**Global Markets Analyst**

# Evaluating External Balances in G10 Economies

**Cristina Tessari**
+1(212)902-7946 | cristina.tessari@gs.com
Goldman Sachs & Co. LLC

**Zach Pandl**
+1(212)902-5699 | zach.pandl@gs.com
Goldman Sachs & Co. LLC

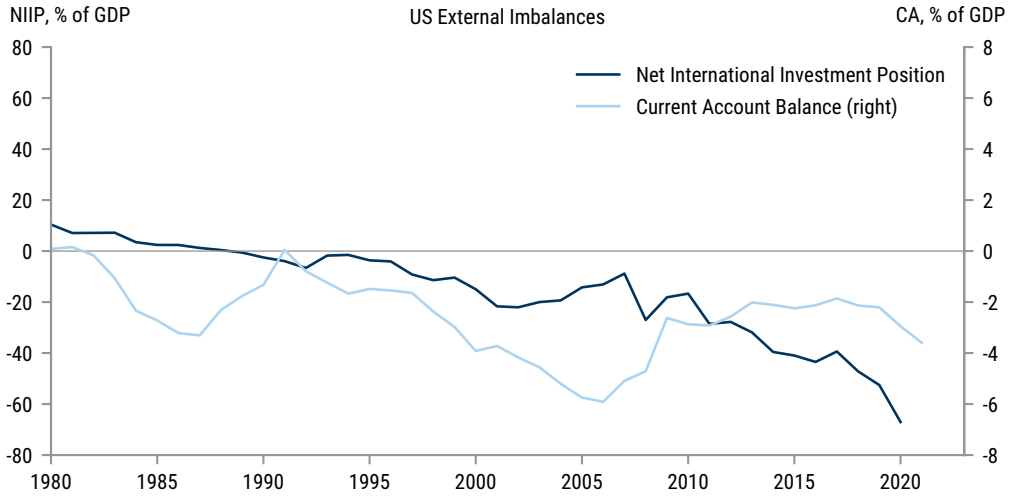


- The US current account balance has deteriorated significantly since the start of the pandemic. And as a result of cumulative current account deficits in prior years, the US now runs the largest Net International Investment Position (NIIP) deficit among major economies in both Dollar terms and as a share of GDP. Continued Dollar strength, wider current account deficits, and the large stock of foreign liabilities have again raised questions around the sustainability of the US balance of payments position.
- In this report we evaluate external balances for the US and other G10 economies. Using a panel regression framework similar to the IMF's External Balance Assessment, we estimate a current account "norm" for the US of -2.2% of GDP. Our estimated current account norms are also slightly negative for the UK, Australia, and New Zealand, but positive for Norway, Switzerland, and Japan; the Euro Area norm is close to zero.
- For the US we complement this analysis by estimating the current account balance that would stabilize the NIIP, conditional on nominal GDP growth, or considering typical returns on US foreign assets and liabilities. These approaches arrive at a sustainable current account balance of -2.0 to -2.7% of GDP.
- Using our estimated current account norms, we calculate the degree of misalignment in trade-weighted exchange rates based on our GSFEER framework. As of Q1 2021 the US current account balance was -3.6% of GDP, wider than the sustainable norm. According to our GSFEER model (which incorporates a few additional variables), this gap implies that the trade-weighted US Dollar is overvalued by 13%.
- The current account balance is primarily a macroeconomic phenomenon and, accordingly, policies that adjust macroeconomic conditions are the most effective tools for tackling undesirable global imbalances. The US fiscal deficit is set to shrink next year, and this may help bring down the current account deficit. However, if the current account deficit remains relatively wide, Dollar depreciation may eventually be required to achieve external balance.

# Evaluating External Balances in G10 Economies

The US current account balance has deteriorated significantly since the start of the pandemic (Exhibit 1). Our economists estimate that deficit will total 3.6% of GDP in 2021, the largest since 2008. The widening reflects a speedy domestic demand recovery—partly resulting from several rounds of fiscal stimulus—as well a relatively sluggish rebound in some important trading partners. The counterpart to ongoing deficits is an increase in the country's stock of foreign borrowing. According to the IMF's latest External Sector Report, the US is by far the most indebted country in the world in Dollar terms. At the end of 2020, the US owed $14 trillion more to the rest of the world than the rest of the world owed to the US. This Net International Investment Position (NIIP) deficit represents 67% of US GDP, up from about 50% at the end of 2019.

**Exhibit 1: A wider current account deficit through the pandemic**




Source: Goldman Sachs Global Investment Research, Haver Analytics

The sharp increase in US foreign liabilities, both in gross and net terms, has raised questions regarding the sustainability of the US balance of payments position, and the potential implications for the Dollar outlook. However, as we discuss further below, whether a current account deficit should be considered problematic depends on country-specific norms. For example, because the US issues the world's reserve currency it is able to borrow at relatively low yields—what economists sometimes call the "exorbitant privilege"—while investing foreign assets in higher-yielding instruments. Partly because of the return differential on its assets and liabilities, the US continues to run a positive net investment income balance (i.e. receipts from investments abroad exceed payments to foreigners for their US investments) despite a deeply negative NIIP.

In this *Global Markets Analyst*, we update the methodology used to compute current account "norms" in developed economies. For the US, we also complement this analysis by calculating the current account balance that would stabilize the NIIP under certain assumptions. Once the norm and the respective deviations from the norm are determined, we use our GSFEER FX valuation framework to determine the required FX adjustment to close the gap between the current account balance and its norm. For the

US we find a current account norm of -2.2% of GDP, which is also roughly the level required to stabilize the NIIP. Given today's current account deficit, this norm implies that the trade-weighted Dollar is 13% overvalued on our GSFEER framework. This valuation gap could close either from Dollar depreciation or other factors that bring the current account balance closer to its norm (e.g. domestic fiscal consolidation).

