

Very preliminary
Comments welcome

Many Creditors, One Large Debtor:
Understanding The Buildup of Global Stock Imbalances after the Global
Financial Crisis*

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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 US asset price boom and dollar appreciation in widening the net US 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.

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INTRODUCTION

During the decade after the global financial crisis, global current account imbalances compressed sharply. The US current account deficit declined in relation to US GDP, and “Southern” euro area countries and economies in Central and Eastern Europe, large borrowers pre-crisis, reduced their deficits or swung into surpluses. On the other side of the ledger, surpluses in China and oil exporters were lower than during the previous decade.

These developments notwithstanding, the period since 2010 has seen a remarkable widening of global creditor and debtor positions in relation to world GDP. On the debtor side, the lion’s share of net external liabilities is accounted for by the United States, where the net external liability position between 2010 and 2021 deteriorated by over \$15 trillion, from some 20 percent of GDP to close to 80 percent 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 US external liabilities, particularly during a period of reduced external borrowing?
- 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 US claims?
- What role has been played by the forces behind the initial surge in global current account imbalances during the period from 1995 to the global financial crisis (global savings glut; mercantilist motives/reserve accumulation; shortage of safe assets; divergence in fiscal policy conduct).
- Do these stock imbalances raise external sustainability issues, and what shape can the adjustment process take?

The dynamics of stock imbalances 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. Returns on foreign assets and liabilities can take the form of investment income, which is recorded in the current account, or capital gains and losses triggered by changes in exchange rates and asset prices—the so-called valuation effects. In a world where the size of external assets and liabilities is large and growing, these valuation effects take a prominent role and need to be considered alongside current account dynamics to understand the evolution of creditor and debtor positions.

While a sizable literature has discussed global imbalances during the period before 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 US, 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 US dollar and especially the run-up in US equity prices, both in absolute terms and relative to the rest of the world. The first factor reduces the US dollar value of US claims denominated in foreign currency, thus worsening the US IIP, while the second factor increases the size of US equity liabilities (portfolio instruments and FDI) relative to the size of US assets. These effects had operated in reverse during the previous decade, limiting the accumulation of US external liabilities despite large external borrowing (as documented in Gourinchas and Rey, 2007 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, 2013).¹ The Special Feature in the 2017 External Sector Report of the IMF is devoted to the study of episodes of large and persistent current account surpluses. Related research has tried to explain the rise in private saving in surplus countries. Research by Dao and Maggi (2018) highlighted rising gross saving and net lending of non-financial corporates across major industrialized countries 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. In country-specific work, Dao (2020) explored 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 US 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), with its last version presented in Milesi-Ferretti (2022a). 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 US net external position associated with valuation effects. Countries with large portfolio equity asset holdings in the US are natural beneficiaries of the run-up in US stock prices. The paper also investigates whether valuation changes to US FDI positions, whose market value the BEA estimates using data on stock prices for the country where FDI is located, appear to be reflected in partner country data or instead in a rising global discrepancy between external assets and liabilities.²

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

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 US stock prices also reflect rising values for overseas production capacity by US MNEs, and conversely that the value of, say, a Toyota plant in the US does not rise because of skyrocketing valuations for US tech companies. The emphasis on valuation effects also ties the paper to the literature on external rates of return (see Gourinchas and Rey, 2007, Curcuru et al, 2008; Curcuru et al, 2013; Adler and Garcia Macia, 2018).

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. This paper 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 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.³ 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, 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.⁴

Finally, the paper closes with considerations on the possible nature of the adjustment process. On the US front, a downward correction in US equity prices (as seen in the first few months of 2022) and a weakening of the US dollar would contribute to reducing US liabilities and also help raise US exports. While the lack of automatic adjustment mechanisms for creditor countries complicates inference on the future path of large creditor positions, the proposed analysis in the paper could help in this respect to the extent that it can better identify the main driving forces at play.

To preview the main findings: I 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.

On the “debtor” side, however, the increase in the US external position reflects primarily net valuation losses on the external portfolio. These have been driven by the appreciation of the US dollar but also by the runup in US 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 current account balances would have suggested, with currency depreciation reducing the size of domestic-currency liabilities relative to foreign exchange assets. Overall, the data point to growing discrepancies in the recording of external assets and liabilities, with rising estimates of US FDI liabilities by the BEA that do not appear fully matched by partner-country FDI claims.

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 (such as Austria, Belgium, Denmark, Germany, the Netherlands, Norway, Sweden, Switzerland).

The paper also highlights a sizable global discrepancy in external positions, with estimated liabilities exceeding assets. An important component of this discrepancy relates to portfolio equity, and it is related to the lack of information on the residence of investors holding a large amount of investment fund shares issued by Ireland and Luxembourg and sold in global financial centers, including importantly the United Kingdom. In regard to new creditor countries, their rising external assets are generally associated with more favorable net government debt developments relative to other countries, a growing footprint of institutional investors such as insurance companies and pension funds, and a less negative net financial position of nonfinancial corporates (which also reflect less favorable equity price dynamics).

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 also on the related subject of global international financial integration. He has revisited the issue of global imbalances in more recent years—for instance in a piece on “25 years of global imbalances” (Obstfeld, 2018) and in a long and insightful discussion of the Menzie Chinn’s piece for the 2017 Jackson Hole conference.

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. By comparing the dynamics of net borrowing and lending and net external positions 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 global 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). The chart identifies countries and country groups where the evolution of external sector 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.

Specifically, surplus countries 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 a couple of small Asian oil exporters (Brunei Darussalam and Timor Leste);⁵

⁵ A number of African countries (Angola, Equatorial Guinea, Gabon, Nigeria) are also fuel exporters but remain in general net debtors.

3. China;
4. Creditors in advanced Europe. These include Germany, Norway, the Netherlands, Switzerland, Austria, Belgium, Denmark, and Sweden.⁶
5. Advanced Asia. This group includes Hong Kong, Korea, Macao, Singapore, and Taiwan.

Deficit countries 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, Ireland, as well as Southern euro area countries such as Greece, Italy, Portugal, and Spain.

The pattern of imbalances from the late 1990s to 2008 is well known: a growing US 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 the euro area periphery. After the sharp retrenchment with the global financial crisis, global current account imbalances narrowed. On the deficit side, net borrowing from the US 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 external 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 shrank relative to their peaks prior to the GFC.

Figure 2 documents the behavior of creditor and debtor positions. On the debtor side, the large increase in US 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 percent 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.

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—despite the narrowing in the global size of current account surpluses and deficits, the main creditor countries have continued to run surpluses and the US 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 percent to over 80 percent. Figure 3 provides a more detailed look at how this happened. It shows that, absent valuation changes, the current account deficits

⁶ Luxembourg could also be included among these creditor countries. It is separated out because of the impact of its gross position 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.

of the period 2011-21 would have led the U.S. debtor position to deteriorate much more modestly, to around 35 percent 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.

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 estimate of global net IIPs highlight a growing negative discrepancy. Recorded global external liabilities have risen faster than global recorded assets.

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

III. THE US NET DEBTOR POSITION AND CREDITOR COUNTRIES

III.1 US valuation losses

As documented in the previous section, the deterioration in the U.S. external position has been driven mainly by valuation changes. The Bureau of Economic Analysis (BEA) provides a useful table which reconciles the changes in the net IIP 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 US stock market index to revalue FDI in the US.⁷ We will come back to this issue in Section IV.

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

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.⁸ The US portfolio structure was traditionally “long equity, short debt” (see, for instance, Gourinchas and Rey, 2007) but now US FDI and portfolio equity liabilities exceed in value US FDI and portfolio equity assets, with the difference approaching -30 percent of US 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

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

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.

by valuation changes—in particular, the sharp increase in US stock prices relative to stock prices in the rest of the world. Specifically, between the end of 2010 and the end of 2021 US stock prices rose by 282 percent according to the MSCI broad market index for the US, while they rose by 31 percent in US dollar terms using the MSCI global stock market index excluding the US—a massive difference.

III.2 Valuation gains and losses in other countries

How did valuation changes play out in other countries? Which countries or country groups benefited most from the runup in US stock prices? How did exchange rate changes during this period impact the value of external portfolios in different countries? Before looking at figures, four important factors must be noted.

