 4 capture the sensitivity of 12-month forward dollar returns to the factors during different return environments—captured by dollar return deciles on the x-axis and the regression coefficients on the y-axis. The regression coefficients represent the beta of dollar returns to each of the fundamental factors that we consider, estimated jointly (i.e., a multivariate regression).

The analysis shows that dollar forward returns were overly dependent on relative growth momentum and relative real rates momentum (Figure 3). These dependencies increased in magnitude as we went from normal to high return environments. This means that changes in the relative speed of either U.S. economic activity or real rates likely have a disproportionate impact on forward dollar returns when returns are already high. These convexity effects are what we call the "new dollar smile."

Relative Real Interest Rates and Economic Growth Momentum Factors

(Fig. 3) Quantile regression coefficients on 12-month forward dollar returns



As of November 21, 2022.

Actual future outcomes may differ materially from the output shown. Changing time periods and other inputs might have a material impact on the results shown.

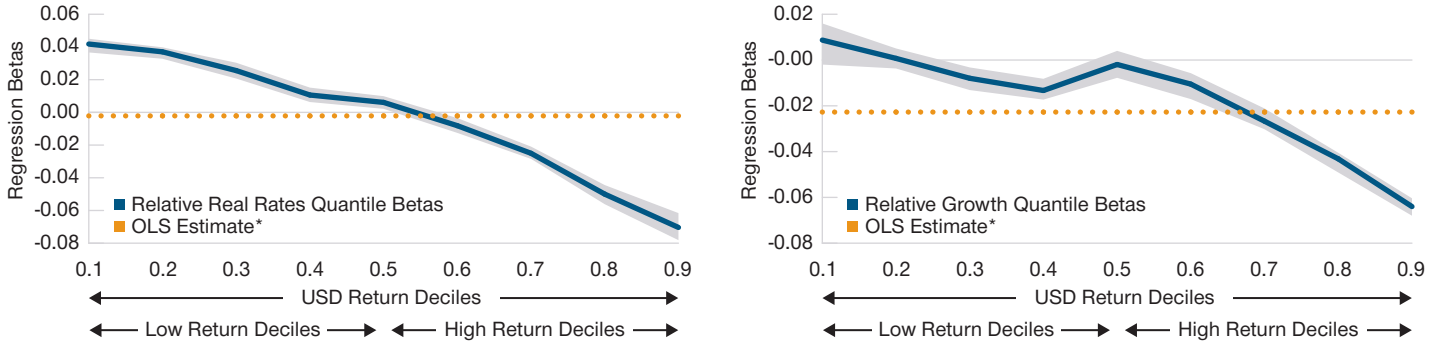
Analysis period January 2006 to November 2022. Shaded area represents confidence interval for beta estimation.

*Ordinary least squares (OLS) is a regression modelling technique that estimates the distance between the predicted values and the observed values.

Sources: J.P. Morgan/Haver Analytics, and DeepMacro, LLC; T. Rowe Price analysis (see Additional Disclosure).

Relative Real Interest Rates and Economic Growth Differential Factors

(Fig. 4) Quantile regression coefficients on 12-month forward dollar returns



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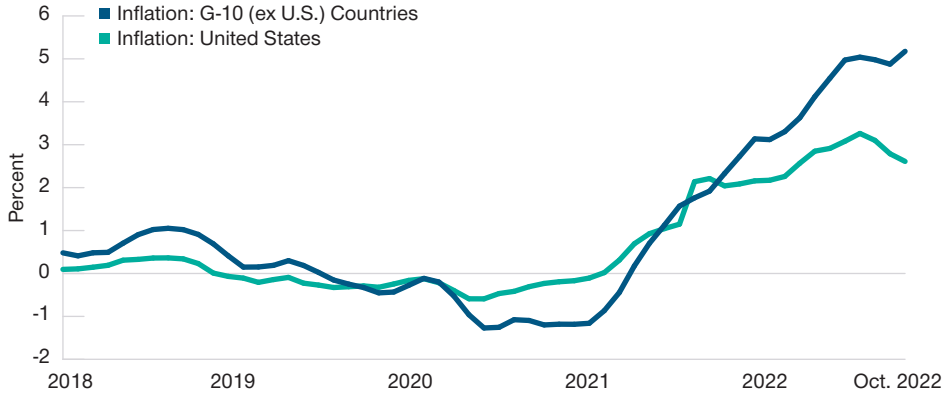
Sources: J.P. Morgan/Haver Analytics, and DeepMacro, LLC; T. Rowe Price analysis (see Additional Disclosure).