## Modeling Global Current Account Balances

Current account balances are an accounting identity, and it is not clear that current account surpluses are necessarily any better for growth than deficits. In some cases, current account imbalances can be appropriate; for example, to smooth out the effect of country-specific shocks or to allow savings to go where they are most productive. Current account balances can, however, become excessive, that is, larger than warranted by the economy's fundamentals. Thus, the main challenge when computing current account norms is to determine how much of an external deficit (or surplus) is appropriate and how much is an "excess" deficit (or surplus) relative to a given country's fundamentals.

To produce an estimate of fundamental current accounts we adopt a panel regression-based approach that relates current accounts (as % of GDP) to a set of macro variables aimed at capturing the fundamental drivers of countries' long-term savings and investment behavior. Our current account model builds on the extensive literature on the macroeconomic determinants of saving and investment decisions[1], and resembles the approach of the IMF's External Balance Assessment (EBA) framework. Because there are many complex drivers of current account balances, no single model is likely to give the right answer in identifying excess imbalances for every country, and any estimate comes with significant uncertainty. Following the latest IMF's EBA report, we combine current account determinants into four main groups: (1) cyclical factors; (2) macroeconomic fundamentals; (3) structural fundamentals; and (4) policy variables:

1. **Cyclical factors:**
   - **Output gap:** The impact of output gaps on current account balances depends on whether business cycles are synchronized. When a single country experiences a cyclical downturn, its current account balance is expected to improve along with its trade balance because its imports shrink while its exports are not affected. However, when many countries simultaneously experience economic weakness, both exports and imports for each country will contract. To account for differential effects when business cycles are not synchronized, the output gap is measured in relative terms with respect to the world average.
   - **Commodity terms of trade gap:** Short-term fluctuations of commodities terms of trade are expected to affect the current account as the associated temporary income gains (losses) arising from terms of trade shocks are

[1] Chinn and Prasad (2003), Edwards (2007)

normally matched by higher saving (dissaving).

2. **Macroeconomic fundamentals:**

- **NIIP (lagged)**: Most current account specifications include the NIIP as an explanatory variable, with an expected sign that is ambiguous a priori. On the one hand, a substantially negative NIIP will entail a negative income balance, thus weighing on the current account balance. On the other hand, inter-temporal considerations suggest that a negative NIIP may raise sustainability concerns and thus exert upward pressure on the trade balance. In general, the positive net income effect outweighs the negative trade balance effect, implying that countries with larger NIIP positions tend to exhibit higher current account balances. Because the NIIP position is, in effect, the accumulation of past current account balances, the lagged value of the position, expressed as a ratio to GDP, should be entered into the regressions to avoid correlation with the independent variable.
- **Output per worker (lagged):** This term aims at capturing the stage of development of a country, based on the idea that richer countries are expected to export capital to poorer countries by running higher-than-otherwise current account balances, while the opposite would be expected for poorer economies. To measure this effect, we consider a country's GDP per working age population (in PPP terms) relative to the average of the top three economies (Germany, Japan, and the United States), to proxy for a country's distance from the world frontier.
- **Expected real GDP growth (one-year ahead)**: This variable drives both investment and savings decisions. Higher expected output growth is likely to lead to higher investment, in anticipation of higher returns to capital, as well as higher consumption and lower saving to the extent that households engage in consumption smoothing. Both effects operate in the same direction, implying that strong expected growth lowers current account balances.
- **Reserve currency status:** Countries that issue reserve currencies, especially the United States, play a unique role in the global financial system. Their status contributes to the demand of assets denominated in the domestic currency, reducing the risk of balance of payment crises and improving external financing conditions, thus allowing for a reduced external constraint.[2]
- **Openness:** A country's degree of openness to international trade, measured as total exports and imports as a share of GDP, can reflect industrial policy choices, including tariff regimes. Developing countries which are highly open to international trade may run higher current account deficits since they have to import a lot of intermediate goods and machinery from developed countries. Widening current account positions could also result in part from increasing globalization, which increases cross-border trade and financial capital flows.

[2] See, for instance, Gourinchas and Rey (2014).

3. **Structural fundamentals:**

   - **Demographics:** Generally, countries with a relatively high share of young or a high share of elderly tend to dissave, while countries with a higher proportion of prime-aged savers will tend to save more. To capture the age-composition effect on current account balances, we include three variables: population growth (which partly proxies the share of young), the old-age dependency ratio, and the share of prime-aged savers as a proportion of the total working age population.
   - **Exhaustible oil and natural gas resources:** Exporters of natural resources are expected to save a portion of their export income in anticipation of future depletion, leading to higher current account balances. The fraction of natural resource exports that is saved often depends on the temporariness of this source of income (that is, countries would save more, the more temporary this income is). Thus, aimed at capturing this effect, the model includes a variable that combines the size of the oil and natural gas balance (as % of GDP), and a measure of its degree of temporariness based on the ratio of current extraction to proven reserves.

4. **Policy variables:**

   - **Private credit over GDP gap**: Generally, the current account deteriorates in countries that experience credit booms, with the opposite occurring during credit busts.
   - **Fiscal policy:** The government budget balance is usually positively related to the current account balance. In other words, higher levels of public saving across countries tend to be associated with larger current account surpluses (or smaller current account deficits). The magnitude of such effect depends, among other things, on the extent of private sector offset. If Ricardian equivalence holds, private consumption would tend to offset the change in government spending in anticipation of future changes in taxes, in which case the effect on the current account would tend to be only partial. On the other hand, fiscal policy may also have supply-side effects that can be expansionary (via public investment) or contractionary (if fiscal policy entails changing distortionary taxes).

Our regression sample covers an unbalanced panel of 15 countries for the period 1989-2019; we exclude 2020 to avoid distortions from the pandemic. As the sample used for the estimation needs to span a sufficiently large cross-country dimension, both advanced and emerging economies are included (all G10 countries and the largest five emerging markets economies: Brazil, Russia, India, China, and Mexico), although we only update the G10 norms in our GSFEER framework. Country fixed effects are not included in our panel regressions since they do not provide an economic explanation of observed current account balances and may simply pick up the impact of many of the fundamentals that evolve only gradually over time.

