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CBO's Model and Projections of U.S. International Investment Holdings and Income Flows

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Abstract

Since 1982, growth in the value of foreign investments in the United States has exceeded growth in the value of U.S. investments abroad and, as a result, the U.S. net international investment position has been negative and trending lower. Even though the value of foreign investments in the United States has exceeded the value of U.S. investments abroad, the total income earned by U.S. investors on their foreign asset holdings has historically exceeded the total income earned by foreign investors on their U.S. holdings. The United States is able to earn positive net international income despite its negative net international investment position because the average yield on U.S. investments abroad has exceeded the average yield on foreign investments in the United States.

The Congressional Budget Office uses its international financial forecasting model to project international capital and income flows. It includes two types of forecasting equations: those that project international asset positions and those that project the income generated by those assets. Over the 10-year forecast period, growth in the value of U.S. holdings of foreign assets is projected to exceed growth in the value of foreign holdings of U.S. assets; consequently, the U.S. net international investment position is expected to rise modestly. In addition, the international yield differential is projected to remain high and roughly steady over the next decade. As a result, net international income is expected to rise as a share of U.S. gross domestic product through 2023 before declining through 2031 (because of higher interest payments on U.S. federal debt held by foreign investors).

Keywords: international investment, international income, current account, yield differentials, asset valuations, exchange rates

JEL Classification: F21, F23, F37

Notes

Some of the figures in this report use shaded vertical bars to indicate the duration of recessions. (A recession extends from the peak of a business cycle to its trough.)

All years referred to in this report are calendar years.

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Introduction

When foreign investors purchase assets in the United States (or vice versa), those transactions are international investment flows. International investment flows allow savers in one country to fund borrowers in other countries, thereby allocating global resources to more productive uses and helping savers earn higher returns than if they had access only to domestic markets. For economies with open capital markets, the size and direction of investment flows can indicate which economies are attractive destinations for global investors and which economies have less attractive investment opportunities.

Over the past four decades, investment flows into the United States have exceeded outflows of investment from the United States. That trend indicates that the United States has been a relatively attractive destination for foreign investment. Foreign purchases of U.S. debt have reduced borrowing costs for U.S. households, businesses, and government entities—supporting domestic consumption and helping to finance large U.S. federal deficits. Those foreign investment flows have also raised the value of the dollar in foreign exchange markets, reducing the competitiveness of U.S. exports in foreign markets.¹ Foreign demand for U.S. federal debt has allowed the federal government to limit interest expenses even as U.S. federal debt has grown substantially over the past two decades.

Despite its status as a net debtor in international financial markets, the United States tends to earn more income on its foreign investments than foreign investors earn on their investments in the United States. That difference in earnings on international investments stems from several factors, including differences in the types of assets held by U.S. and foreign investors and certain tax-related incentives that influence where companies locate their production facilities and report their profits. That positive net international investment income partially offsets the income outflows needed to pay for the persistent U.S. trade deficit. As a result, net borrowing by the United States from the rest of the world is lower than it would be if flows of net international income (the difference between U.S.–earned foreign income and foreign-earned U.S. income) were negative.

The Congressional Budget Office projects that the United States will continue to remain an attractive destination for international investment over the next 10 years. Underlying that current-law forecast are two important assumptions: that current laws governing taxes and spending will remain generally unchanged and that the Federal Reserve will achieve its dual

¹ All else being equal, increased foreign demand for U.S. assets tends to boost the exchange value of the dollar. However, the correlation between the trade-weighted value of the dollar and changes in aggregate foreign investment flows has not been particularly strong historically. One reason for that disconnect is that countries intervene in exchange rate markets to manage the value of their currencies relative to the dollar. That management is often done to prevent their currencies from appreciating, which would reduce the price competitiveness of their exports in trade markets. See Gagnon and Sarsenbayev (2021) for an analysis of the causes of current-account balances.

mandate of price stability and maximum employment. In CBO's projections, foreign demand for U.S. federal debt remains robust, and the foreign share of U.S. federal debt holdings remains roughly steady. In addition, CBO expects that the United States will continue to earn more on its foreign investments than foreign investors earn on their U.S. investments. However, that income surplus is projected to decline slightly in the later years of the projection period. CBO's baseline projections are subject to several risks that would affect the long-run sustainability of the large negative U.S. net international investment position.

How Do International Investment Flows Affect the U.S. Economy?

International investment flows affect both domestic production and national income in the United States. Inflows of foreign capital can increase domestic investment in productive assets and therefore U.S. gross domestic product (GDP). Because some of the income generated by that new production is returned to foreign investors, the new production raises U.S. national income (the income earned by residents of the United States) less than U.S. domestic income (the income earned within the United States).

The effect of international investment flows on national income is more appropriately measured by changes to U.S. gross national product (GNP) rather than U.S. GDP. Unlike GDP, which measures the value generated by all production that occurs within a country's borders, GNP measures the value of production attributed to a country's residents regardless of where that production takes place. Therefore, GNP is a better measure of the income of a country's residents than the more commonly cited GDP.

The difference between GDP and GNP is called net international income (NII), which is equal to the labor and investment income earned by a country's residents abroad, minus the labor and capital income earned by foreign labor and investment in the domestic economy. Changes in the income derived from international assets affect net international income and, as a result, the amount of income available to a country's residents to save or spend on goods and services.

$$\text{NII} = \text{GNP} - \text{GDP}$$

International investment flows can also affect the wealth of U.S. residents. The cumulative effect of past international investment flows on U.S. wealth is reflected in the U.S. net international investment position (NIIP). The U.S. net international investment position measures the difference between the dollar value of all foreign assets owned by U.S. residents (AX) and the value of all U.S. assets owned by foreign investors (AM) at one point in time. Changes to the value of those assets can affect the wealth of international investors. For example, a depreciation of the U.S. dollar would increase the dollar value of U.S.-held foreign assets that are denominated in foreign currency, raising the U.S. net international investment position and the wealth of U.S. residents, in turn.

$$\text{NIIP} = \text{AX} - \text{AM}$$

International investment flows affect the U.S. economy through other channels as well. For example, when foreign investors purchase U.S. assets, that increase in demand for U.S. assets tends to raise the exchange value of the dollar and reduce the competitiveness of U.S. exports in global markets. In addition, greater foreign demand for U.S. debt reduces domestic interest rates, making borrowing cheaper for U.S. consumers, businesses, and the federal government.²

Because interest rates on government debt are sensitive to changes in foreign demand for U.S. federal debt, international investors can affect the U.S. federal deficit. When demand for U.S. federal debt from foreign central banks and private investors rises, the U.S. federal government is able to borrow at lower rates than it would otherwise, reducing federal interest expenditures. As a result, changes in foreign demand for U.S. federal debt, both in CBO's model and in practice, can have substantial ramifications for the U.S. federal budget.

Given projections of high and rising federal budget deficits, foreign demand for U.S. assets and the role of the dollar in the global economy have implications for the likelihood of fiscal crises. A fiscal crisis is a situation in which investors lose confidence in a government's ability to service and repay its debt, causing abrupt increases in interest rates or inflation or precipitating other financial and economic disruptions.³ If the dollar's use in global financial and trade markets declined, U.S. federal debt would become riskier and the likelihood of a fiscal crisis would increase.⁴ If a fiscal crisis were to occur, countries like the United States that issue debt in their own currency could avoid paying the higher interest rates by printing more currency and using it to pay off their debt. However, doing so raises the concern of an inflationary spiral—a situation in which the currency depreciates because investors and others expect prices to rise abruptly.

How Have U.S. International Investment and Income Flows Changed Over Time?

The development of global financial markets and increases in global saving over the past four decades have led to rapid growth in investment flows both into and out of the United States. Over that time, the types of investment assets available to global investors and the preferences of

² Beltran and others (2013) studied the effect of foreign purchases on 5-year U.S. Treasury rates and estimated that a decline of \$100 billion per month in purchases of Treasury securities by foreign official investors (a group that comprises governments and governmental agencies) would increase 5-year Treasury rates by 20 basis points in the long run. (A basis point is one one-hundredth of a percentage point.) Also see Warnock and Warnock (2009) for additional evidence of the effect of foreign inflows on U.S. government bond yields.

³ The likelihood of a fiscal crisis depends on the fiscal policies in place in the United States. If the Congress changed federal taxation and spending policies to reduce the federal budget deficit and the projected path of federal debt, the likelihood of a fiscal crisis would be lower.

⁴ See Congressional Budget Office (March 2021).

those investors have changed; as a result, the composition of international asset holdings has shifted as well. Among the many changes in investors' preferences has been an increase in demand for U.S. government assets from foreign investors and governments. The cumulative effect of those changes has been a substantial drop in the U.S. net international investment position that has coincided, somewhat counterintuitively, with an increase in U.S. net international income flows (which are the difference between inflows and outflows of income).

Growth of U.S. International Investment Positions

The development of international capital markets over the past four decades has facilitated a dramatic increase in international investment flows. Across those years, the combination of financial deregulation and globalization increased the scale of domestic and foreign financial markets and facilitated the creation of new financial products that could be traded internationally. As a result, between 1978 and 2018, the value of all U.S.-owned foreign assets rose from roughly 20 percent to 130 percent of U.S. GDP, according to data from the Bureau of Economic Analysis (BEA). Over those same years, the value of foreign-owned U.S. assets rose more strongly—from 16 percent to 175 percent of U.S. GDP (see Figure 1).⁵

Since the global financial crisis in 2009, however, the growth of U.S. international assets and liabilities (foreign claims on U.S. assets) has slowed substantially.⁶ The value of U.S.-owned foreign assets relative to U.S. GDP has remained roughly steady at 130 percent, and the value of foreign-owned U.S. assets has grown only slightly, from 160 percent to 175 percent of U.S. GDP.

The most important factor contributing to that slowdown in growth in the value of international asset and liability positions for the United States has been the very slow growth in international bank lending following the crisis, which may be a response to the tightening of global financial regulations.⁷ Also contributing to that slowdown has been the sharp decline in the value of cross-border holdings of financial derivatives (which are assets that do not convey ownership or earn interest themselves but instead derive their value from other assets).

Composition of U.S. International Investment Positions

International investments can be divided into five major categories of assets: direct investments, portfolio investments, financial derivatives, other investments, and reserve assets (see Table 1). Direct investments are investments in businesses located abroad in which domestic investors

⁵ In this analysis, the terms “owned” and “held” are equivalent and are used interchangeably, as in U.S. holdings and foreign holdings and U.S.-owned and foreign-owned assets.

⁶ According to Bussiere, Schmidt, and Valla (2016), that weakness has been broadly observed among global economies. However, the slowdown in flows has been somewhat more pronounced among developed economies than it has been in emerging markets.

⁷ Ibid.

have a controlling ownership.⁸ Examples of U.S. direct investments abroad include factories built by U.S. companies in other countries, the outright acquisition of foreign businesses by U.S. investors, and debt assets held by foreign affiliates of U.S. corporations. Direct investments can take the form of either equity holdings or debt holdings.⁹

By contrast, portfolio investments are financial assets in which foreign investors do not own a controlling interest. Portfolio investments can be either equities or debt assets. Portfolio equities usually take the form of stock holdings.¹⁰ Portfolio debt includes any tradable debt securities issued by a foreign entity. Financial derivatives are contracts between two parties agreeing to buy and sell particular assets at a set price and date.¹¹ The category labeled “other investments” is a catch-all for assets that do not fit into the other categories, such as international bank loans, currency holdings and deposits, and trade credits. The last category of investments is reserve assets, which are only available for U.S. holdings of foreign assets. That category includes all international assets held by the Federal Reserve, including special drawing rights (assets issued by the International Monetary Fund), monetary gold, and other international securities.

The composition of U.S.–owned foreign assets has changed in the past five decades in ways that reflect the development of foreign financial markets. Between 1982 (the first year for which those data are available) and 1990, other investments accounted for about 54 percent, on average, of all U.S. holdings of foreign assets, the largest share among asset categories (see Figure 2). Those assets consisted primarily of bank loans to foreigners and holdings of monetary gold. Over time, though, the relative importance of gold as a foreign exchange asset declined. In addition, as foreign financial markets matured, foreign businesses became less reliant on bank loans for funding because they could access capital markets by issuing stocks and bonds on financial exchanges. As a result, the percentage of other investments has shrunk steadily as a share of all U.S.–owned foreign asset holdings, whereas portfolio equity’s and (to a lesser extent) portfolio debt’s shares of U.S.–owned foreign assets have grown. Unlike other investments and portfolio assets, holdings of foreign direct investment assets have maintained their relatively large (about 30 percent) share of all U.S. international asset holdings since the early 1980s.

⁸ According to BEA’s international investment position accounts, “ownership control of 10 percent or more of the nonresident’s voting securities is the threshold for separating direct investment from other types of investment.” See Bureau of Economic Analysis (2014).

⁹ BEA defines direct investment in debt to be “direct investment that results from changes in net outstanding loans between parents (or for inward investment, other foreign parent group members) and their affiliates, including loans by parents to affiliates and loans by affiliates to parents.”

¹⁰ BEA also includes investment fund shares as part of portfolio investments in equities.

¹¹ Financial derivatives are a small component of U.S.–owned foreign assets and foreign-owned U.S. assets. That category of assets has been included separately in BEA’s international investment position data only since 2006.

The portfolio of foreign-owned U.S. assets has expanded since 1982 to include a much broader range of U.S. assets.¹² Whereas the large majority of foreign-owned U.S. assets in 1982 were in the form of other investments (such as loans and deposits) and government securities (portfolio debt), foreign investors have shifted their holdings to include larger quantities of direct investments, equities, and corporate debt (see Figure 3). Even with the growth of those additional categories of foreign-owned U.S. assets, though, foreign investors have continued to increase their holdings of U.S. government securities and other investments (such as loans and deposits) as a share of GDP. In contrast to U.S. investors—who hold larger positions in foreign equities—foreign investors are much more likely to invest in U.S. corporate and government debt.

U.S. Net International Investment Position

Since 1982, growth in the value of foreign investments in the United States has exceeded growth in the value of U.S. investments abroad and, as a result, the U.S. net international investment position has been negative and trending lower (see Figure 4). The most important reason for that long-run decline has been strong foreign demand for U.S. debt assets, particularly U.S. government bonds. Evidence suggests that before 2020, changes in the values of international assets had raised the measured U.S. NIIP, partially offsetting the downward trend. Starting in 2020, however, the accumulated changes in asset valuations began having the opposite effect, pushing the U.S. NIIP further negative.