By contrast, when dollar returns were high, the growth and real rates level factors differential became negative (orange dotted line goes from positive to negative on Figure 4). This means that, for longer forward time horizons, the mean reversion effects were more pronounced for high return environments. This result also explains why the traditional dollar smile emerges: When U.S. growth is sufficiently strong, it can lift the growth of all economies and result in the dollar depreciating as capital flows out of the U.S. and into other economies, taking advantage of subdued risk aversion and in search of stronger returns.

The combination of Figures 3 and 4 has a profound implication for the dollar in the current environment. Dollar returns have been so strong (in the top deciles) that, for appreciation to continue, the U.S. economy also needs to continue to accelerate from this point forward. Importantly, dollar returns become increasingly dependent on momentum factors to continue moving higher.

U.S. Inflation Remains Below Developed Market Peers

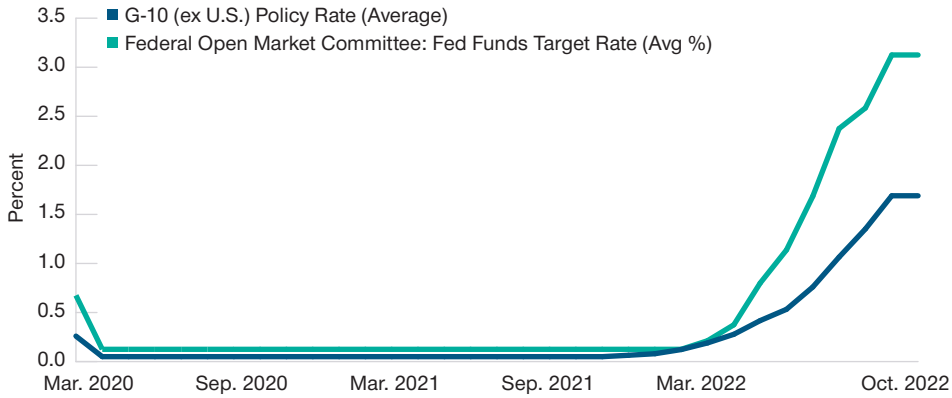
(Fig. 5) Inflation factors: U.S. vs. G-10 (ex U.S.)



As of October 31, 2022.
The inflation factor estimates are a daily measure of price pressures from DeepMacro, LLC, which produces a high frequency, point-in-time "nowcast" of inflation across over 30 countries.
Source: DeepMacro, LLC/Haver Analytics; T. Rowe Price analysis.

U.S. Monetary Policy Is Tighter Than Developed Market Peers

(Fig. 6) Policy rates: U.S. vs. G-10 (ex U.S.)



As of October 31, 2022.
Sources: Bank of Canada, European Central Bank, Sveriges Riksbank, Bank of England, Bank of Japan, Federal Reserve Board/Haver Analytics; T. Rowe Price analysis.

As it stands currently, dollar supportive factors need to keep outperforming simply to keep the dollar in place. Or, put another way, the hurdle for dollar returns currently is extremely high.

— **Camila Henao Arbeláez**
Senior Multi-Asset Solutions Analyst

Accordingly, this dependence on the momentum factors highlights potential future dollar weaknesses. If we were to see a reversal in the relative speed of either economic activity or real interest rates, then the forward dollar correction could be significant as well as rapid. As it stands currently, dollar supportive factors need to keep outperforming simply to keep the dollar in place. Or, put another way, the hurdle for dollar returns currently is extremely high.

The U.S. Relative to Other Markets

Relative to the U.S., other G-10 economies currently have higher rates of inflation (Figure 5) as well as easier monetary policy (Figure 6).

Given the monetary policy cycle mismatch that exists between the U.S. and the other G-10 economies, we believe that there is a high probability that either this policy differential eases, or that U.S. economic activity slows more than in other G-10 economies, over the next 6–12 months.

Conclusion

We have found that convexity effects in relation to the U.S. dollar are large and that current circumstances point to the asymmetry likely materializing to the downside, as U.S. growth exceptionalism wanes. The dollar has become increasingly reliant on continued upside surprises to economic growth and real rates, a difficult feat to continue. The dependence on these momentum factors, therefore, highlight potential future dollar weaknesses. If a reversal in the relative speed of either economic activity or real rates were to eventuate, then we anticipate a significant, and rapid, downward dollar correction.

Furthermore, we also find that the beta of the dollar returns to growth and real rate factors depend on what dollar return environment we are in, and our analysis shows that it is the changes in relative growth momentum and relative real rates momentum that can have an outsized impact. When the dollar value and dollar returns were at extremely high levels, changes in these momentum factors have historically driven returns disproportionately for the next 12 months.

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