The estimated model is described by the following equation:

$$\frac{CA}{GDP} = \alpha + X^{cyc\prime}\beta^{cyc} + X'\beta + P'\gamma + e,$$

where country and time subscripts have been omitted to simplify the notation. The set of policy variables are summarized in the vector P. All macroeconomic and structural variables are summarized in the vector X, whereas the vector $X^{cyc}$ includes the cyclical factors.

Following the literature, we specify most regressors as deviations from a GDP-weighted global average. This transformation ensures stationarity of the explanatory variables. It also provides a straightforward interpretation for the transformed variables, which can be seen as deviations from a common norm, corresponding to world averages. This implies that, for instance, population aging will affect a country's current account balance only to the extent that the country is aging faster or slower than the world average. Similarly, the fiscal balance affects the current account only if other countries maintain different fiscal balances.

Exhibit 2 reports the current account regression results. In general, the sign and magnitude of the estimated coefficients correspond to those found in previous studies. The regression is able to explain almost 80% of the variance of the dependent variable despite the omission of country fixed effects and a lagged dependent variable.

**Exhibit 2: Baseline current account regression**

| Current account regressions | |
|---|---|
| Independent variable | Current account ( as % of GDP) |
| *Cyclical factors* | |
| Output gap | -0.1876*** |
| | [-5.1916] |
| Commodity terms of trade gap | 0.0027*** |
| | [2.732] |
| *Macroeconomics fundamentals* | |
| NIIP/GDP (lagged) | 0.0374*** |
| | [4.8398] |
| Output per worker (lagged) | 0.0009*** |
| | [4.6242] |
| Expected GDP growth 1-year ahead | 0.3632*** |
| | [4.6295] |
| Reserve currency status | -0.0430*** |
| | [-3.1168] |
| Openness | 0.0395** |
| | [2.4491] |
| EM dummy | 0.0522*** |
| | [3.8572] |
| *Structural fundamentals* | |
| Population growth | -3.3871*** |
| | [-5.7414] |
| Old dependency ratio | -0.0399 |
| | [-0.9744] |
| Share of prime-aged savers | 0.0301 |
| | [0.6379] |
| Exhaustible resources of oil and natural gas | -0.037 |
| | [-0.5960] |
| *Policy variables* | |
| Private credit/GDP gap | -0.0559*** |
| | [-4.3650] |
| General government fiscal balance/GDP | 0.1959* |
| | [1.9401] |
| Number of observations | 425 |
| R-squared | 0.79 |
| F-statistic | 108.5 |
| Fixed effects | No |
| Number of countries | 15 |

Note: *, **, and *** denote significance at 10%, 5%, and 1%, respectively. Robust t-statistics are reported in square brackets. The sample period is 1989 to 2019.

Source: Goldman Sachs Global Investment Research

## Obtaining Current Account Norms

The current account norm is defined as the current account balance implied by all underlying macroeconomic fundamentals at their actual values, assuming all policy variables are set at their desirable levels $P^*$, and excluding cyclical factors, that is:

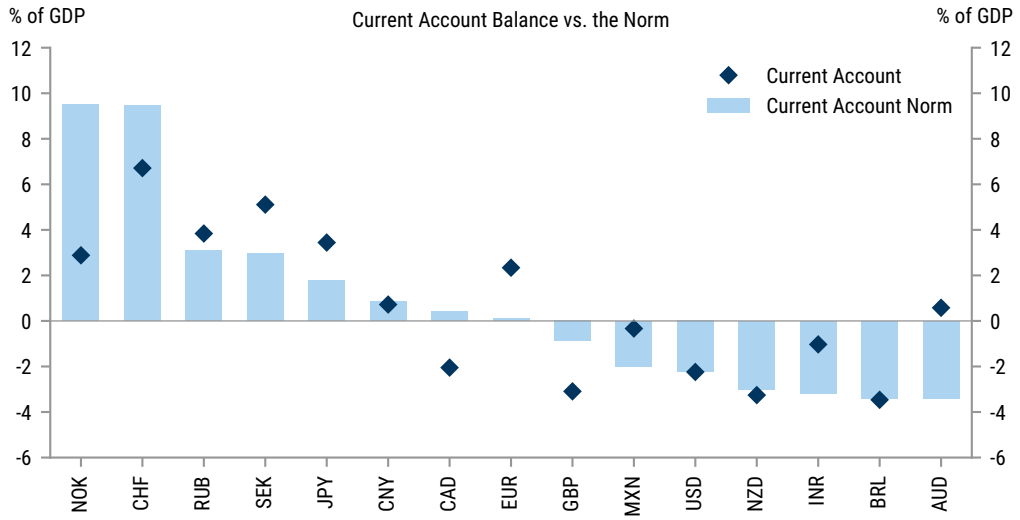
$$CA\ norm = \hat{\alpha} + X'\hat{\beta} + P^{*\prime}\hat{\gamma},$$

where the hat denotes estimates. In this way, the norm excludes the influence of the

output gap, budget deficit, and other non-structural variables on the current account balance.

Exhibit 3 reports current account balances against the model-implied norms for 2019, which we also carry over for 2020-21. As shown in the chart, for all countries except Australia and Canada, the actual current account balance and its corresponding norm have the same sign, implying that countries whose fundamentals justify negative (positive) current account norms also tend to exhibit current account deficits (surpluses). For the US, we estimate a current account norm of -2.2% of GDP.