Foreign Purchases of U.S. Federal Debt. Foreign purchases of U.S. government assets have been a key driver of the negative and widening U.S. net international investment position. Those purchases have mostly come from foreign governments and central banks, although purchases by private investors have also grown steadily. Over the past three decades, many foreign central banks, particularly those in emerging market economies, accumulated large reserves of U.S. government bonds—generally regarded as some of the safest assets to hold. The data on international asset holdings show that foreign official investors (foreign governments and government agencies), also known as “official holdings,” have historically held a larger share of U.S. federal debt than foreign private investors (see Figure 5).¹³

Foreign governments have increased their holdings of U.S. federal government assets over the past four decades, for several reasons. Some foreign governments (particularly emerging market economies and countries with ample energy resources) have purchased U.S. Treasury securities as a safe place to store sovereign wealth; in addition, foreign central banks acquired U.S. Treasury securities to insure against the possibility of large changes in their exchange rate and

¹² The first year for which data are available for disaggregated international asset stocks is 1982.

¹³ As defined by the U.S. Treasury, foreign official and international accounts include those of foreign governments and central banks, as well as a small number of international organizations and government investment funds that have accounts at the Federal Reserve Bank of New York.

currency crises.¹⁴ Some countries stockpiled U.S. Treasury securities to improve their trade competitiveness. For example, during most of the 2000s, China's central bank accumulated those securities, which suppressed the value of its currency and tended to reduce the price of Chinese exports in U.S. markets.¹⁵

Before the 2009 global financial crisis, the share of all U.S. federal borrowing financed by foreign investors rose steadily. In the years following the crisis, however, that share has moderated and declined. Between 1990 and 2008, the share of all publicly held U.S. federal debt owned by foreign investors (official and private) rose from about 20 percent to over 50 percent. (Publicly held U.S. federal debt does not include the debt owned by the U.S. federal government.) In the years since the financial crisis, the share of foreign holdings of total U.S. publicly held debt has waned significantly: As of the first quarter of 2021, foreigners held 33 percent of all outstanding publicly held U.S. federal debt. Part of that decline in the foreign share of U.S. federal debt holdings can be explained by the shifting investment preferences of foreign investors. Since the global financial crisis, foreign investors have shifted from purchasing U.S. federal debt to purchasing more U.S. portfolio equities and direct investments. More recently, the sharp decline in the foreign share of U.S. federal debt holdings since the start of 2020 reflects the surge in purchases of U.S. federal debt by the Federal Reserve.¹⁶

For nearly all other categories of assets, growth in U.S. holdings of foreign assets and growth in foreign holdings of U.S. assets have been roughly offsetting over the past four decades. Large differences in asset accumulation show up only in the portfolio debt class of assets, and U.S. government assets have been the largest component of those foreign holdings.¹⁷

Other Factors Affecting the U.S. NIIP. Purchases and sales of assets alone fail to explain all movements in the net international investment position, for two reasons. First, international investment positions are affected by changes in asset prices and changes in the exchange value of the dollar, both of which affect the values of international asset positions in dollar terms. Second, statistical discrepancies exist between data on international asset stocks (NIIP) and asset flows. Those discrepancies tend to result from purchases and sales of assets that are not properly accounted for in the asset stock data.

¹⁴ The relative safety of U.S. Treasury securities stems in part from the creditworthiness of the U.S. government as a borrower. In addition, the deep global market for those securities ensures that an investor can find a buyer for them relatively easily.

¹⁵ Gagnon (2012) estimates the extent to which various currencies are undervalued against the dollar and explains the implications of those currency values for trade competitiveness.

¹⁶ Federal Reserve holdings of U.S. federal debt are considered part of public holdings.

¹⁷ One other substantial change in international capital markets in the past three decades has been the rising influence of sovereign wealth funds. Although data on those funds are not readily available, estimates suggest that the value of assets held by sovereign wealth funds rose from about \$3 trillion in 2007 to about \$8.3 trillion at the end of 2020 (Maire, Mazarei, and Truman, 2021). Consequently, those government-directed funds (many of which would show up as private investments in U.S. asset data) have had outsized influences on asset prices and global investment flows.

Valuation Changes. Changes in asset prices and exchange rate fluctuations can alter the value of a country's international assets or liabilities in dollar terms. For example, an appreciation of the U.S. dollar reduces the dollar value of assets that are denominated in foreign currencies. In addition, any factor that affects the price of international assets (such as changes in monetary policy or changes in risk premia) affects international investment positions.

Changes in asset prices or exchange rates that affect the value of U.S. international assets and liabilities differently will influence the U.S. NIIP differently.¹⁸ For example, if the value of the U.S. dollar appreciates, the dollar value of U.S. assets will probably decline, but the dollar value of U.S. foreign liabilities will be unchanged. Because U.S. liabilities are almost entirely denominated in dollars, a rise in the exchange value of the dollar will have no effect on their value. As a result, the dollar's appreciation will cause the U.S. net international investment position to decline. As gross international positions (the sum of U.S. international assets and international liabilities) have ballooned over the past four decades, changes in the exchange rate or perceived riskiness of the assets have caused larger fluctuations in asset values and have therefore had a larger effect on the NIIP.¹⁹

Statistical Discrepancies. Certain statistical discrepancies between asset flow data and asset stock data (NIIP) prevent researchers from being able to account for all changes in the NIIP. Curcuro, Thomas, and Warnock (2008) describe a few sources of those discrepancies (see the appendix for details). As a result of those discrepancies, some investment flows are not valued appropriately in the data collected on U.S. international asset positions. Those statistical discrepancies have historically had a much smaller effect on the NIIP than have changes in asset valuations.

From the early 2000s until around 2019, changes in the valuation of international assets have increased the value of U.S. international assets to a greater extent than they have increased U.S. international liabilities, which has boosted the U.S. NIIP (see Figure 6).²⁰ The positive effect of changing asset valuations on the U.S. NIIP rose from around 2003 until 2010. Over that period, the values of nearly all categories of U.S.–held foreign assets rose relative to the value of foreign holdings of U.S. assets (see Figure 7). After 2010, the valuation effects declined as the value of

¹⁸ Changes in asset valuations have had a larger effect on the U.S. NIIP at times than have cumulated asset purchases or sales. For example, fluctuations in asset valuations during the global financial crisis caused a rapid swing in the NIIP. Evidence from Benetrix, Lane, and Shambaugh (2015) found that exchange rate fluctuations during the financial crisis and since then have decreased the value of U.S. assets held abroad and reduced the U.S. net international investment position.

¹⁹ Researchers such as Obstfeld (2012) have pointed out that gross flows of assets may have become more important than the net international investment position. In that paper, he highlights how valuation changes have been increasingly important in driving changes in the NIIPs of many countries over time.

²⁰ BEA's international investment position tables contain annual data on changes in the valuation of U.S. international assets and liabilities starting in 2003.

foreign-held U.S. equities and foreign direct investments in the United States rose relative to the value of U.S.–held foreign equities and U.S. foreign direct investments.²¹

That trend continued in 2020, when the effect of asset valuations on the U.S. NIIP became negative for the first time since the early 2000s. During 2020, large increases in the Federal Reserve’s balance sheet and greater demand for U.S. equities raised the value of U.S. assets relative to foreign assets. As a result, the value of foreign-held U.S. assets rose by more than U.S.–held foreign assets, contributing to the nearly \$3 trillion decline in the U.S. NIIP in that year.

U.S. Net International Income Flows

Even though the value of foreign investments in the United States has exceeded the value of U.S. investments abroad, the total income earned by U.S. investors on their foreign asset holdings has historically exceeded the total income earned by foreign investors on their U.S. holdings (see Figure 8). The United States is able to earn positive net international income despite its negative NIIP because the average yield (income generated from an asset divided by its value) on U.S. investments abroad has exceeded the average yield on foreign investments in the United States. On average, between 1990 and 2019, U.S.–owned foreign assets provided a yield of about 4.7 percent per year. By contrast, foreign-owned U.S. assets provided a yield of approximately 3.4 percent to their investors over the same period. The difference of 1.3 percentage points between these two yields is called the international yield differential.

Portfolio Composition

Different types of assets earn different yields. The difference between those yields is known as the yield differential. An important determinant of an asset’s yield is its relative riskiness; over time, riskier assets (such as stocks and corporate bonds) tend to earn higher yields than safer assets (such as government bonds). Because foreign investors own larger shares of relatively safe U.S. government bonds and lower shares of riskier assets than do U.S. investors, foreigners earn less on their assets. Even after controlling for the relative riskiness of the two asset portfolios, however, evidence suggests that U.S. investors holding foreign assets still earn a greater yield than foreign investors holding those same types of U.S. assets. Differences in the mix of international assets held by foreign investors and U.S. investors explain a small portion of the international yield differential.

Direct Investment Income

Most of the international yield differential is attributable to the income earned on one type of asset in particular—foreign direct investments (companies or productive assets located abroad

²¹ Atkeson, Heathcote, and Perri (2021) ascribe a large portion of the decline in U.S. net international investment since 2011 to changes in asset valuations (equity assets, in particular). Using an open-economy model of the macroeconomic and financial markets, the authors find that those changes in valuation may be associated with large unanticipated transfers of U.S. output to foreign holders of U.S. equities.

that are owned by domestic investors).²² Between 1990 and 2019, U.S. investors earned 7.7 percent on their foreign direct investments, on average, whereas foreigners earned 3.0 percent (see Figure 9). The difference of 4.7 percentage points between the yields is larger than the differential for any other major class of assets.

Part of that yield differential on direct investment income can be explained by international differences in corporate income tax rates and how those differences influence where multinational corporations locate production facilities across their international affiliates. Corporate income tax rate differentials incentivize multinational corporations to locate their production facilities in lower-tax jurisdictions to minimize their overall tax liability. That incentive is largest for corporations in industries with the highest pretax profit margins. As a result, for countries with relatively high corporate income tax rates (such as the United States before 2018), the industrial composition of their foreign direct investments might skew toward industries with lower pretax yields. In contrast, countries with extremely low corporate income tax rates (such as Ireland) probably see the industrial composition of their direct investments skew toward industries with higher yields, such as pharmaceuticals or technology. Tax differentials, therefore, may have altered the industrial composition of the U.S. domestic economy by encouraging high-profit industries to locate their production facilities in lower-tax countries instead of locating them domestically.

In addition to changing the location of their production facilities, multinational corporations use other strategies to shift reported taxable income from affiliates in countries with higher corporate tax rates to affiliates in countries with lower rates. Those other income-shifting strategies, which may have large effects on international income flows, include locating the ownership rights to intellectual property in affiliates in low-tax jurisdictions and using tax-motivated transfer pricing. Estimates from Guvenen and others (2019) suggest that shifting income to tax havens (countries or places where corporate income is subject to low effective tax rates) may account for almost \$300 billion in income per year that is allocated to foreign affiliates of multinational corporations but that should have been allocated to domestic sources. If U.S. foreign-earned direct investment income was reduced by that amount, it would more than eliminate the yield differential on direct investment income and would imply that the United States would earn negative net international income.

Two statistical issues contribute to overstating the U.S. yield differential on direct investments. One issue is how measured foreign income and measured domestic income account for tax liabilities. In BEA's official data, international income is measured net of all taxes paid only in

²² Curcuru, Thomas, and Warnock (2013) examined the sources of the U.S. international yield differential and identified factors that accounted for the persistent difference in yields. The authors found that differences in the measurement of foreign and U.S. direct investment income, tax rates, risk, and the age of investments explained most of the gap between the yields on U.S.-owned foreign direct investments and foreign-owned direct investments in the United States.

the jurisdiction where that income is earned.²³ Before 2018, income earned abroad by U.S. multinational corporations was taxed not only by the local tax jurisdiction but again by the U.S. government upon repatriation. That type of residual taxation has become increasingly rare over the past few decades and, by 2018, very few U.S. trading partners taxed income earned abroad. Because BEA's measure of income earned abroad did not account for residual taxes owed to the U.S. government, it is difficult to properly compare the two measures of cross-border income before 2018, and BEA's measure would imply that U.S. holdings of foreign assets appear to earn higher yields. This issue is closely related to income shifting because if U.S. multinational income reported in tax havens was measured net of residual taxes owed to the United States, that income, and the yield differential in turn, would be substantially lower.

The second issue is that BEA's standard international income-reporting procedures double-count some U.S. direct investment income earned abroad.²⁴ For companies with complex international organizational structures, reporting rules may direct those companies to attribute some of their foreign income to affiliates in two different countries. As a result, in those cases data on foreign direct investment income earned abroad would be overstated.

How Does CBO Forecast International Investment and Income Flows?

CBO's projections of international investment and income flows affect its macroeconomic forecasts for the U.S. economy. Forecasts of net international income go directly into projections of U.S. national income (the funds available to U.S. resident households and businesses). And forecasts of foreign demand for U.S. Treasury securities affect projections of U.S. interest rates.

CBO's international financial forecasting model includes two types of forecasting equations: those that project international asset positions and those that project the income generated by those assets.

Forecasting Asset and Liability Positions

CBO forecasts total U.S.-owned foreign assets, AX , and total foreign-owned U.S. assets, AM , as the sum of four categories of international assets (see Figure 10 and Figure 11 for diagrams of those asset models). The three major categories are equity assets, AX_{EQ} and AM_{EQ} , debt assets, AX_{DEBT} and AM_{DEBT} , and derivatives, AX_{DERIV} and AM_{DERIV} :

²³ That measurement inconsistency is not unique to income from direct investments. In particular, the yield differential on portfolio equity income is similarly skewed.

