

# Many Creditors, One Large Debtor:

## Understanding The Buildup of Global Stock Imbalances after the Global Financial Crisis

Gian Maria Milesi-Ferretti

Hutchins Center on Fiscal and Monetary Policy  
The Brookings Institution

### Abstract

The past decade has seen a remarkable widening of global creditor and debtor positions in relation to world GDP, with the lion's share of net external liabilities accounted for by the United States, and a surge in net global claims particularly in advanced Europe and smaller economies of advanced Asia. This has occurred despite a compression in global current account imbalances. This paper explores the factors underpinning these developments, highlighting the role of the U.S. asset price boom and dollar appreciation in widening the net U.S. debtor position, and examines how, where, and to what extent those valuation gains are reflected in other countries' external accounts. It also looks at the economic and structural factors explaining the emergence of new large international creditors, highlighting common features but also important country-specific factors.

Corresponding address: Hutchins Center on Fiscal and Monetary Policy, The Brookings Institution, 1775 Massachusetts Ave, Washington, DC 20036. Email: [gmilesiferretti@brookings.edu](mailto:gmilesiferretti@brookings.edu).

*This paper was prepared for the IMF's 2022 Annual Research Conference in honor of Maurice Obstfeld. A revised version will be published in the IMF Economic Review. I am grateful to my discussants Emine Boz and Prachi Mishra, two anonymous referees, Cian Allen, Mai Dao, Philip Lane, Martin Schmitz, conference participants, and seminar participants at the BIS, Swiss National Bank, Bank of Korea, and the Korean Development Institute for useful comments. Alex Conner provided excellent research assistance and Eli Asdourian provided very helpful fact-checking.*

*The Brookings Institution is financed through the support of a diverse array of foundations, corporations, governments, individuals, as well as an endowment. A list of donors can be found in our annual reports published online [here](#). The findings, interpretations, and conclusions in this report are solely those of its author(s) and are not influenced by any donation.*



---

## Introduction

During the decade after the global financial crisis, global current account imbalances compressed sharply. The U.S. current account deficit declined in relation to U.S. GDP, and large pre-crisis deficits in “Southern” euro area countries and Central and Eastern European countries were reduced or turned into surpluses. On the other side of the ledger, surpluses in China and oil exporters declined relative to the previous decade.

Despite reduced current account imbalances, global creditor and debtor positions in relation to world GDP have widened sharply since 2010. On the debtor side, the United States accounts for the lion’s share of net external liabilities: Between 2010 and 2021 its net international investment position (NIIP) deteriorated by over \$15 trillion, from some 20% of GDP to close to 80% of GDP. On the creditor side, the surge in net global claims is primarily concentrated in advanced Europe and smaller economies of advanced Asia. Net external assets continued to rise in absolute terms also in the main creditor countries of the previous decade—oil exporters, Japan, and China—but to a more limited extent than in advanced Europe and the remainder of advanced Asia.

These developments raise a number of questions.

- What explains the dramatic build-up in U.S. external liabilities, particularly during a period of reduced external borrowing? Is this build-up fully reflected in creditor positions elsewhere?
- What macroeconomic and structural features help explain the rise in global net claims by new creditor countries? To what extent is the rise in claims linked to valuation gains on their U.S. claims?
- Do these stock imbalances raise external sustainability issues, and what shape can the adjustment process take?

The dynamics of external positions have important macroeconomic repercussions. They affect consumption and investment through balance sheet and wealth effects; they influence the transmission of monetary and fiscal policies via the exchange rate channel, which is an important mechanism by which international risk sharing operates. They can signal sustainability issues, providing warning signals of future exchange rate adjustments and external crises. In a world where the size of external assets and liabilities is large and growing, capital gains and losses triggered by changes in exchange rates and asset prices—the so-called valuation effects—take a prominent role in explaining the evolution of creditor and debtor positions, alongside current account dynamics.

While a sizable literature has discussed global imbalances prior to the global financial crisis (GFC) and how they unwound, the literature on these most recent questions remains relatively limited, outside of its coverage in the IMF External Sector Reports. For instance, the thorough literature review on global imbalances and valuation effects by Gourinchas and Rey (2014) covers data developments until 2010. In regard to the U.S., Milesi-Ferretti (2021), and Atkeson, Heathcote, and Perri (2022) have highlighted how the worsening in its external position over the past decade owes primarily to very large valuation effects, driven by the appreciation of the U.S. dollar and especially the run-up in U.S. equity prices, both in absolute terms and relative to the rest of the world. The first factor reduces the U.S. dollar value of U.S. claims denominated in foreign currency, thus worsening the U.S. NIIP, while the second factor increases

the size of U.S. equity liabilities (portfolio instruments and FDI) relative to the size of U.S. assets. These effects had operated in reverse during the previous decade, limiting the accumulation of U.S. external liabilities despite large external borrowing (as documented in Gourinchas and Rey, 2007b and 2022 and Lane and Milesi-Ferretti, 2009).

With regard to the second question, it is addressed only partially in a parallel literature that has focused on explaining the pattern of current account deficits and surpluses rather than the evolution of creditor and debtor positions. A good example is Chinn (2017), who builds on an older current account regression literature (Chinn and Prasad, 2003) adding inter alia variables capturing the role of foreign exchange intervention (along the lines of Gagnon, 2012 and Bayoumi et al., 2015).<sup>1</sup> Related research has tried to explain the rise in private saving in surplus countries. Dao and Maggi (2018) highlight rising gross saving and net lending of non-financial corporates across major advanced economies over the last two decades, most pronounced in countries with persistent current account surpluses. Allen (2019) documents how shifts in the balance sheet of non-financial corporations and the government play an important role in diverging current account dynamics during periods of large and persistent external imbalances. Koomen and Wicht (2022) find that a fully funded pension system is associated with a stronger current account balance, an effect increasing with the system's generosity. Dao (2023) explores the link between wealth inequality and private savings in Germany, the largest of the creditor countries in advanced Europe. However, we are not aware of papers trying to ascertain which countries are "on the other side of the ledger" for the very large valuation changes driving the U.S. position.

This paper makes three related contributions. The first is to provide evidence on the factors explaining the widening of global stock imbalances since 2010, using the global database developed by Lane and Milesi-Ferretti (2001a; 2007; 2018), updated in Milesi-Ferretti (2022). Specifically, it uses data on the instrument, geographical, and currency composition of countries' external positions to identify the counterparts to the large deterioration in the U.S. net external position associated with valuation effects. Countries with large portfolio equity holdings in the U.S. are natural beneficiaries of the run-up in U.S. stock prices. The paper also investigates whether valuation changes to U.S. FDI positions, whose market value estimates use data on stock prices for the country where FDI is located, appear to be reflected in partner country data.<sup>2</sup>

The second contribution is to highlight the existence of a global discrepancy in external stock accounts, with estimates of external liabilities exceeding those of external assets. We analyze the components of external balance sheets accounting for the discrepancy and identify the likely measurement gaps, including the countries for which it is most difficult to track liability ownership.

The third contribution is an analysis of the macroeconomic and structural factors that have led to growing creditor positions during the past decade in a group of advanced economies in Europe and Asia. The analysis builds on the existing literature by examining the increase in creditor positions through the lens of national balance sheet data, which helps track the evolution of domestic wealth as well as the shifts

...

1. See the excellent discussion of that paper by Obstfeld (2017), who points out weaknesses in the attempt at estimating the impact of foreign exchange intervention on imbalances.

2. Milesi-Ferretti (2021a) questions the appropriateness of this methodology, arguing that higher U.S. stock prices also reflect rising values for overseas production capacity by U.S. MNEs, and conversely that the value of, say, a Toyota plant in the U.S. does not rise because of skyrocketing valuations for U.S. tech companies. The emphasis on valuation effects also ties the paper to the literature on external rates of return (see Gourinchas and Rey, 2007a and 2022, Curcuru, Dvorak, and Warnock, 2008 and 2013; Adler and Garcia Macia, 2018).

in asset-liability positions across different sectors of the economy that give rise to larger creditor positions. A similar approach was used in Chen, Milesi-Ferretti, and Tressel (2013) to characterize the evolution of external imbalances in the eurozone in the years preceding the euro area crisis and by Allen (2019) to explain current account deficits and surpluses across advanced economies.<sup>3</sup> In turn, these shifts can be associated with macroeconomic and structural characteristics of the economies (exchange rate regimes, trend growth, demographics, evolution of funded pension schemes). Clearly some factors are likely to be more country-specific (geopolitical factors driving asset accumulation in Taiwan, the role of major public sector wealth funds such as GIC and Temasek in Singapore, or inflows of Chinese wealth directed overseas in Hong Kong), but the exercise still yields useful insights on the forces at play across a wider spectrum of countries<sup>4</sup> Related work by Gagnon and Sarsenbayev (2021) emphasizes the importance of the government balance sheet and in particular its foreign-currency component for understanding the size of net international investment positions across countries.

Finally, the paper closes with considerations on the possible nature of the adjustment process—the third question highlighted above. On the U.S. front, a downward correction in U.S. equity prices (as seen during 2022) and a weakening of the U.S. dollar would contribute to reducing U.S. liabilities and also help raise U.S. exports. While the lack of automatic adjustment mechanisms for creditor countries complicates inference on the future path of large creditor positions, the paper’s analysis of the sensitivity of external positions to stock price and exchange rate changes is relevant for identifying the most likely counterparts of future valuation changes.

To preview the main findings: We find that the emergence of large creditor positions is primarily a reflection of large current account surpluses rather than capital gains. This is particularly the case for European advanced economies, with the exception of Norway, whose large sovereign wealth fund benefited from the boom in global equity prices. Among Asian advanced economies, the creditor position of Hong Kong has increased much more rapidly than current account balances would suggest. As for other creditors, the capital gains of large oil exporters are likely to have been substantial given the large portfolio equity assets held by their sovereign wealth funds which are invested in advanced economies, but a more precise assessment is hampered by lack of data on the size and geographical allocation of these countries’ asset portfolios. A group of countries that have been large beneficiaries of higher U.S. asset prices are English-speaking advanced economies—Canada in particular but also Australia and the United Kingdom—with large holdings of equity instruments in the U.S. and currencies that have weakened vis-à-vis the U.S. dollar.

On the “debtor” side, the increase in the U.S. external position reflects primarily net valuation losses on the external portfolio. These have been driven by the appreciation of the U.S. dollar but also by the runup in U.S. equity prices. In contrast, the net external position of emerging and developing economies (excluding China and the main oil exporters—the Gulf states and Russia) has worsened by much less than

...

3. That paper underscores the importance of using more comprehensive balance sheet data, as opposed to a simple sectoral decomposition of external assets and liabilities. For instance, the runup of Greek net external liabilities up to 2007 reflected mostly a rising stock of government debt held by nonresidents. However, the rise was accompanied by a substantial reduction in domestic holdings of government debt, not matched by an accumulation of foreign claims. Hence the deterioration in the external position was very much related to worsened private balance sheets.

4. The advanced Europe group includes a wider set of countries (Austria, Belgium, Denmark, Germany, the Netherlands, Norway, Sweden, and Switzerland).

current account balances would have suggested, with currency depreciation reducing the size of domestic-currency liabilities relative to foreign exchange assets.

The paper also highlights a sizable global discrepancy in external positions, with estimated liabilities exceeding assets. This has been the case in recent years for FDI, where rising estimates of U.S. FDI liabilities at market value by the U.S. Bureau of Economic Analysis do not appear fully matched by partner-country FDI claims. But the most important component of this discrepancy relates to portfolio equity and reflects lack of information on the residence of investors holding equity through intermediaries or custodians in financial centers. This is the case for some holdings of U.S. equities as well as a large amount of investment fund shares issued by Ireland and Luxembourg and sold in global financial centers, including importantly the United Kingdom.

Finally, the empirical analysis in Section 5 shows how rising external assets are generally associated with more favorable net government debt developments and a growing footprint of institutional investors such as insurance companies and pension funds, which are likely to hold substantial equity portfolios, including foreign equities.

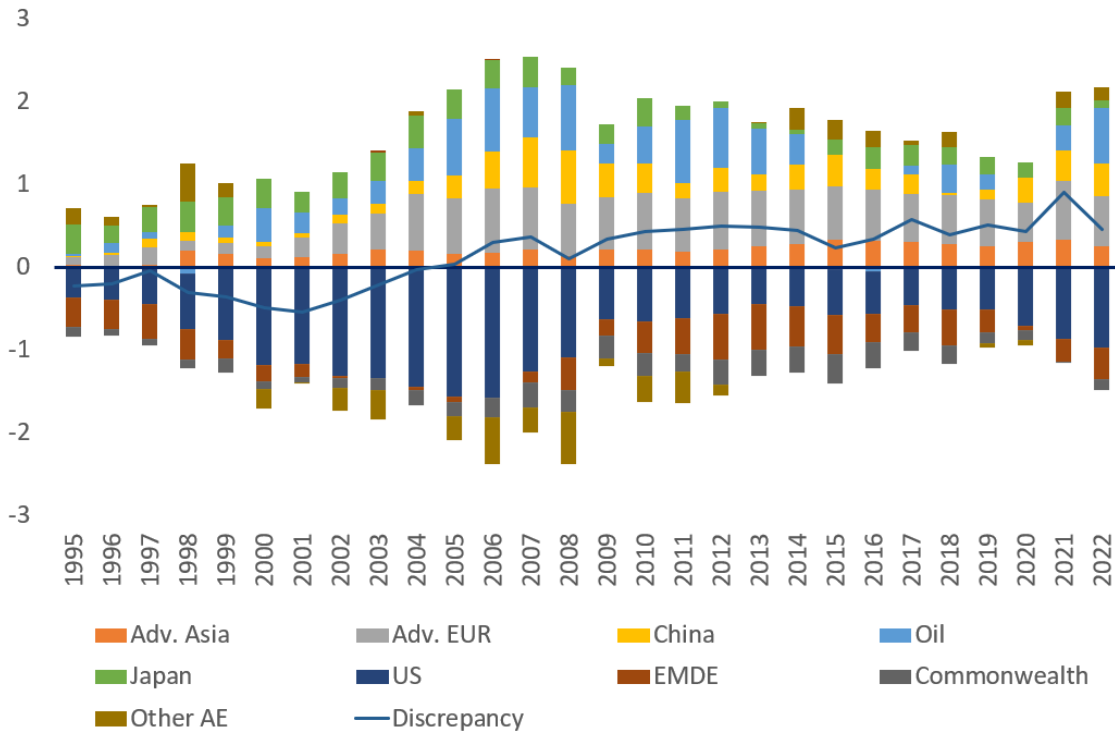
This paper owes much to the seminal contributions of Maurice Obstfeld in this area, including his pioneering work on global capital markets over the course of history (Obstfeld and Taylor, 2004), his extensive writings about global imbalances and exchange rate adjustment, including his joint work with Ken Rogoff (Obstfeld and Rogoff, 2007, 2009), and on the related subject of global international financial integration. He revisited the issue of global imbalances in more recent years—for instance in a piece on “25 years of global imbalances” (Obstfeld, 2018).

The remainder of the paper is organized as follows. Section 2 briefly describes the evolution of global current account imbalances and external positions in the period following the Global Financial Crisis, and thus identifies the main creditor and debtor countries and regions. Section 3 analyzes the general importance of flows versus valuation effects in explaining the growth in creditor and debtor positions, and highlights outstanding issues, including differences in valuation estimates and an increasing global discrepancy. Section 4 discusses the discrepancies identified in Section 3, including estimation methods for calculating FDI at market value, valuation changes for advanced European countries, and the sources of gaps in estimates of global assets and liabilities. Section 5 looks at the economic and structural factors explaining the emergence of new creditor countries, and Section 6 concludes with a discussion of the possible adjustment process.

## II. Global Imbalances during the Past Decade: Flows and Stocks

As widely documented in the literature, global current account imbalances narrowed sharply in the aftermath of the global financial crisis. Figure 1 identifies countries and country groups where the evolution of external balances played an important role during the past 20 years. For consistency we maintain the composition of country groups unchanged even though some of the countries in specific groups switched from deficit to surplus or vice versa during the period under examination.

**Figure 1. Global Current Account Balances**  
(Percent of world GDP)



Note: See Section II for the definition of country groups.