- 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 US 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 can be 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 is a function of the currency in which they are calculated. While for the US the dollar is the natural metric, for other countries—say, members of the euro area or Japan—their domestic currency may be 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 US dollars.
- Last but not least, the exchange rate and asset price changes that generate valuation gains and losses on the net IIP do not imply that a country's wealth is increasing when valuation gains are positive and vice versa. For instance, US residents hold the majority of US stocks. When their price goes up, US wealth rises, but since some US shares are held by nonresidents, part of the wealth gain accrues to them as well. 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 US 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.⁹ We first focus on aggregate valuation gains and losses, and then turn to examine more specifically exposures to US 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

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

$$b_{21}^{\$} - b_{10}^{\$} = \sum_1^{10} f_{10+i} + \sum_1^{10} [v_{10+i} + oth_{10+i}]$$

where $b^{\$}$ is the net IIP in US dollars, the subscript indicates the year, f are annual net financial transactions, v are annual net valuation changes and oth are other changes to the estimated net IIP, also in US dollars. In the analysis below, the sum $v+oth$ and its cumulative value over 2011-21 are derived residually from the “observables” b and f . As the Appendix clarifies, the measure of valuation and other changes is going to be a function of the currency in which the calculations are performed, and here the calculations are done for each year in current US dollars, following the reporting convention in the IMF’s Balance of Payments and International Investment Position statistics.

Figure 6 breaks down changes in the net IIP of our countries and country groups into cumulative net financial transactions on the one hand and valuation and other changes on the other hand. Focusing first on international creditors, we find mixed evidence on the valuation front. The net accumulation of external saving by Japan, China, and especially European surplus countries over the past decade is in excess of the change 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.¹⁰

The largest positive differences between changes in the net IIP 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 percent.

Before discussing the reasons behind the patterns of gains and losses across countries depicted in Figure 6, it is important to highlight that the data point to very substantial global discrepancies. In particular, the data on net financial transactions across the world shows a positive annual discrepancy throughout the period 2010-onwards, albeit smaller than the one on the overall current account balance depicted in Figure 1, because the balancing terms “errors and omissions” has been consistently negative throughout this period (Figure 7). Preliminary data show a particularly large discrepancy for the year 2021. At the same time, the data show a growing negative discrepancy between global external assets and global external liabilities, as was shown in Figure 2. Taken together, these two measurement gaps together imply that recorded global valuation and other changes (the sum of the grey bars in Figure 6, which we calculate residually) are going to be substantially negative for the world as a whole.

We will turn to possible explanations for these gaps in Section IV. Before doing so, it is useful to discuss what the main sources of valuation changes are, how they affect the net IIP, and also what are the main

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”.

¹⁰ Adopting a different computation method for valuation changes, which uses domestic-currency figures subsequently converted to US 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.

counterparts to the US 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 US dollar—and asset prices, as well as by the behavior of asset prices in counterpart nations. With regard to asset price dynamics, the impact on valuation 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. With regard to exchange rates, for all our large individual countries and for our country groups as an aggregate the general pattern is “short domestic currency, long foreign currency”. In particular, equity and FDI liabilities are mostly denominated in domestic currency and so is for advanced economies the lion's share of their 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.

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 US stock prices. The MSCI stock price index for the broad US market rose by over 280 percent between end-2010 and end-2021, while stock markets elsewhere rose (in US dollar terms) by under 31 percent.¹¹ US stock market valuations affect the value of foreign holdings of portfolio equity in the US, as well as the value of foreign FDI holdings according to the BEA methodology. Given the size of the US financial market, the valuation repercussions for partner countries can be very large. For instance, in 2020 portfolio equity investment in the US (as reported in US external accounts) represented 37 percent of portfolio equity claims reported by all other countries, while US FDI liabilities (as reported in US external accounts) accounted for almost ¼ of the combined FDI reported by all other countries. We would thus expect countries with substantial equity and FDI investment in the US to have experienced sizable valuation gains. More generally, the rising value of equity globally tends to improve the net IIP 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 US 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.¹²

III. The counterparts to rising US equity prices

To add some quantitative evidence to these general considerations, Table 1 and Table 2 show holdings of FDI and portfolio equity claims on the US in 2010 by partner country group, as well as an estimate of the value those claims would have taken in 2021 solely based on US stock price changes (that is, disregarding net transactions in those assets over that period). The calculations make use of data from several sources:

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

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

portfolio equity claims on the United States reported by partner countries in the Coordinated Portfolio Equity Survey (CPIS) as well as those reported in US surveys of portfolio liabilities (the annual survey and the monthly survey); and for FDI the bilateral value of foreign holdings by country of ultimate beneficial owner, as reported by the United States. Appendix 2 provides further details on the calculation methods. 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.¹³ Hence all FDI holdings by in the US, regardless of the source, are revalued using a broad index of US stock prices.

Table 1 shows that valuation gains by FDI investors in the US 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 \$2.5 trillion), advanced European creditor countries (over \$2 trillion), other advanced economies (\$1.6 trillion), and Japan (close to \$1 trillion).

Table 2 presents the same statistics for portfolio equity investment. Here the estimates are much more precise since country-by-country data on estimated holdings is at market value in the first place. Once again, the data show that the largest beneficiaries of these valuation gains would have been Commonwealth countries (\$2 trillion), European creditor countries (over \$1.6 trillion), other advanced economies (\$1.4 trillion), and Japan (\$760 billion), with gains for other countries and country groups also substantial. Looking at the last two columns we see that these theoretical valuation gains for the period 2011-21 align well with 2021 holdings of US equity instruments reported in the CPIS and evinced from US annual and monthly surveys of foreign portfolio holdings. The large discrepancy between actual and projected holdings in Ireland and Luxembourg can be explained by their large net purchases of US equity instruments during the period 2011-21.

Tables 1 and 2 highlight exclusively valuation gains for foreign equity claims on the US, 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 US 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, even though 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.

Turning to other countries and country groups, however, it is harder to “match” estimated gains on equity claims in the US with the overall gains and losses of Figure 6. This is especially the case for European creditor countries, where estimated gains amount to over \$3.5 trillion dollars, but the net IIP data show net valuation losses. It is theoretically possible that valuation changes in other parts of the balance sheet 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 US positions but overall losses.

¹³ 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, so as to avoid double counting. 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 US stock market valuations between end-2010 and end-2021 to the estimated 2010 positions.

For emerging and developing economies (excluding China and oil exporters) estimated equity gains on US holdings are more modest. This reflects both their smaller overall FDI and portfolio equity claims, but possibly also an underestimation of portfolio holdings overseas.¹⁴ This notwithstanding, the large aggregate valuation gains for this country group may at first blush seem surprising, but it is 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, which are captured in the current account. At the same time, non-residents will incur “capital losses” on their holding of the principal as currency depreciation reduces its real value. When external debt is calculated at market value, capital losses by nonresidents can be substantial when spreads rise (the case of Argentina is a good example). A further factor increasing valuation gains for these countries is real depreciation. Collectively this country group is “short” domestic currency and “long” foreign currency, a 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.¹⁵ Hence real depreciation will improve the net foreign asset position. Finally, stock market performance in many of these countries during the decade has been subdued, which has implied limited gains on equity holdings by nonresidents.

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 US. At the same time, large discrepancies between changes in global assets and liabilities remain, and valuation changes in the US and “the rest of the world” do not appear to be consistent. The next Section addresses this issue in more detail.

IV. GLOBAL DISCREPANCY AND VALUATION CHANGES

In the previous section we have highlighted how valuation gains and losses have contributed to the pattern of rising debtor and creditor positions around the world. We now turn to possible reasons for the widening discrepancy between global external assets and liabilities (as illustrated by the line in Figure 2). We start the discussion 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 US dollar and the smaller increases in equity prices compared to their financial trading partners, particularly the United States. And finally, the third reason is the availability of data reconciling balance of payments flows with changes in the net IIP for most countries.

Specifically, we collected detailed data on valuation changes for the countries in the advanced Europe group for which it is available (Austria, Belgium, Denmark, Germany, Netherlands, and Switzerland), and we derived valuation changes for the remaining two countries (Norway and Sweden) as the difference

¹⁴ There is a sizable literature on capital flight from emerging and developing economies.

¹⁵ Benetrix et al (2019) present a database on the currency composition of countries’ external assets and liabilities which highlights these shifts over time.

between the change in the net IIP and net financial transactions.¹⁶ The data are presented in Table 3. The first thing to note is that there have been on net downward revisions to net creditor positions unrelated to valuation changes, totaling over \$800 bn. 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 and exchange 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, German data shows a very large price valuation loss on financial derivatives—over \$400 billion over the decade.¹⁷ 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.¹⁸ Furthermore, Switzerland estimates FDI positions at book value, and hence rising global stock prices are not reflected in their direct investment statistics.