²⁴ Blouin and Robinson (2020) argue that in 2016, 67 percent of all aggregate foreign affiliate income for U.S. multinational businesses was double counted. Albertus (2019) also describes how U.S. direct investment income may be counted twice in the official statistics.

$$AX = AX_{EQ} + AX_{DEBT} + AX_{DERIV}$$

$$AM = AM_{EQ} + AM_{DEBT} + AM_{DERIV}$$

The fourth category is other assets. For both U.S. holdings and foreign holdings, total equity holdings are further subdivided into two subcategories, portfolio equity positions, AX_{EQ}^P and AM_{EQ}^P , and direct investment equity positions, AX_{EQ}^{FDI} and AM_{EQ}^{FDI} .

$$AX_{EQ} = AX_{EQ}^P + AX_{EQ}^{FDI}$$

$$AM_{EQ} = AM_{EQ}^P + AM_{EQ}^{FDI}$$

For foreign asset holdings of U.S. debt assets, AM_{DEBT} , CBO separates holdings of U.S. federal government debt, AMG_{DEBT} , from holdings of other types of debt, AMO_{DEBT} . Foreign holdings of U.S. government debt are then further subdivided, by whether the owners are private investors, AMG_{DEBT}^{PRI} , or official investors (foreign governments and agencies), AMG_{DEBT}^{OFF} :

$$AM_{DEBT} = AMO_{DEBT} + AMG_{DEBT}^{PRI} + AMG_{DEBT}^{OFF}$$

For U.S. holdings of foreign debt assets, AX_{DEBT} , the available data do not distinguish between holdings of foreign government debt and other types of debt assets—so CBO does not make that same separation. In addition, derivative positions, AX_{DERIV} and AM_{DERIV} , are not divided into any subcategories.²⁵

To forecast international asset positions, CBO normalizes most international asset position variables as a share of the market capitalization of the companies in the Standard & Poor's (S&P) 500 index. The reason that asset positions are normalized by market capitalization is because that measure of aggregate financial market value controls for factors affecting the overall supply of and demand for financial assets. Growth of financial market values is not always closely tied to economic fundamentals, and growth in financial markets has tended to outpace nominal output growth in the United States over the past five decades. In addition, CBO's large-scale macroeconomic forecasting model includes very few measures of aggregate financial wealth, and the S&P 500's market capitalization is the broadest measure available of the value of U.S. financial markets for those forecasting equations.

²⁵ In the portfolio equity category, CBO includes "other equity" in the "other investment" category of assets. Debt holdings include portfolio debt, direct investment debt, and all "other investment" assets (reserve assets, bank loans, deposits, currency, the International Monetary Fund's special drawing rights, and trade credits); debt holdings exclude the "other equity" category of "other investment" assets.

Foreign Holdings of U.S. Federal Debt

CBO projects two measures of foreign holdings of U.S. federal government debt: debt held by foreign official holders and debt held by foreign private investors. Accumulation of U.S. federal debt by foreign central banks and governments has evolved much differently than have purchases of those assets by private foreign investors (see Figure 5). Because of that different evolution, CBO projects those series separately.

Official Holdings of U.S. Federal Debt. CBO projects growth of foreign official holdings of U.S. federal debt assets as a residual from its projections of the current-account balance, projections for all other asset classes, and the relationship between the current account and changes in the NIIP. This variable was chosen as a residual because it is driven by factors that are hard to measure. For example, it is difficult to explain the growth in official debt holdings in the late 1990s and early 2000s as a function of existing model variables.

The equation used to project official holdings of U.S. federal debt exploits the relationship between the current account and changes in the NIIP. Changes in the NIIP can be explained by two factors, net purchases of international assets and changes in asset valuations:

$$\Delta\text{NIIP} = \text{CAB} + \Delta\text{VAL}$$

In that equation, the U.S. current-account balance, CAB, is a measure of net capital flows into a country (if positive) or out of a country (if negative).²⁶ The CAB is also equal to the sum of the trade balance (exports minus imports), net international income, and net unilateral transfers. When U.S. imports fall, the U.S. trade deficit also falls. That decline in the trade balance necessitates fewer capital outflows to pay for that smaller U.S. trade deficit; those changes increase both the U.S. CAB and the NIIP. When U.S. net income from abroad rises, that change in income is a capital inflow; it increases the U.S. CAB and the U.S. net international investment position.

Projections of the current-account balance are driven by changes in national saving and investment. Increases in domestic saving (relative to domestic investment) reduce a country's reliance on foreign capital to fund domestic investments and increases the country's NIIP. CBO projects future valuation changes ΔVAL as a function of the long-run average of past valuation changes as well as projected changes in the trade-weighted value of the dollar. Then, based on the forecasts for all other international asset variables, CBO projects foreign official holdings of federal debt using the following equation:

²⁶ That equation does not include net capital transfers. Because they are such a small component of changes in the NIIP, they are omitted from the equation for simplification purposes. In addition, the equation does not include the effects of statistical discrepancies on the NIIP; on net, those effects have been small and cannot be easily projected.

$$\begin{aligned} \text{AMG}_{\text{DEBT},t}^{\text{OFF}} &= \text{AMG}_{\text{DEBT},t-1}^{\text{OFF}} - (\text{CAB} + \Delta\text{VAL}) + \Delta\text{AX} \\ &\quad - (\Delta\text{AM}_{\text{EQ}} - \Delta\text{AMO}_{\text{DEBT}} - \Delta\text{AMG}_{\text{DEBT}}^{\text{PRI}} - \Delta\text{AM}_{\text{DERIV}}) \end{aligned}$$

In CBO’s model, projections of foreign official holdings of U.S. federal debt depend on projections of all other international asset and income variables. For example, those holdings will be sensitive to changes in the U.S. trade balance.²⁷ Holding all else equal, CBO estimates that a growing trade deficit will increase the current-account deficit and, in turn, foreign holdings of U.S. federal debt. In addition, those holdings will grow with increases in U.S. holdings of foreign assets but will decline with increases in all other foreign holdings of U.S. assets, CBO projects. To the extent that projected valuation changes are not reflected in changes in the value of other international assets, those changes will flow through to CBO’s projected foreign official holdings of U.S. federal debt.

Private Holdings of U.S. Federal Debt. CBO forecasts private holdings of U.S. federal debt by projecting those holdings as a share of all U.S. assets held by foreign private investors

$\frac{\text{AMG}_{\text{PRI}}^{\text{DEBT}}}{\text{AM} - \text{AMG}_{\text{OFF}}^{\text{DEBT}}}$ (see Figure 12). Changes in that portfolio share are modeled as a function of changes in the publicly available supply of federal debt (relative to foreign portfolio size), changes in the Federal Reserve’s holdings of U.S. federal debt (relative to foreign portfolio size), and three moving average terms. The forecasting equation implies that in the absence of changes in the available supply of U.S. Treasury securities or changes in the Federal Reserve’s purchases of those securities, foreign investors will maintain a constant share of U.S. Treasury securities in their portfolio of U.S. assets.

In the model, increases in the supply of U.S. federal debt are associated with increases in foreign private holdings of U.S. federal debt. The estimated model suggests that an increase of one percentage point in the ratio of total federal debt to the value of foreign holdings of U.S. assets by private investors corresponds to an increase of 7 basis points in the share of U.S. Treasury securities in the foreign private portfolio of U.S. assets.

In addition, the Federal Reserve’s purchases of U.S. federal debt are associated with declines in the value of U.S. federal debt held by private foreign investors. The estimated model suggests

²⁷ There are compelling reasons for associating changes in the U.S. trade deficit with changes in foreign official holdings of U.S. federal debt. Because the U.S. dollar has been the dominant reserve currency, most U.S. trade flow payments and receipts are denominated in dollars. Therefore, when the United States runs a trade deficit, which it has for nearly four decades, that imbalance is financed through net outflows of U.S. dollars. As a result, foreign central banks in trade surplus countries tend to accumulate dollar balances, which they tend to invest in safe U.S. federal debt. Causality sometimes runs in the other direction as well. Foreign central banks that wish to keep their currencies undervalued relative to the dollar have historically purchased U.S. Treasury securities and sold their local currencies. The stronger dollar reduces the competitiveness of U.S. exports in those foreign markets and increases the U.S. trade deficit.

that when the ratio of Federal Reserve holdings of U.S. Treasury securities relative to the value of the foreign private portfolio of U.S. assets rises by one percentage point, the share of U.S. Treasury securities relative to total U.S. assets in the overall portfolio of U.S. assets held by foreign private investors will fall by 6 basis points.

Foreign Holdings of U.S. Portfolio Equity and U.S. Direct Investment Equity

To forecast foreign holdings of U.S. portfolio equity and direct investment equity, CBO uses a simple forecasting equation. Because changes in the value of those types of asset holdings (relative to the market capitalization of the U.S. S&P 500 index) are stationary over history, CBO forecasts those changes as a function of a constant term, meaning that those holdings change at a rate consistent with long-run historical trends (see Figure 13). CBO was unable to find explanatory variables that could improve the out-of-sample forecasting properties of that forecasting equation, so the agency projects those variables using a simple linear time trend.

Foreign Holdings of U.S. Private Debt Assets

CBO projects growth of foreign holdings of private U.S. debt as a function of the market capitalization of the S&P 500 over the long run and as a function of changes in the trade-weighted dollar exchange rate in the short run. Those forecasting equations take the form of an error-correction model.²⁸ Since 1983 (the earliest year for which data are available), the ratio of foreign holdings of private debt to the S&P market capitalization has exhibited a weakly positive trend relationship (see Figure 14). That long-term trend drives CBO's long-term projection for those foreign-held private debts. In the short run, deviations from that trend are correlated positively with the trade-weighted value of the U.S. dollar. A stronger dollar indicates greater demand for all U.S. dollar-denominated assets, including private debt assets—which implies an increase in net purchases of those assets and an increase in their value.

U.S. Holdings of Foreign Debt Assets

To project U.S. holdings of foreign debt assets, CBO uses the forecasting equation framework that it uses for foreign holdings of U.S. private debt assets, with an additional dollar exchange rate term that picks up changes in the valuation of those assets. Historically, those two international debt series (foreign holdings of U.S. private debt and U.S. holdings of foreign debt) have been strongly correlated.²⁹ That correlation at least partially results from growth in offsetting cross-border bank liabilities, especially in the run-up to the global financial crisis.³⁰

²⁸ An error-correction model is a time-series model of variables that share an underlying long-run trend. The model explains movements in one variable as a function of a long-run (cointegrating) relationship with other variables that explain short-run deviations from that long-run trend.

²⁹ The correlation between the log growth rates of those two series is 0.79.

³⁰ Shin (2012) describes how the accumulation of large offsetting debt holdings by U.S. and European banks accounted for a large share of the growth in gross asset positions before the global financial crisis.

U.S. Holdings of Foreign Portfolio Equity and Foreign Direct Investment Equity

CBO models U.S. holdings of foreign portfolio equity assets as a function of a long-run time trend and changes in asset valuations (see Figure 15). The forecasting equation asserts that U.S. holdings of foreign portfolio assets grow at a constant rate relative to the S&P 500 index's market capitalization. In addition, exchange rate changes and fluctuations in foreign growth affect the dollar value of those asset holdings. For instance, a rise in the value of the dollar would reduce the dollar value of foreign portfolio assets that are denominated in foreign currencies. Stronger foreign growth should increase the value of equity positions in foreign economies, however.

To project U.S. holdings of foreign direct investment equity assets, CBO uses a similar modeling framework. Changes in U.S. holdings of those assets are modeled as a function of changes in the U.S. trade-weighted dollar index (to proxy for valuation changes) and a time trend that picks up the long-run trend in the accumulation of those assets.

Derivatives

CBO uses a simple equation to forecast international derivative positions: Both U.S.-held derivatives and foreign-held derivatives equal their last observed value throughout the 10-year projection period. That simple equation is used because historical data on international derivative positions only go back to 2006, so CBO has a limited history from which to discern useful economic relationships. As of 2020, foreign holdings of U.S. derivatives and U.S. holdings of foreign derivatives accounted for less than 10 percent of the value of gross international asset holdings for both U.S. and foreign investors.

Forecasting International Income Flows

To project international income flows, CBO forecasts the different yields for each type of asset (j). Each asset type (j) in CBO's model of international investment, except for derivatives, earns income (interest, dividends, or reinvested profits), and the ratio of income Y_j to asset value A_j represents a yield, i_j :

$$i_j = \frac{Y_j}{A_j}$$

CBO uses error-correction models to project those international yields. To do so, long-run cointegrating relationships are found with comparable yields for domestic and foreign assets.

Yields on International Debt Assets

CBO models the yield on foreign holdings of U.S. federal debt as a function of the yield on all U.S. federal debt. Those two yields have historically moved in tandem, and the gap between them has narrowed steadily over time (see Figure 16). The gap between the two rates reflects the fact that historically the average maturity of foreign holdings of U.S. federal debt has been

shorter than the average maturity of the entire portfolio of publicly held U.S. federal debt. The narrowing of that gap over time is a result of both the persistent decline in interest rates among developed economies and a gradual lengthening of the average maturity of foreign holdings of U.S. federal debt. CBO projects that those two rates will converge in the long run because of CBO's projected reversal of the trend decline in interest rates; as a result, during the projection period, the gap between the rates narrows gradually.

The yield on foreign holdings of U.S. private debt assets is projected as a function of two domestic yields: the yield on foreign-held U.S. federal debt and the yield on Moody's seasoned grade Baa corporate debt.³¹ The long-run decline in the private yield is explained by the yield on federal debt, whereas short-run deviations from that trend can be explained by changes in the corporate yield.

To model the yield on U.S. holdings of foreign debt, CBO makes use of the observed co-movement between that yield and two other variables in CBO's forecasting model: the yield on foreign-held U.S. debt assets and the U.S. nominal output gap. When the U.S. output gap falls (in other words, when actual output declines relative to potential output), interest rates in the United States and abroad have tended to fall and, as a result, the yields on debt assets tend to fall as well. However, over the past 30 years, when the U.S. output gap has been large, the yield on U.S. holdings of foreign debt has declined by a larger magnitude than foreign holdings of U.S. private debt, leading to a drop in the yield differential on those assets (see Figure 17). The reason for that historical pattern is not clear, although it might stem from differences in the average maturity or risk profile of U.S. and foreign debt holdings.

Yields on International Equity Assets

The yields on foreign holdings of U.S. portfolio equities and U.S. direct investment equities are modeled using their long-run linkages to yields on similar domestic assets. In CBO's model, long-run changes to the path of yields on foreign holdings of U.S. portfolio equities are driven by changes in the dividend yield on the S&P 500, and the yields on foreign-held U.S. direct investments are modeled as a function of the ratio of U.S. corporate profits to the S&P 500 market capitalization. The yields on U.S. holdings of foreign equity assets are projected in a similar way, but they are adjusted for exchange rate effects.