Source: Author's calculations based on IMF, Balance of Payments Statistics and World Economic Outlook.

Surplus countries and country groups include:

1. Japan;
2. Main oil exporters. These include Gulf states (Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates), many with large sovereign wealth funds, as well as Algeria, Libya, Russia, Azerbaijan, Kazakhstan, Venezuela, and small East Asian oil exporters (Brunei Darussalam and Timor Leste);<sup>5</sup>
3. China;
4. Creditors in advanced Europe. These include Germany, Norway, the Netherlands, Switzerland, Austria, Belgium, Denmark, and Sweden.<sup>6</sup>
5. Advanced Asia. This group includes Hong Kong, Korea, Macao, Singapore, and Taiwan.

...

5. A few African countries (Angola, Equatorial Guinea, Gabon, and Nigeria) are also fuel exporters but remain net debtors.

6. Luxembourg, another creditor country in the region, is separated out because of the impact of its gross positions on the composition of assets and liabilities in the group. Specifically, Luxembourg has very large portfolio equity liabilities (because it hosts a sizable share of the European investment fund industry, and investment fund liabilities are classified as equity regardless of the investment pattern of the fund) while its assets include both equity and debt securities.

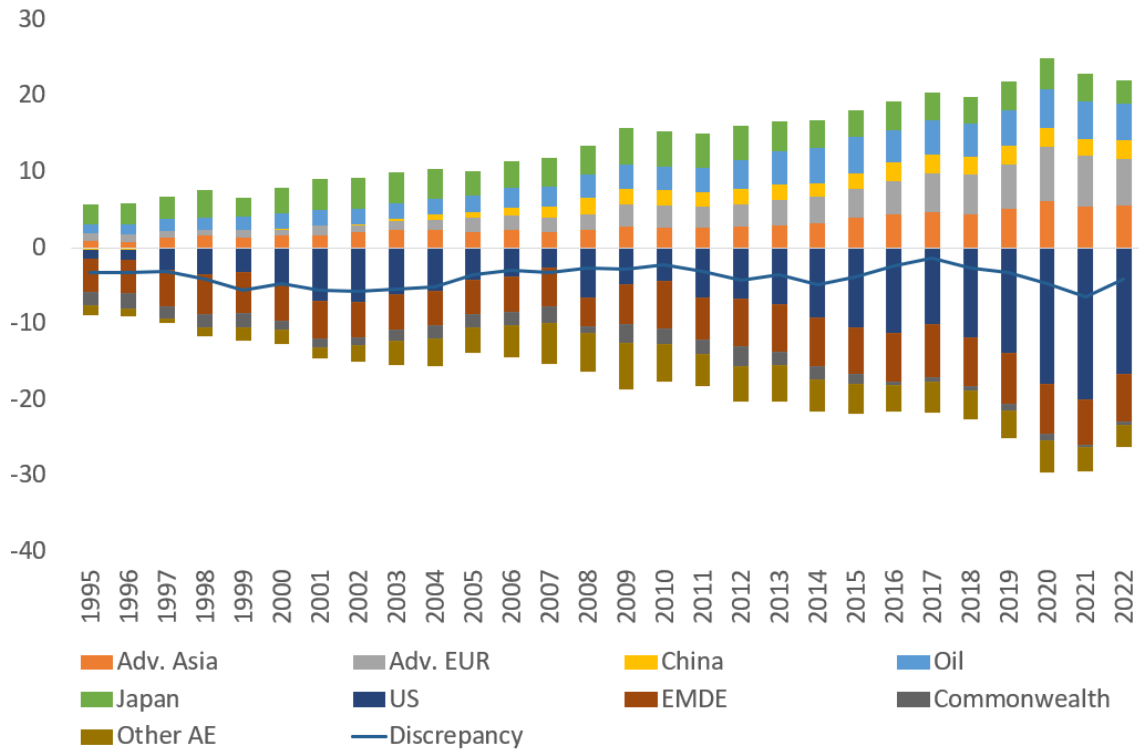
Deficit countries and country groups include:

1. The United States;
2. Emerging and developing economies (excluding China and the main oil exporters);
3. “Commonwealth” advanced economies: Australia, Canada, New Zealand, and the United Kingdom;
4. Other advanced economies. This group includes France and Ireland, as well as Southern euro area countries such as Greece, Italy, Portugal, and Spain. We classify it as a deficit country group because of the current account deficits it ran between 2000 and 2012.

The pattern of imbalances from the late 1990s to 2008 is well known: A growing U.S. deficit until 2006, accompanied by growing surpluses in Japan, advanced Europe, China, and oil exporters, as well as widening deficits in emerging economies (particularly in central and eastern Europe) and in some euro area countries (most notably Greece, Portugal, and Spain). After the sharp retrenchment of the Global Financial Crisis, global current account imbalances narrowed. On the deficit side, net borrowing from the U.S. became much smaller, and the deficit in “other advanced economies” (which includes countries running large deficits prior to the GFC) disappeared after the 2011 euro area crisis. On the surplus side, countries in advanced Europe and in advanced Asia were large net lenders throughout the period, while the pattern for oil exporters followed the dynamics of the oil price, with large surpluses early in the 2010s and then in 2021. As for China and Japan, their surpluses as a share of GDP shrank relative to their peaks prior to the GFC. The period 2010-2021 was also characterized by a persistently positive global current account discrepancy, especially large in 2021.

Figure 2 documents the behavior of creditor and debtor positions. On the debtor side, the large increase in U.S. net external liabilities is the most striking development, particularly if compared to the position in 2010. In contrast, the net debtor position of EMDEs has remained broadly stable (at around 6% of world GDP) and the net debtor position of other advanced economies has shrunk with their shift to current account surpluses. On the creditor side, the picture documents how advanced Europe and advanced Asia now represent the largest creditor regions, followed by oil exporters, while the creditor positions of Japan and China have shrunk as a share of global GDP.

**Figure 2. Global Net International Investment Positions**  
(Percent of world GDP)



Note: See Section II for the definition of country groups.

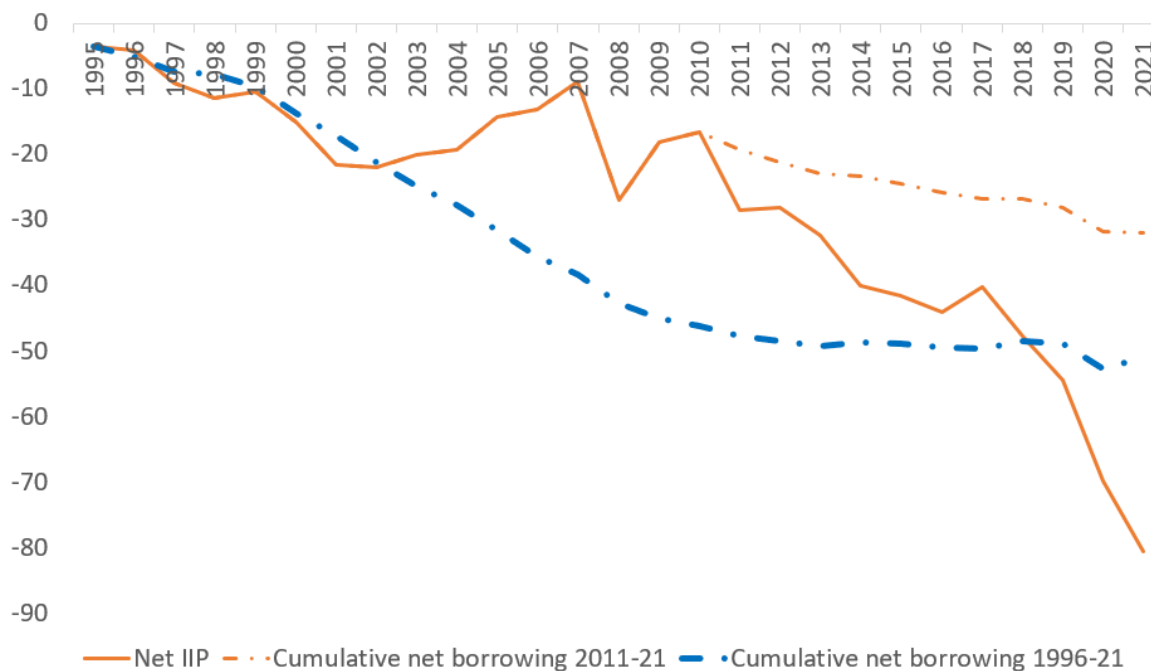
Source: Author's calculations based on Milesi-Ferretti (2021) and IMF, Balance of Payments and International Investment Position Statistics.

How does this expansion in debtor and creditor positions square with the reduction in the size of international borrowing and lending documented in Figure 1? The two developments are actually broadly consistent in the aggregate, although not for all individual countries and country groups. This is because despite the narrowing in the global size of current account surpluses and deficits, the main creditor countries have continued to run surpluses and the U.S. and EMDEs excluding China and oil exporters have continued to run deficits, thus contributing to growing creditor and debtor positions.

But two factors stand out when comparing Figure 1 with Figure 2. The first is the magnitude of the deterioration in the U.S. external position: In relation to domestic GDP, net liabilities (excluding gold holdings) went from 19% to over 80%. Figure 3 provides a more detailed look at how this happened. It shows that, absent valuation changes, the current account deficits of the period 2011-21 would have led the U.S. debtor position to deteriorate much more modestly, to around 35% of GDP. And as the blue broken line in Figure 3 shows, these massive valuation losses also exceed the sizable valuation gains experienced by the United States over the previous decade.



**Figure 3. U.S. Net International Investment Position and Cumulative External Borrowing**  
(FDI at market value, percent of GDP)



\*Note: The dashed blue (orange) line is the U.S. IIP in 1995 (2011) plus the cumulative sum of net financial flows to the United States in the subsequent years. Net financial flows to the U.S. (net borrowing) are equal to the sum of the current account balance, capital transfers, and errors and omissions, with the sign reversed.

Source: Author’s calculations based on BEA statistics for U.S. international transactions and the U.S. IIP.

The second factor is that while current account statistics highlight a positive “global discrepancy,” with balance of payments data recording net global accumulation of financial assets abroad, our estimates of global NIIPs highlight a growing negative discrepancy. Recorded global external liabilities have risen faster than global recorded assets, even though recorded global net lending abroad has been positive throughout the decade.

In the remainder of the paper, we try to shed light on these developments—the deterioration of the U.S. external position, its counterparts on the creditor side, and the rising global discrepancy between global external assets and liabilities—and also assess how they are related. We start in Section III by looking at the source of the U.S. valuation changes, and discerning which countries and country groups are the most likely counterparts, before turning in Section IV to the global discrepancy between external assets and liabilities.

### III. The U.S. Net Debtor Position and Creditor Countries

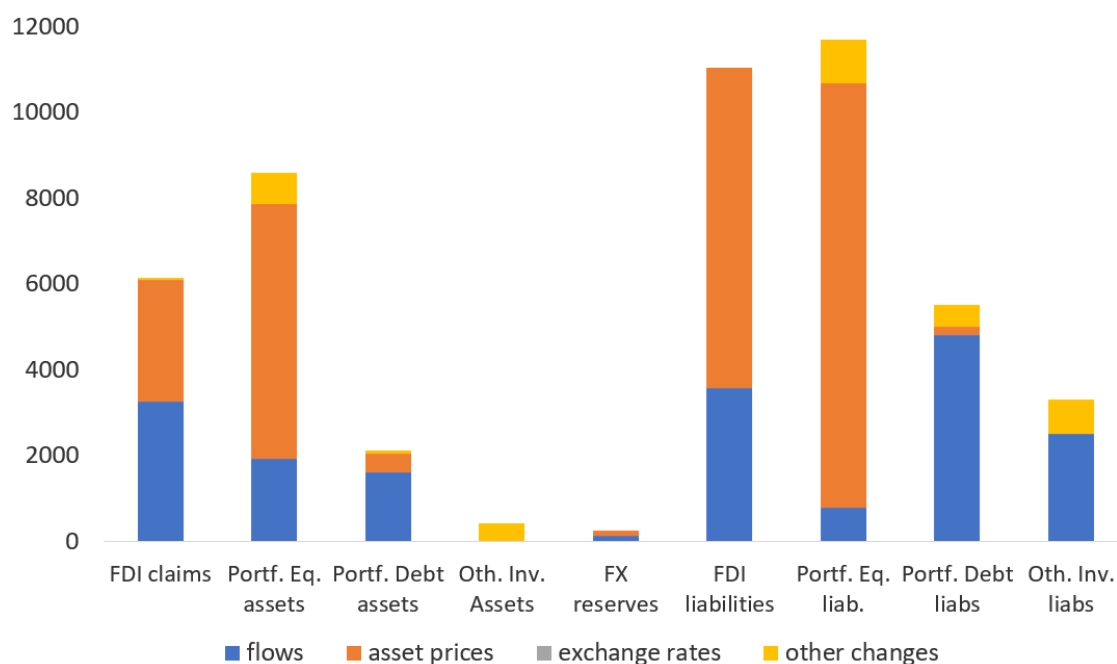
#### III.1 U.S. Valuation Changes

As documented in the previous section, the deterioration in the U.S. external position has been driven mainly by valuation changes. The U.S. Bureau of Economic Analysis (BEA) provides a useful table that reconciles the changes in the NIIP with net financial transactions from the balance of payments, valuation

effects, and “other changes” (which include reclassifications, changes in survey coverage, etc.). External assets and liabilities are estimated at market value, including for FDI positions. In particular, as discussed in Landefeld and Lawson (1991), the BEA uses the stock market index of the country where FDI affiliates are located to estimate changes to these affiliates’ market value—and hence the U.S. stock market index to revalue FDI in the U.S.<sup>7</sup> We will come back to this issue in Section IV.

Figure 4 depicts the factors underlying changes in the U.S. NIIP between 2010 and 2021 using the BEA data. The importance of valuation changes for portfolio equity and FDI is remarkable: While the value of U.S. holdings abroad in these categories has increased faster than flows would suggest, these gains are swamped by the valuation gains of nonresidents on their U.S. holdings. In turn, these are explained by the boom in U.S. stock prices during this period. Also notable are the valuation losses for U.S. assets abroad arising from the appreciation of the dollar, which reduces the value of U.S. foreign-currency claims.

**Figure 4. United States: Changes in the External Portfolio, 2010-21**  
(Billions of U.S. dollars)



Note: The bars show the source of changes in U.S. external assets and liabilities between end-2010 and end-2021. The “flow” bars indicate cumulative net purchases during the period. The “asset prices” and “exchange rates” bar denote the cumulative impact of changes in asset prices (interest rates, stock prices, etc.) and exchange rates on the valuation of assets and liabilities. The bars “other changes” indicate the cumulative impact of other adjustments to the estimates of external assets and liabilities.

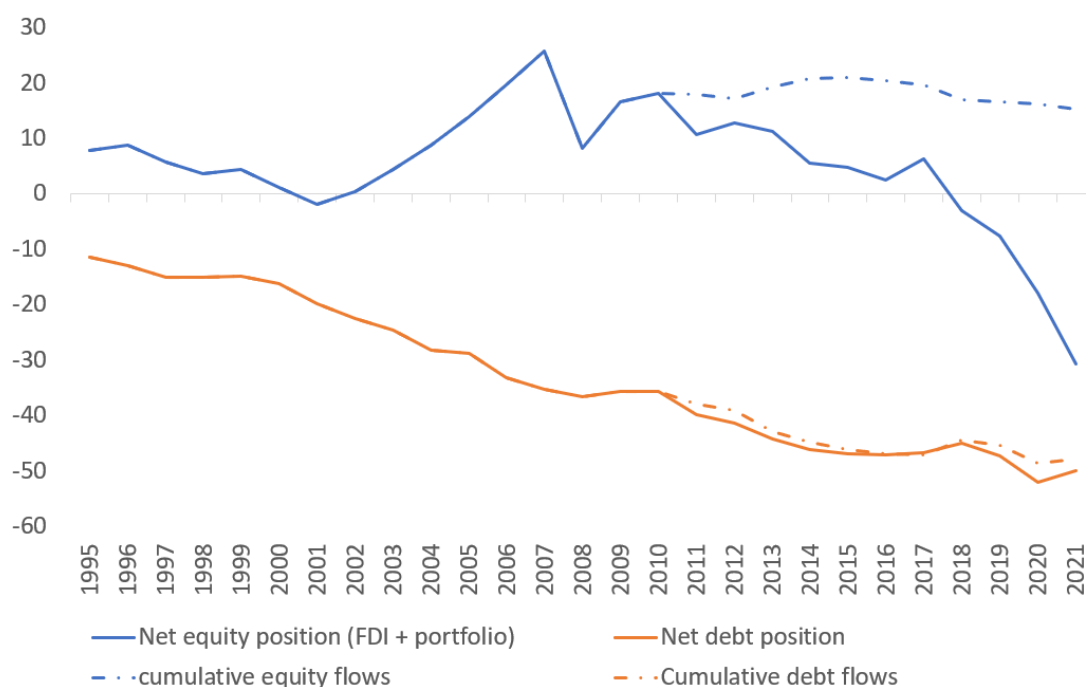
Source: Author’s calculations based on BEA data.