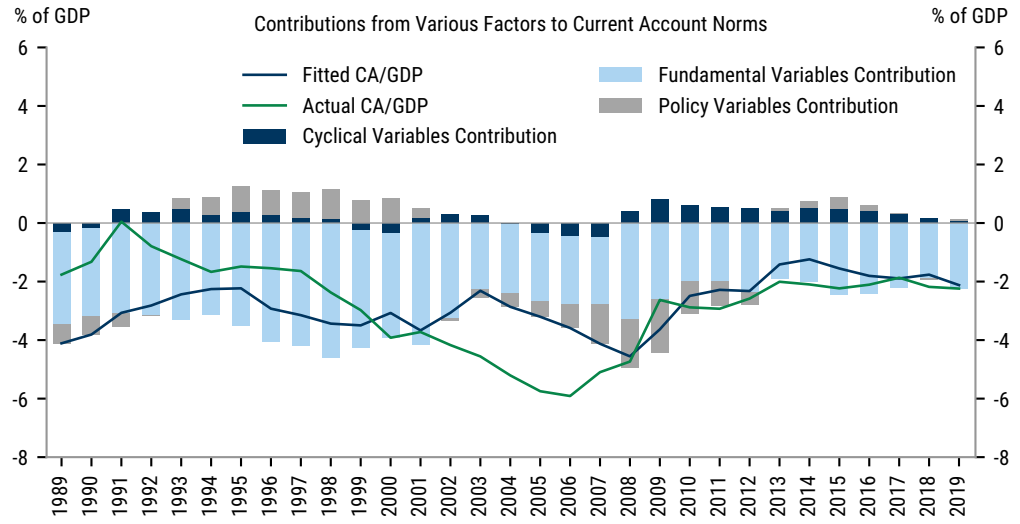
**Exhibit 3: In-sample current account norms for 2019**




Source: Goldman Sachs Global Investment Research, Haver Analytics

Exhibit 4 shows the contributions from various factors to the US current account. It is worth noting that the relation between current account balances and the fitted values from our model is quite strong over time. The chart shows that US current account balances are driven primarily by economic fundamentals, followed by policy variables.

**Exhibit 4: US current account is driven primarily by economic fundamentals**




Source: Goldman Sachs Global Investment Research, Haver Analytics

# Cross-Checking with Current Account Sustainability

For the United States specifically, to complement our panel model approach to current account norms, we also assess sustainability from the perspective of the country's NIIP. The NIIP, which represents the difference between US residents' foreign financial assets and liabilities, is a key determinant (along with rates of return) of US net investment income (NII): the sum of receipts on foreign assets owned by US residents net of payments on foreign claims on US residents. For this reason, the academic literature argues that a necessary condition for current account sustainability is that the NIIP/GDP ratio be stable.[3] Otherwise, if the (negative) NIIP/GDP ratio were to rise without limit, the ratio of net investment payments to GDP would rise as well, and could eventually exceed GDP. Thus, as a cross-check to our previous analysis, we determine the current account balance that would stabilize the NIIP position over the medium term at a benchmark or desired level.[4] This analysis constitutes a relevant starting point for the assessment of external sustainability for the US.

### NIIP-Stabilizing Current Account Balances

Leaving aside errors and omissions, the change of the NIIP position between two consecutive periods can be expressed as a function of the current account balance (CA) and NIIP valuation changes (VC):

$$NIIP_t - NIIP_{t-1} = CA_t + VC_t.$$

Assuming, for simplicity, that valuation effects net out to zero, we can rewrite the previous expression in terms of nominal GDP as:

$$ca_t = niip_t - \frac{1}{(1+g_t)} niip_{t-1},$$

where lowercase variables denote ratios to nominal GDP, and $g_t$ denotes the growth rate of nominal GDP. In the steady-state, $niip_t = niip_{t-1}$, and the current account balance ($ca^S$) that stabilizes the NIIP position at a given niip level is:

$$ca^S = \frac{g}{(1+g)} niip.$$

This expression illustrates that, for a debtor economy like the US, a lower growth rate requires a higher current account balance to stabilize the NIIP position at the desired level. For example, if in the steady state foreigners are willing to hold the equivalent of 35% of US GDP in the form of net US assets, the US could sustain a current account deficit of (only) 1% of GDP (assuming a 3% growth rate for the GDP).[5] If, on the other hand, foreigners' net demand for US assets grows to 67% of GDP—which, as shown in Exhibit 1, was approximately the level of NIIP position by the end of 2020—the US sustainable current account deficit is 2% of GDP. And if foreigners' are willing to hold (net) US assets for the equivalent of 100% of GDP—a figure that many researchers and

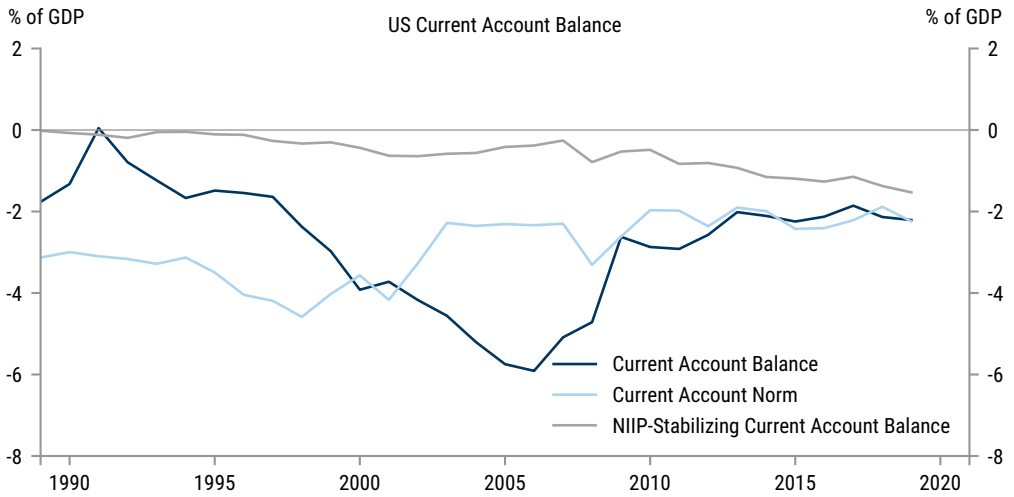
[3] For more details, see Mann (1999, 2002, 2003); Mussa (2004); Cline (2005); and Edwards (2005).

[4] The exercise is performed in a similar spirit to IMF's External Balance Assessment.