One key result of CBO's modeling of the yields on U.S. holdings of foreign direct investments is that the direct investment yield differential is projected to remain roughly steady over the entire projection period. Consequently, CBO's forecast implies that the large yield differential in direct

³¹ Moody's seasoned Baa corporate bond yield measures the yield on corporate bonds that are rated Baa by Moody's. According to Moody's Analytics, "The 'corporate' yields are unweighted averages of the more specific 'industrial' and 'utility' categories. These are 'long-term' bonds, with minimum and average maturities of 20 and 28 years, respectively." See Phillip Thorne, "Understanding Data: U.S.—Moody's Bond Rates in H.15," *Moody's Analytics Blog* (undated), <https://tinyurl.com/fmuhbha9>.

investment assets, which is the primary driver of the positive U.S. net international income flow, will persist over the next 10 years (see Figure 18).³²

What Are CBO’s Forecasts of U.S. International Investment Holdings and Income Flows?

CBO uses its forecasting equations to project international asset and income holdings over a 10-year period. Those projections have important implications for the agency’s forecasts of total demand for U.S. federal debt and for U.S. national income.³³

International Asset Positions

Over the next 10 years, growth of international asset holdings is projected to decline slightly relative to U.S. nominal GDP (see Figure 19). CBO’s projected growth rates for those gross asset positions are even slower than the weak rates of growth that have persisted since the global financial crisis.³⁴ The reason for that slow growth is that U.S. GDP is expected to grow more quickly over the next 10 years than will the market capitalization of the S&P 500, in CBO’s estimation. As a result, gross international asset positions are likely to decline in value relative to the size of the U.S. economy.

Over the 10-year projection period, growth in the value of U.S. holdings of foreign assets is projected to exceed growth in the value of foreign holdings of U.S. assets—and, consequently, the U.S. NIIP is expected to rise modestly (see Figure 20). That trend change in the path of the U.S. NIIP reflects CBO’s expectation that the recent decline in the “valuation effect and statistical discrepancy” component of the U.S. NIIP will reverse in 2021. During 2020, the value of U.S. assets rose substantially relative to the value of foreign assets, which caused the cumulative valuation effect on the NIIP to change from positive to negative (for the first time in nearly 20 years). Because the value of the U.S. dollar is expected to continue to decline, and because foreign growth is projected to rise in 2021 and beyond (as the effects of the 2020–2021 coronavirus pandemic wane), the cumulative valuation effect is projected to rebound gradually through 2031 while remaining negative. Those changes in the valuation of gross asset positions will offset the effect of further sustained net investment inflows into the United States, resulting

³² CBO’s view that the yield differential in equity assets will persist is informed by CBO’s projection that income-shifting behavior will not change materially over the 10-year period. Even though the tax treatment for income of multinational corporations was changed by the 2017 tax act, in CBO’s view those changes will not substantially affect the amount of income shifting that takes place by those corporations. For details, see Congressional Budget Office (2018).

³³ This paper describes the projections included in CBO’s July 2021 budget and economic outlook. See Congressional Budget Office (July 2021).

³⁴ During 2020, the ratio of gross asset positions to U.S. GDP spiked, primarily as a result of large increases in the demand for equities (both in the United States and abroad), which led to large net purchases of those assets and gains in their value.

in a U.S. NIIP that remains roughly flat (relative to U.S. GDP) over the 10-year period of CBO's forecast.

Foreign Holdings of U.S. Federal Debt

Throughout the forecast period, total foreign accumulation of U.S. assets is projected to exceed total U.S. holdings of foreign assets, primarily because of a widening gap in holdings of international debt assets (see Figure 21). That widening gap is partially a consequence of strong projected growth in foreign holdings of U.S. federal government debt. CBO expects foreign demand for U.S. federal debt to remain strong throughout the next 10 years (see Figure 22).

Even though federal debt is expected to rise substantially, the share of all publicly available federal debt owned by foreign governments and investors is projected to remain steady over the next decade (see Figure 23). The slight rise beginning in 2025 in the share of U.S. federal debt held by foreign investors coincides with the projected reduction in the size of the Federal Reserve's balance sheet, implying that foreign investors will step in to purchase a greater share of all newly issued federal debt once the Federal Reserve's holdings begin to diminish.

International Income Flows

CBO projects that net international income will rise as a share of U.S. GDP through 2023 before declining through 2031 (see Figure 24). The near-term increase in net international income results from two factors: a recovery in net corporate profits and a projected rebound in the value of U.S. holdings of foreign debt assets. The decline in net international income starting in 2024 is driven in large part by a decrease in net interest income that stems from increased interest paid to foreign investors who hold U.S. federal debt.

Net Interest Income

Between 2020 and 2022, U.S. net interest income is projected to rise gradually, for two reasons. First, the effective interest rate on U.S. holdings of foreign debt is expected to rise relative to foreign holdings of U.S. debt. That pattern in effective yields on international debt is consistent with the pattern observed following the 2001 recession, the 2007–2009 recession, and what has been observed in the aftermath of the 2020 recession (see Figure 17). Second, the growth in foreign holdings of U.S. debt is projected to slow relative to its recent pace, and U.S. net holdings of international debt assets are expected to have risen slightly in the first half of 2021.

Beyond 2022, U.S. net interest income is projected to decline, because foreign holdings of U.S. debt assets will continue to grow faster than U.S. holdings of foreign debt assets, as has been the long-run trend. CBO projects that growth in foreign holdings of U.S. federal debt assets is the largest contributor to that difference in asset accumulation. The fact that the United States owes much more in debt to the rest of the world than it holds in foreign debt implies that U.S. net interest income will drop significantly as global interest rates rise. That increase in interest outflows comes even as the yield differential on debt assets remains high relative to the observed differential from the previous three decades.

Rising interest rates on government debt and larger foreign holdings of U.S. federal debt will both contribute to a substantial increase in the value of interest payments that the U.S. federal government will make to foreign investors. Over the 2021–2031 period, those interest payments will rise from 0.6 percent to 0.9 percent of U.S. GDP, CBO projects (see Figure 25).

Net Corporate Profits

In CBO’s projections, U.S. net international corporate profits (relative to U.S. GDP) are expected to rebound in 2021 and then gradually increase over the remainder of the forecast period. Two factors contribute to that projected rebound. The first factor is the sharp decline in dividends relative to the value of the S&P 500 in 2021, which persists through 2023 in CBO’s projections. Lower dividend yields on U.S. equities reduce foreign dividend income and raise net corporate profits. The second factor is the projected rebound of the yield differential for portfolio equity (see Figure 18). During 2020, the U.S. yield on foreign portfolio equity fell relative to foreign earnings on U.S. equity. CBO expects the yield differential on portfolio equity to rebound, however, as the yield on foreign equity rises in line with an improving global business outlook. Over the second half of the projection period, net corporate profits are projected to decrease modestly as the yield differential on equities continues its long-run trend decline.

International Yield Differentials

The yield differential on international assets will remain high and roughly steady over the next 10 years, CBO projects (see Figure 26). That differential is expected to rise modestly over the next two years as the average yield on U.S. debt falls more than the yield on the debt of major financial partners. In later years, the yield differential is projected to decline slightly because U.S. interest rates are expected to rise slightly relative to those of major financial partners, reducing the yield differential on debt assets. Over the 10-year period, the yield differential on equity assets is expected to remain steady (see Figure 18). The changes to the yield differential on debt assets are modest, however, relative to the overall differential, which remains close to 2 percent over the next decade.

CBO’s forecast of net international income suggests that national income will remain high relative to U.S. output, meaning that the gap between GNP and GDP will remain wide. Even as the U.S. NIIP declines, the high and persistent yield differential implies that the United States is projected to earn positive net income on its international asset position. Although the gap between GNP and GDP is expected to narrow slightly in later years of the projection period, U.S. national income is expected to continue to exceed U.S. domestic income by a historically large margin over the next 10 years. By earning positive net international income despite having a negative NIIP, the United States will be able to sustain its international debt position through 2031, CBO projects.

Risks to CBO's Forecasts of U.S. International Investment Holdings and Income Flows

One risk to CBO's projections of U.S. international investment holdings and income flows is that foreign preferences might shift between different categories of U.S. assets. For example, in 2020, foreign demand for U.S. Treasury securities declined, whereas foreign demand for U.S. equities rose. As a result, the composition of the foreign portfolio of U.S. assets changed in a way that increased the portfolio's riskiness but also its expected yield. That shift in the composition of foreign holdings of U.S. assets raised U.S. Treasury rates while also boosting U.S. equity prices. If that kind of shift continued, it would put additional upward pressure on U.S. Treasury rates, U.S. federal interest expenses, and the federal budget deficit. In addition, that continued shift would also be likely to reduce the U.S. yield differential and, in turn, push down U.S. net international income.

Another risk to CBO's forecast is a potential reduction in foreign preferences for all dollar-denominated assets. Such a change would cause the value of the dollar to depreciate and would lead to two adjustments that would make the U.S. NIIP less negative.³⁵ The first adjustment would occur through valuation effects. A depreciation of the dollar would increase the U.S. NIIP by boosting the dollar value of U.S. holdings of foreign assets (ones that are denominated in foreign currencies) relative to the dollar value of foreign-held U.S. assets. In addition, a weaker dollar would raise the dollar value of U.S. earnings on those foreign assets, which would increase net international income. That higher net international income would occur at the same time as a smaller current-account deficit and a smaller value of net foreign purchases of U.S. assets.

The second adjustment would occur through the trade balance. A weaker dollar would improve the competitiveness of U.S. exports in foreign markets and tend to reduce the U.S. trade deficit. A smaller trade deficit would decrease the U.S. current-account deficit by limiting outflows of capital that would be required to pay for foreign goods and services. Thus, by reducing the U.S. trade balance, a weaker dollar would require a smaller amount of foreign asset purchases to finance the U.S. trade deficit. A weaker dollar, therefore, would tend to slow the speed at which foreign investors accumulated U.S. assets and, as a result, would lead to smaller outflows of income and higher net international income.

³⁵ See Gourinchas and Rey (2007) for a discussion of how a depreciation of the dollar would facilitate an increase in the negative U.S. net international investment position.

Appendix: Statistical Discrepancies in International Investment Position Data

To estimate the extent to which valuation changes have affected the U.S. net international investment position (NIIP) over time, the Congressional Budget Office compared changes in the NIIP with the U.S. current-account balance (CAB)—which is a measure of net international investment flows, meaning net purchases of international assets. In the absence of any valuation changes, the change in the NIIP in any year should be equal to the CAB. The difference between those two measures should reflect the extent to which other factors have affected the NIIP. Therefore, in theory, changes to the NIIP can be modeled like this:

$$\Delta\text{NIIP} = \text{CAB} + \Delta\text{VAL} \quad (1)$$

In practice, though, statistical discrepancies (SD) between measures of the stock of assets and measures of the flow of assets may prevent that equation from holding.

$$\Delta\text{NIIP} = \text{CAB} + \Delta\text{VAL} + \text{SD} \quad (2)$$

Curcuro, Thomas, and Warnock (2008) describe a few sources of those measurement discrepancies. For example, they point to some types of assets, such as direct investments in intangible assets, for which data on transactions tend to be reliable (and thus show up properly in the current account) but are probably not accurately valued in the international investment position data.³⁶ As a result, some investment flows that would be reflected in measurements of the U.S. CAB might not be valued appropriately in the data collected on U.S. international asset stocks. Those statistical discrepancies would explain why equation (1) sometimes fails.

³⁶ See Curcuro, Thomas, and Warnock (2008) for more information on statistical discrepancies in U.S. asset data and U.S. financial flows data.

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Table

Table 1. Composition of International Asset Holdings

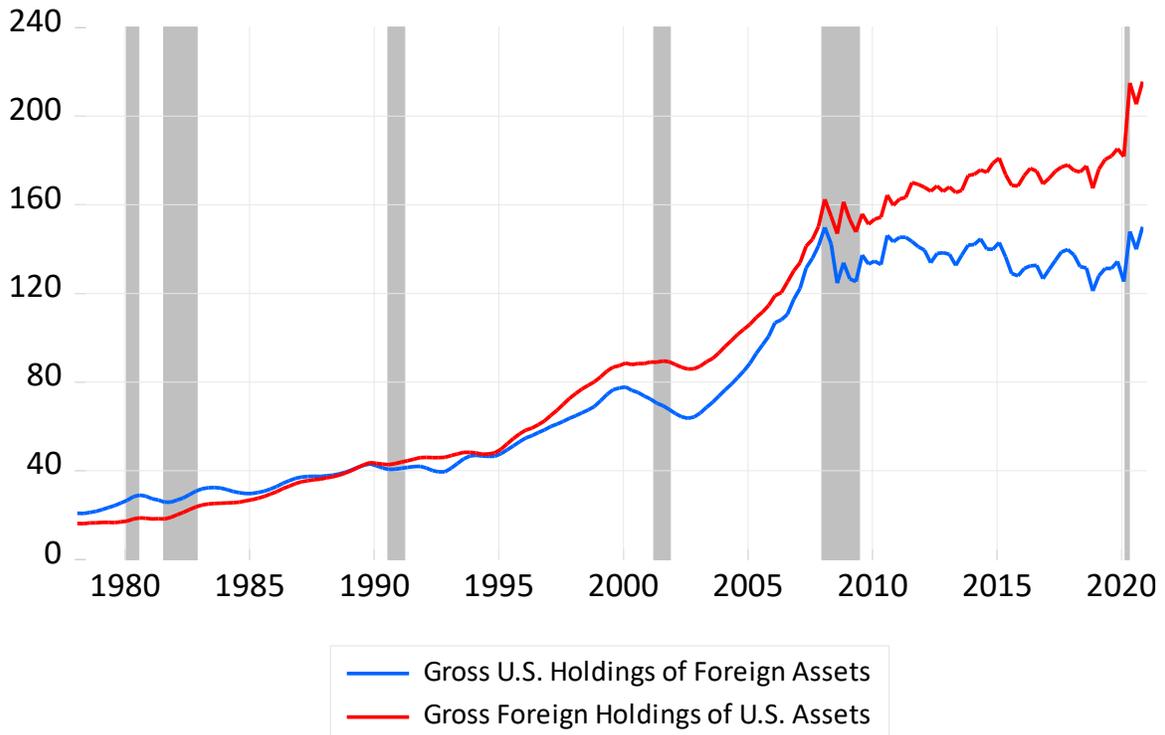
Asset Category	Components
Direct Investments	Equity, Debt Holdings
Portfolio Investments	Equity and Investment Fund Shares, Debt Securities
Financial Derivatives	Over-the-Counter Contracts (Including foreign exchange contracts), Exchange-Traded Contracts
Other Investments	Other Equity Instruments, Currency and Deposits, Loans, Insurance Technical Reserves, Trade Credit and Advances
Reserve Assets	Monetary Gold, Special Drawing Rights, Reserve Positions at the International Monetary Fund, Currency and Deposits, Securities, Derivatives Held As Reserves by Foreign Monetary Authorities)

Data source: Bureau of Economic Analysis (international investment position tables).