...

7. Estimating the market value for portfolio equity assets and liabilities is much more straightforward, given that they overwhelmingly consist of listed shares.

Figure 5 compares the dynamics of the net FDI and portfolio equity position with the dynamics of the net debt position, defined as the sum of net portfolio debt and net other investment.<sup>8</sup> The U.S. portfolio structure was traditionally “long equity, short debt” (see, for instance, Gourinchas and Rey, 2007b) but now U.S. FDI and portfolio equity liabilities exceed in value U.S. FDI and portfolio equity assets, with the difference approaching 30% of U.S. GDP at the end of 2021. And as Figure 4 and the dotted lines in Figure 5 highlight, the sharp deterioration of the net equity position over the past decade is virtually entirely driven by valuation changes—in particular, the sharp increase in U.S. stock prices relative to those in the rest of the world. Specifically, between the end of 2010 and the end of 2021 U.S. stock prices rose by 282% according to the MSCI broad market index for the U.S., while they rose by 31% in U.S. dollar terms using the MSCI global stock market index excluding the U.S.—a massive difference.

**Figure 5. United States: Decomposition of the Net International Investment Position**  
(Net FDI + portfolio equity vs net debt, percent of GDP)



Note: The solid lines represent the net U.S. position in FDI and equity instruments (blue) and portfolio debt and other investment, plus reserves (orange). The dashed blue line is the net FDI + portfolio equity position of the U.S. in 2010 plus the cumulative sum of net financial flows from the U.S. in those categories (net purchases by U.S. residents of foreign equity and FDI minus net purchases by nonresidents of U.S. equities and FDI). The dashed orange line is the same cumulative sum for net financial flows in portfolio debt and other investment instruments. All variables are scaled by GDP.

Source: Author’s calculations based on BEA data.

8. Strictly speaking, the net FDI position includes a debt component and the net other investment position includes a (small) component measuring equity not in the form of securities or direct investment, such as shares of certain international organizations. Re-allocating such components to generate a net equity vs. net debt position would leave the overall picture virtually unchanged.

### III.2 Valuation Gains and Losses in Other Countries

Having established the impact of asset prices and an appreciating U.S. dollar on the U.S. NIIP, we turn now to partner countries to investigate which countries or country groups benefited most from the runup in U.S. stock prices and how exchange rate changes during this period affected the value of their external portfolios. But before looking at figures, it is important to highlight four factors that have an important bearing on valuation calculations as well as on their interpretation.

- First, for countries and country groups we will proxy valuation changes with the difference between the change in the net IIP and net financial transactions as captured by a country's balance of payments. That is, other changes to the IIP, caused for instance by a broadening of the scope of surveys measuring assets or liabilities or by other factors, are lumped together with changes in the valuation of assets. Unfortunately, only a subset of countries produces tables analogous to the one for the U.S. referred to above that reconcile changes in the net IIP with flows, valuation changes, and other factors. We will make use of this more detailed data for European creditor countries in the next Section.
- Second, there are methodological differences across countries in the recording of external assets and liabilities—for instance, some countries may report debt or FDI holdings at book value rather than market value. We will come back to this consistency issue in Section IV.
- Third, defining valuation gains and losses on external positions in a way that is consistent across countries is problematic, because the value of such gains and losses depends on the currency in which they are calculated. While for the U.S. the dollar is the natural metric, for other countries—say, members of the euro area or Japan—their domestic currency is a more appropriate metric. But given the volatility of exchange rates, including across major currencies, calculations in different currencies can yield results which are quite different. The Appendix provides simple formulas that establish the relation between measures of capital gains and losses calculated in different currencies and then converted into U.S. dollars.
- Finally, a country's total wealth is not necessarily increasing when valuation gains on the external position are positive and vice versa. For instance, U.S. residents hold the majority of U.S. stocks. When their price goes up, U.S. wealth rises, but since some U.S. shares are held by nonresidents, part of the wealth gain accrues to them as well, worsening the U.S. external position. Or consider a country whose capital stock is destroyed by an earthquake. The value of FDI and equity claims in the country will plummet, but this “valuation gain” on the external position is associated with a massive loss of domestic wealth.

While keeping these considerations in mind, we illustrate the evolution of external positions over the past decade, keeping U.S. dollars as the unit of measure so as to preserve year-by-year comparability across countries, and track how this evolution relates to countries' net borrowing and lending, as measured by the financial account in the balance of payments.<sup>9</sup> We first focus on aggregate valuation gains and losses and then turn to examine more specifically exposures to U.S. asset prices.

...

9. The financial account balance measures the difference between the net acquisition of financial claims by a country's residents on residents of other countries and the net acquisition of financial claims by residents of other countries on domestic residents. It is equal to the sum of the current account balance, the capital account balance (measuring net capital transfers) and “errors and omissions.”

We start from an identity linking changes in the net IIP over the period 2010-2021 with underlying flows, valuation changes, and other changes:

$$S_{21}^{\$} - S_{10}^{\$} = \sum_{i=1}^{10} F_{10+i} + \sum_{i=1}^{10} [V_{10+i} + O_{10+i}]$$

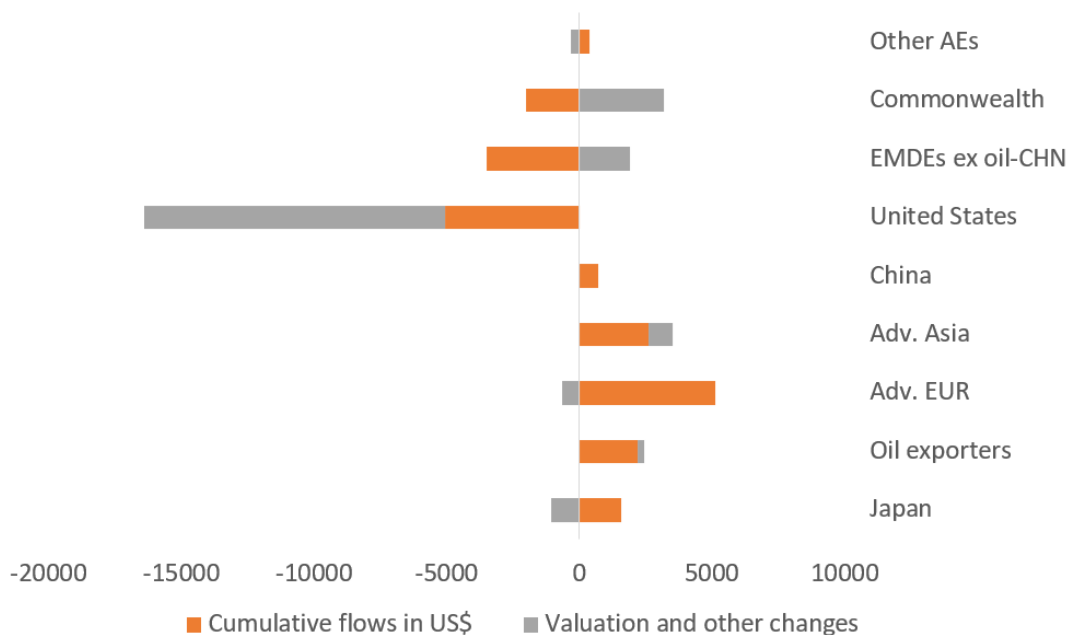
where  $S^{\$}$  is the net IIP in U.S. dollars, the subscript indicates the year,  $F$  are annual net financial transactions,  $V$  are annual net valuation changes (arising both from currency and asset price fluctuations), and  $O$  are other changes to the estimated net IIP, also in U.S. dollars. In the analysis below, the sum  $V+O$  and its cumulative value over 2011-21 are derived residually from the “observables”  $S$  and  $F$  (reported in international investment position and balance of payments statistics respectively). As explained in the Appendix, the measure of valuation and other changes is a function of the currency in which the calculations are performed, and here the calculations are done for each year in current U.S. dollars, following the reporting convention in the IMF’s Balance of Payments and International Investment Position statistics.

Figure 6 breaks down changes in the NIIP of our countries and country groups into (i) cumulative net financial transactions and (ii) valuation and other changes. Focusing first on international creditors, we find mixed evidence on the valuation front. The net accumulation of external savings by Japan, China, and especially European surplus countries over the past decade is in excess of the improvement in their net IIP. The two creditor country groups where the improvement in the IIP is well in excess of their cumulative surpluses are oil exporters and advanced Asian economies. Hence in the aggregate we find no clear evidence that creditor countries have been the largest beneficiaries of valuation gains during the past decade<sup>10</sup> The largest positive differences between changes in the NIIP and cumulative financial transactions arise for emerging and developing economies (excluding China and oil exporters) and the remainder of the English-speaking advanced economies. For both country groups the differences are very substantial—well in excess of \$2 trillion. In relation to domestic GDP in 2021, the gains are particularly striking for Commonwealth advanced economies: over 38%.

...

10. Adopting a different computation method for valuation changes, which uses domestic-currency figures subsequently converted to U.S. dollars, reduces substantially Japan’s valuation losses. Japan is a creditor country whose currency has depreciated substantially during 2010-21. As a result, valuation changes using domestic-currency estimates are more favorable, as illustrated in the Appendix.

**Figure 6. Change in the Net International Investment Position, 2010-21**  
(Billions of U.S. dollars)



Note: The orange bars represent the cumulative value over 2011-21 of net purchases of assets overseas by residents minus net purchases by foreign residents of domestic assets. The gray bars represent the change in the valuation of the net external position for factors other than net purchases and sales of financial instruments.

Source: Author's calculations based on Lane and Milesi-Ferretti, External Wealth of Nations database (Milesi-Ferretti, 2022).

In order to better understand this evidence, we briefly discuss the main sources of valuation changes and how such changes affect the NIIP before turning to a more detailed analysis of the main counterparts to the U.S. massive valuation losses, so as to see whether they seem fully reflected in other countries' statistics. Valuation changes for each country group are going to be affected by the behavior of their exchange rates—particularly vis-à-vis the U.S. dollar—and asset prices, as well as by the behavior of asset prices in counterpart nations.

The impact of asset price changes on the NIIP is straightforward—higher domestic asset prices tend to generate valuation losses (valuation gains for foreign holders of domestic assets) and higher foreign asset prices tend to generate valuation gains. The impact of exchange rate fluctuations on the NIIP instead depends on the currency composition of external assets and liabilities. For the United States, China, Japan, and our country groups, assets in foreign currency exceed liabilities in foreign currency, while the opposite is true for domestic-currency instruments. In particular, equity and FDI liabilities are mostly denominated in domestic currency and so is for advanced economies the lion's share of debt liabilities. In contrast, FDI and portfolio equity assets are mostly denominated in foreign currency, and so are foreign exchange reserves and some holdings of debt instruments abroad in the form of portfolio debt securities or other investment. This implies that, *ceteris paribus*, countries that experienced exchange rate depreciations tend to have valuation gains on their external position. This pattern ("short domestic

currency, long foreign currency”) does not hold for all countries: Many emerging and developing economies, particularly those that are less financially developed, are net debtors in foreign currency terms (see Benetrix et al., 2019) and hence more vulnerable to negative balance sheet effects when their currency depreciates.

Focusing first on asset prices, the most salient development of the decade (for valuation purposes) has been the increase in global equity prices and in particular the boom in U.S. stock prices. The MSCI stock price index for the broad U.S. market rose by over 280% between end-2010 and end-2021, while stock markets elsewhere rose (in U.S. dollar terms) by under 31%.<sup>11</sup> The dramatic rise in the valuation of U.S. technology stocks was the key factor explaining U.S. stock market performance. U.S. market valuations affect the value of foreign holdings of portfolio equity in the U.S., as well as the value of FDI in the U.S., according to the BEA methodology. Given the size of the U.S. financial market, the valuation repercussions for partner countries can be very large. For instance, in 2020 portfolio equity investment in the U.S. (as reported in U.S. external accounts) represented 37% of portfolio equity claims reported by all other countries, while U.S. FDI liabilities (as reported in U.S. external accounts) accounted for almost ¼ of the combined FDI reported by all other countries. We would thus expect countries with large equity and FDI investment in the U.S. to have experienced sizable valuation gains. More generally, the rising value of equity globally tends to improve the NIIP of countries that are “long” in equity instruments and also the position of countries where equity prices underperform compared to their foreign investment.

In regard to exchange rates, during the period 2010-2021 the U.S. dollar has appreciated substantially in both nominal and real terms vis-à-vis the currencies of many of its financial partners, both advanced economies and emerging and developing economies. The exceptions are countries where the exchange rate is pegged to or tightly linked to the dollar (oil exporters; advanced Asia; and China). On that score we would then expect country groups with depreciating currencies vis-à-vis the dollar to see more valuation gains. The final consideration is inflation differentials. Countries with higher inflation than their financial partners will generally pay higher yields on their borrowing in domestic currency, which will be reflected in a higher investment income bill and hence higher net borrowing from abroad. At the same time, the value of the principal is eroded by inflation, generating a valuation gain in the external accounts.<sup>12</sup>

### III.3 The Counterparts to Rising U.S. Equity Prices

Given the importance of valuation changes on the U.S. equity and FDI portfolios, we make use of bilateral data on U.S. portfolio equity and FDI liabilities to explore which partner countries should have experienced large valuation gains during the period 2010-21 and whether those gains are reflected in asset-side data in those countries. We focus first on U.S. portfolio equity liabilities, where the calculations are more straightforward because bilateral data are reported at market value (since the vast majority of portfolio equity holdings consist of listed equity and investment funds, with a well-defined market price) and then on FDI.

...

11. The local-currency increase in stock prices outside the U.S. over this period was larger but muted in part by the appreciation of the U.S. dollar.

12. Adler, Garcia-Macia, and Krogstrup (2019) discuss the bias to external accounts imparted by inflation differentials.

### III.3.1 U.S. Portfolio Equity Liabilities

The calculations make use of data from several sources. Portfolio equity positions are estimated using as a primary source portfolio equity claims on the United States reported by partner countries in the Coordinated Portfolio Equity Survey (CPIS). These data, which are only available for CPIS reporters (some 75 countries in 2010 and a few more by 2021) are integrated with those reported in U.S. surveys of portfolio liabilities (consisting of an annual survey conducted in June since 2002 as well as a monthly survey conducted since December 2011). For portfolio equity flows (net purchases of U.S. equity instruments by nonresident investors) we rely on bilateral balance of payments data published by the BEA for a set of major countries and integrate these data with monthly series constructed by Bertaut and Judson (2022) for a broader set of countries. Appendix 2 provides further details on the calculation methods.