Looking more broadly at FDI positions, the data for European creditor countries show very limited valuation price gains on FDI abroad.¹⁹ 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 the size of their effective US holdings for rising US stock prices, as the Bureau of Economic Analysis does for US data (see the estimates in Table 1).²⁰

But what are the components of external assets and liabilities which account for the global discrepancy? Figure 8 illustrates the answer. Note that the IIP components in the Figure include estimated assets and liabilities in small financial centers.²¹ However, the estimates of the global net position 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. For this reason, the net IIP line is not equal to the sum of the components.

The bars show the emergence of a negative global FDI discrepancy from 2018 onwards, a period during which US stock prices doubled. Indeed, as illustrated in figure 9, during this period the wedge between the net FDI position of the US at market value and current cost widened very sharply. As noted in Milesi-

¹⁶ This implies that for Norway and Sweden we cannot distinguish between changes in the external position due to asset price or exchange rate fluctuations and those due to other factors.

¹⁷ 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.

¹⁸ 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.

¹⁹ The Netherlands is a partial exception, but the estimated price gains over the decade (round \$500bn) are broadly the same as the gains made by foreign direct investors in the Netherlands.

²⁰ Note that in Table 1 we estimate the increase in value of FDI in the US 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.

²¹ These include The Bahamas, Bermuda, British Virgin Islands, Cayman Islands, Curacao, Guernsey, Jersey, Isle of Man, San Marino, and Turks and Caicos.

Ferretti (2021a), it is questionable to assume that a broad US stock price index contains useful information to estimate the value of, say, foreign car manufacturers or foreign banks' affiliates in the US but not to estimate the value of US FDI abroad, despite the fact that foreign sales account for a nontrivial fraction of profits for the largest US 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.

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 (see Milesi-Ferretti, 2022b) 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. We then compare these data with the portfolio equity liabilities reported these destination countries (or estimated in the EWN database for nonreporters). 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) and some modest share of foreign exchange reserves are invested in portfolio equity instruments. Therefore, we expect derived liabilities to fall short of reported ones, but the share of assets held by nonreporters is still small compared to CPIS participants.

The comparison, reported in Table 4, reveals three countries which account for the lion share of the discrepancy between derived and reported equity liabilities: the United States (\$3 trillion), Luxembourg (\$2.3 trillion), and Ireland (\$2.1 trillion). However, the United States conducts a detailed annual survey as well as monthly surveys of foreign holdings of US portfolio instruments, and this allows to allocate most US holdings to the likely investor countries, including nonreporters. In turn, these US-source estimates are used in the EWN database to estimate total portfolio equity holdings of countries that do not report IIP statistics or to correct data for likely under-reporters.²² However, no such liability surveys exist for investment in Ireland and Luxembourg.

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, the 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 the owner of the security is not a UK resident) 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 data on the location of investment fund holders for Luxembourg is very limited—statistics only identify the main markets where funds are sold. In euro area statistics, these liabilities of Ireland and Luxembourg

²² Indeed, these US-source estimates are used in the database to estimate total portfolio equity holdings of countries that do not report IIP statistics. There is still a financial center "custodial bias" in the 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). This inflates US-reported holdings in countries such as Switzerland and the United Kingdom compared to the holdings by residents of these countries reported in the CPIS.

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. Some of these holdings can be attributed to the CPIS nonreporters mentioned earlier, but these are unlikely to account for a sizable share of the total (Milesi-Ferretti, 2022b). Indeed, as Table 4 shows, the global gap between portfolio equity assets and liabilities is close to the size of the equity liabilities in Ireland and Luxembourg for which the ultimate investor country cannot be identified.

This is clearly an area where much progress can 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, that 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, 2013; Bayoumi et al, 2013; Chinn, 2017 as well as IMF work including Lee et al, 2006, International Monetary Fund, 2013, and Cubeddu et al, 2019—the latter paper still forming the basis for the IMF's assessment of excess imbalances and associated 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 also 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 allow 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. 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. Given the relatively narrow sample we focus on a limited set of variables associated with external creditor and debtor positions. These include:

1. 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 use of data on the net financial position of the government allows for the inclusion of public assets which may not be included in traditional “government net debt” concepts, such as assets of sovereign wealth funds.

2. The net financial position of nonfinancial corporates. By construction, this captures the value of nonfinancial assets by corporates (with the opposite sign), and co-moves with equity valuations, a key driver of valuation changes during the past decade. It is also linked to the location of nonfinancial assets: equipment, structures, and intangibles overseas are owned through foreign affiliates, and hence are classified as financial claims.
3. 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.
4. Finally, we include GDP per capita (which proxies the level of development), demographic variables, and a dummy for Taiwan as additional controls. The dummy variable is meant to capture the desire to accumulate net foreign assets because of geopolitical factors. Demographic variables include population growth, the old-age dependency ratio, as well as two variables related to the incentive to accumulate saving: the life expectancy and the population share of prime age savers. These demographic variables are used in the econometric work underpinning the current account assessments published in the IMF’s External Sector Report.²³

It is worth noting that we exclude the household sector from the regression. In the extreme case in which nonfinancial corporates and the government are pure “veils”, as in some optimizing representative agent models, we would not expect a systematic relation between their financial balances and the net external position.

Table 5 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, compared to a deterioration for the US as well as for the remaining set of countries, as well as the size of the deterioration in the net equity position of US nonfinancial corporate entities, consistent with the runup in US equity prices.

Table 6 provides some time series and cross-sectional evidence on the correlates of the net external position. Column (1)-(3) present results of a panel estimation with fixed country effects, which provides evidence on the correlates 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. Columns (2)-(3) and (5)-(6) focus on a sample that excludes a few countries that can leverage aggregate results because of extreme observations. Those are Norway (where the sovereign wealth fund has

²³ Lane and Milesi-Ferretti (2001b) use instead three parameters capturing a cubic spline approximation of the entire population age structure.

amassed sizable net external assets, raising the aggregate co-movement between the net external position and the net financial position of the government); Iceland (which entered the decade with net external liabilities exceeding 500 percent of GDP and subsequently restructured such liabilities); and Ireland and Luxembourg, financial centers whose external accounts are heavily influenced by financial activities of multinational corporations. The time series analysis also includes time fixed effects, as some of the variables should affect the net external position as deviation from world averages.

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, where the relation is particularly strong given the role of the sovereign wealth fund in saving oil revenues. The net external position also co-moves with the net financial position of nonfinancial corporate business, which is heavily affected by equity valuations, and—once outliers are excluded—with total financial assets of institutional investors (insurance companies and pension funds). Finally, 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 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 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. Once demographic variables are added, the net financial position of nonfinancial corporates is also related to the net external position in a statistically and economically significant way, likely capturing differences in investment rates. 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.²⁴ The regression also shows that countries with stronger population growth during the decade have been those with a stronger net external position. The direction of causality here is likely to be reversed, as several countries with high net external liabilities after the global financial crisis experienced net migration given the painful process of adjustment.

The sample of countries with financial balance sheet data is relatively limited. To check robustness of the findings we have run panel regressions on a larger sample of countries, using the net foreign asset position data from the External Wealth of Nations database, net debt of the general government from the World Economic Outlook database, GDP per capita, and the same set of demographic variables used in Table 5. Results, available from the author, are in line with those in Table 5: rising net government debt is associated with a worsening external position within countries, and countries with rising old-age dependency ratios have accumulated more net external assets.

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

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 through public funds (GIC, Temasek) play a crucial role in explaining the size and dynamics of its creditor position, even though data

²⁴ Not all demographic variables are available for Taiwan—hence the dummy is not identified in regression (6).

for the size of these institutions' net assets is not available. 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. On the debtor side the lion's share of the widening is accounted for by a sizable deterioration of the US external position, driven to an important extent by rising asset valuation for US equities and by an appreciating dollar. On the creditor side the main counterparts have been advanced European and Asian countries, where net asset accumulation has been driven to a large extent by large current account surpluses. Valuation gains on holdings in the United States have accrued mostly to countries with large equity and FDI positions in the US, including most Anglo-Saxon countries (for instance Canada) 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 instead declined both as a share of domestic and global GDP, as its current account surplus has shrunk and its currency has appreciated substantially. For the remainder of 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.