Reserve assets are broken out only for U.S. holdings of foreign assets. For foreign holdings of U.S. assets, BEA does not separate out the assets held at foreign monetary authorities from other holdings; therefore, the components of reserve assets for foreign holdings are folded into all the other categories of investments.

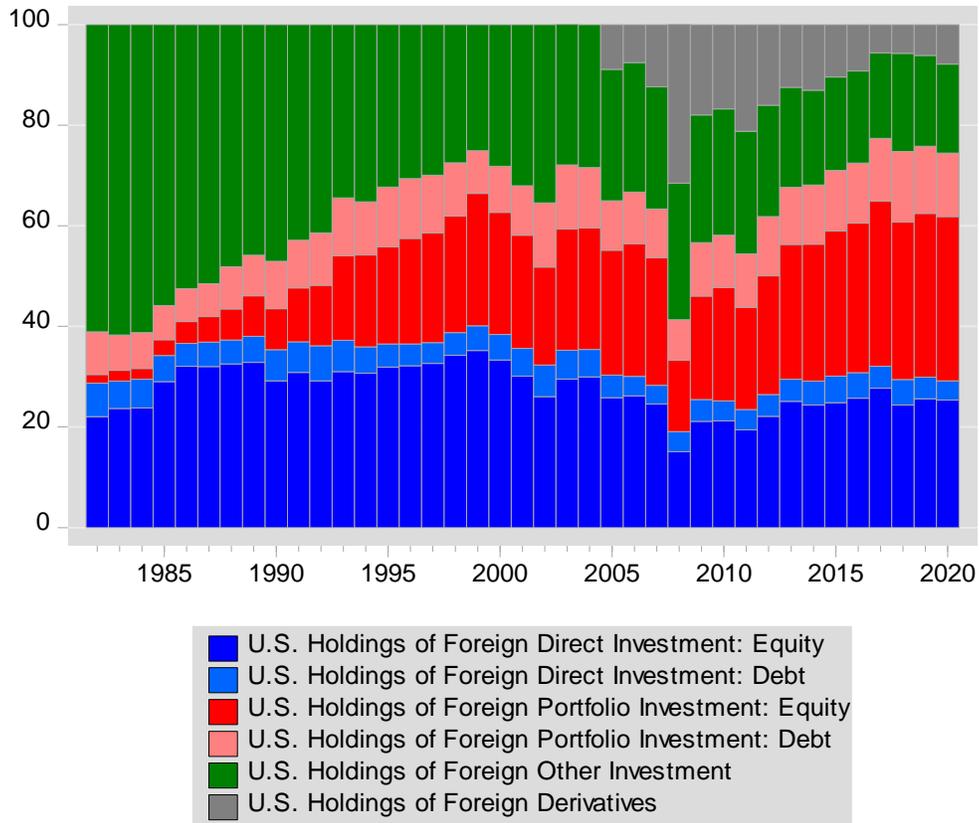
Figures

Figure 1. Value of International Asset Holdings
Percentage of U.S. GDP



Data source: Bureau of Economic Analysis (international investment position tables, national income and product accounts).

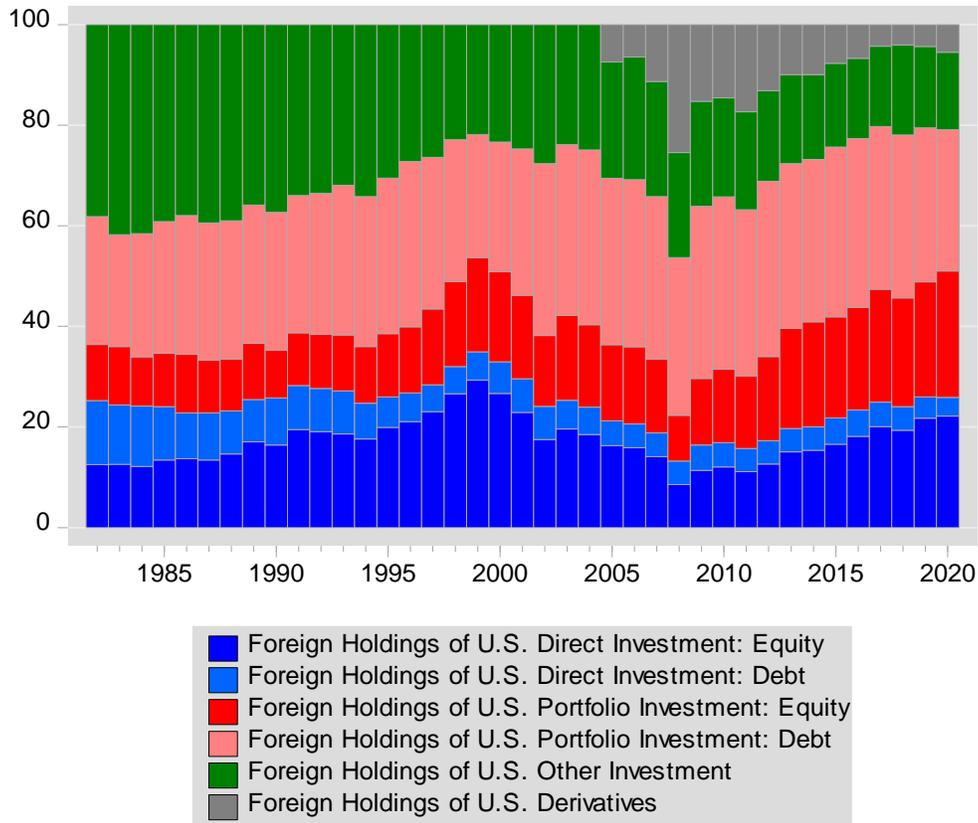
Figure 2. Distribution of U.S. Holdings of Foreign Assets, by Asset Type
 Percentage of Total



Data source: Bureau of Economic Analysis (international investment position tables).

BEA started publishing data on international derivative holdings in 2006.

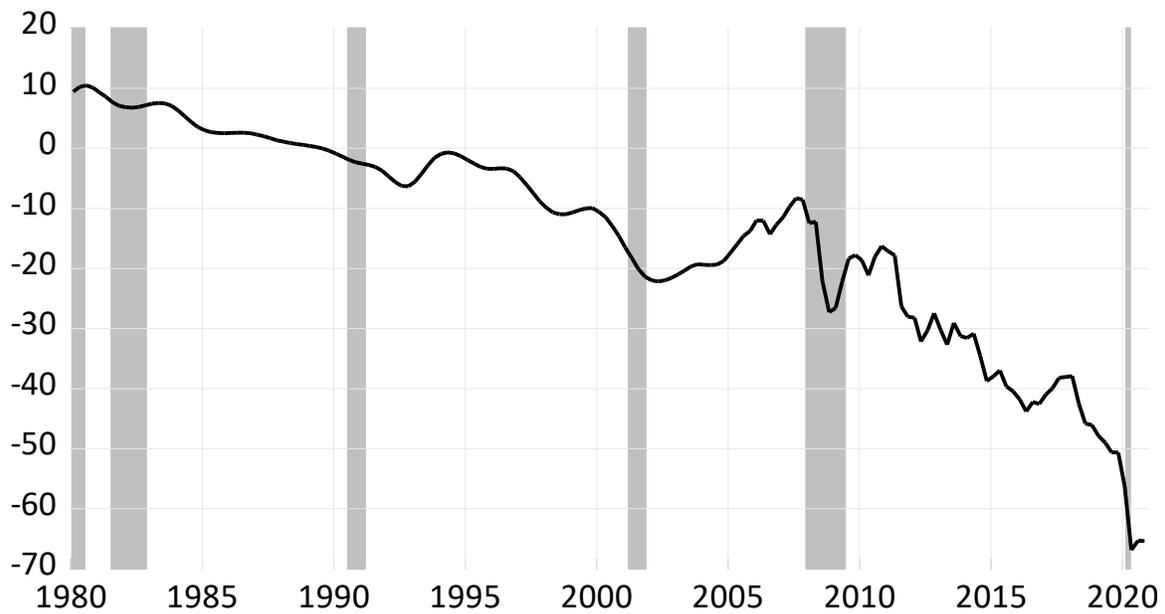
Figure 3. Distribution of Foreign Holdings of U.S. Assets, by Asset Type
 Percentage of Total



Data source: Bureau of Economic Analysis (international investment position tables).

BEA started publishing data on international derivative holdings in 2006.

Figure 4. U.S. Net International Investment Position
Percentage of U.S. GDP

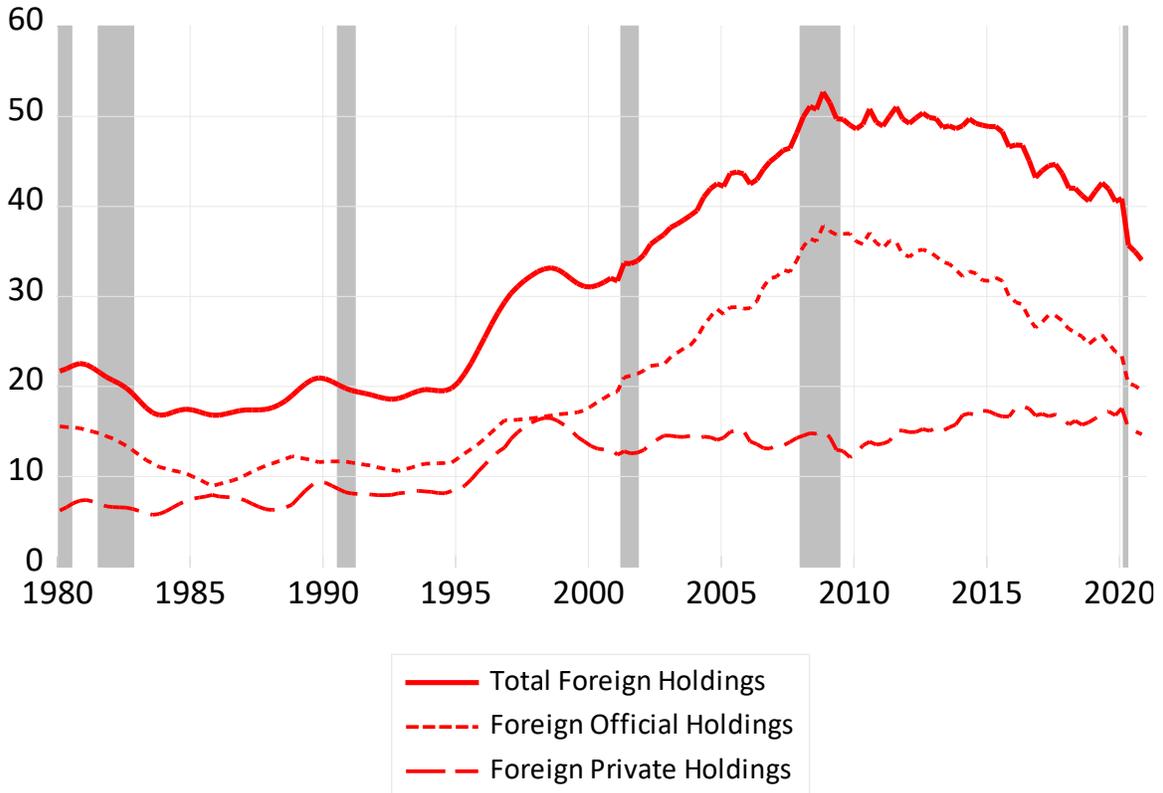


Data source: Bureau of Economic Analysis (international investment position tables, national income and product accounts).

The sharp drop in the U.S. NIIP relative to U.S. GDP in 2020 can be attributed to the steep decline in U.S. GDP and the large increase in the value of U.S. assets relative to the value of foreign assets (rather than changes in the amount of assets purchased).