Table 1 presents the results. In the first column it reports holdings of U.S. equities as of end-2010. The second column reports net purchases of such equities during 2011-21, and column (3) provides an estimate of the capital gain accruing on the 2010 position and subsequent flows because of U.S. stock price increases. The data show that the largest beneficiaries of these valuation gains would have been Commonwealth countries (\$2.3 trillion) and European creditor countries (over \$1.8 trillion), but estimated gains are very large also for financial centers (Ireland and Luxembourg and offshore centers). Column (4) scales estimated capital gains by the size of the respective economies in 2021, highlighting the macro relevance of the figures in column (3), particularly for Commonwealth countries but also for European and Asian creditors. Comparing column (5) with column (6) we see that reported holdings of U.S. equities in 2021 are broadly consistent with the sum of 2010 positions, cumulative flows, and estimated capital gains, which in turn suggests that the valuation changes on U.S. portfolio equity liabilities are broadly matched by corresponding changes in partner countries. Some of the differences across country groups have reasonable explanations: for instance, coverage of equity claims by offshore centers has broadened over time, and hence it is not surprising to see that claims in 2021 are higher than the sum of 2010 positions, flows, and estimated capital gains. Conversely some flows to U.S. equities from financial centers such as the United Kingdom (Commonwealth), Switzerland (European creditors) or Hong Kong/Singapore (advanced Asia) may be on behalf of investors from other countries, which would make reported positions in 2021 lower than the sum in column (5).<sup>13</sup>

...

13. The bilateral flow data comes from the liability side (the U.S.), which makes it more difficult to pinpoint who the ultimate buyer is (securities may be held by a foreign custodian on behalf of an investor by a different country).



**Table 1. Portfolio Equity Investment in the U.S., 2010-21:  
Initial Holdings, Estimated Flows and Valuation Gains, and Final Holdings**  
(Billions of U.S. dollars)

Group	(1)	(2)	(3)	(4)	(5)	(6)
	2010		2010-21		2021	
	Holdings	Cumul. flows	Estimated K-gain	Pct of 2021 GDP	Sum (1)-(3)	Holdings
	USD	USD	USD		USD	USD
Creditor Europe	591	171	1813	21.0	2575	2328
Advanced Asia excl. Japan	151	288	624	18.5	1063	808
Japan	270	0	758	15.3	1027	885
China	155	-190	308	1.7	273	295
Oil exporters	162	-47	460	8.6	576	717
Commonwealth	724	56	2280	32.3	3060	2906
Other advanced economies	151	83	416	5.0	649	531
Ireland and Luxembourg	336	498	1328	227.3	2162	2246
EMDEs excl. China and oil	83	-17	263	1.5	329	269
Offshore centers	553	-253	1601	.....	1901	2280

Note: Data on the at end-2010 (first column) are author's estimates based on holdings of U.S. equities reported by individual countries to the IMF's Coordinated Portfolio Investment Surveys (CPIS) and the results of the U.S. Treasury-Fed annual surveys on holders of U.S.-issued securities (see Appendix 2). Cumulative flows (column 2) are estimates using BEA data and the Bertaut-Judson (2022) dataset. Capital gains (column 3) are estimates of the increase in market value of the 2010 position (282% according to the MSCI broad U.S. stock price index) plus gains accruing on subsequent flows calculated using the same index (Appendix 2). Data for 2021 (last column) are similarly obtained from the CPIS and integrated with data from the U.S. annual and monthly surveys on foreign holdings of U.S. portfolio instruments. Sources: Author's calculations based on Bureau of Economic Analysis; Bertaut and Judson, 2022; IMF's Coordinated Portfolio Investment Survey, and U.S. Treasury, annual and monthly surveys of foreign holdings of U.S. securities.

### III.3.2 FDI in the U.S.

Valuation calculations for FDI are more complex, as discussed in detail in Appendix 2. The major difficulty comes from the fact that the headline figure for FDI in the U.S. is estimated at market value, but available bilateral figures on FDI in the U.S. are estimated at historical cost. This complicates the task of estimating the impact of valuation changes in U.S. FDI liabilities statistics on specific countries or regions. Furthermore, chains of ownership control within multinational corporations imply that the country of the foreign parent of a U.S. affiliate may not be the country of the firm ultimately controlling the affiliate, and this latter country should be the one whose accounts reflect valuation changes. Finally, FDI has both an equity and a debt component, and valuation changes related to changes in equity prices affect the former only.

In light of these considerations, we deal with the ownership issue by using bilateral FDI in the U.S. by country of ultimate beneficial owner (UBO), which is also reported by the BEA. To estimate the equity share of country-specific FDI (not available on a UBO basis) we rely on statistics on bilateral FDI by country of the immediate foreign parent, for which such split is available. Finally we convert the country-specific historical cost estimated of FDI in the U.S. into market value by multiplying the equity component by the ratio of the market value of equity to its historical value for total FDI in the U.S. As noted earlier, to estimate FDI at market value the equity component of FDI is revalued by the BEA on the basis of stock price increases in the country where FDI is located, corrected to take into account the inclusion of retained earnings in new FDI flows.<sup>14</sup> Hence all FDI holdings by in the U.S., regardless of the source, are revalued using a broad index of U.S. stock prices.

Having thus constructed country- and group-specific FDI valuations for 2010, we follow the same approach as in Table 1 and use the MSCI broad index of U.S. stock prices to estimate country- and group-specific capital gains on those holdings by 2021 which are consistent with the valuation of U.S. FDI liabilities.<sup>15</sup> As for aggregate U.S. FDI statistics, the debt component of FDI is assumed to be denominated in U.S. dollars and hence unaffected by valuation changes.

Table 2 shows the results. Valuation gains by FDI investors in the U.S. according to the BEA methodology on the basis of their 2010 FDI claims would have been very large for a number of partner countries and country groups: Commonwealth countries (with gains exceeding \$3.2 trillion), advanced European creditor countries (over \$1.7 trillion), other advanced economies (\$1.3 trillion), and Japan (close to \$1 trillion). The last column highlights again the size of these estimated gains in relation to the size of these economies' GDP, which is very high for Commonwealth countries (close to 50% of 2021 GDP) but also for creditor Europe and Japan.

...

14. Because retained earnings boost stock market valuations, it is important to correct valuation gain calculations for the inclusion of such earnings in new FDI flows to avoid double counting. So the adjusted cumulative flow equation has to include a denominator term including the rate of earnings per share  $E$  (Landefeld and Lawson, 1991):

$$S_t = \frac{S_{t-1} * \frac{P_t}{P_{t-1}} + F_t * \frac{P_t}{P_t^{avg}}}{1 + E_t * \frac{P_t}{P_t^{avg}}}$$

where all other variables are defined as in Appendix 2. In our exercise we exclusively focus on an extrapolation of the value of 2010 holdings without including FDI flows in subsequent years, and hence simply apply the change in U.S. stock market valuations between end-2010 and end-2021 to the estimated 2010 equity component of FDI positions.

15. We don't attempt to estimate valuation changes that accrued during the 2011-21 period because we lack information on the equity component of bilateral FDI flows by country of beneficial owner, which are necessary to estimate overall valuation gains.

**Table 2. FDI Positions in the U.S.: Valuation Gain Projections Based on 2010 Data**  
(Billions of U.S. dollars)

	2010			2021		
	FDI equity (hist. cost)	FDI equity (mkt value)	FDI debt	Total FDI	Projected equity gain	
	USD	USD	USD	USD	USD	Pct of 2021 GDP
Creditor Europe	376	617	196	813	1742	20.2
Advanced Asia excl. Japan	43	70	10	43	197	5.9
Japan	223	365	36	223	1032	20.9
China	4	7	1	4	21	0.1
Oil exporters	28	45	7	28	128	2.4
Commonwealth	706	1158	50	706	3272	46.4
Other advanced economies	284	466	27	284	1317	15.7
Ireland and Luxembourg	43	71	80	43	201	34.4
EMDEs excl. China and oil	49	80	5	49	226	1.3

Note: Positions on an ultimate beneficial owner (UBO) basis. Because the split between equity and debt is only available for FDI in the U.S. by country of foreign parent (and not UBO), the value of equity at historical cost for country groups in 2010 is estimated as total FDI on a UBO basis times a weighted average of the share of equity in FDI on a country of foreign parent basis, with weights equal to the country's weight in the group on a UBO basis. The market value of equity for each country or region in 2010 is estimated by multiplying the country-specific historical cost estimate of equity by the ratio of the estimated market value of equity to the estimated historical cost of equity in 2010 for aggregate FDI in the U.S., as published by the BEA. Total FDI is the sum of equity at market value and debt. The projected equity gain is calculated as the market value of equity at end-2010 (second column) multiplied by the percentage change in U.S. stock prices between end-2010 and end-2021 (282% according to the MSCI broad U.S. stock market index). Source: Author's calculations based on BEA data.

### III.4 Counterparts to U.S. Valuation Changes: A Summary

Tables 1 and 2 highlight exclusively valuation gains for foreign equity claims on the U.S. and hence provide only a partial view of all the valuation changes that affect the evolution of the net foreign asset position in other countries and country groups. At the same time, given their magnitude, they provide a useful first benchmark that can be compared with the evidence on total valuation and other changes presented in Figure 6. Specifically, Tables 1 and 2 highlight the very large exposures to U.S. equity prices of the "Commonwealth" country group, thus providing a first explanation for the very large valuation gains of these countries during the decade. The valuation gains experienced by advanced Asian economies and oil exporters are also broadly consistent with the data in Tables 1 and 2. However, we must keep in mind the very large margins of uncertainty surrounding estimates of the size and composition of the asset portfolio in oil exporters, given that many of the largest creditors in that group (Kuwait, Qatar, United Arab Emirates) do not report comprehensive data on their holdings abroad.

Turning to other countries and country groups, however, it is harder to “match” estimated gains on equity claims in the U.S. with the overall gains and losses of Figure 6. This is especially the case for European creditor countries. Their estimated gains on their U.S. investment in portfolio equity and FDI amount to over U.S.\$3.5 trillion (see Table 1 and Table 2), but the NIIP data show net valuation losses. It is theoretically possible for valuation changes in other parts of the balance sheet to have more than offset such gains, and we explore this possibility in the next section. The differences are also notable for Japan—again with substantial gains on U.S. positions but overall losses.

### III.5 Valuation Effects in Emerging and Developing Economies

For emerging and developing economies (excluding China and oil exporters) estimated equity gains on U.S. holdings are more modest. This reflects both their smaller overall FDI and portfolio equity claims, but possibly also an underestimation of portfolio holdings overseas.<sup>16</sup> At the same time, stock market performance in many of these countries during the decade has been subdued, which has implied limited gains on equity holdings by nonresidents.

While large total valuation gains for this country group may at first blush seem surprising, they are actually quite intuitive. Systematic factors at play are inflation differentials and currency depreciation. These economies have higher inflation on average than advanced economies. This implies that liabilities denominated in domestic currency will generally have higher nominal yields to compensate for the inflation differential. These higher yields will be reflected in the current account—specifically, in higher debits on their investment income balance. At the same time, nonresidents will incur valuation losses on their holding of the principal as currency depreciation reduces its real value, even though their overall rates of return (including the higher yields) may well exceed domestic rates of return. When external debt is calculated at market value, capital losses by nonresidents can also be substantial when spreads rise (the case of Argentina is a good example). A further factor generating valuation gains for these countries can be real depreciation. Over the past 30 years, the external portfolio for this country group has gradually become “short” domestic currency and “long” foreign currency, reducing balance sheet vulnerabilities to exchange rate depreciation. This development that has been facilitated by several factors: the partial shift in external financing from debt instruments to equity and FDI flows during the past 30 years, rising foreign exchange reserves, as well as more reliance on external borrowing in domestic currency as nonresidents increase their presence in domestic bond markets.<sup>17</sup> Hence real depreciation will improve the net foreign asset position of the country group.

Still, it is important to keep in mind that while risks arising from exchange rate depreciation have moderated for emerging economies as a country group, foreign exchange vulnerabilities remain. A number of countries, especially the less developed ones, still have sizable liabilities mostly denominated in foreign currency, often exceeding foreign currency assets. Furthermore, sectoral exposures can be relevant even for countries that on an aggregate basis may be net creditors in foreign currency, and the sectors with foreign exchange liabilities may not be those holding the lion’s share of foreign exchange assets.

...

16. There is a sizable literature on capital flight from emerging and developing economies.

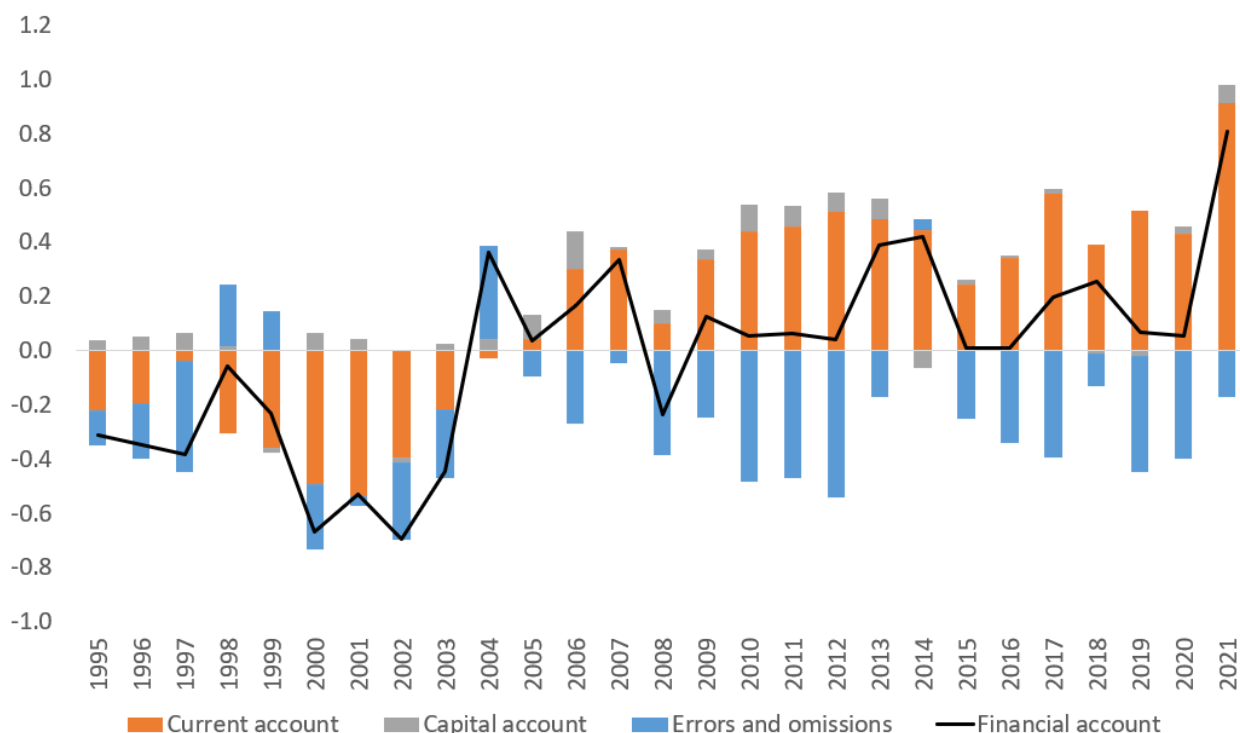
17. Benetrix et al. (2019) present a database on the currency composition of countries’ external assets and liabilities which highlights these shifts over time.

Overall, this Section has highlighted how large valuation changes have been during the past decade and how the quantitative importance valuation gains on equity positions in the U.S. At the same time, large discrepancies between changes in global assets and liabilities remain, and valuation changes in the U.S. and the rest of the world do not appear to be consistent. The next Section addresses this issue in more detail.

#### IV. Valuation Changes and Global Discrepancy

As illustrated by the line in Figure 2, there is a widening discrepancy between global external assets and liabilities. This occurs despite a sizable discrepancy of the opposite sign in global current account balances and a more modest one in financial flows, documented in Figure 7.

**Figure 7. Global Current Account Discrepancy**  
(Percent of world GDP)



Source: Author's calculations based on IMF, Balance of Payments Statistics and national sources.