[5] The GDP annual growth rate in the U.S. averaged 3.12 percent from 1948 until 2021.

policymakers consider to be implausible—the sustainable US current account deficit can be as high as 3% of GDP. Exhibit 5 illustrates this point by presenting the current account balance that would stabilize the NIIP position over time.[6]

**Exhibit 5: US NIIP-stabilizing current account balance**




Source: Goldman Sachs Global Investment Research, Haver Analytics

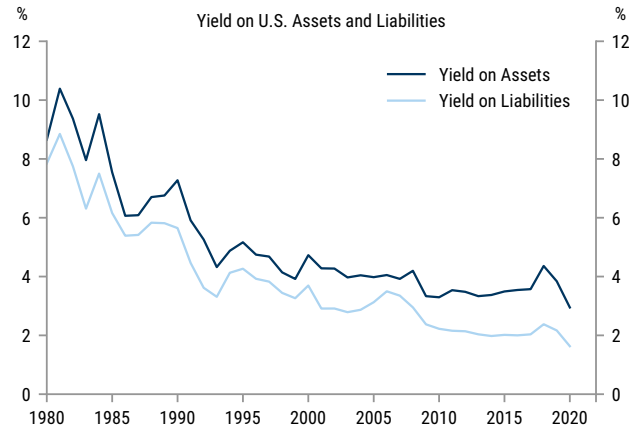
## Looking Ahead: NIIP Position and Return Differentials

The NIIP does not fully summarize the sustainability of the external position. As will be discussed further below, depending upon the rate of return, the same NIIP may be associated with very different net investment income flows.

Exhibit 6 shows the rate of return earned by US residents on their foreign assets (yield on assets) and the rate of return received by foreign investors on their US assets (yield on liabilities). As shown in the chart, the average yield on US assets has consistently exceeded the one on its liabilities—the "exorbitant privilege" discussed above. Moreover, even with a substantial negative NIIP, on net the US earns income on its net international position (Exhibit 7). Furthermore, not only is US net international income positive—it amounted to $196 billion in 2020 (or 1% of GDP)—but over time it has improved even as the net investment position has deteriorated.

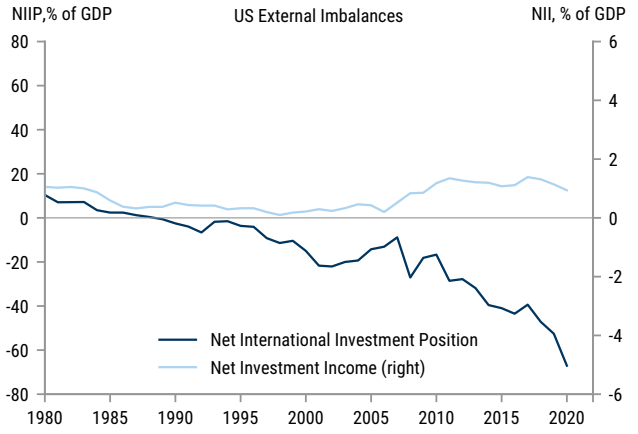
[6] When computing NIIP-stabilizing current account balances, we assume a 3% growth rate for the GDP.

**Exhibit 6: The average yield on US assets has consistently exceeded the one on its liabilities**




Source: Goldman Sachs Global Investment Research, Haver Analytics

**Exhibit 7: The negative NIIP and positive NII paradox**




Source: Goldman Sachs Global Investment Research, Haver Analytics

With these relationships in mind, we perform a sensitivity analysis with respect to changes in returns on US assets and liabilities. The goal of this exercise is to show how the trade balance that stabilizes the NIIP position changes depending on future return differentials. We then approximate the sustainable current account balance based off of the sustainable trade balance (the largest component of the US current account).

We first rewrite the current account (as % of GDP) as a sum of different components:

$$ca_t = tb_t + ib_t + nib_t + re_t + ntr_t,$$

where $tb_t$ is the trade balance, $ib_t$ is net investment income, $nib_t$ is the non-investment primary income, $re_t$ are reinvested earnings, $ntr_t$ are net current transfers, and all variables are defined as a share of current GDP. As $NIIP_t = A_t - L_t$, where A and L are the stocks of assets and liabilities, respectively, we can rewrite the net investment income, $ib_t$, as $r_{t,A}A_{t-1}-r_{t,L}L_{t-1}$. After some algebraic manipulations, it can be shown that the "sustainable" trade balance (as % of GDP) is given by[7]

$$tb^S \cong (g - r_A)a - (g - r_L)l.$$

The previous equation implies that the sustainable trade balance depends on two key parameters: The stock of assets and liabilities and the corresponding yields. Exhibit 8 reports the corresponding NIIP-stabilizing trade balances (as % of GDP) for the US for alternative values of returns on assets and returns on liabilities, assuming a 3% growth rate for GDP. If we assume that the returns on US assets and liabilities reported in Exhibit 6 were to remain constant over time, that is, $r_A$=3% and $r_L$=1.5%, the results in the previous table imply that the trade balance that stabilizes the NIIP position would be something around -3.3% of GDP. Over the last ten years, the US current account deficit has averaged 0.6pp smaller as a share of GDP than the trade balance. Therefore, this exercise implies a sustainable current account balance, given relative returns on US foreign assets and liabilities, of about -2.7%.

[7] For simplicity, we assume that the sum of the non-investment primary income, the reinvested earnings, and the net current transfers is zero.