Figure 5. Publicly Held U.S. Federal Debt Owned by Foreign Investors

Percent

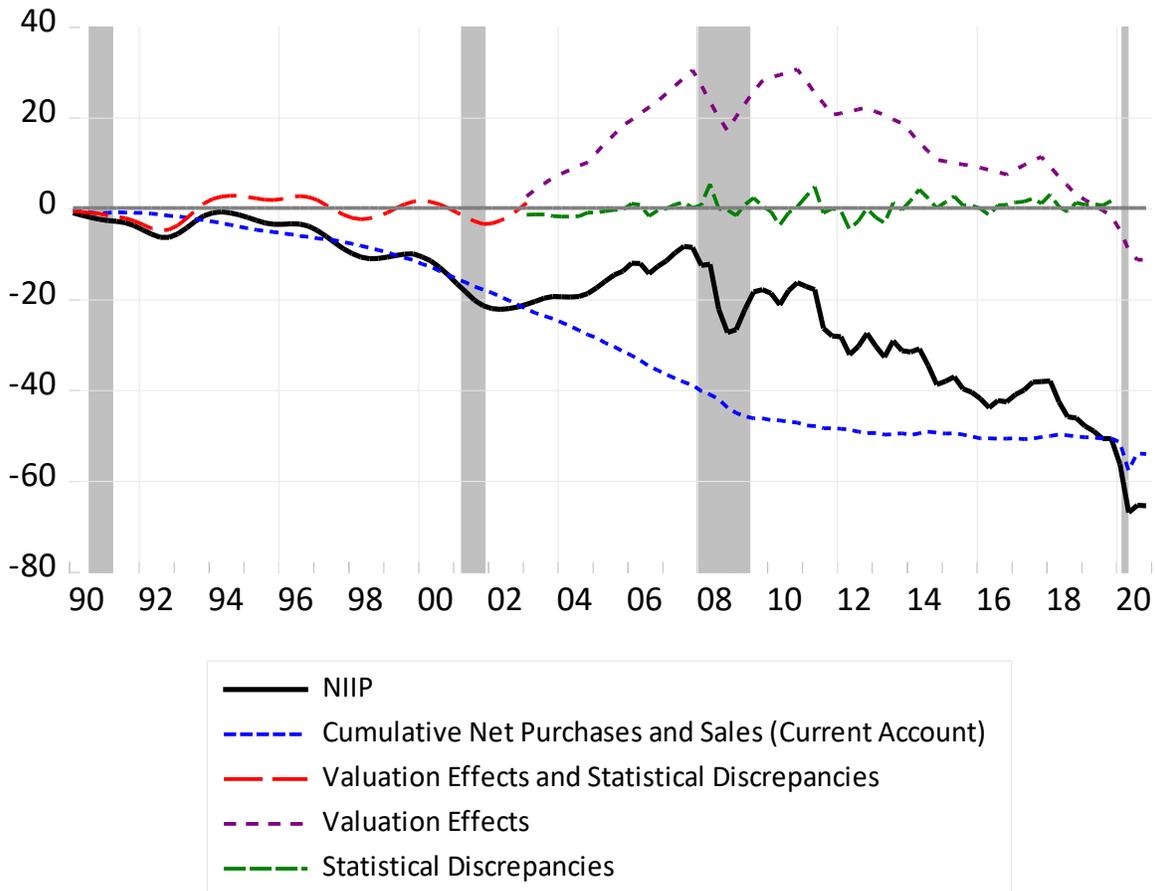


Data sources: Bureau of Economic Analysis (international investment position tables, Monthly Treasury Statement); U.S. Treasury (treasury international capital data).

Foreign official holdings are holdings by foreign governments and central banks. Foreign private holdings are holdings by all other investors (including sovereign wealth funds). Changes in the total share of foreign holdings have been driven primarily by changes in foreign official holdings rather than foreign private holdings.

Figure 6. Factors That Have Contributed to Changes in the U.S. Net International Investment Position

Percentage of U.S. GDP

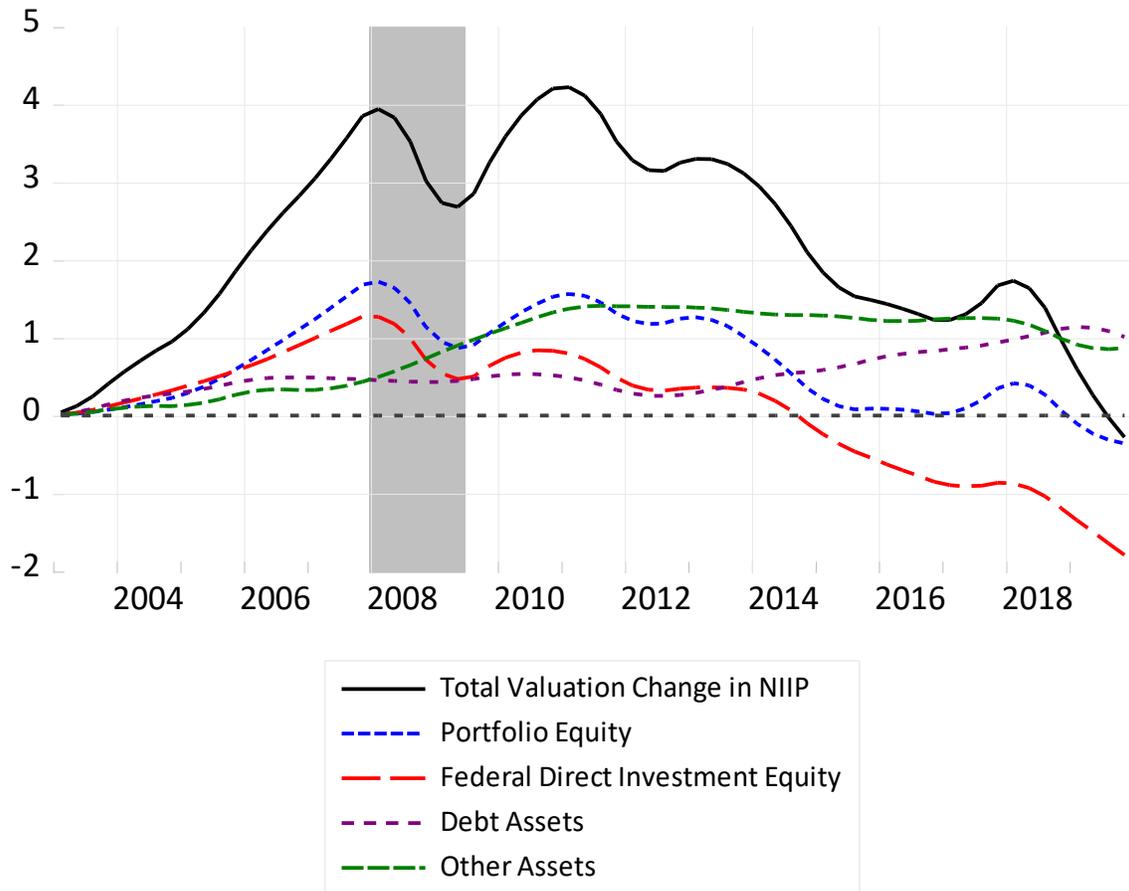


Data sources: Bureau of Economic Analysis (international investment position tables, national income and product accounts); Congressional Budget Office.

The category of “cumulative net purchases and sales” of assets isolates the effect of changes in holdings of international assets among investors and is equivalent to cumulated current-account deficits since 1990. “Valuation effects” describes all changes in the value of U.S. assets or liabilities arising from any source besides a financial transaction. Those valuation effects include price changes, exchange rate changes, and changes in volume and valuation not included elsewhere. “Statistical discrepancies” describes statistical differences between asset flow data and asset stock data that prevent CBO from being able to reconcile those two types of data. BEA began publishing data on valuation changes starting in 2003; for prior years, this figure combines the effects of valuation changes with the effects of statistical discrepancies.

Figure 7. How Changes in Asset Valuations Have Contributed to Changes in the U.S. Net International Investment Position, by Asset Category

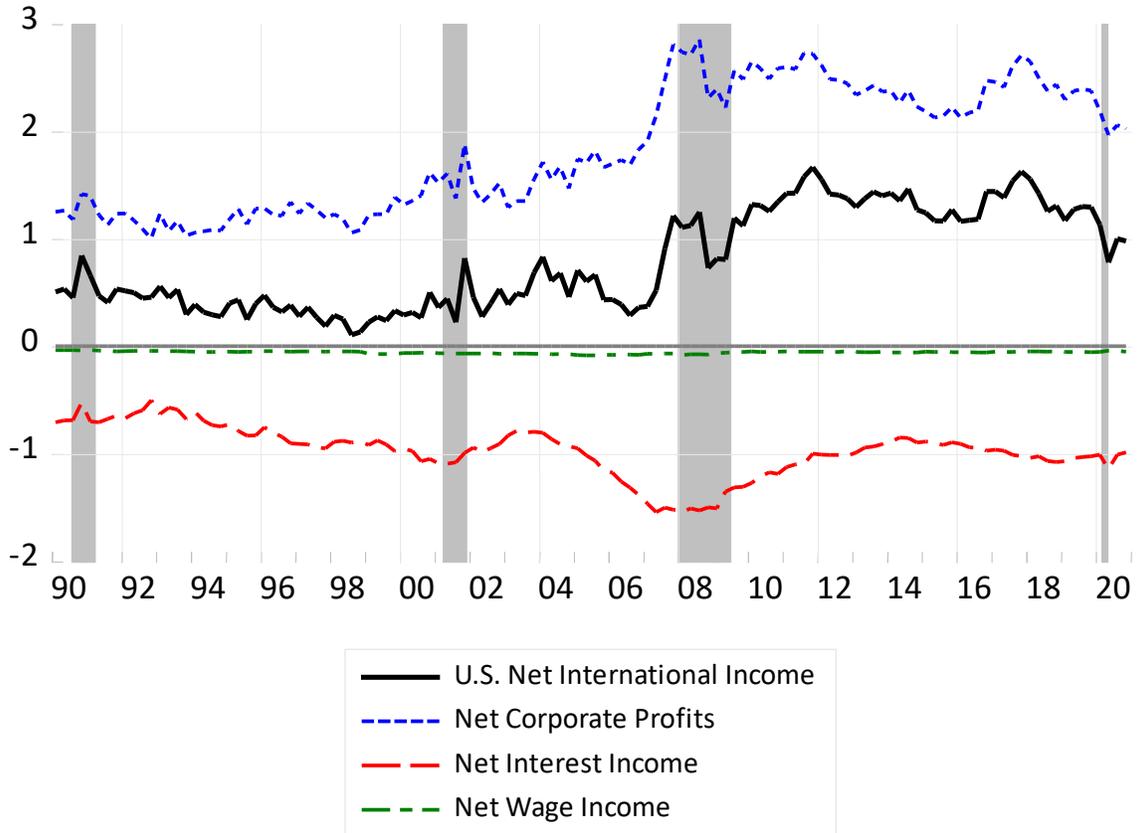
Trillions of Dollars



Data source: Bureau of Economic Analysis (international investment position tables).

BEA started publishing these data series in 2003. The effect of valuation changes on the U.S. NIIP rose from 2003 through 2010 and has since declined. That pattern has been driven primarily by changes in the value of portfolio equities and foreign direct investments.

Figure 8. Components of U.S. Net International Income
 Percentage of U.S. GDP

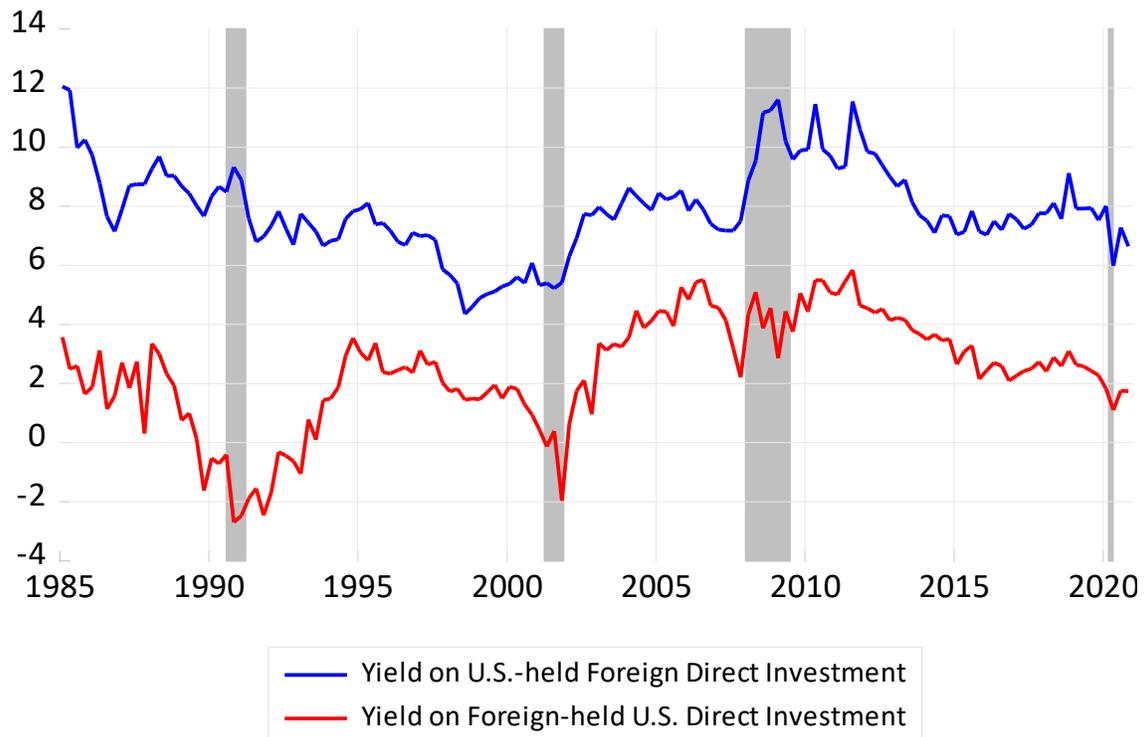


Data source: Bureau of Economic Analysis (national income and product accounts, balance of payments data).

Since 1990, net international income has been positive: Large and positive net corporate profits have outweighed negative net interest income and net wage income. Net corporate profits are equal to U.S. equity income earned abroad minus foreign equity income earned in the United States. Net interest income is equal to the difference between interest income earned by U.S. investors on foreign debt assets and foreign interest income earned on U.S. debt assets. Net wage income is equal to the difference between wages earned by U.S. residents abroad and wages earned by foreign residents in the United States.

Figure 9. Yields on International Direct Investment

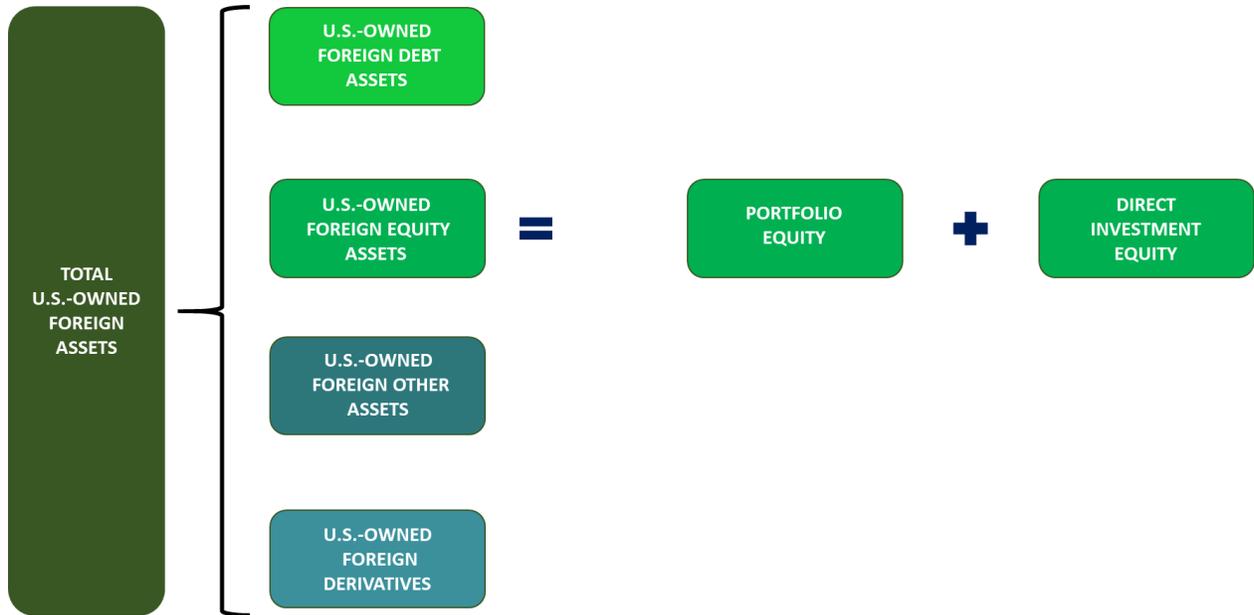
Percent



Data source: Bureau of Economic Analysis (international investment position tables, national income and product accounts, balance of payments data).