##### IV.1 Valuation Effects in European Creditor Countries

We start investigating the discrepancy between global external assets and liabilities by focusing on data for creditor European countries, for three reasons. The first is that this is the largest creditor group in absolute terms. The second is that these countries do not show systematic valuation gains during the decade, despite the depreciation of the euro vis-à-vis the U.S. dollar and the smaller increases in equity

prices compared to their financial trading partners, particularly the United States.<sup>18</sup> And finally, the third reason is the availability of data reconciling balance of payments flows with changes in the NIIP for most countries. Specifically, we collected detailed data on valuation changes and other changes for the countries in the advanced Europe group for which it is available (Austria, Belgium, Denmark, Germany, Netherlands, and Switzerland), and we derived the sum of valuation changes and other changes for the remaining two countries (Norway and Sweden) as the difference between the change in the net IIP and net financial transactions.<sup>19</sup>

The data are presented in Table 3. The first thing to note is that there have been downward revisions to net creditor positions unrelated to valuation changes, totaling over \$900 billion. Those are particularly large for Germany and relate in particular to an upward revision of estimated foreign holdings of German portfolio instruments. The second thing to note is that if we exclude Norway, where valuation gains have been massive given that their sizable sovereign wealth fund holds large positions in portfolio equity instruments, price valuation gains have been negligible and exchange rate valuation gains have been negative, despite the asset price and exchange rate developments highlighted above. Once again data for Germany contribute to this finding: In particular, the price valuation loss in Table 3 is explained by a very large loss on financial derivatives—over \$400 billion over the decade—which more than offsets price gains on other categories of the external portfolio, including equity.<sup>20</sup> Also, Swiss data show large net valuation losses. These arise in part from the fact that Switzerland has positive net FDI holdings abroad but negative net portfolio equity positions (Swiss multinationals have mostly nonresident shareholders). Rising stock prices have a larger impact on the market value of portfolio equity than the market value of FDI because of the different treatment of retained earnings.<sup>21</sup> Furthermore, Switzerland estimates FDI positions at book value, and hence rising global stock prices are not reflected in their direct investment statistics.

...

18. See Lane and Shambaugh, 2010, for an early analysis of the impact of exchange rate fluctuations on external positions through currency exposures.

19. As explained in Appendix 2, for Norway we also provide an estimate of exchange rate valuation changes constructed from the database of Benetrix et al. (2019) and attribute the residual to price valuation changes.

20. Hünnekes, Schularick, and Trebesch (2019) argue that the rate of return on German investment overseas over the past 6 decades was unusually low by international standards. The investment income component of returns is captured by the current account, but capital gains and losses are part of the valuation term highlighted in this section.

21. Retained earnings by affiliates of multinational corporations are treated as new FDI in statistics, but in the case of firms with foreign shareholders they are reflected in equity prices and not in equity flows.

**Table 3. Valuation Effects, Advanced Europe, 2010-21 1/**  
(Billions of U.S. dollars)

	Valuation and other changes	Price valuation	Exchange rate valuation	Other changes
Austria 1/	14	48	-6	-28
Belgium 2/	147	209	-16	-46
Denmark 3/	-19	-45	18	8
Germany	-713	-169	-3	-541
Netherlands	134	220	126	-211
Norway 4/	828	511	316	
Sweden 4/	-8			
Switzerland	-529	-225	-290	-98
<b>Advanced Europe</b>	<b>-147</b>	<b>549</b>	<b>144</b>	<b>-916</b>

Note: 1/ Valuation effects plus other changes are the difference between the change in the net international investment position measured in U.S. dollars between end-2010 and end-2021 and cumulative net financial outflows between 2011 and 2021 (from the balance of payments), also measured in U.S. dollars. In turn, net financial outflows are equal to the sum of the current account balance, net capital transfers, and errors and omissions. Valuation effects originating from fluctuations in exchange rates and asset prices are comprised in the term “valuation.” Other changes are instead related to factors such as changes in the coverage of asset and liability surveys, other methodological changes, etc. See Appendix 2 for country-by-country detail on the calculations.

2/ Other changes calculated over 2012-21

3/ Other changes calculated over 2013-21

4/ Assumes all changes are in the valuation term because national authorities do not provide a table reconciling changes in the international investment position with financial flows.

Source: Author’s calculations based on national central bank data and External Wealth of Nations database.

Looking more broadly at FDI positions, the data for European creditor countries show very limited valuation price gains on FDI abroad.<sup>22</sup> This suggests that most countries in this group are not estimating FDI assets and liabilities at market value, or in any case they are not adjusting estimates of their U.S. holdings in proportion to rising U.S. stock prices, as the BEA does for U.S. liabilities (see the estimates in Table 2).<sup>23</sup>

...

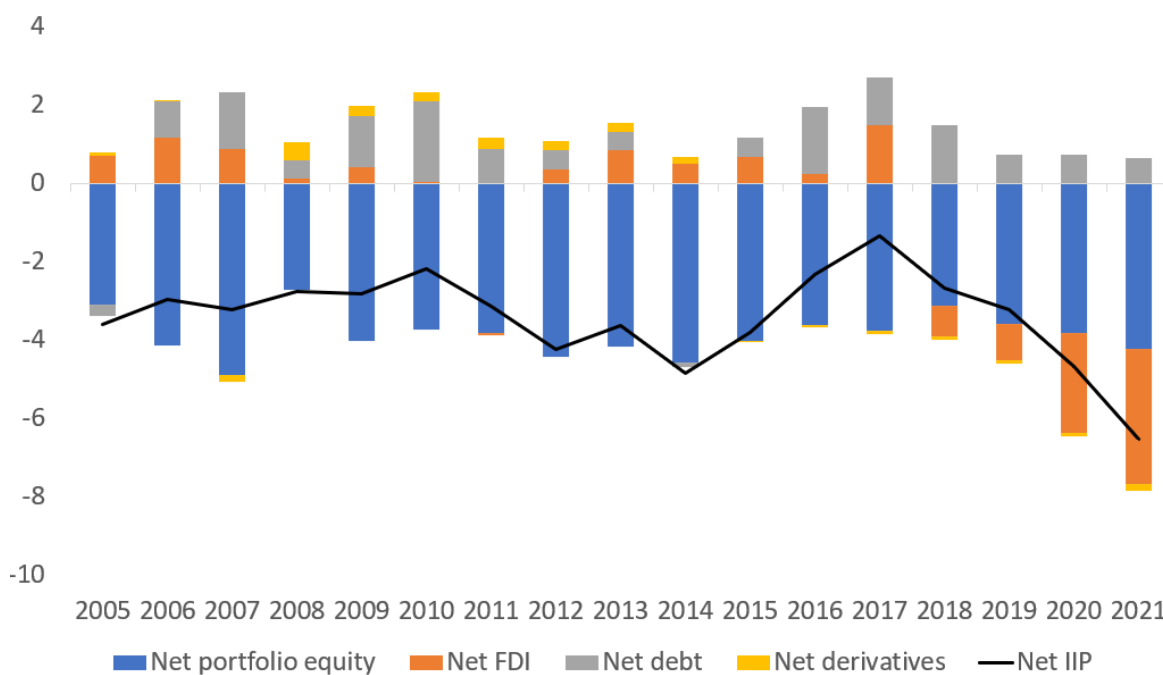
22. The Netherlands is a partial exception, but the estimated price gains over the decade (around \$500 billion) are broadly the same as the gains made by foreign direct investors in the Netherlands.

23. Note that in Table 2 we estimate the increase in value of FDI in the U.S. consistent with the BEA methodology on the basis of the ultimate beneficial owner of the direct investment holdings, rather than the immediate counterpart country, as the beneficiary of valuation gains should be the ultimate parent company.

## IV.2 Global Discrepancy between External Assets and Liabilities

But what are the components of external assets and liabilities which account for the global discrepancy? Figure 8 illustrates the answer.<sup>24</sup> The bars show the emergence of a negative global FDI discrepancy from 2018 onwards, a period during which U.S. stock prices doubled. Indeed, as illustrated in Figure 9, during this period the wedge between the net FDI position of the U.S. at market value and current cost widened very sharply. As noted in Milesi-Ferretti (2021), it is questionable to assume that a broad U.S. stock price index contains useful information to estimate the value of, say, foreign car manufacturers or foreign banks' affiliates in the U.S. but not to estimate the value of U.S. FDI abroad, despite the fact that foreign sales account for a nontrivial fraction of profits for the largest U.S. listed companies. The FDI valuation data for advanced European countries also suggests that differences in estimation methodology across countries are likely to be an important explanation for the FDI discrepancy.

**Figure 8. The Global Discrepancy in International Investment Positions**  
(Percent of world GDP)



Note: Net debt is defined as the sum of net portfolio debt securities, net other investment, and foreign exchange reserves excluding gold. The IIP components include estimated assets and liabilities in small financial centers (listed

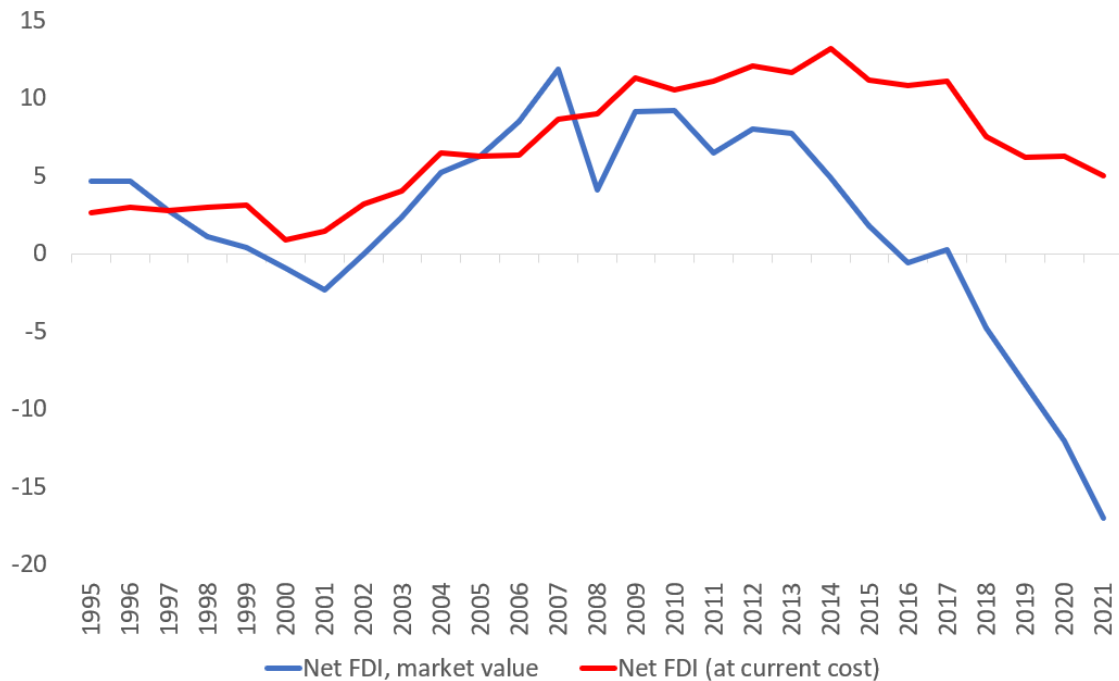
24. The IIP components in the Figure include estimated assets and liabilities in small financial centers, provided in the EWN database. These include The Bahamas, Barbados, Bermuda, British Virgin Islands, Cayman Islands, Curacao, Guernsey, Jersey, Isle of Man, Marshall Islands, San Marino, and Turks and Caicos. The data on external assets and liabilities for these economies refers to those components of their external portfolio that can be identified from what is reported by these economies or by their financial trading partners. However, the data are clearly incomplete. Given the tiny size and population of these centers and their pass-through nature for financial transactions we know that correctly measured external assets and liabilities have to be close to equal, and hence for the purpose of constructing the NIIP line their net position is assumed to be zero. For this reason, the NIIP line in figure 8 is not equal to the sum of the components.



in the database). However, the estimates of “Net IIP” do not include the difference between estimated assets and liabilities in these centers because this difference reflects incomplete data coverage--these financial centers’ net position is in reality tiny as they are pure pass-through centers. Hence the net IIP line is not equal to the sum of the components. For small financial centers estimated liabilities exceed estimated assets. This reflects the use of counterparty data in estimating assets and liabilities—as partner countries are more likely to report a geographical breakdown of their assets than their liabilities the coverage of these centers’ liabilities is broader.

Source: Author’s estimates based on External Wealth of Nations database.

**Figure 9. U.S. Net FDI Position at Current Cost and Market Value**  
(Percent of GDP)



Source: Author’s calculations based on Bureau of Economic Analysis data.

However, the largest and most persistent discrepancy in global external positions arises in portfolio equity. While a full discussion of this issue goes beyond the scope of this paper, it is useful to briefly highlight the likely source of these data shortcomings. This is actually easier to undertake than for FDI because differences in valuation methodology across countries do not play as large a role: The lion's share of equity investment consists of listed equity and investment funds with a defined market price. We make use of the data of the IMF's Coordinated Portfolio Investment Survey (in which participant countries report the geographical allocation of their portfolio investment) to construct derived portfolio equity liabilities by summing up all reporters' holdings in each destination country.<sup>25</sup> We then compare these data with the portfolio equity liabilities reported by these destination countries (or estimated in the EWN database for non-reporters). A few economies with large portfolio equity investment do not report data to the CPIS (United Arab Emirates; Qatar; British Virgin Islands) or do so only partially (Kuwait, Cayman Islands). Furthermore, partner countries are not identified for a component of portfolio holdings overseas (some \$670 billion in 2021). Therefore, we expect derived liabilities to fall short of reported ones, but the share of assets held by non-reporters is still small compared to those held by CPIS participants.

The comparison is reported in Table 4. On the equity liabilities side, the top rows show that three countries account for the lion's share of the discrepancy between derived and reported equity liabilities: the United States (\$3.6 trillion), Luxembourg (\$2.2 trillion), and Ireland (\$2.1 trillion). For the United States we can directly fill some of the gaps because of the availability of a detailed annual survey of portfolio equity liabilities. These surveys allow to allocate a share of U.S. holdings to the likely investor countries, including non-reporters, and are used in the EWN database to help estimate total portfolio equity holdings of countries that do not report IIP statistics or to correct data for likely under-reporters. However, there is still a financial center "custodial bias" in the U.S. data, reflecting the global importance of third-party holdings in financial centers (custodians in country X holding claims on country Y on behalf of an investor from country Z). As a result, U.S.-reported holdings in countries such as Switzerland and the United Kingdom exceed U.S. holdings by residents of these countries reported in the CPIS (by some \$500 billion and \$850 billion respectively) but most likely reflect U.S. holdings by residents of other countries through Swiss and UK intermediaries.

...

25. Coppola et al. (2021) provide an estimated re-mapping of bilateral portfolio holdings in the CPIS on the basis of the nationality of the issuer of the security, as opposed to the residence, highlighting how this procedure boosts measures of investment in Chinese securities.

**Table 4. Global Portfolio Equity Gaps, 2021**  
(Billions of U.S. dollars)

Global portfolio equity liabilities	53,042
Portfolio equity liabilities derived from CPIS reporting 1/	44,563
Difference	8,479
Of which:	
United States	3,596
Luxembourg	2,220
Ireland	2,120
Other countries	544
Global portfolio equity assets	48,972
Portfolio equity assets reported in CPIS 2/	44,812
Difference	4,160
CPIS non-reporters	2,022
of which:	
United Arab Emirates	816
Taiwan	389
Qatar	328
Gap for CPIS reporters	2138
of which:	
Cayman Islands	644
Kuwait	548
United Kingdom	426
Global portfolio equity liabilities - global portfolio equity assets	4,070
<hr/>	
1/ excludes confidential and non-allocated holdings.	
2/ Exclude portfolio equity assets held by central banks (classified as reserves).	

Note: Global portfolio equity assets and liabilities are calculated from the EWN database. Derived portfolio equity liabilities are calculated from the IMF's Coordinated Portfolio Investment Survey (excluding holdings for which no destination country is reported). CPIS portfolio equity assets exclude holdings by central banks classified as foreign exchange reserves (around \$500 billion). Liabilities derived from CPIS reporting do not include the unallocated and confidential component of assets (\$670 billion) and holdings of equity in international organizations (\$77.7 billion).