**Exhibit 8: NIIP-stabilizing trade balance (% of GDP)**

| Return on assets (%) \ Return on liabilities (%) | 1.0 | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 | 4.5 | 5.0 | 5.5 | 6.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.0 | -1.3 | -0.2 | 0.9 | 2.0 | 3.1 | 4.2 | 5.3 | 6.4 | 7.5 | 8.6 | 9.7 |
| 1.5 | -2.1 | -1.0 | 0.1 | 1.2 | 2.3 | 3.4 | 4.5 | 5.6 | 6.7 | 7.9 | 9.0 |
| 2.0 | -2.9 | -1.8 | -0.7 | 0.4 | 1.5 | 2.7 | 3.8 | 4.9 | 6.0 | 7.1 | 8.2 |
| 2.5 | -3.7 | -2.5 | -1.4 | -0.3 | 0.8 | 1.9 | 3.0 | 4.1 | 5.2 | 6.3 | 7.4 |
| 3.0 | -4.4 | -3.3 | -2.2 | -1.1 | 0.0 | 1.1 | 2.2 | 3.3 | 4.4 | 5.5 | 6.6 |
| 3.5 | -5.2 | -4.1 | -3.0 | -1.9 | -0.8 | 0.3 | 1.4 | 2.5 | 3.7 | 4.8 | 5.9 |
| 4.0 | -6.0 | -4.9 | -3.8 | -2.7 | -1.5 | -0.4 | 0.7 | 1.8 | 2.9 | 4.0 | 5.1 |
| 4.5 | -6.7 | -5.6 | -4.5 | -3.4 | -2.3 | -1.2 | -0.1 | 1.0 | 2.1 | 3.2 | 4.3 |
| 5.0 | -7.5 | -6.4 | -5.3 | -4.2 | -3.1 | -2.0 | -0.9 | 0.2 | 1.3 | 2.4 | 3.6 |
| 5.5 | -8.3 | -7.2 | -6.1 | -5.0 | -3.9 | -2.8 | -1.6 | -0.5 | 0.6 | 1.7 | 2.8 |
| 6.0 | -9.1 | -8.0 | -6.8 | -5.7 | -4.6 | -3.5 | -2.4 | -1.3 | -0.2 | 0.9 | 2.0 |

Source: Goldman Sachs Global Investment Research, Haver Analytics

# Applying the GSFEER Framework

Once the current account norms and the respective deviations from the norm are determined, the next step is to incorporate additional factors and determine the size of the required FX moves using our existing Goldman Sachs Fundamental Equilibrium Exchange Rate (GSFEER) framework. The general idea behind the GSFEER model is to map the external (and internal) imbalances in the economy onto a required FX adjustment, estimating how much currency appreciation or depreciation would be needed to close an economy's current account deviation from its norm.

The GSFEER model parameters were estimated by our EM colleagues in earlier work. In a panel framework, they regress future three-year changes in the real effective exchange rate (REER) on (i) the deviation of the current account (CA) from its norm at the beginning of the period; (ii) lagged changes in the REER (up to 16 quarters), to reflect the fact that it takes time for real exchange rate changes to feed through to current account and (iii) domestic output gaps (OG), to reflect the fact that the adjustment might come through the demand channel. They also control for changes in the VIX and country fixed effects. The equation below shows the final mapping from the input variables to the REER misalignment (with rounded coefficients):

$$\Delta REER_{t,t+12} = \frac{1}{(EXP/GDP)_t}(CA_t - CA_t^*) + 1.05OG_t - 0.6\Delta REER_{t-1,t}$$
$$-0.5\Delta REER_{t-3,t-1} - 0.45\Delta REER_{t-6,t-3}$$
$$-0.3\Delta REER_{t-9,t-6} - 0.1\Delta REER_{t-16,t-9}$$

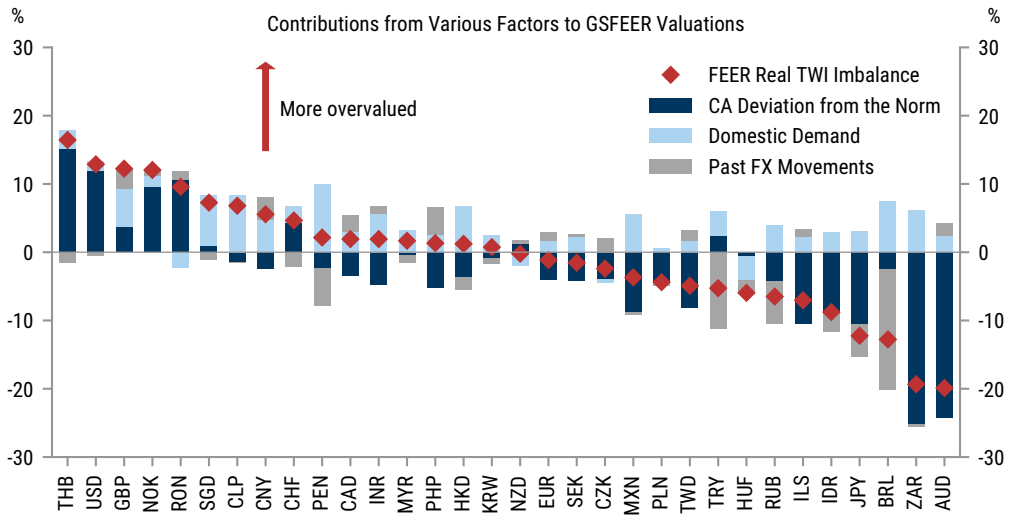
where CA* denotes the "sustainable" current account balance, EXP/GDP is the exports share of GDP, and OG the output gap.[8] Two key inputs into the GSFEER model therefore (apart from the lagged FX changes) involve assumptions on what constitutes internal

[8] To support the idea that it takes larger FX adjustments to close the same current account gap in closed economies than in open, we interact the current account deviation from its norm with the inverse of the exports share of GDP (EXP/GDP).

and external balance. For the latter, we assume that CA* is given by the average of our estimate of the current account norm and the 10-year moving average of the current account.[9] For the internal balance, we assume that it is achieved when output is in line with potential. Together with the methodological changes to our current account norms for G10 economies described above, we have also updated the methodology behind the output gap estimates. In particular, we employ updated estimates based on the same methodology presented in a recent *Global Markets Analyst*, consisting of a simple HP-filter approach on real GDP, with lambda = 10,000 (smoother than conventional practice). We estimate the output gaps on quarterly real GDP series, which are extended using our economists' GDP forecasts, in order to at least partially address the 'end-point bias' of this simple estimation approach, as our long-term output forecasts often assume a gradual convergence towards potential. We further calibrate the output gaps by assuming potential growth to linearly trend between the estimated value at end-2013 to the estimated value at end-2024, to limit the impact that the Covid-19 crisis creates on potential output estimates using the simple filtering approach.