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, but for portfolio equity investment they reflect primarily our lack of knowledge on the ultimate investor base of a sizable fraction of investment funds domiciled in Ireland and Luxembourg. 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 US 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, the net financial position of nonfinancial firms (in turn related to stock price valuations and the location of firms' nonfinancial capital), 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 countries such as Norway and Singapore provide the most 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 US net external liabilities (some 80 percent 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 US statistics, which rely on the stock market of the country where affiliates are located (thus boosting the value of US-based affiliates), the size of US 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 US liabilities has been associated with three main factors: i) the boom in US stock market valuations over 2010-21, which has boosted the value of US equities held by nonresidents; ii) the sizable appreciation of the US 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, US domestic wealth has risen much more sharply, as US investors have benefited from higher valuations of US firms and assets more generally. As of late 2022, one of these factors has been operating in reverse-- over the first 3 quarters of 2022 US stock market valuations have declined by over 20 percent, and this has reduced the value of US liabilities. Indeed, the BEA estimates that the US net IIP improved by \$1.8 trillion by the end of the 2nd quarter of 2022, compared to the end of 2021. However, the dollar has continued to appreciate, thus reducing the value of US assets denominated in foreign currencies, and its strength is also likely to hamper current account adjustment going forward. And while the US has so far maintained a positive balance on investment income, despite the worsening in the net IIP, higher interest rates in the United States, not matched to the same extent by higher interest rates in its financial trading partners, will take a toll on the income balance, given the importance of US liabilities in the form of Treasury and corporate debt securities. External adjustment is thus unlikely to meaningfully materialize until US demand slows compared to demand in its trading partners.

APPENDIX I

Capital gains in national currency

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

Let b and f be the net IIP and net financial transactions (the financial account), measured in US dollars, and let e be the exchange rate (units of domestic currency per US 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) will be given by

$$V_t^d = b_t e_t - b_{t-1} e_{t-1} - f_t e_t$$

while the corresponding calculation in dollar terms will be

$$V_t^{\$} = b_t - b_{t-1} - f_t$$

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

$$\frac{V_t^d}{e_t} - V_t^{\$} = b_{t-1} \frac{e_t - e_{t-1}}{e_t}$$

This implies that for a debtor country ($b < 0$) whose currency is depreciating ($e_t > e_{t-1}$) the valuation gain calculated in domestic currency will be smaller than when calculated in US 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 US 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 US dollars at the final period's exchange rate. The calculation yields the following formula:

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

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 US 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. FDI in the US

The Bureau of Economic Analysis publishes data on foreign direct investment in the United States by immediate investor as well as by country of ultimate beneficial owner (UBO). For the purpose of calculating the increase in the value of claims on the US the second definition seems more appropriate, as changes in the value of holdings should accrue to the country of the UBO. However, bilateral FDI positions are only published at historical cost, rather than market value. To provide a rough first estimate of market value we use the ratio of the estimated market value of equity to the estimated historical cost of equity in 2010 as published by the BEA, and multiply the estimated positions at historical cost in 2010 by that ratio. That is, we assume a common relation between historical cost and market value across all countries of UBO, an assumption we will relax in future revisions. We then use the change in US stock prices between end-2010 and end-2021 to revalue the position estimates, following the BEA methodology.

B. Portfolio equity investment in the US

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 US 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 US equity instruments, but financial intermediaries or custodians in those centers may be holding US equity on behalf of investors resident in other countries. At the same time, however, reporting by investor countries may be incomplete and some countries do not participate to the CPIS, and hence the US surveys provide very useful information. 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.

Appendix 3. Financial balance sheet analysis: country sample

Australia, Austria, Belgium, Brazil, 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, 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 28 countries, and by 2010 data are available for 38 countries. The sample ends in 2021 for 22 countries, with most of the remainder having data until 2020. Only Brazil, India, and Russia have data ending in 2019.

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Table 1. FDI positions in the US: valuation gain projections based on 2010 data*

US\$ billion

	2010			2021	
	Equity (historical cost)	Equity (market value)	Debt	Total FDI	projected equity gain
Creditor Europe	573	735	124	859	2077
Advanced Asia ex. Japan	53	68	11	41	192
Japan	259	333	56	203	940
China	5	7	1	4	20
Oil Exporters	34	44	7	27	124
Commonwealth	757	972	164	593	2745
Other Advanced Economies	311	400	67	244	1129
Ireland and Luxembourg	123	158	27	97	448
EMDEs excl. China and oil	54	69	12	42	196

* Positions on an ultimate beneficial owner basis. Source: author's calculations based on BEA data.

Table 2. Portfolio equity positions in the US:
2021 data valuation gain projections based on 2010 data

Group	2010		2021	
	Estimated position	Projected valuation gain	Projected market value (based on 2010 holdings)	Estimated position (based on CPIS and US surveys)
Creditor Europe	591	1671	2262	2328
Advanced Asia ex. Japan	151	425	576	908
Japan	270	761	1031	885
China	159	449	607	300
Oil Exporters	194	549	744	747
Commonwealth	724	2046	2770	2906
Other Advanced Economies	151	425	576	530
Ireland and Luxembourg	336	948	1284	2246
EMDEs excl. China and oil	123	349	472	294

*Estimation based on the increase in the broad MSCI US stock price index. Data for holdings at end-2010 are author's estimates based on reported CPIS holdings and the results of the US Treasury-Fed annual surveys on holders of US-issued securities. Data for 2021 are obtained from the CPIS and integrated with data from the US annual and monthly surveys on foreign holdings of US portfolio instruments.

Table 3. Valuation effects, advanced Europe, 2010-21

	Valuation and other changes	Valuation	Other changes
Austria 1/	10	42	-28
Belgium 2/	88	193	-46
Denmark 2/	1	-84	85
Germany	-713	-172	-541
Netherlands	134	345	-211
Norway 3/	853	853	
Sweden 3/	-23	-23	
Switzerland	-614	-516	-98
Advanced Europe	-264	638	-839

1/ Other changes calculated over 2012-21

2/ Other changes calculated over 2013-21

3/ Assumes all changes are in the valuation

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

Table 4. Global Portfolio Equity Gaps, 2021

Portfolio equity estimates, 2021	
Global gaps	
Global portfolio equity liabilities - derived equity liabilities (CPIS)	8,111
United States	3,079
Luxembourg	2,281
Ireland	2,120
Other countries	632
Global portfolio equity assets - CPIS portfolio equity assets	4,248
Non CPIS reporters	2,155
Gap for CPIS reporters	2,093
Global portfolio liabilities - global portfolio equity assets	3,494

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, and they are equal to CPIS portfolio equity assets minus the "confidential" component of assets (around \$700 billion).

Table 5a. Financial balance sheets: stylized facts*

Median values, in percent of GDP

		New creditors		US		Other	
		2010	2020	2010	2020	2010	2020
Net financial position	Domestic economy	12.2	73.6	-18.6	-40.7	-54.9	-23.3
Net financial position	ROW (sign changed)	11.2	70.3	-17.3	-68.0	-55.2	-22.7
Net financial position	Government	-7.0	6.8	-100.0	-126.3	-28.8	-46.8
Net financial position	Financial corporates	0.1	8.7	-6.0	-15.9	-1.0	1.2
Net financial position	Households	125.7	285.1	268.4	419.4	76.6	112.5
Net financial position	Nonfinancial corporates	-114.4	-163.5	-181.0	-318.0	-120.4	-116.9
Net equity position	Nonfinancial corporates	-71.3	-112.5	-121.6	-256.7	-69.2	-86.9
Net debt position	Nonfinancial corporates	-45.2	-51.2	-59.5	-61.2	-39.8	-34.3
Total financial assets	Ins. co. and pens. funds	72.9	140.8	155.6	183.7	30.8	42.8

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.

Table 5b. Demographics and GDP per capita: stylized facts

Median values (in percent where indicated)

	New creditors		US		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.