For Ireland and Luxembourg we do not have comprehensive liability surveys like the U.S. one. In Ireland, investment funds account for the large majority of foreign portfolio equity investment and in Luxembourg for virtually the entirety. The Central Bank of Ireland disseminates data on where Irish investment funds are sold, but the data is on an “immediate counterparty” basis and hence the custodial bias is particularly severe, especially in regard to investment intermediated in the United Kingdom. For instance, an Irish investment fund can be sold to through the London office of a large global fund

manager to an emerging economy investor. In this case the claim will not be captured by UK liability surveys (since neither the issuer nor the owner of the security are resident in the UK) and will likely be missed by the statistical authorities of the emerging market in question unless the investor is an institution with detailed reporting requirements. Available public data on the location of investment fund holders for Luxembourg is much more limited—statistics only identify the main markets where funds are sold.<sup>26</sup> Some of these holdings can be attributed to the CPIS non-reporters mentioned earlier, but these are unlikely to account for a sizable share of the total (Milesi-Ferretti, 2023) given the estimated size of equity claims in these economies. The largest share of these holdings likely reflect under-reported claims by CPIS reporters, but without reliable survey data we cannot allocate these investment funds to their likely holders.

Hence to construct asset-side equity data we have no usable information from bilateral data on Ireland and Luxembourg. As detailed in the EWN database, we therefore rely on estimates of assets of sovereign wealth funds for countries such as Kuwait, Qatar, and the United Arab Emirates, the reported IIP for Taiwan, and use U.S. liabilities data to generate estimates for some offshore destinations (like the British Virgin Islands) or to substantially raise the reported CPIS figure (for the Cayman Islands). Overall, once estimates of equity assets of CPIS non-reporters are added and estimates of under-reporters are corrected, we obtain an estimate for global portfolio equity assets that, while \$4 trillion higher than the CPIS figure, is still \$4 trillion smaller than the estimate for equity liabilities.<sup>27</sup>

This is clearly an area where much progress should be made to improve reporting, especially for third-party holdings in large financial centers, since the statistical authorities of the investor’s country are unlikely to be able to capture such holdings in their surveys.

## V. New Large Creditors: Common Factors

The previous sections have documented the surge in creditor positions over the past decade, particularly in a number of countries in advanced Europe and advanced Asia, which have been the counterpart to the growing debtor positions in the United States. This section looks at the factors associated with these shifts in cross-border positions, using the lens of balance sheet data.

The most extensive empirical literature on external imbalances focuses on drivers of current account deficits and surpluses, including pioneering work by Chinn and Prasad, 2003, as well as a substantial follow-up literature which includes Gagnon, 2012; Bayoumi et al., 2015; Chinn, 2017, Gagnon and Sarsenbayev (2021) as well as IMF work including Lee et al., 2006, International Monetary Fund, 2013,

26. In euro area statistics, these liabilities of Ireland and Luxembourg whose holders are not identified are considered liabilities vis-à-vis non euro area residents, since each euro area country reports bilateral holdings in Ireland and Luxembourg through CPIS, and euro area liabilities are calculated residually after netting out such intra euro area holdings from the sum of external portfolio liabilities of individual euro area countries.

27. In the construction of Figure 8, we have included all foreign exchange reserves net of gold in the “net debt” bar. However, a modest share of foreign exchange reserves are invested in portfolio equity instruments, and these amounts would drive a wedge between global portfolio equity assets and liabilities (since the asset counterpart of these equity liabilities would be classified as reserves and not portfolio investment). Total holdings of equities by the central banks participating to a survey parallel to the CPIS totaled close to \$500 billion at the end of 2021. The survey does not include China. Given that the U.S. reports equity liabilities vis-à-vis China which exceed China’s reported portfolio equity claims on the U.S. by \$180 billion, it is possible that part of this difference reflects central bank holdings of U.S. equities.

and Cubeddu et al., 2019—the latter paper still forming the basis for the IMF’s assessment of excess imbalances and exchange rate misalignments. This literature identifies a variety of macroeconomic, demographic, structural, and institutional factors which are associated with current account deficits and surpluses.

In this section we focus on creditor and debtor positions—as opposed to flow imbalances—and we make use of data on financial balance sheets disseminated by the OECD. These data, which cover the period 1995-2021 for 44 countries (with some countries’ data starting in the 2000s) allow us to track not just the position of a country vis-à-vis the rest of the world but also the underlying shifts in financial positions across sectors. This is important during a period of growing financial integration across borders, as an exclusive focus on external positions (even by sector) can obscure the underlying forces at play. For instance, an increase in external government debt is consistent with an unchanged net financial position of the government if foreign investors increase their holdings of domestic government debt during the period under consideration. Work by Allen (2019) on current account dynamics highlights the usefulness of tracking the domestic sectoral counterpart of external imbalances across government, households, and corporations.

The shortcoming of using data on financial balance sheets is that country coverage is much more limited compared to the data in the External Wealth of Nations—it consists primarily of advanced economies, as well as a few of the larger emerging market economies (see the Appendix for a full country list). At the same time the set of countries is generally more homogeneous. We focus on time series and cross-sectional evidence, with particular emphasis on the evolution of positions during the past decade. We start by highlighting some connections between sectoral financial balance sheets and net external accounts, following the evidence in existing empirical literature.

- The net financial position of households. In the extreme case in which non-financial corporates and the government are pure "veils," as in some optimizing representative agent models, we would expect the evolution of the net external position to solely reflect household sector decisions.
- The net financial position of the general government. Evidence presented in Lane and Milesi-Ferretti (2001b) documents a strong co-movement between net external positions and general government net debt, and the literature on current account imbalances finds a correspondingly robust link between the fiscal balance and the current account balance. The data on the net financial position of the government usefully includes public assets which may not be included in traditional “government net debt” concepts, such as assets of sovereign wealth funds. Related work by Gagnon and Sarsenbayev (2021) highlights the strong link across countries between the net external position in foreign currency instruments of the public sector (government and central bank) and the NIIP.
- The net financial position of non-financial corporates. By construction, this captures the value of non-financial assets by corporates (with the opposite sign), and co-moves with equity prices, a key driver of valuation changes during the past decade. It is also linked to the location of non-financial assets: equipment, structures, and intangibles overseas are owned through foreign affiliates, and hence are classified as financial claims, while domestic holdings of these assets are not.
- The size of institutional investors. Given the role of higher global equity prices in boosting international creditor and debtor positions, we explore whether countries where institutional investors such as insurance companies and pension funds have a larger role have accumulated

larger creditor positions. The potential link with the accumulation of net foreign assets could also work through the domestic saving channel—recent work by Koomen and Wicht (2022) finds that, in a sample of advanced economies and emerging markets, the presence of a fully funded pension system is associated with stronger current account balance, an effect increasing with the system’s generosity.

Table 5a provides median values for components of the financial balance sheet for new creditor countries in the sample and for the remaining countries for the years 2010 and 2020, separating out the United States. It highlights the improvement in the median net financial position of the government for new creditors as well as the improvement in remaining countries, primarily driven by the reduction in liabilities across economies in Central and Eastern Europe. In contrast, there is a notable deterioration in the United States. An interesting pattern emerges when looking at the individual components of the financial balance sheets. In particular, between 2010 and 2020 we see an improvement in the net financial position of households for all countries in the sample, likely driven by rising asset prices. It is therefore important to look at the financial balance sheets for other sectors to understand the evolution of net external positions.

**Table 5a. Financial Balance Sheets: Stylized Facts**  
(Median values, in percent of GDP)

		New creditors		U.S.		Other	
		2010	2020	2010	2020	2010	2020
Net fin. position	Domestic economy	12.2	73.6	-18.6	-40.7	-56.3	-25.9
Net fin. position	ROW (sign changed)	11.2	70.3	-17.3	-68.0	-56.3	-27.3
Net fin. position	Government	-7	6.4	-100.0	-126.3	-28	-46.8
Net fin. position	Financial corporates	0.1	8.3	-6.0	-15.9	-0.1	0.7
Net fin. position	Households	125.7	285.1	268.4	419.4	76.6	109.9
Net fin. position	Nonfin. corporates	-114.4	-163	-181.0	-318.0	-120.4	-112.1
Net equity pos.	Nonfin. corporates	-71.3	-112.9	-121.6	-256.7	-66.7	-86.7
Net debt pos.	Nonfin. corporates	-45.2	-50.3	-59.5	-61.2	-44.2	-28.6
Total fin. assets	Ins. co. and pens. funds	72.9	140.8	155.6	183.7	28.3	41.9

Note: New creditors group includes Korea, Taiwan, Austria, Belgium, Denmark, Germany, Netherlands, Norway, Sweden, Switzerland. For some countries, including the United States, there is a discrepancy between the net financial position for the domestic economy (obtained by aggregating domestic sectors) and the international investment position (see rows 2 and 3).

Source: Author’s calculations based on OECD, Financial Balance Sheets data.

In the other direction, the data show a sizable deterioration in the net financial position of non-financial corporations (for 33 out of 39 countries with data for both years), driven by higher equity valuations. The deterioration is particularly large in the United States, a country where equity prices rose rapidly and where stock market capitalization (and household share ownership) is high. When we look instead at the net financial position of the government, we see a median improvement in creditor countries and a deterioration for the U.S. as well as for the remaining set of countries. Finally, we see an across-the-board increase in the size of total financial assets held by insurance companies and pension funds, which is particularly large for new creditor countries. Table 5b provides median values for demographic variables and GDP per capita, showing in particular the rapid rise in dependency ratios across the board.

**Table 5b. Demographics and GDP Per Capita: Stylized Facts**  
(Median values, in percent where indicated)

	New creditors		U.S.		Other	
	2010	2020	2010	2020	2010	2020
Population growth (percent)	0.5	0.4	0.9	0.7	0.6	1.1
Life expectancy prime age worker	34.98	36.11	34.0	34.4	34.12	35.40
Old age dependency ratio (percent)	35.1	41.7	28.2	37.3	29.8	0.39
Prime savers share	0.56	0.60	0.57	0.56	0.54	0.55
Real GDP per capita	43863	44846	51996	60687	18088.2	19767

Source: Author's calculation based on World Bank, World Development Indicators.

In Table 6 we provide a more formal regression analysis of the variables associated with the evolution of net external positions. Among the explanatory variables we include the net financial position of the general government, more plausibly exogenous, but no other net private sector position. We also include total financial assets of insurance companies and pension funds for the reasons mentioned earlier. With a net financial position close to zero across countries, there is no mechanical link between this variable and a country's net external position. To capture the role of valuation changes we include the nominal effective exchange rate (NEER) and a stock market price index in domestic currency. A caveat to the inclusion of the exchange rate is that it is likely to respond to the evolution of the international investment position, and hence it is hard to draw causality inferences. We also include GDP per capita (which proxies the level of development) and two demographic variables: population growth and the old-age dependency ratio.<sup>28</sup> Finally, in cross-sectional regressions explaining the level of net creditor and debtor positions we include a dummy for Taiwan, which is meant to capture the desire to accumulate net foreign assets because of geopolitical factors.

...

28. These demographic variables are used in the econometric work underpinning the current account assessments published in the IMF's External Sector Report (Cubeddu et al., 2019) alongside two additional variables (life expectancy and the population share of prime age savers) which turn out to be statistically insignificant in all our regressions and are hence excluded. Lane and Milesi-Ferretti (2001b) use instead three parameters capturing a cubic spline approximation of the entire population age structure.

Columns (1)-(3) of Table 6 present results of a panel estimation with fixed country effects, which provides evidence on the drivers of net external position dynamics within countries, while columns (4)-(6) present evidence from cross-sectional regressions which average variables over the 2010-2020 decade.<sup>29</sup> The time series analysis also includes time fixed effects, as some of the variables should affect the net external position through deviation from world averages. Our sample includes all countries for which financial balance sheet data are available through the OECD with three exceptions: Ireland and Luxembourg, financial centers whose external accounts are heavily influenced by purely financial activities of multinational corporations, and Iceland, which entered the decade with net external liabilities exceeding 500% of GDP and subsequently restructured such liabilities in 2015. Hence Icelandic data is included only 2015-onwards. Columns (2) and (5) also exclude Norway, a country where the net financial position of the government (and its net IIP) are very large in relation to GDP because of the investment abroad of sizable oil revenues.

The time series results highlight the strength of the co-movement between the net external position and the net financial position of the government, even after excluding Norway. The net external position also co-moves with the size of the balance sheet of institutional investors (insurance companies and pension funds) which, as noted earlier, are more likely to hold equity claims on the rest of the world. Finally, for the entire sample a rising old-age dependency ratio is associated with a rising creditor position, as many aging societies continue to accumulate net foreign assets and others (such as countries in Central and Eastern Europe) reduced their net liabilities substantially after the global financial crisis. In the time series analysis, the coefficients on the stock market index and the NEER are not statistically significant. For the stock market index this result is likely related to differences across countries in stock market capitalization relative to GDP and in foreign participation in the domestic stock market. For the NEER, the sign is ambiguous a priori since currency appreciation tends to worsen the net IIP through valuation effects but real exchange rates tend to appreciate as countries accumulate net external wealth.

In the cross-sectional analysis (columns (4), (5), and (6)) the data still point to a strong relation between the net external position and the net financial position of the government, even though quantitatively smaller than the one estimated along the time series dimension. The regressions also confirm the positive relation between the net external position and the size of the balance sheet of institutional investors. The estimated coefficient on the dummy for Taiwan is very large (roughly of the same magnitude as their average net external creditor position during the period) and statistically significant, suggesting that factors beyond net government assets and the level of development are crucial for explaining its large creditor position.<sup>30</sup>

...

29. Data for 2021 is missing for several emerging economies (such as Brazil, Colombia, India, and Russia)—hence the choice of 2020 as the end year for this analysis.

30. Geopolitical factors are an obvious one. Data on the old age dependency ratio is not available for Taiwan—hence the dummy is not identified in regressions (5) and (6).



**Table 6. Dynamics of International Investment Position:  
Time Series and Cross-Sectional Evidence**

	(1)	(2)	(3)	(4)	(5)	(6)
	1995- 2021	1995- 2021 excl. NOR	2010-21	2010-21	2010-21	2010-21 excl. NOR
	1995-2021 Within (FE)			2010-21 Between (BE)		
Net fin. assets general govt (pct of GDP)	0.74*** (9.76)	0.54*** (5.66)	0.74*** (9.55)	0.50*** (5.11)	0.53*** (4.95)	0.35** (2.47)
Fin. assets insurance co. and pension funds (pct of GDP)	0.22 (1.44)	0.31** (2.19)	0.36** (2.41)	0.42*** (3.19)	0.40*** (2.86)	0.43*** (3.12)
log GDP per capita	10.9 (0.66)	18.2 (1.07)	62.4** (2.33)	9.80 (0.93)	-2.27 (-0.16)	-4.42 (-0.32)
Log stock price index (dom. currency)	-0.37 (-0.06)	-0.59 (-0.09)	-7.92 (-1.12)			
Log nom. eff. exch. rate	-16.3 (-1.22)	-14.3 (-1.08)	18.9 (1.41)			
Population growth	10.7 (1.00)	13.6 (1.29)	-2.56 (-0.35)		13.5 (1.10)	11.6 (0.97)
Old age dependency ratio	3.67*** (4.87)	3.90*** (6.46)	0.20 (0.18)		1.17 (1.39)	0.99 (1.19)
Taiwan dummy				174.4*** (4.22)		
Observations	892	865	465	40	39	38
R <sup>2</sup>	0.63	0.48	0.69	0.71	0.63	0.50

Note: Dependent variable is the international investment position in percent of GDP. t statistics in parenthesis. Robust standard errors clustered at the country level in equation (1)-(3). Baseline regressions exclude Ireland and Luxembourg (financial centers), and Iceland (very high negative IIP position after the global financial crisis, restructured in 2015). Sources: EWN database (international investment position); OECD (financial balance sheets); World Bank (GDP per capita, population growth); External sector report database (old age dependency ratio); MSCI and national sources (stock price index); BIS (nominal effective exchange rates).

Finally, in Table 7 we focus on the change in the net external position between 2010 and 2020, as well as between 2015 and 2020. Results are in line with those in Table 6, with improvements in the net financial position of the government and higher assets of insurance companies and pension funds

associated with rising net external assets. The regression also shows that countries with stronger population growth during the 2010-20 decade have been those where the net external position has improved. This result is driven by economies in Central and Eastern Europe, which underwent a painful process of external adjustment after the global financial crisis, during which net migration rose sharply. Finally, for the period 2015-20, during which stock prices rose rapidly, particularly in the U.S., the coefficient on the stock market index in domestic currency approaches statistical significance, with a 10-percentage point increase in domestic stock prices associated with a deterioration of the net IIP/GDP ratio of around 2 percentage points, consistent with the importance of valuation effects through this channel. In contrast, nominal exchange rate appreciation is associated with an improvement in the net external position, despite valuation effects operating in the opposite direction.