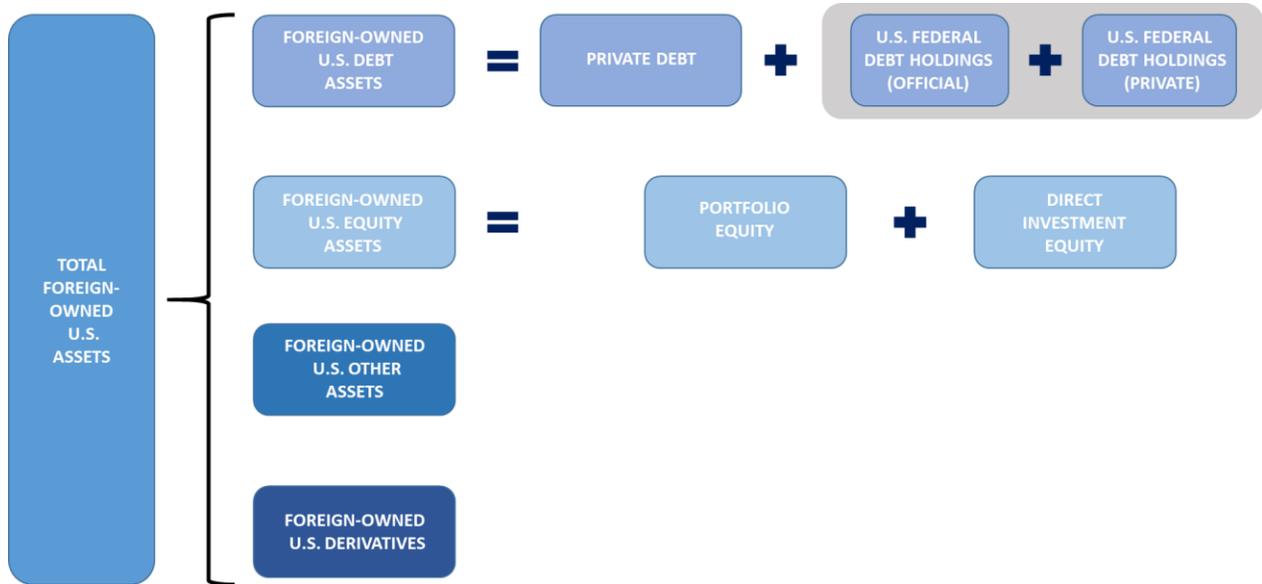
The yield differential on direct investment is one of the most important factors contributing to the positive international yield differential earned by U.S. investors.

Figure 10. CBO's Model of U.S.-Owned Foreign Assets, by Asset Type



Source: Congressional Budget Office.

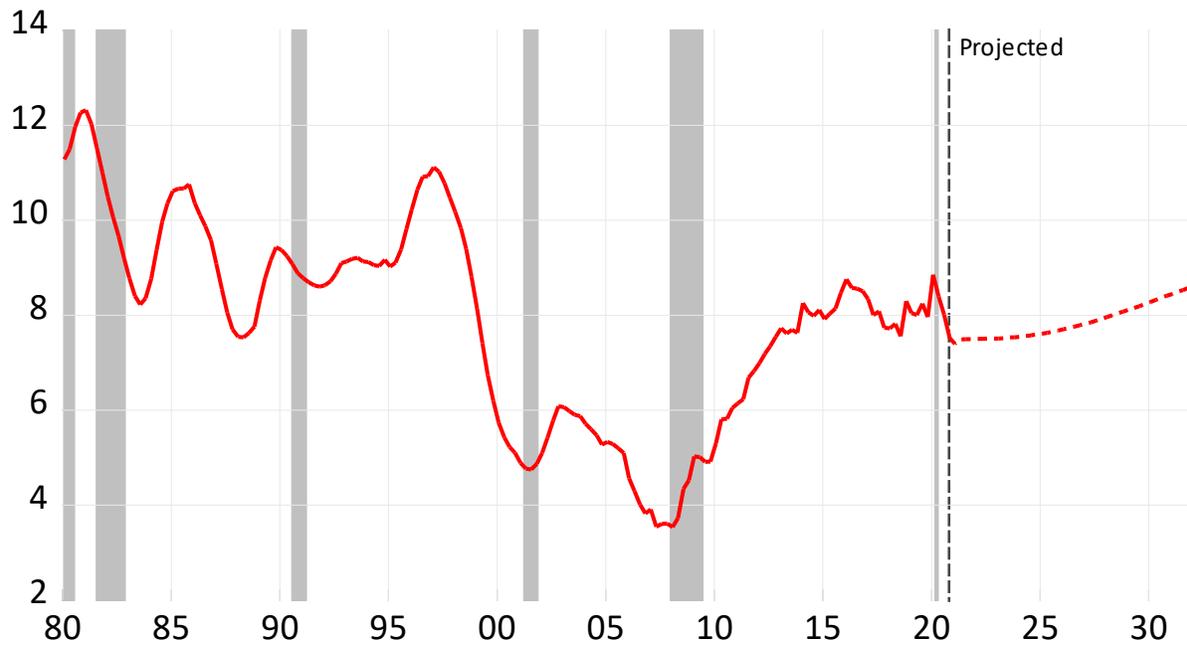
Figure 11. CBO's Model of Foreign-Owned U.S. Assets, by Asset Type



Source: Congressional Budget Office.

**Figure 12. Share of U.S. Federal Debt in the Total Portfolio of U.S. Assets
Held by Foreign Investors**

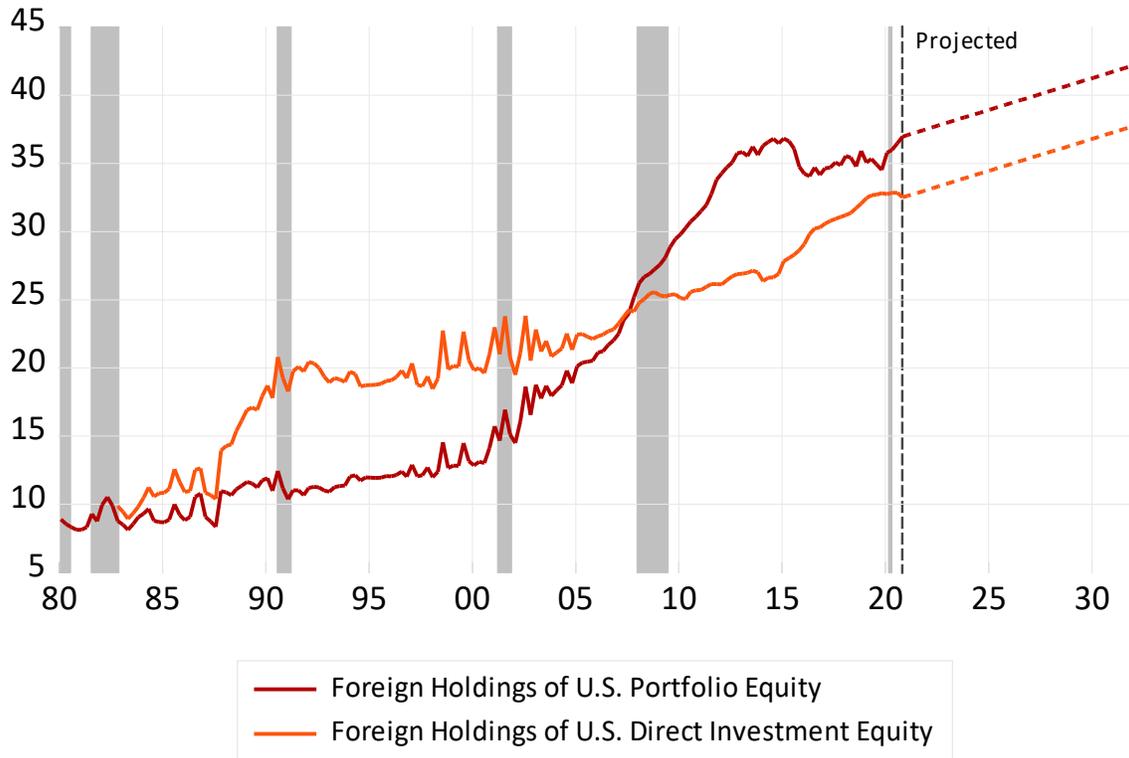
Percent



Data source: Bureau of Economic Analysis (international investment position tables).

Figure 13. Foreign Holdings of U.S. Portfolio Equity and U.S. Direct Investment Equity, As Shares of the Market Capitalization of the S&P 500 Index

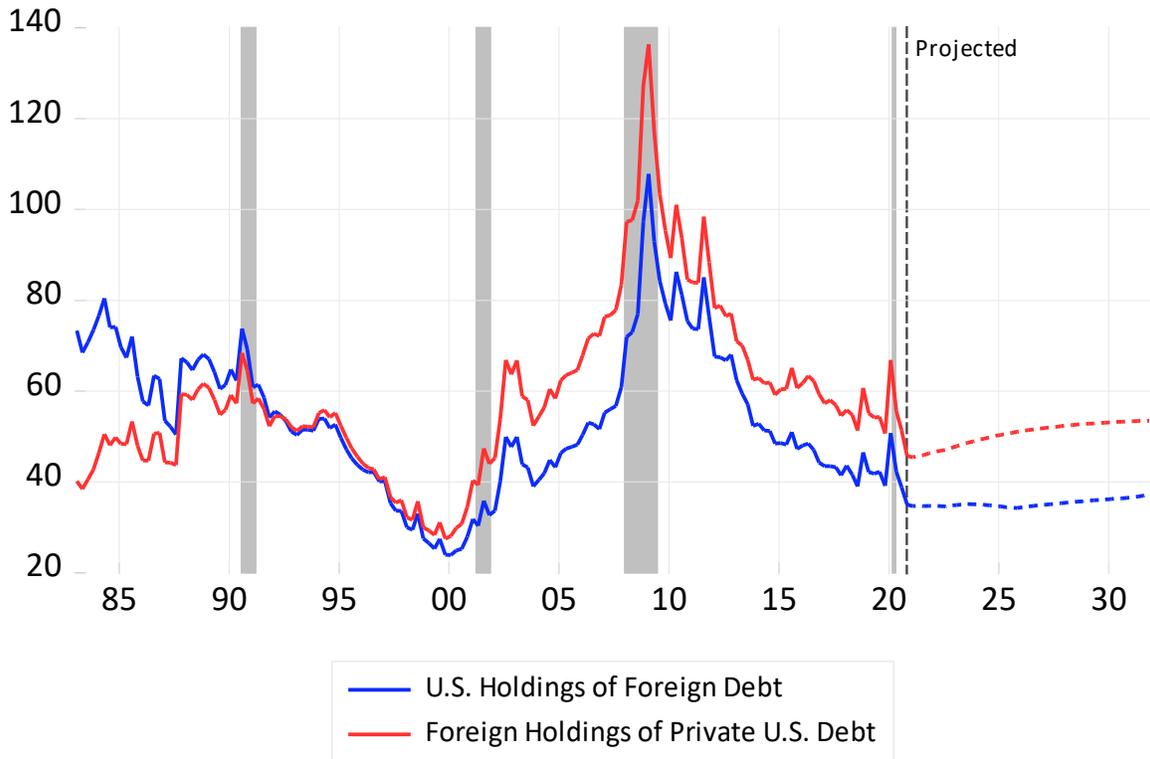
Percent



Data sources: Bureau of Economic Analysis (international investment position tables); Standard and Poor's; Congressional Budget Office.

Figure 14. International Debt Holdings, As a Share of the Market Capitalization of the S&P 500 Index

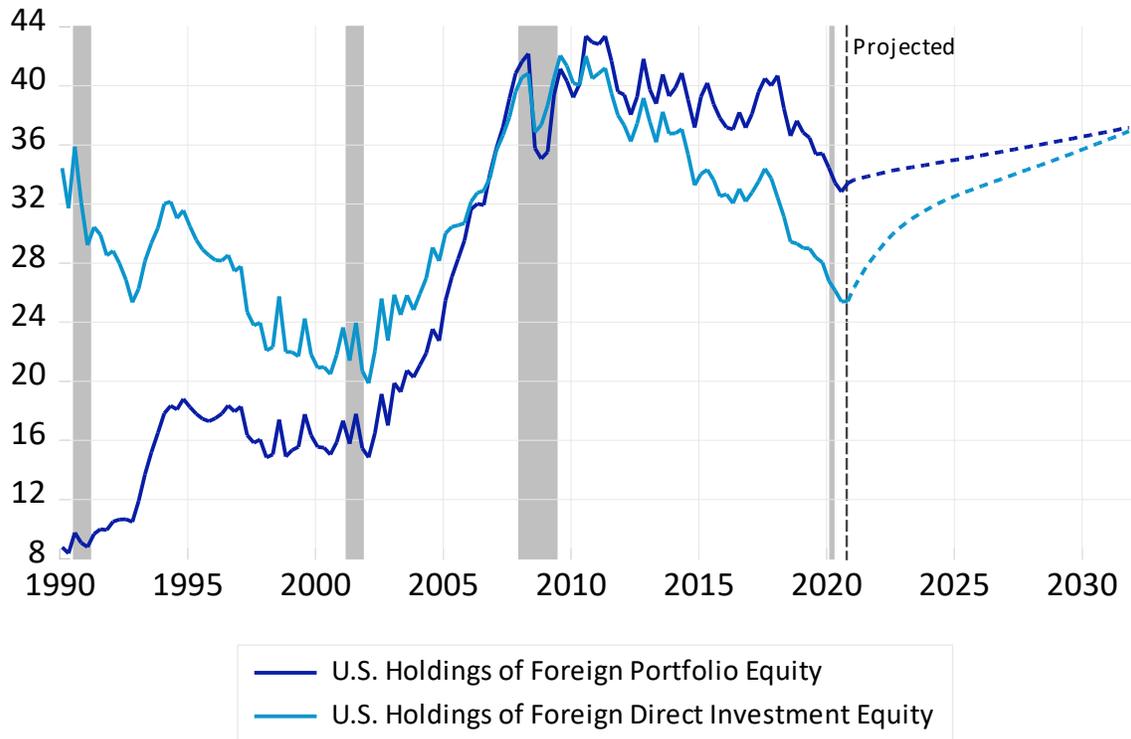
Percent



Data sources: Bureau of Economic Analysis (international investment position tables); Standard and Poor's; Congressional Budget Office.