Table 6. Correlates of the international investment position:

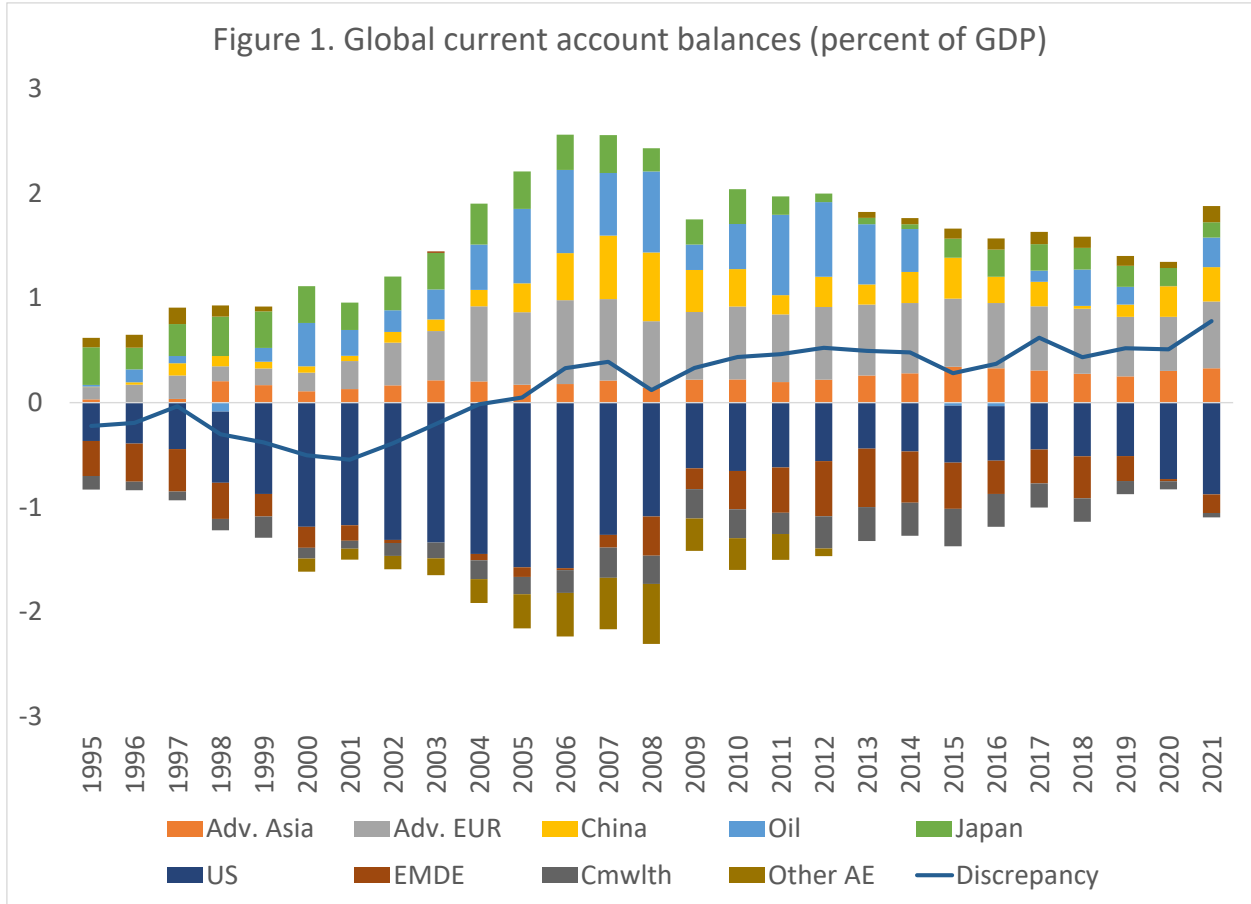
Time series and cross-sectional evidence from financial balance sheets

	(1)	(2)		(4)	(5)	(6)
	All	no outl.	no outl.	All	no outl.	no outl.
	1995-2021			2010-21		
	Within (Fixed country effects)			Between		
Net fin. assets general govt (percent of GDP)	0.95*** (9.60)	0.77*** (5.41)	0.81*** (10.63)	0.53*** (4.02)	0.45*** (3.31)	0.43*** (2.97)
Net financial assets nonfin. corporates (pct of GDP)	0.87*** (3.35)	0.59*** (6.35)	0.56*** (7.00)	0.45** (2.58)	0.44*** (3.33)	0.48*** (3.79)
Fin. assets ins. co. and pension funds (pct of GDP)	0.50 (1.24)	0.90*** (6.20)	0.81*** (7.43)	0.22 (1.45)	0.50*** (3.99)	0.37*** (2.84)
log real GDP per capita	-11.7 (-0.58)	-0.28 (-0.01)	3.59 (0.25)	15.2 (0.95)	12.8 (1.13)	-10.4 (-0.52)
Taiwan dummy				238.4*** (4.13)	208.1*** (5.21)	
Population growth (pct)			0.40 (0.06)			54.0** (2.70)
old-age dependency ratio (pct)			2.93*** (4.48)			2.09 (1.48)
Prime savers share (pct)			-0.095 (-0.11)			4.01 (1.14)
Life expect. of a current prime-aged saver			-3.17 (-0.69)			-1.09 (-0.25)
Observations	918	828	828	421	381	375
Countries	40	36	36	41	37	36
R ²	0.53	0.66	0.71	0.58	0.71	0.66
Time Effects	yes	yes	yes			

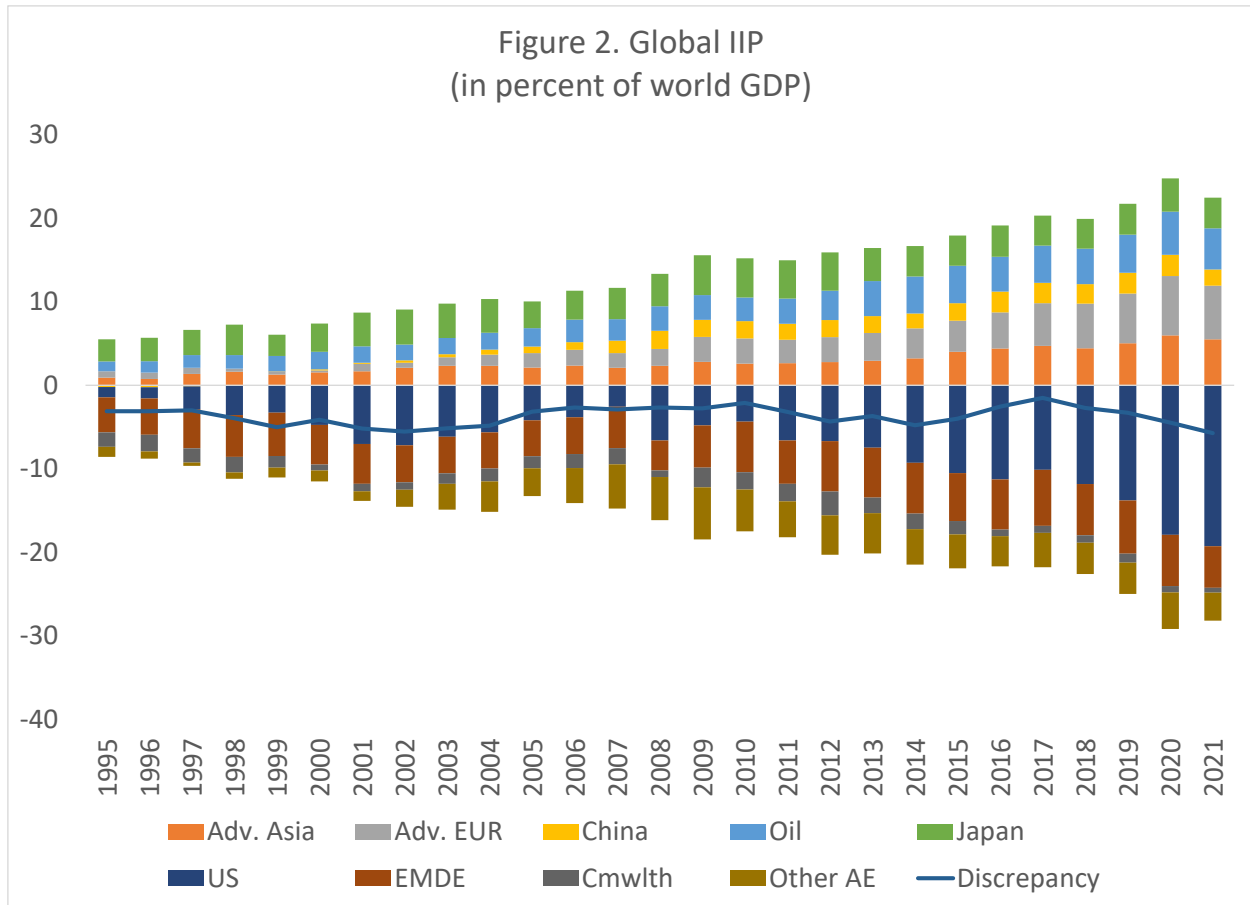
Dependent variable is the international investment position in percent of GDP. t statistics in parenthesis. Robust standard errors clustered at the country level in equation (1)-(3). Outliers include Norway (very large government sovereign wealth funds, Ireland and Luxembourg (financial centers), and Iceland (very high negative IIP position after the global financial crisis, restructured in 2015).