Exhibit 9 shows contributions from various factors to GSFEER valuations. In general, for countries with positive current account gaps—defined as the deviation of the current account balance from its model-implied norm—the GSFEER model implies negative real TWI imbalances. The intuition for this result is simple. Consider the case of Australia, for instance. It has an actual current account surplus of about 0.6% of GDP and, on our estimates, a current account norm of about -3.4% (Exhibit 3). In this case, the underlying current account balance is above its sustainable level, implying that the trade-weighted Australian dollar would need to appreciate to restore external balance.

**Exhibit 9: Current account "gaps" remain one of the main drivers of GSFEER valuations**
Positive numbers reflect overvaluation




Source: Goldman Sachs Global Investment Research, Haver Analytics

Exhibit 10 summarizes the results from our GSFEER model for Q1 2021. Following

[9] For emerging market economies, CA* is the average of three metrics: (i) the 10-year moving average of the current account, (ii) our economists' estimate of the current account norm where available, and (iii) the model-implied current account "norms" estimated by our EM colleagues in earlier work (see "EM FX - Back to assessing value", *Global Markets Analyst*, September 10, 2018).

previous iterations of the GSFEER model (for example, here and here), we also report the valuations from our GSDEER model, which tries to estimate an equilibrium real exchange rate based on relative productivity and terms of trade differentials. To summarize the broad message on valuation, we report a simple weighted average of the two approaches (with the weights inversely related to the volatility of the valuation measures).

**Exhibit 10: GSFEER and GSDEER valuations vs. the USD and on the TWI basis**
Positive numbers reflect overvaluation

| | | | | | Bilateral | | | Trade-weighted | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Spot | GSFEER | GSDEER | WA* | GSFEER | GSDEER | WA | GSFEER | GSDEER | WA |
| **G10** | | | | | | | | | | |
| **USD** | | | | | | | | 12.9% | 10.5% | 11.5% |
| **EUR/$** | 1.17 | 1.37 | 1.28 | 1.32 | -14.7% | -8.7% | -11.1% | -1.2% | 1.9% | 0.7% |
| **GBP/$** | 1.38 | 1.42 | 1.36 | 1.38 | -2.6% | 1.3% | -0.3% | 12.2% | 12.5% | 12.4% |
| **AUD/$** | 0.76 | 1.07 | 0.87 | 0.95 | -28.9% | -12.8% | -19.2% | -19.9% | -6.7% | -12.0% |
| **NZD/$** | 0.70 | 0.82 | 0.70 | 0.75 | -15.3% | 0.0% | -6.1% | -0.2% | 6.0% | 3.5% |
| **$/CAD** | 1.26 | 1.22 | 1.21 | 1.21 | -3.0% | -4.1% | -3.6% | 1.9% | -1.4% | -0.1% |
| **$/CHF** | 0.95 | 0.86 | 0.97 | 0.92 | -9.3% | 2.1% | -2.5% | 4.7% | 11.2% | 8.6% |
| **$/NOK** | 8.56 | 8.41 | 6.78 | 7.43 | -1.8% | -20.8% | -13.2% | 12.0% | -11.9% | -2.4% |
| **$/SEK** | 8.73 | 7.45 | 6.59 | 6.93 | -14.7% | -24.6% | -20.6% | -1.5% | -16.4% | -10.4% |
| **$/JPY** | 110.75 | 85.56 | 94.44 | 90.89 | -22.7% | -14.7% | -17.9% | -12.2% | -9.8% | -10.8% |
| **EMEA** | | | | | | | | | | |
| **$/CZK** | 22.25 | 18.53 | 22.37 | 20.83 | -16.7% | 0.5% | -6.4% | -2.4% | 12.2% | 6.4% |
| **$/HUF** | 308.79 | 248.17 | 248.88 | 248.59 | -19.6% | -19.4% | -19.5% | -6.0% | -10.7% | -8.8% |
| **$/PLN** | 3.95 | 3.22 | 3.18 | 3.19 | -18.5% | -19.6% | -19.2% | -4.4% | -10.8% | -8.2% |
| **$/RUB** | 75.63 | 60.19 | 67.76 | 64.73 | -20.4% | -10.4% | -14.4% | -6.5% | -0.3% | -2.8% |
| **$/TRY** | 8.26 | 6.60 | 3.96 | 5.02 | -20.0% | -52.1% | -39.2% | -5.3% | -48.9% | -31.5% |
| **$/ILS** | 3.34 | 2.74 | 3.68 | 3.30 | -18.0% | 10.0% | -1.2% | -7.0% | 19.5% | 8.9% |
| **$/ZAR** | 14.77 | 10.34 | 10.24 | 10.28 | -30.0% | -30.7% | -30.4% | -19.3% | -27.5% | -24.2% |
| **Americas** | | | | | | | | | | |
| **$/BRL** | 5.63 | 4.32 | 3.42 | 3.78 | -23.3% | -39.3% | -32.9% | -12.8% | -34.6% | -25.9% |
| **$/MXN** | 20.42 | 18.70 | 17.68 | 18.08 | -8.4% | -13.4% | -11.4% | -3.7% | -11.4% | -8.3% |
| **$/CLP** | 720.45 | 672.49 | 572.29 | 612.37 | -6.7% | -20.6% | -15.0% | 6.8% | -12.9% | -5.0% |
| **$/PEN** | 3.74 | 3.41 | 2.96 | 3.14 | -8.9% | -21.0% | -16.2% | 2.2% | -14.3% | -7.7% |
| **Asia** | | | | | | | | | | |
| **$/CNY** | 6.56 | 5.88 | 5.61 | 5.72 | -10.3% | -14.4% | -12.8% | 5.6% | -9.2% | -3.3% |
| **$/HKD** | 7.77 | 6.96 | 7.69 | 7.40 | -10.5% | -1.1% | -4.9% | 1.2% | 7.5% | 5.0% |
| **$/INR** | 73.17 | 63.06 | 73.92 | 69.58 | -13.8% | 1.0% | -4.9% | 1.9% | 7.5% | 5.3% |
| **$/KRW** | 1128.70 | 976.47 | 1238.37 | 1133.61 | -13.5% | 9.7% | 0.4% | 0.7% | 20.3% | 12.5% |
| **$/MYR** | 4.14 | 3.64 | 3.46 | 3.54 | -12.0% | -16.4% | -14.6% | 1.7% | -11.7% | -6.4% |
| **$/SGD** | 1.35 | 1.24 | 1.45 | 1.37 | -7.8% | 8.1% | 1.7% | 7.3% | 13.3% | 10.9% |
| **$/THB** | 31.23 | 31.21 | 32.59 | 32.04 | -0.1% | 4.4% | 2.6% | 16.4% | 12.0% | 13.8% |
| **$/IDR** | 14567.00 | 11525.08 | 15266.74 | 13770.08 | -20.9% | 4.8% | -5.5% | -8.8% | 11.1% | 3.2% |
| **$/PHP** | 48.52 | 42.91 | 54.49 | 49.86 | -11.6% | 12.3% | 2.8% | 1.3% | 18.1% | 11.4% |