**Table 7. Change in International Investment Position, 2010-20 and 2015-20**

	(1)	(2)	(3)	(4)
	All	Excl. Norway	No outliers	Excl. Norway
	2010-20	2010-20	2015-20	2015-20
Change in govt net fin. position percent of GDP	0.79*** (11.00)	0.59** (2.33)	0.77*** (13.27)	0.66*** (3.30)
Change in insurance comp. and pension fund assets (pct of GDP)	0.56** (2.70)	0.59*** (2.92)	0.58*** (4.01)	0.61*** (4.00)
Growth rate in GDP per capita	48.4 (1.47)	62.3* (1.74)	57.5 (1.40)	65.5 (1.64)
Change in log stock price index (domestic currency)	-7.99 (-0.76)	-5.34 (-0.47)	-18.7* (-1.81)	-16.6 (-1.58)
Change in nominal effective exchange rate	11.6 (0.57)	7.38 (0.33)	40.0** (2.68)	37.8** (2.45)
Population growth rate	-182.9** (-2.66)	-175.7** (-2.52)	-66.7 (-1.38)	-65.8 (-1.35)
Change old dependency ratio	0.11 (0.08)	0.18 (0.14)	-0.40 (-0.31)	-0.30 (-0.23)
Constant	16.9 (1.37)	9.72 (0.65)	10.4 (1.40)	7.52 (0.93)
Observations	38	37	40	39
R <sup>2</sup>	0.74	0.53	0.82	0.68

Note: Dependent variable is change in the international investment position in percent of GDP between 2010 and 2020 (columns 1-2) and 2015-20 (columns 3-4). t statistics in parenthesis, robust standard errors. Baseline sample excludes Ireland and Luxembourg (financial centers), and Iceland (very high negative IIP position after the global

financial crisis, restructured in 2015). Sources: EWN database (international investment position); OECD (financial balance sheets); World Bank (GDP per capita, population growth); External sector report database (old age dependency ratio); MSCI and national sources (stock price index); BIS (nominal effective exchange rates).

In results available from the author, we find that, for the countries in our sample, a variable constructed by Gagnon and Sarsenbayev (2021) which measures the net official external position in foreign currency (including government and central bank) is strongly associated with the overall net IIP in the cross-section, as in their paper. This result is consistent with the important role of the official sector in external finance, particularly but not exclusively for emerging economies. However, the correlation does not hold within countries once the net financial position of the government is controlled for. Hence in our sample the variable does not contribute to explaining the build-up in creditor and debtor positions in recent years.

With regard to new creditor countries, two of the advanced Asian economies, Hong Kong and Singapore, do not publish financial balance sheet data. Both countries have large net creditor positions that have grown sizably during the period 2010-21. For Singapore, government savings, including through public funds (GIC, Temasek) are likely to play a crucial role in explaining the size and dynamics of its creditor position, even though data for the size of these institutions' net assets is not available.<sup>31</sup> In Hong Kong the large increase in the net creditor position likely reflects at least in part the investment overseas of capital from mainland China, even though valuation changes, discussed in the previous sections, are also playing a role.

## VI. Concluding Remarks

We have highlighted how the compression of global current account imbalances since the global financial crisis has been accompanied by a widening of global creditor and debtor positions. The sizable deterioration of the U.S. external position, driven to an important extent by rising valuations for U.S. equities and an appreciating dollar, explains most of the widening on the debtor side. We have shown how on the creditor side the main counterparts have been advanced European and Asian countries, where net asset accumulation has been primarily driven by large current account surpluses. Valuation gains on holdings in the United States have instead accrued mostly to countries with large equity and FDI positions in the U.S., including “Commonwealth” countries (for instance Canada and the United Kingdom) as well as countries with large sovereign wealth funds, including Norway and a number of oil exporters in the Middle East. The creditor position of China has declined both as a share of domestic and global GDP, as its current account surplus has shrunk, and its currency has appreciated substantially. For other emerging and developing economies, the external position has deteriorated by much less than net external borrowing would have suggested, as currency depreciation has reduced the value of domestic currency liabilities relative to foreign exchange assets. In turn, this development highlights the changing nature of the external balance sheet of emerging economies as a whole compared to decades such as the 1980s

...

31. Gagnon and Sarsenbayev (2021) quote a figure close to U.S.\$500 billion for the financial assets of the government in Singapore in March 2010. In their empirical analysis, they find that after 1995 official flows explain around half of the country's large current account surplus.

where foreign currency liabilities were dominant and the balance sheet effects of exchange rate depreciation very costly.

Our analysis has also highlighted several important measurement issues. There are meaningful gaps between our estimates of global liabilities and global assets, particularly for FDI and portfolio equity. These are likely associated with differences in valuation methodologies for FDI, a category for which we don't see in partner countries a rise in the estimated value of claims on the United States in line with the increase in the market value of U.S. FDI liabilities as estimated by the BEA. For portfolio equity investment global gaps reflect primarily our lack of knowledge on the ultimate investor base of a sizable fraction of investment funds domiciled in Ireland and Luxembourg, as well as U.S. equities held through financial centers such as Switzerland and the United Kingdom. We have also shown how the creditor position of advanced European countries would have been expected to be even larger because of valuation gains on their U.S. holdings, but these have been offset by other adjustments to external account estimates.

Our analysis of financial balance sheets indicates that rising creditor positions are positively associated with the net financial position of the government and the size of the balance sheet of institutional investors such as insurance companies and pension funds. The latter can contribute to a stronger net external position through higher saving or a greater propensity to invest in equity instruments overseas. Among advanced European and Asian economies, Norway and Singapore provide vivid illustration of the link between the net external position and net assets of the government, but the relation holds more generally. The empirical analysis also shows how these factors cannot account for the very large creditor position of Taiwan, likely associated with geopolitical factors.

The size of U.S. net external liabilities (some 80% of GDP at end-2021) is virtually unprecedented for any large country, let alone the largest economy in the world. While questions remain on the market value estimation of FDI positions in U.S. statistics, the size of U.S. liabilities has risen sharply even with alternative estimation methods for FDI. A natural question to ask is the extent to which the external position poses risks, and how an adjustment process could unfold. The growth in net U.S. liabilities has been associated with three main factors: i) the boom in U.S. stock market valuations over 2010-21, which has boosted the value of U.S. equities held by nonresidents; ii) the sizable appreciation of the U.S. dollar over the same period; and iii) a persistent current account deficit, even though smaller as a share of GDP than prior to the global financial crisis. Overall, while net external liabilities have grown, U.S. domestic wealth has risen much more sharply, as U.S. investors have benefited from higher valuations of U.S. firms and assets more generally. In 2022, valuation changes operated in reverse—U.S. stock market valuations declined by over 20%, and sharply higher interest rates reduced the market value of U.S. portfolio debt liabilities. These effects dominated those arising from a further appreciation of the U.S. dollar, with the BEA estimating an improvement in the U.S. net IIP by \$2.6 trillion by the end of 2022 (over 10 pp of GDP), compared to the end of 2021.

Should policymakers care about an increase in external liabilities driven by market estimates of improved prospects for domestic firms (reflected in equity prices)? This should not in principle be a source of concern. Indeed, empirical evidence in Catão and Milesi-Ferretti (2014) suggests that while the net debt position is a powerful predictor of external crises, there is no clear association between the net position in equity instruments and crisis probabilities. Of course, policymakers should be mindful of the macroeconomic consequences of rapidly rising asset prices, particularly when they fuel credit and aggregate demand booms, as a voluminous literature highlights. The period before the global financial crisis provides a vivid example of excess external borrowing fueled by financial over-optimism.

At the same time, the U.S. net liability position in debt instruments—debt securities as well as loans and deposits—is elevated (around 50% of GDP). While the role of the dollar as the main world reserve currency and the U.S. stock of wealth are factors that temper such concerns, a correction to this steady deterioration will eventually have to occur. The U.S. does still maintain a positive net investment income balance, despite its large net external liabilities, in good part because of higher reported investment income on its FDI claims compared to its liabilities.<sup>32</sup> Growing external asset and liability positions have sustained the income balance, given the positive return differential. However, the steady deterioration in the NIIP and the recent rise in interest rates worldwide imply that the income balance is shrinking (from 1.4% of GDP in 2017 to 0.6% in 2022), a process that could pick up speed if long-term interest rates remain elevated compared to the pre-COVID period. *Ceteris paribus*, a permanent 1 pp increase in long-term interest rates across the world would worsen the U.S. income balance by around ½% of GDP, even though it would also reduce the market value of outstanding U.S. debt, as can be seen in U.S. external accounts in 2022. External adjustment will eventually have to occur and will require slower U.S. demand compared to trading partners and a weaker dollar. Given that U.S. liabilities are in U.S. dollars and an important share of its assets are in foreign currency, a weaker dollar helps both current account adjustment and on the valuation front. A rebalancing of the U.S. NIIP would also be eased by asset prices in trading partners rising more rapidly than those in the U.S.

...

32. As discussed in Guvenen et al. (2022) this differential is heavily affected by international tax considerations and the incentive for U.S. multinationals to book profits in overseas affiliates. A recent paper by Bertaut et al. (2023) discusses the rate of return differential between U.S. portfolio investment abroad and foreign portfolio investment in the U.S., which is primarily driven by the higher share of equity in the U.S. asset portfolio.

---

## APPENDIX 1. CAPITAL GAINS IN NATIONAL CURRENCY

When a country's exchange rate vis-à-vis the dollar changes, capital gains and losses calculated in U.S. dollars year after year will differ from capital gains calculated in domestic currency and subsequently converted into U.S. dollars.

Let  $S$  and  $F$  be the NIIP and net financial transactions (the financial account), measured in U.S. dollars, and let  $e$  be the exchange rate (units of domestic currency per U.S. dollar). For simplicity we disregard exchange rate changes that occur within a year, so that the period-average exchange rate equals the end-of-period exchange rate. It follows that valuation gains measured in domestic currency ( $V^d$ ) are given by

$$V_t^d = S_t e_t - S_{t-1} e_{t-1} - F_t e_t \quad (\text{A1})$$

while the corresponding calculation in dollar terms will be

$$V_t^\$ = S_t - S_{t-1} - F_t \quad (\text{A2})$$

Converting the domestic-currency calculation of the capital gain/loss into U.S. dollars and comparing with the result with  $V_t^\$$  we obtain:

$$\frac{V_t^d}{e_t} - V_t^\$ = S_{t-1} \frac{e_t - e_{t-1}}{e_t} \quad (\text{A3})$$

This implies that for a debtor country ( $S < 0$ ) whose currency is depreciating ( $e_t > e_{t-1}$ ) the valuation gain calculated in domestic currency will be smaller than when calculated in U.S. dollars, while the opposite is true for a creditor country. A simple example illustrates this result. Consider a country with a net IIP in dollars equal to -100 in both year  $t-1$  and year  $t$ , and with net financial transactions of zero in year  $t$ . In this case  $V_t^\$ = 0$ . However, if the domestic currency depreciates from 0.8 to parity vis-à-vis the U.S. dollar between period  $t-1$  and period  $t$ ,  $V_t^d = -20$ . That is, liabilities in year  $t-1$  are higher when converted into dollars at the  $t-1$  exchange rate (as in the  $V_t^\$$  calculation) than when converted into dollars at the current exchange rate (as in the  $\frac{V_t^d}{e_t}$  calculation).

In the more general case in which exchange rates fluctuate within the year, the flow term in the first equation above would be multiplied by the period-average exchange rate (as net financial transactions occur throughout the year) while the net IIP terms would be multiplied by the end-of-period exchange rate (as the net IIP is calculated at the end of the year). In turn, this implies that in comparing valuation changes as in Equation (3) above we would have an additional term capturing the impact of within-year exchange rate changes on the measure of flows. In practice, this term is generally much smaller than the one on the LHS of equation (3).

Consider now the same calculation undertaken over a longer time horizon, with cumulative valuation changes in domestic currency converted into U.S. dollars at the final period's exchange rate. The calculation yields the following formula:

$$\frac{V_{t+k}^d}{e_{t+k}} - V_{t+k}^{\$} = S_{t-1} \left( \frac{e_{t+k} - e_t}{e_{t+k}} \right) + \sum_{i=0}^{k-1} F_{t+i} \left( 1 - \frac{e_{t+i}}{e_{t+k}} \right)$$

The additional term captures the extent to which exchange rate changes during the period of calculation drive a wedge between flows in domestic currency converted into dollars at the final period's exchange rate and flows calculated in U.S. dollars period by period. A period of currency depreciation would imply a larger valuation gain in domestic currency if the country is accumulating assets ( $F > 0$ ). This happens because the depreciation reduces the cumulative value of net saving when those are converted into dollars at a more depreciated exchange rate, and hence—*ceteris paribus*—increases the valuation gain.

---

## APPENDIX 2. FOREIGN FDI AND PORTFOLIO EQUITY POSITIONS IN THE UNITED STATES

### A. Portfolio Equity Investment in the U.S.

To calculate portfolio equity positions by country group in the United States we use as main guide the Coordinated Portfolio Equity Survey (CPIS) conducted under the auspices of the IMF. To establish the residence of investors in the United States it is in principle preferable to rely on data reported by holders of U.S. equities, such as CPIS data, because data obtained in surveys conducted by the United States is likely to suffer from “custodial bias.” That is, it will identify financial centers as large holders of U.S. equity instruments, but financial intermediaries or custodians in those centers may be holding U.S. equity on behalf of investors resident in other countries.

At the same time, however, reporting by investor countries may be incomplete (for instance for Kuwait, whose reported portfolio equity holdings exclude those of the main sovereign wealth fund) and is altogether absent for non-participating countries (for instance Qatar, Taiwan, and the United Arab Emirates, and several small offshore centers). In these cases the U.S. surveys provide very useful information, since they have wider coverage (virtually universal for the annual survey). Because the annual survey is conducted at end-June, for every year of the survey we construct end-December estimates as follows:

$$S_{12} = S_6 * \frac{P_{12}}{P_6} + \sum_7^{12} F_t$$

where  $S$  is the country-specific stock of U.S. equity holdings, the subscript indicates the month,  $P$  is the end-of-period MSCI U.S. stock price index, and  $F_t$  are net purchases of U.S. equities by the country during month  $t$ , with the index going from July to December. The data on  $F$  are taken from the monthly estimates of portfolio equity flows constructed by Bertaut and Judson, 2022 for the countries for which such data are available. We report the estimated positions at the end of 2010 in Table 1, column (1).

For annual data on bilateral portfolio equity flows to the U.S. by country of origin we use as primary source data provided by the BEA (BEA Table 1.3. U.S. International Transactions, Expanded Detail by Area and Country). We integrate these data, which are available for a limited set of individual countries, with estimates by Bertaut and Judson (2022) which are available for a broader set of countries on a monthly basis from January 2012-onwards. For countries and country groups for which 2011 flows remain unavailable we estimate 2011 flows using the equity position at the end of 2011, the position at the end of 2010, and U.S. stock prices as follows:

$$F_{2011} = \left( S_{2011} - S_{2010} * \frac{P_{2011}}{P_{2010}} \right) * \frac{P_{2011}^{AVG}}{P_{2011}}$$

where the stock price index  $P$  without superscript refers to its end-year value and  $P^{AVG}$  to its average value during the year. We report the cumulative value of estimated flows into U.S. equities by country/country group of origin in Table 1, column (2).

We estimate capital gains (column (3) in Table 1) as follows. We first calculate the increase in value of the 2010 position between end-2010 and end-2021 using the percentage change in the MSCI broad stock



market index during this period (an increase of over 280%). We add to that estimated gains and losses accruing on the 2011-2021 flows:

$$KG_{2010-21} = S_{2010} * \left( \frac{P_{2021}}{P_{2010}} - 1 \right) + \sum_{2011}^{2021} \left( F_t \frac{P_t}{P_t^{AVG}} * \frac{P_{2021}}{P_t} \right) - \sum_{2011}^{2021} F_t$$

where the first term on the right-hand side is the capital gain on the 2010 position, the second term is the value of 2011-21 flows at 2021 stock prices, and the third term is the cumulative sum of unadjusted flows.