Table 7. Change in international investment position, 2010-20

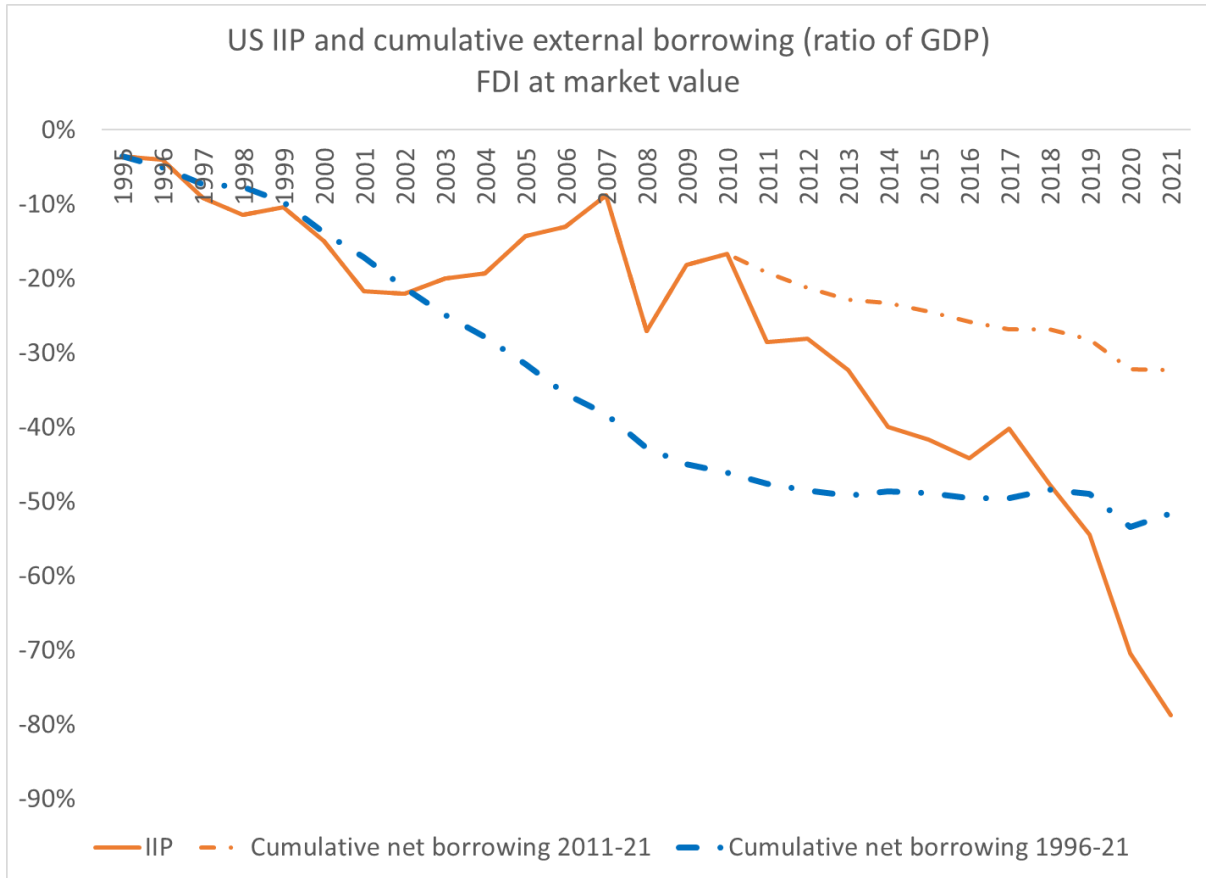
	(1)	(2)	(3)
	All	No outliers	No outliers
Change in govt net fin. position in pct of GDP, 2010-20	0.81*** (17.92)	0.67*** (3.48)	0.64** (2.45)
Change in nonfin. corporates net fin. position in pct of GDP, 2010-20	0.57*** (3.34)	0.47*** (3.71)	0.46*** (3.63)
Change in ins. co. and pension fund assets in pct of GDP, 2010-20	0.52 (1.66)	0.79*** (8.21)	0.72*** (7.32)
Growth rate in GDP per capita, 2010-20	4.77 (0.18)	39.7 (1.39)	56.0 (1.48)
Population growth rate, 2010-20			0.86 (0.49)
10-year change old dependency ratio			1.65 (1.15)
10-year change in prime savers share			1.63 (1.09)
10-year change in life expectancy prime-aged saver			-1.82 (-0.17)
Constant	29.7*** (3.74)	17.9* (1.85)	4.44 (0.30)
Observations	38	35	35
R ²	0.70	0.72	0.74



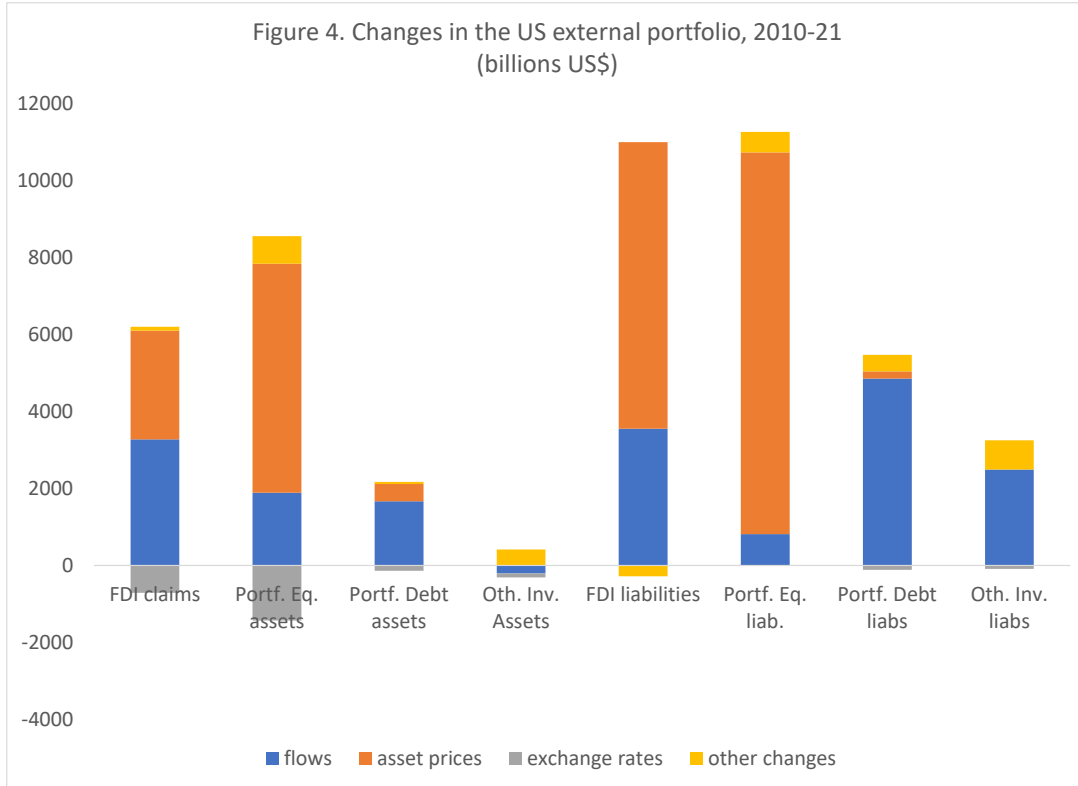
Source: author's calculations based on IMF, Balance of Payments Statistics and World Economic Outlook.