*WA is the weighted average (0.4 x GSFEER + 0.6 x GSDEER).

Source: Goldman Sachs Global Investment Research

As of Q1 2021, the US current account balance was -3.6% of GDP, and the estimated norm was -2.2%, implying a current account "gap" of -1.4pp. Applying the GSFEER equation shown above—which also incorporates information on the output gap and past FX movements—we estimate that the trade-weighted Dollar is overvalued by 13%. The

IMF's EBA uses a slightly different estimate for the elasticity of the current account balance to changes in the exchange rate. Using the IMF's approach, a US current account gap of -1.4pp would imply Dollar overvaluation of 7%.[10] On the one hand, our results suggest much more modest Dollar overvaluation compared to certain periods in the past. During 2006, for example, our GSFEER framework implied that the Dollar was as much as 25% overvalued. On the other hand, the latest deterioration in the current account balance has occurred despite a near-zero net oil trade balance. The secular increase in the net oil trade balance—as result of domestic shale oil production—may have obscured a worsening in US trade competitiveness in recent years.

## Concluding Remarks

The current account balance is primarily a macroeconomic phenomenon and, accordingly, policies that adjust macroeconomic conditions are the most effective tools for tackling undesirable global imbalances. A government may have little leverage over some determinants of the current account. For instance, a country with a young population will have less savings, and therefore a larger current account deficit, than a country in which a larger proportion of its population is in their prime earning years, all else equal. But there are policy options over which countries do have control. For example, the US could focus on raising national savings. An important component of national saving is government saving, that is, whether the government has a budget surplus or deficit. Recent estimates indicate that on average, a one percentage point increase in the government budget deficit raises the current account deficit by up to a half of a percentage point. As our colleagues noted in a recent report, US fiscal stimulus will decline over the next year, even with passage of the infrastructure bill and the Biden Administration's social spending plan. This may help bring the US current account deficit closer to its sustainable level. If the current account deficit remains wide even as fiscal stimulus fades, Dollar weakness may eventually be required to achieve external balance.

[10] However, the IMF also uses a smaller current account norm of -0.5%.

# Appendix: Variable Definitions

| Variable | Definition |
|---|---|
| NIIP/GDP | This variable enters directly in level terms. NIIP data are an updated and extended version of the Lane and Milesi-Ferreti (2007) EWN dataset. For countries and/or years where such estimates are not available, data from the IMF's BoP database is used. |
| Output per worker, relative to top 3 economies | Ratio of PPP GDP to working age population relative to average of Germany, Japan, and US, demeaned (in thousands). Data is from the OECD's Economic Outlook database. |
| Expected GDP growth (one year ahead) | GDP growth one year ahead from Consensus Economics is used to proxy for expected growth. |
| Reserve currency status | Share of the country's own currency in total stock of world reserves proxies. Data is available from the IMF's COFER database. |
| Exhaustible resources of oil and natural gas | Following the latest IMF's EBA publication, we define this variable as the net oil and gas external balance (five-year moving average, in percent of GDP) multiplied by a relative measure of temporariness, relative to the same ratio for Norway in 2010. Temporariness is defined as the ratio of current oil extraction to proven reserves published by the British Petroleum Statistical Review. This variable enters only when the of the oil and gas balance is positive. |
| Share of prime-aged savers | Current share of prime savers (ages 45-64) as a proportion of the total working-age population (ages 30-64). Data is available from the UN World Population Prospects. |
| Output gap | This variable is available from the OECD's Economic Outlook database. For countries and/or years where such estimates are not available, HP filtered estimates of the output gap (using real GDP growth from the IMF's WEO database) are used. |
| Commodity terms of trade gap | Ratio of the geometric weighted-average price of key commodity exports to the geometric weighted-average price of key commodity imports. To produce a cyclical gap measure, the time series is filtered by the HP procedure for each country. Data is available from the IMF's Commodity Terms of Trade database. |
| Old-age dependency ratio | Ratio of population aged over 65 divided by population between 30 and 64 years old. Data is available from the UN World Population Prospects. |
| Population growth | Annual growth rate of total population. Data is available from the UN World Population Prospects. |
| General government fiscal balance | For most countries and years, the general government fiscal balance from the OECD's Economic Outlook database is used. |
| Private credit to GDP gap | The private credit-to-GDP ratio is measured as total credit (bank and non-bank) provided to the non-financial private sector, excluding non-bank cross-border flows from the BIS Credit Statistics database. This variable is then detrended using a one-sided HP filter. |
| Openness | Average ratio of goods and services exports and imports to GDP. Data is from the OECD's Economic Outlook database. |

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