Column (4) calculates the sum of the 2010 position, cumulative flows, and estimated capital gains, while column (5) has the positions in 2021 as reported by individual countries and country groups. Overall, the estimated values are reasonably close to the reported values, suggesting that the big valuation changes on portfolio equity liabilities reported by the U.S. are broadly matched in partner-country data.

A major advantage of the data on portfolio equity is that it is all at market value, a much easier computation for the survey since most equity instruments are actively traded on markets and hence prices are easy to determine.

## B. FDI in the U.S.

Country-specific calculations of valuation gains for FDI in the United States are more complex, for a variety of reasons.

- The BEA publishes aggregate figures for FDI in the U.S. at market value, but the bilateral data is published valuing FDI at historical cost.
- Furthermore, the more detailed bilateral statistics (for instance those providing a breakdown between FDI in equity or debt form, necessary to estimate valuation gains) are those where investment is classified by the residence of the foreign parent rather by the country of the ultimate beneficial owner (UBO). Given that many multinationals use chains of control for their FDI, we chose to use bilateral statistics by country of UBO.
- The last layer of complication has to do with the treatment of debt liabilities of U.S. parent companies vis-à-vis their overseas affiliates and of foreign parent companies to U.S.-based foreign affiliates. The headline aggregate FDI statistics published by the BEA use the so-called “asset-liability” principle for FDI, which implies that liabilities of U.S. parent companies vis-à-vis their overseas affiliates are classified as FDI in the U.S. and the liabilities of foreign parent companies to U.S.-based foreign affiliates are classified as U.S. FDI abroad. Instead the bilateral statistics are based on the so-called directional principle, which treats liabilities of U.S. parent companies vis-à-vis their overseas affiliates as negative FDI abroad and the liabilities of foreign parent companies to U.S.-based foreign affiliates as negative FDI in the U.S. So the “FDI debt” component of bilateral statistics captures net debt of U.S. affiliates vis-à-vis foreign parents. However, we focus in the table on the equity component of FDI, which is the one that the BEA adjusts in line with U.S. stock prices, and that component is the same under both the asset-liability and the directional principle.

To calculate estimated positions by country at market value in 2010 we need to first come up with an estimate of the split between FDI in equity form and in debt form, and then to convert the historical cost estimate of equity to a market value one. The split between equity and debt in bilateral FDI is only

available for larger economies and for statistics on a foreign parent basis. We use that equity component as a share of total FDI of that investor country as the country-level benchmark and apply it to the values of total FDI on a UBO basis to calculate equity at historical cost in 2010:

$$EQ^{UBO} = FDI^{UBO} * \frac{EQ^{FP}}{FDI^{FP}}$$

where  $EQ$  indicates the equity component of FDI, the superscripts  $UBO$  and  $FP$  refer to ultimate beneficial owner basis and foreign parent basis, and  $FDI$  is total FDI in the U.S. by that country. For country groups (in particular creditor Europe, advanced Asia ex Japan, and Commonwealth) we sum these components across countries to obtain total equity at historical cost.

We subsequently convert the country and group-specific historical cost estimate of equity in 2010 into a market value one by using the same ratio of FDI equity at market value to FDI equity at historical cost for FDI in the U.S. as a whole:

$$EQ_{MV}^{UBO} = EQ^{UBO} * \frac{EQ_{MV}^{US}}{EQ_{HC}^{US}}$$

where the subscript  $MV$  indicates market value,  $HC$  indicates historical cost, and the superscript  $U.S.$  refers to data for FDI in the U.S. as a whole.

We then provide an estimate of the capital gain on the outstanding stock of FDI driven by higher equity prices between 2010 and 2021 by multiplying the market value of equity in 2010 by the percentage increase in U.S. stock prices between 2010 and 2021. Given the variety of assumptions needed for this exercise we don't attempt to integrate this measure of estimated capital gains with those accruing from flows occurring between 2010 and 2021.

---

## APPENDIX 3. CONSTRUCTION OF DATA ON VALUATION CHANGES FOR TABLE 3

The key identity defining valuation changes and other changes is the following:

$$S_t - S_{t-1} = F_t + V_t^{ER} + V_t^P + O_t$$

where  $S$  is the stock of external assets or liabilities under consideration,  $F$  is net transactions in that asset or liability category during year  $t$ ,  $V_t^{ER}$  is the change in the value of the stock due to exchange rate changes,  $V_t^P$  is the change in the value of the stock due to changes in asset prices (other than exchange rates), and  $O_t$  represents other changes in the estimation of  $S$ , due to factors such as broader coverage of the surveys measuring  $S$ , reclassifications, other methodological changes etc.

A number of countries provide a table reconciling changes in external positions (our term  $S$ ) with balance of payments flows (our term  $F$ ), as well as decomposition of the factors explaining differences between changes in stocks and underlying flows ( $V_t^{ER}$ ,  $V_t^P$ , and  $O_t$ ). We use data from such reconciliation tables for Austria, Belgium, Denmark, Germany, the Netherlands, and Switzerland. For the first 5 countries the data is obtained from the European Central Bank data portal (for the years indicated in the table), while for Switzerland it is obtained from published data by the Swiss National Bank.

Norway and Sweden do not publish a stock-flow reconciliation table. In both cases, we estimate ( $V_t^{ER} + V_t^P + O_t$ ) from national data on the international investment position and the balance of payments. For Norway, we estimate the impact of exchange rate changes using the database of Benetrix et al. (2019), which provides the currency composition of external assets and liabilities, and attribute the remainder of valuation effects to asset price changes. Given the dominant importance of listed equity investments by Norway's sovereign wealth fund, we think the methodology yields reasonable results. We do not attempt the same exercise for Sweden given uncertainties concerning the estimation method used for FDI in the calculation of currency shares (Sweden produces data on FDI according to different methodological approaches).

All valuation terms are estimated using the domestic-currency version of the equation above and converted into U.S. dollars at the end-of-period exchange rate. These dollar figures are then summed over the period 2010-21 to obtain the totals listed in Table 3.

---

## **APPENDIX 4. FINANCIAL BALANCE SHEET ANALYSIS: COUNTRY SAMPLE**

Australia, Austria, Belgium, Brazil, Bulgaria, Canada, Chile, Colombia, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, India, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Taiwan, Turkey, United Kingdom, United States.

Data source: OECD, financial balance sheet statistics. Data are for non-consolidated financial balance sheets, with the exception of Australia. Data start in 1995 for 30 countries, and by 2010 data are available for 40 countries (missing only for Colombia, India, Russia, and Taiwan). For the subsequent period (2011-21) data is available for Colombia and Taiwan over the period 2015-21, for Brazil, India, New Zealand, and Russia over 2011-20.

---

## REFERENCES

- Adler, Gustavo, and Daniel Garcia-Macia, 2018, “The Stabilizing Role of Net Foreign Asset Returns,” IMF Working Paper 2018/079, April.
- Adler, Gustavo, Daniel Garcia-Macia and Signe Krogstrup, 2019, “The Measurement of External Accounts,” IMF Working Paper 19/132, July.
- Allen, Cian, 2019, “Revisiting external imbalances: Insights from sectoral accounts,” *Journal of International Money and Finance* 96, 67-101.
- Atkeson, Andrew, Jonathan Heathcote, and Fabrizio Perri, 2022, “The End of Privilege: A Reexamination of the Net Foreign Asset Position of the United States,” NBER Working Paper 29771, February.
- Bayoumi, Tamim, Joseph Gagnon, and Christian Saborowski, 2015, “Official Financial Flows, Capital Mobility, and Global Imbalances,” *Journal of International Money and Finance* 52: 146-174, October.
- Benetrix, Agustin, Deepali Gautam, Luciana Juvenal, and Martin Schmitz, 2019, “Cross-Border Currency Exposures,” IMF Working Paper 2019/299, December.
- Bertaut, Carol, Stephanie Curcuru, Ester Faia, and Pierre-Oliver Gourinchas, 2023, “The Global (Mis-) Allocation of Capital,” mimeo, NBER.
- Bertaut, Carol, and Ruth Judson, 2022, “Estimating U.S. Cross-Border Securities Flows: Ten Years of the TIC SLT,” FEDS Notes. Washington: Board of Governors of the Federal Reserve System, <https://doi.org/10.17016/2380-7172.3068>.
- Catão, Luis A. V. and Gian Maria Milesi-Ferretti, 2014, “External Liabilities and Crises,” *Journal of International Economics* 94, 18-32.
- Chen, Ruo, Gian Maria Milesi-Ferretti and Thierry Tresselt, 2013, “External imbalances in the eurozone,” *Economic Policy* vol. 28(73), 103-142, January.
- Chinn, Menzie, 2017, “The Once and Future Global Imbalances? Interpreting the Post-Crisis Record,” Jackson Hole Symposium, August.
- Chinn, Menzie and Eswar Prasad, 2003, “Medium-Term Determinants of Current Accounts in Industrial and Developing Countries: An Empirical Exploration,” *Journal of International Economics*, 59, 47-76, March.
- Coppola, A., M. Maggiori, B. Neiman, and J. Schreger, 2021, “Redrawing the Map of Global Capital Flows: The Role of Cross-Border Financing and Tax Havens,” *Quarterly Journal of Economics* 136(3), 1499–1556.
- Cubeddu, Luis, Signe Krogstrup, Gustavo Adler, Pau Rabanal, Mai Chi Dao, Swarnali Ahmed Hannan, Luciana Juvenal, Nan Li, Carolina Osorio Buitron, Cyril Rebillard, Daniel Garcia-Macia, Callum Jones, Jair Rodriguez, Kyun Suk Chang, Deepali Gautam, and Zijiao Wang, 2019, “The External Balance Assessment Methodology: 2018 Update,” IMF Working Paper 2019/065.
- Curcuru, Stephanie, Tomas Dvorak, and Francis E. Warnock, 2008, “Cross-Border Returns Differentials,” *Quarterly Journal of Economics*, 123(4): 1495–1530, November.

- Curcuru, Stephanie, Tomas Dvorak, and Francis E. Warnock, 2013, “On Returns Differentials,” *Journal of International Money and Finance* 36, 1-25.
- Dao, Mai, 2023, “The Evolution of Germany’s Primary Income Balance: 1991-2018,” IMF Working Paper, forthcoming.
- Dao, Mai and Chiara Maggi, 2018, “The Rise in Corporate Saving and Cash Holding in Advanced Economies: Aggregate and Firm Level Trends,” IMF Working Paper 18/262, December.
- Gagnon, Joseph, 2012, “Global Imbalances and Foreign Asset Expansion by Developing Economy Central Banks,” Peterson Institute for International Economics Working Paper No. 12-5, March. Peterson Institute for International Economics, Washington, D.C.
- Gagnon, Joseph, and Madi Sarsenbayev, 2021, “Fiscal and Exchange Rate Policies Drive Trade Imbalances,” PIIIE Working Paper No. 21-4. Washington: Peterson Institute for International Economics.
- Gourinchas, Pierre-Olivier and Helene Rey, 2007a, “International Financial Adjustment,” *Journal of Political Economy*, 115(4): 665–703, February.
- Gourinchas, Pierre Olivier and Helene Rey, 2007b, “From World Banker to World Venture Capitalist: U.S. External Adjustment and the Exorbitant Privilege,” In: [G7 Current Account Imbalances: Sustainability and Adjustment](#), 11-66, National Bureau of Economic Research, Cambridge, MA.
- Gourinchas, Pierre-Olivier and Helene Rey, 2014, “External Adjustment, Global Imbalances, Valuation Effects,” [Handbook of International Economics](#), 4: 585–645.
- Gourinchas, Pierre-Olivier and Helene Rey, 2022, “Exorbitant Privilege and Exorbitant Duty,” CEPR Discussion Paper 16944, January.
- Güvener, Fatih, Raymond J. Mataloni Jr., Dylan G. Rassier, and Kim J. Ruhl, 2022, “Offshore Profit Shifting and Aggregate Measurement: Balance of Payments, Foreign Investment, Productivity, and the Labor Share,” *American Economic Review* 112 (6): 1848–1884.
- Hünnekes, Franziska, Moritz Schularick, and Christoph Trebesch, 2019, “Exportweltmeister: The Low Returns on Germany’s Capital Exports,” CEPR Discussion Paper 13863.
- International Monetary Fund, 2013, “[External Balance Assessment \(EBA\) Methodology: Technical Background](#)”.
- International Monetary Fund, “External Sector Report,” various years.
- Koomen, Miriam and Laurence Wicht, 2022, “Pension systems and the current account: An empirical Exploration,” *Journal of International Money and Finance* vol. 120, February.
- Landefeld, J. Steven and Ann M. Lawson, 1991, “Valuation of the U.S. Net International Investment Position,” *Survey of Current Business* 71 no. 5, pp. 40-49, May.
- Lane, Philip R. and Gian Maria Milesi Ferretti, 2001a, “The External Wealth of Nations: Measures of Foreign Assets and Liabilities for Advanced and Developing Countries,” *Journal of International Economics*, 55(2): 263-294, December.
- Lane, Philip R. and Gian Maria Milesi Ferretti, 2001b, “Long-Term Capital Movements,” *NBER Macroeconomics Annual*.

- Lane, Philip R. and Gian Maria Milesi Ferretti. 2007, “The External Wealth of Nations Mark II: Revised Estimates of External Assets and Liabilities, 1970-2004,” *Journal of International Economics*, 73(2): 223-250, November.
- Lane, Philip R. and Gian Maria Milesi-Ferretti, 2009. "Where did all the borrowing go? A forensic analysis of the U.S. external position," *Journal of the Japanese and International Economies*, vol. 23(2), pages 177-199, June.
- Lane, Philip R. and Gian Maria Milesi Ferretti, 2018, “The External Wealth of Nations Revisited: International Financial Integration in the Aftermath of the Global Financial Crisis”, IMF Economic Review 66: 189-222, March.
- Lee, Jaewoo, Gian Maria Milesi-Ferretti, Jonathan D. Ostry, Alessandro Prati, and Luca A. Ricci, 2008, “Exchange Rate Assessments: CGER Methodologies,” Occasional Paper No. 261, April. (Washington: International Monetary Fund).
- Lane, P. R. and J. C. Shambaugh, 2010, “Financial exchange rates and international currency exposures.” *American Economic Review* 100(1), 518–540.
- Milesi-Ferretti, Gian Maria, 2021, “[The U.S. is increasingly a net debtor nation. Should we worry?](#),” blog, The Brookings Institution.
- Milesi-Ferretti, Gian Maria, 2022, “[The External Wealth of Nations Database](#),” The Brookings Institution.
- Milesi-Ferretti, Gian Maria, 2023, “Global Discrepancies in Portfolio Equity Positions: A Note,” mimeo, Brookings Institution, Hutchins Center on Fiscal and Monetary Policy.
- Obstfeld, Maurice, 2017, “Commentary: The Once and Future Global Imbalances? Interpreting the Post-Crisis Record”, Jackson Hole conference, August.
- Obstfeld, Maurice, 2018, “25 years of Global Imbalances,” in *Sustaining Economic Growth in Asia*, edited by Jérémie Cohen-Setton, Thomas Helbling, Adam Posen, and Changyong Rhee, Peterson Institute for International Economics.
- Obstfeld, Maurice, and Kenneth Rogoff, 2007, “The Unsustainable U.S. Current Account Revisited,” in *G7 Current Account Imbalances: Sustainability and Adjustment*, edited by Richard Clarida, Chicago: University of Chicago Press for NBER.
- Obstfeld, Maurice, and Kenneth Rogoff, 2009, “Global Imbalances and the Financial Crisis: Products of Common Causes,” in *Asia and the Global Financial Crisis*, ed. R. Glick and M. Spiegel, Federal Reserve Bank of San Francisco.
- Obstfeld, Maurice, and Alan Taylor, 2004, *Global Capital Markets: Integration, Crises, and Growth*, Cambridge University Press.



The mission of the Hutchins Center on Fiscal and Monetary Policy is to improve the quality and efficacy of fiscal and monetary policies and public understanding of them.

Questions about the research? Email [communications@brookings.edu](mailto:communications@brookings.edu).  
Be sure to include the title of this paper in your inquiry.