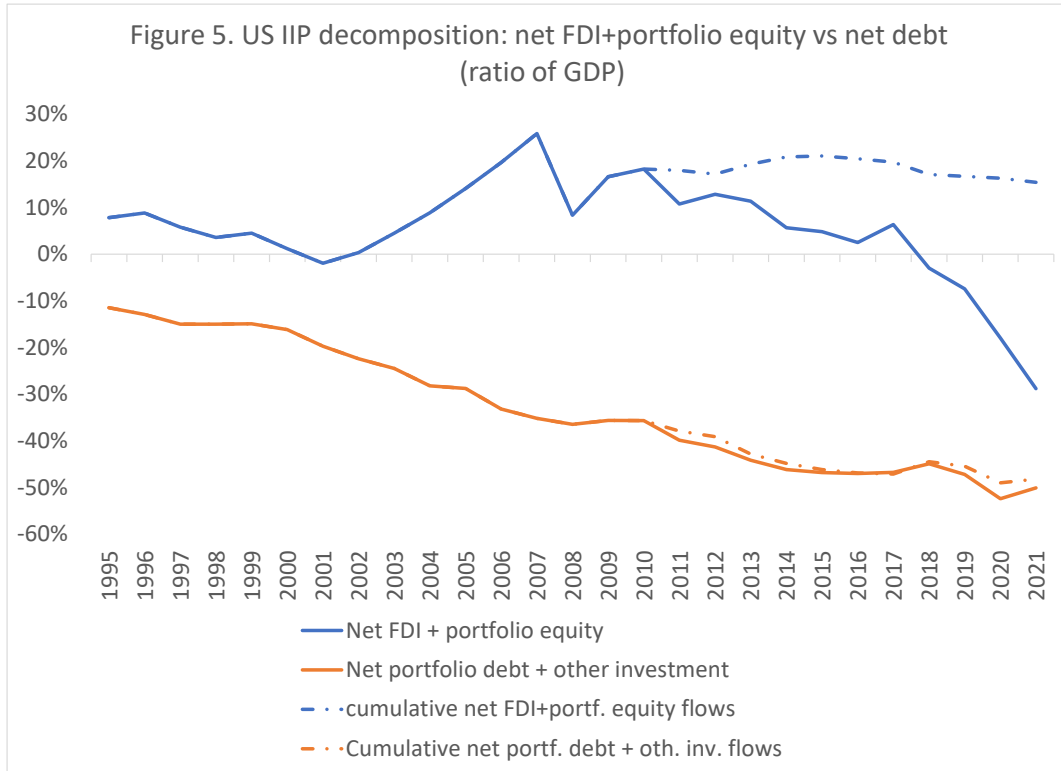
Source: author's calculations based on Milesi-Ferretti (2021) and IMF, Balance of Payments and International Investment Position Statistics.



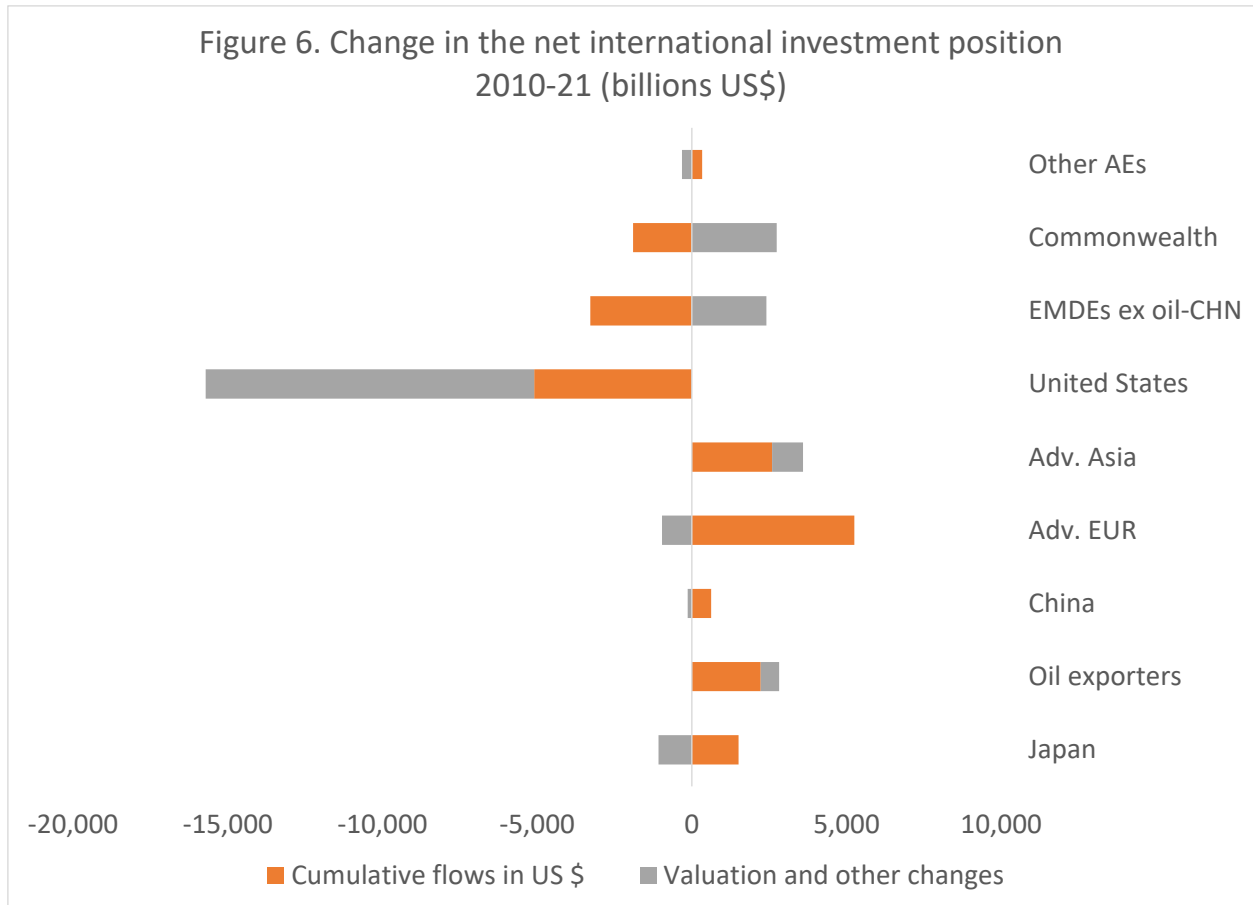
Source: author's calculations based on BEA statistics for US international transactions and the US IIP.



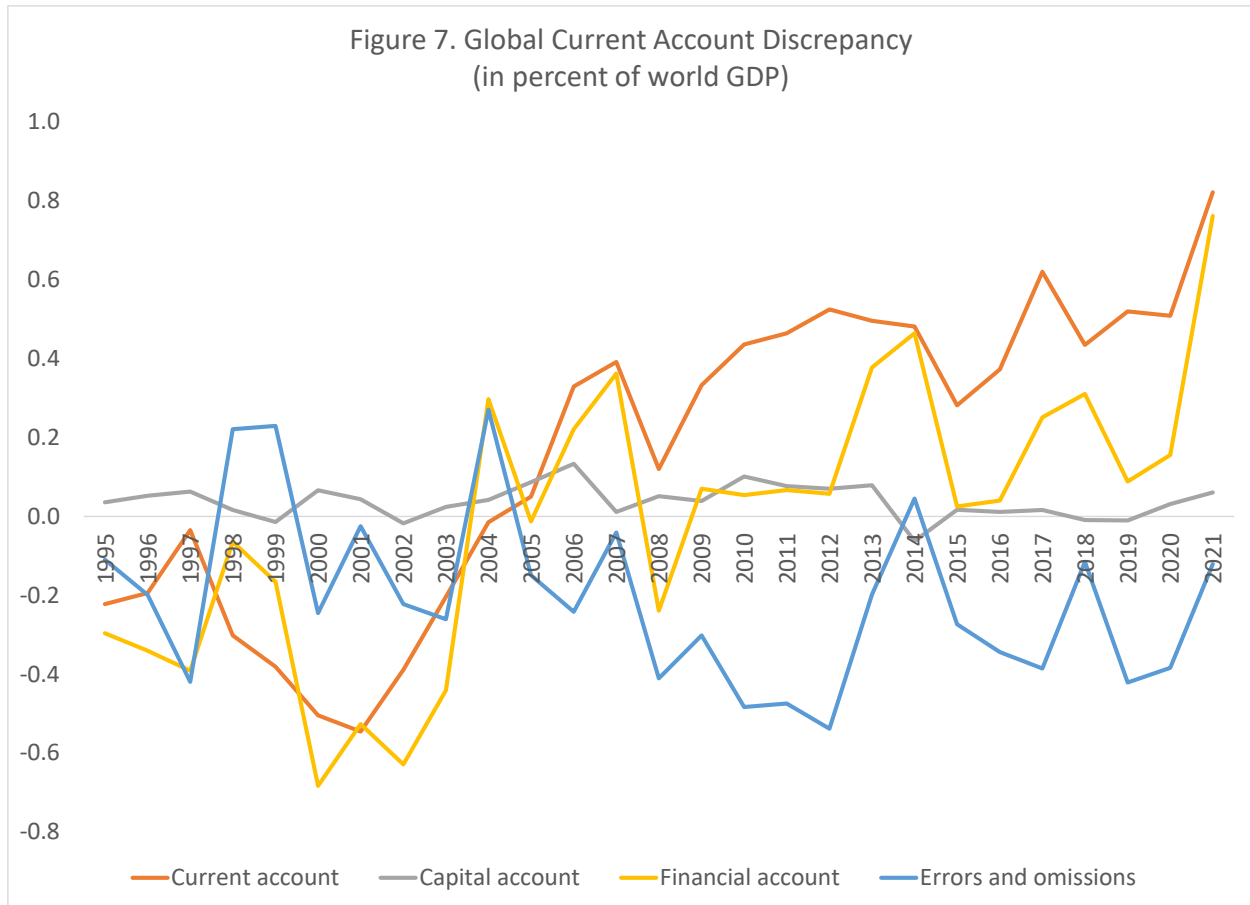
Source: author's calculations based on BEA data.



Source: author's calculations based on BEA data.

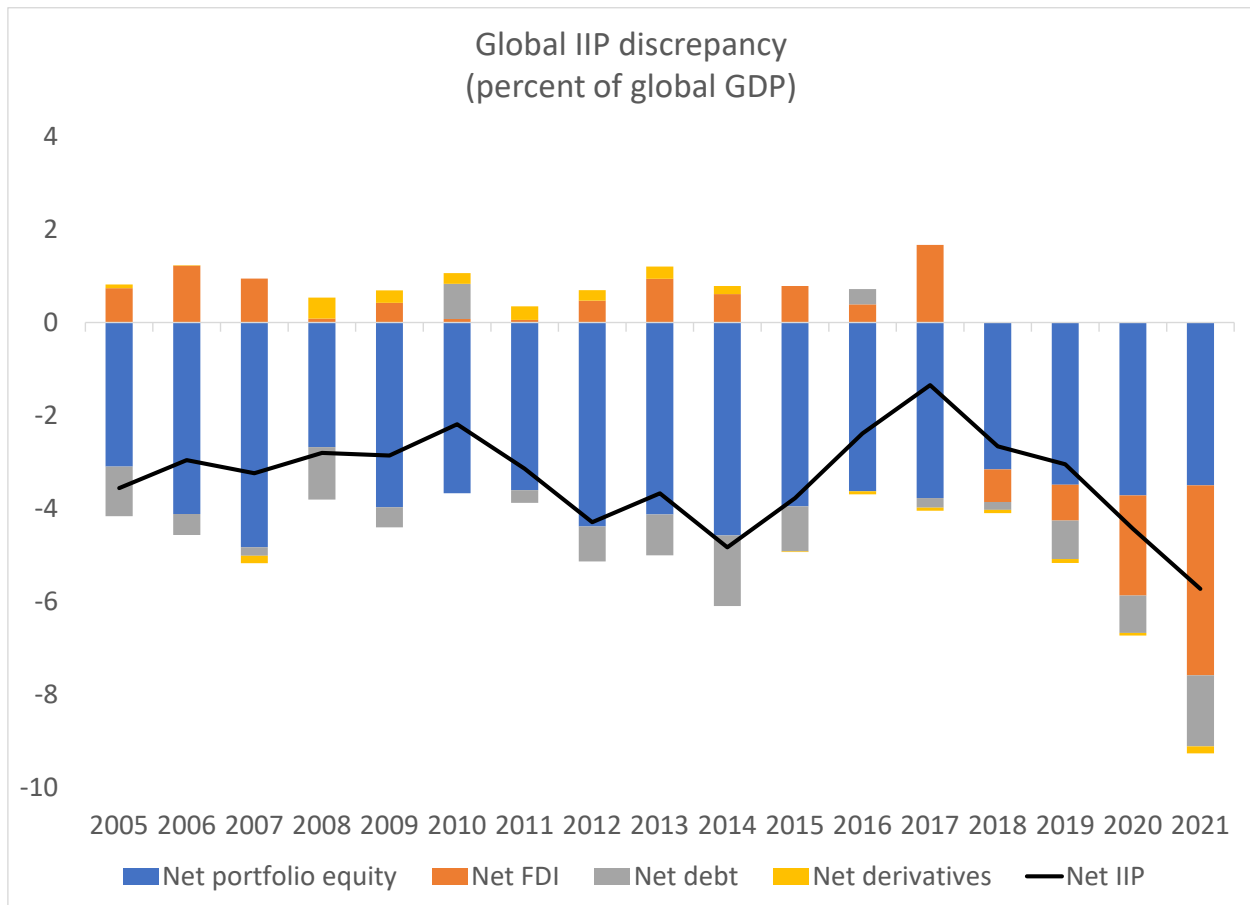


Source: author's calculations based on Lane and Milesi-Ferretti, External Wealth of Nations database (Milesi-Ferretti, 2021b).



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

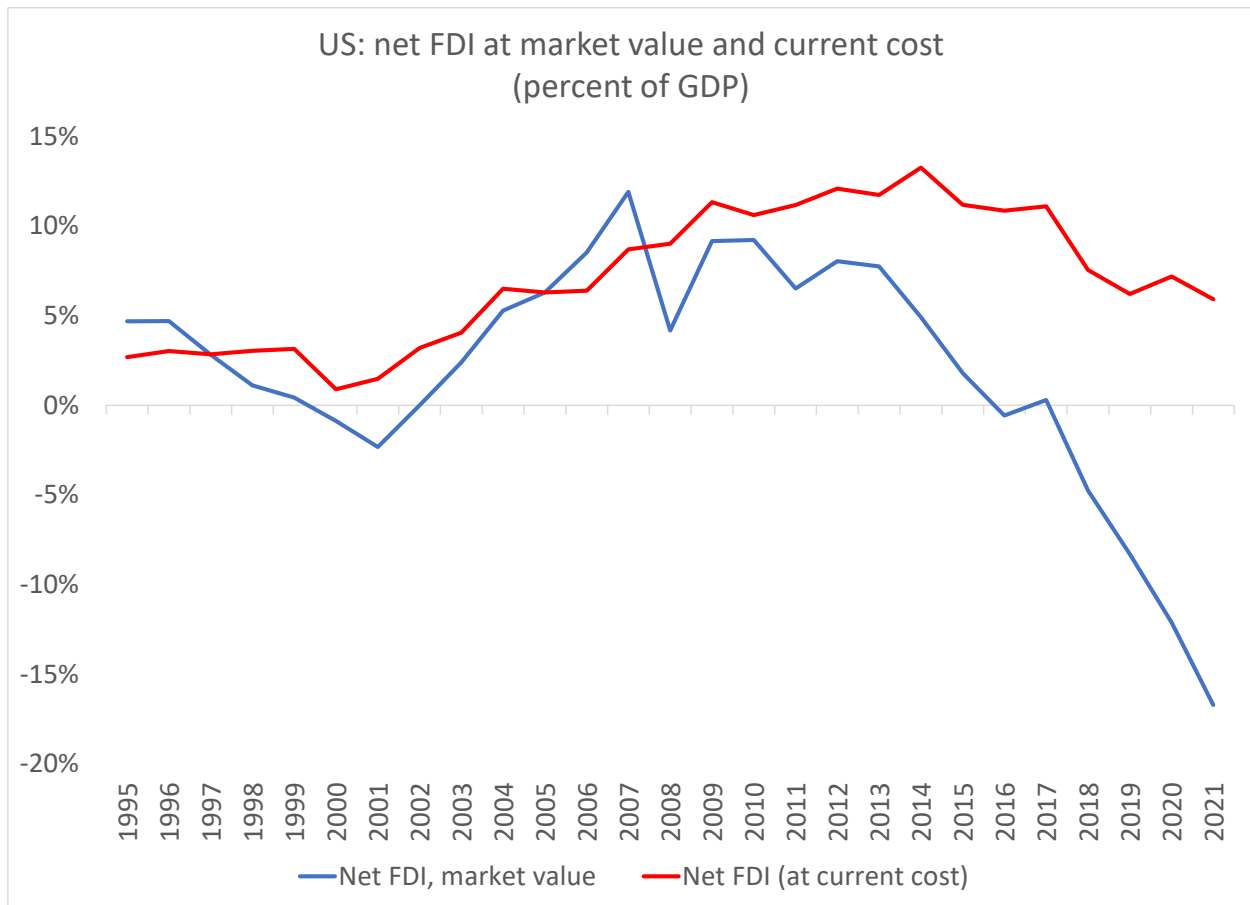
Figure 8. The Global Discrepancy in International Investment Positions



Note: the IIP components include estimated assets and liabilities in small financial centers (listed in the database). However, the estimates of the 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. For this reason the net IIP line is not equal to the sum of the components.

Source: author's estimates based on External Wealth of Nations database.

Figure 9. US net FDI position at current cost and market value



Source: author's calculations based on Bureau of Economic Analysis data.