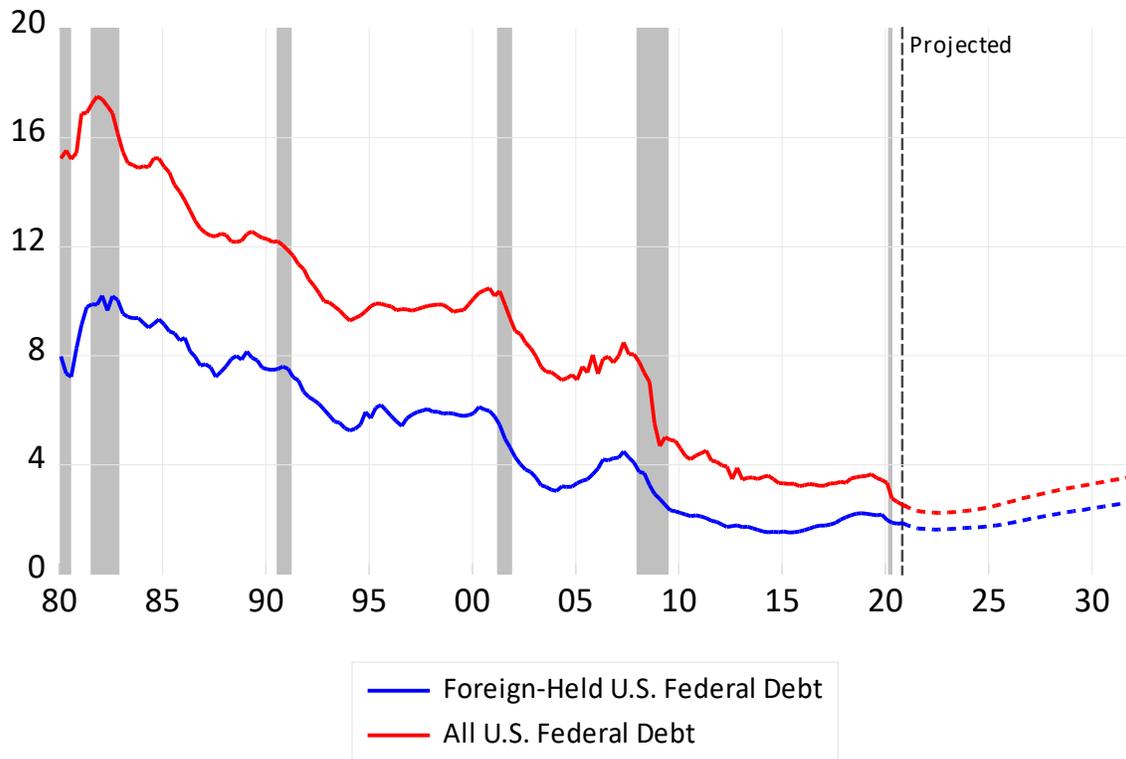
Figure 15. U.S. Holdings of Foreign Portfolio Equity and Foreign Direct Investment Equity, As Shares of the Market Capitalization of the S&P 500 Index

Percent



Data sources: Bureau of Economic Analysis (international investment position tables); Standard and Poor's; Congressional Budget Office.

Figure 16. Yields on Total and Foreign-Held U.S. Federal Debt Held by the Public
Percent

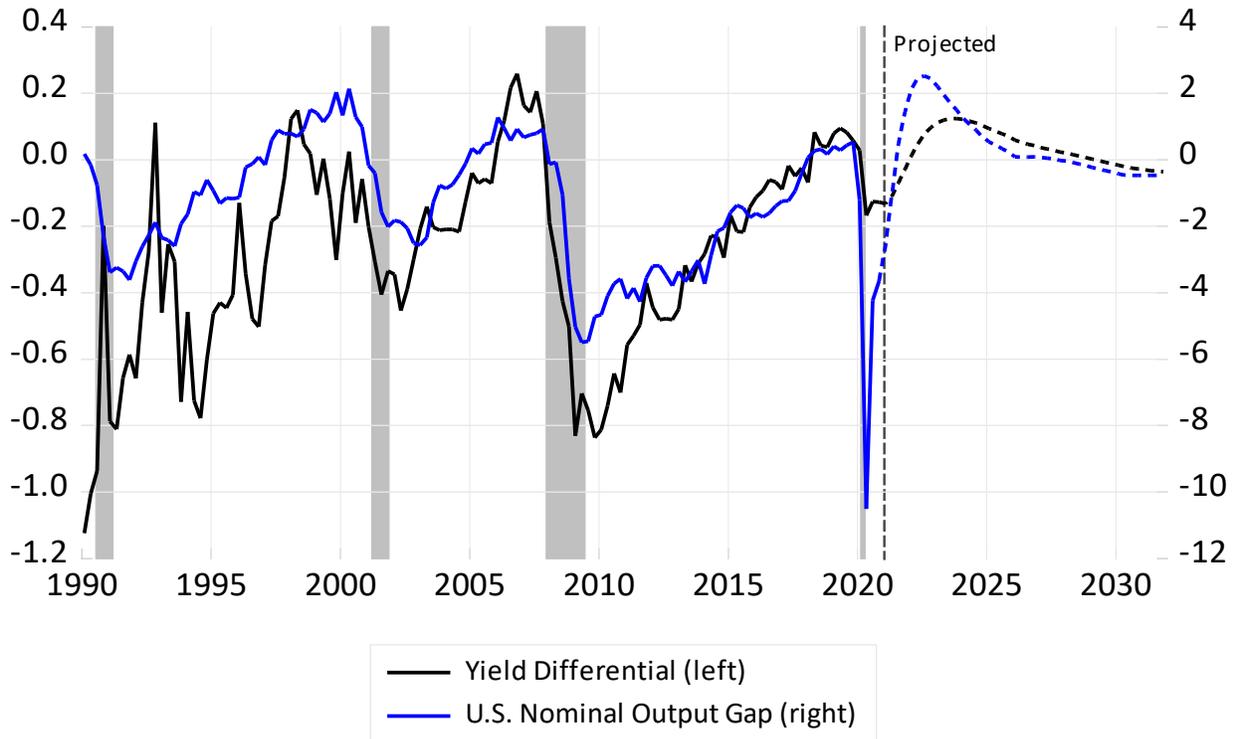


Data sources: Bureau of Economic Analysis (international investment position tables, balance of payments data, Monthly Treasury Statement, national income and product accounts); Congressional Budget Office.

Yield is defined here as income generated from an asset divided by its value.

Figure 17. Yield Differential on International Debt Holdings and the U.S. Nominal Output Gap

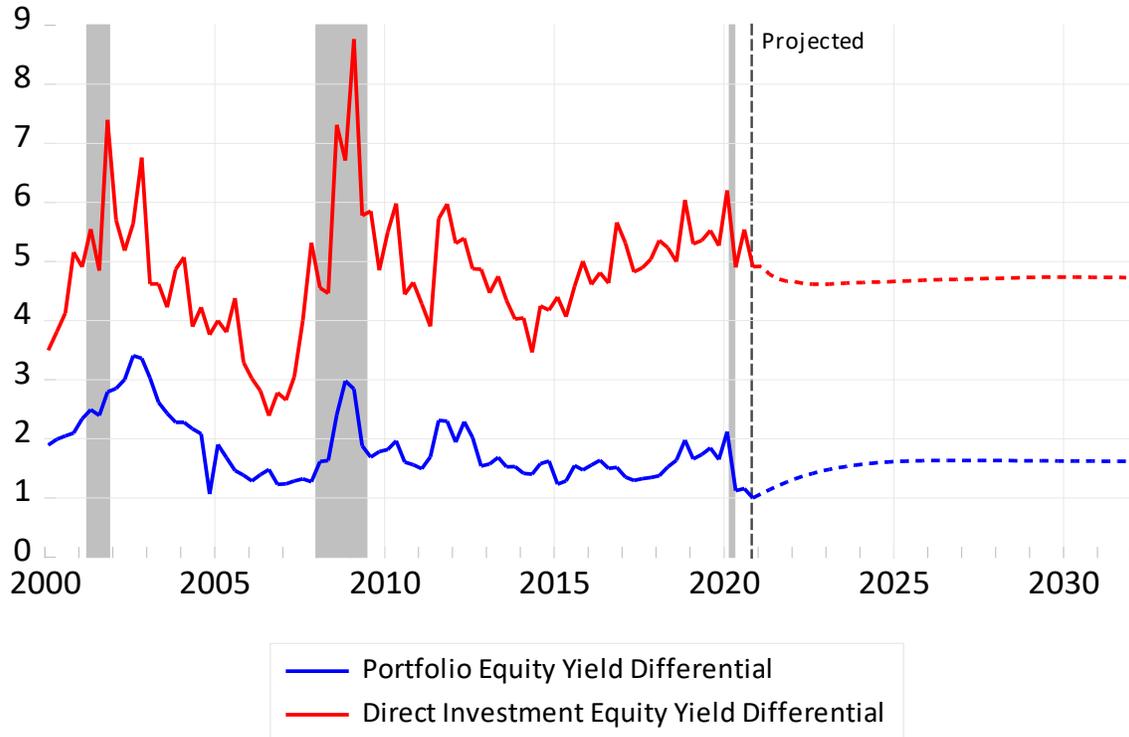
Percentage Points (Yield differential), Percent (Output gap)



Data sources: Bureau of Economic Analysis (international investment position tables, balance of payments data); Congressional Budget Office.

The yield differential on international debt holdings is equal to the difference between the yield on U.S. holdings of foreign debt and the yield on foreign holdings of U.S. debt. Since 1990, that differential has been somewhat procyclical, rising during U.S. expansions but falling during U.S. recessions. As such, that differential has exhibited a similar pattern to CBO's estimates of the U.S. nominal output gap, which is the percentage difference between CBO's estimate of U.S. nominal potential output and actual U.S. nominal output.

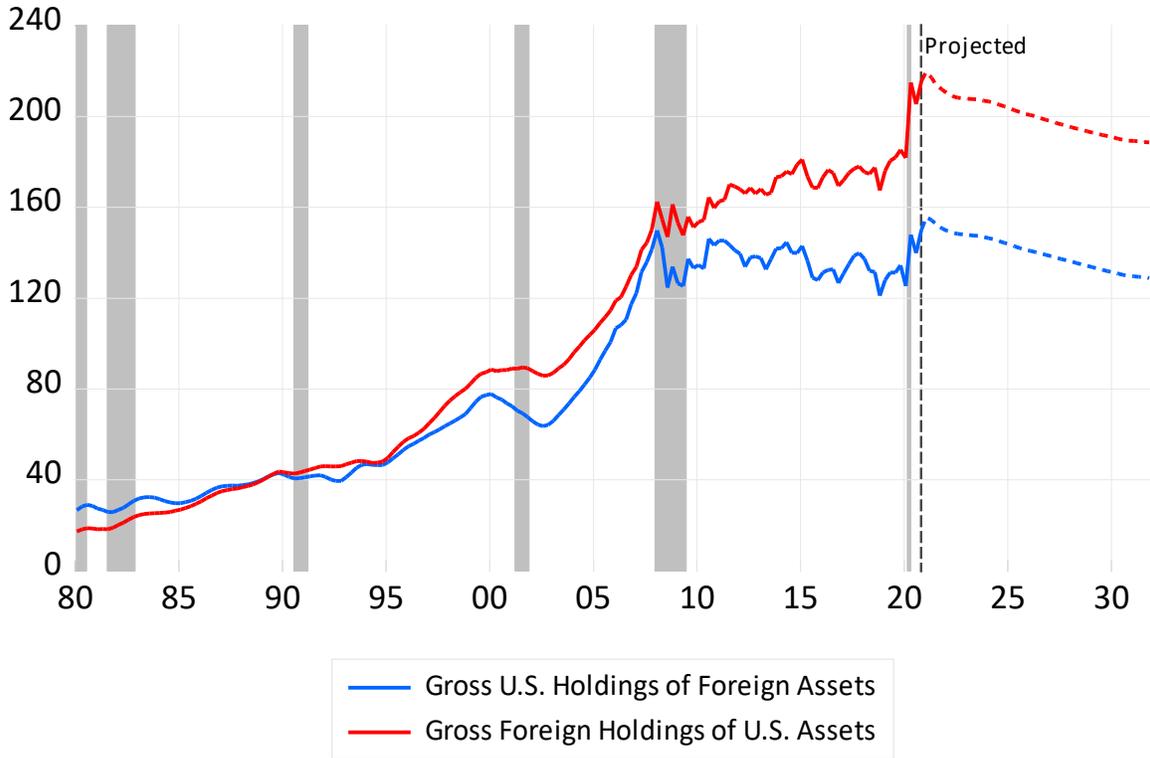
Figure 18. Yield Differentials on International Equity Holdings
Percentage Points



Data sources: Bureau of Economic Analysis (international investment position tables, balance of payments data, national income and product accounts); Congressional Budget Office.

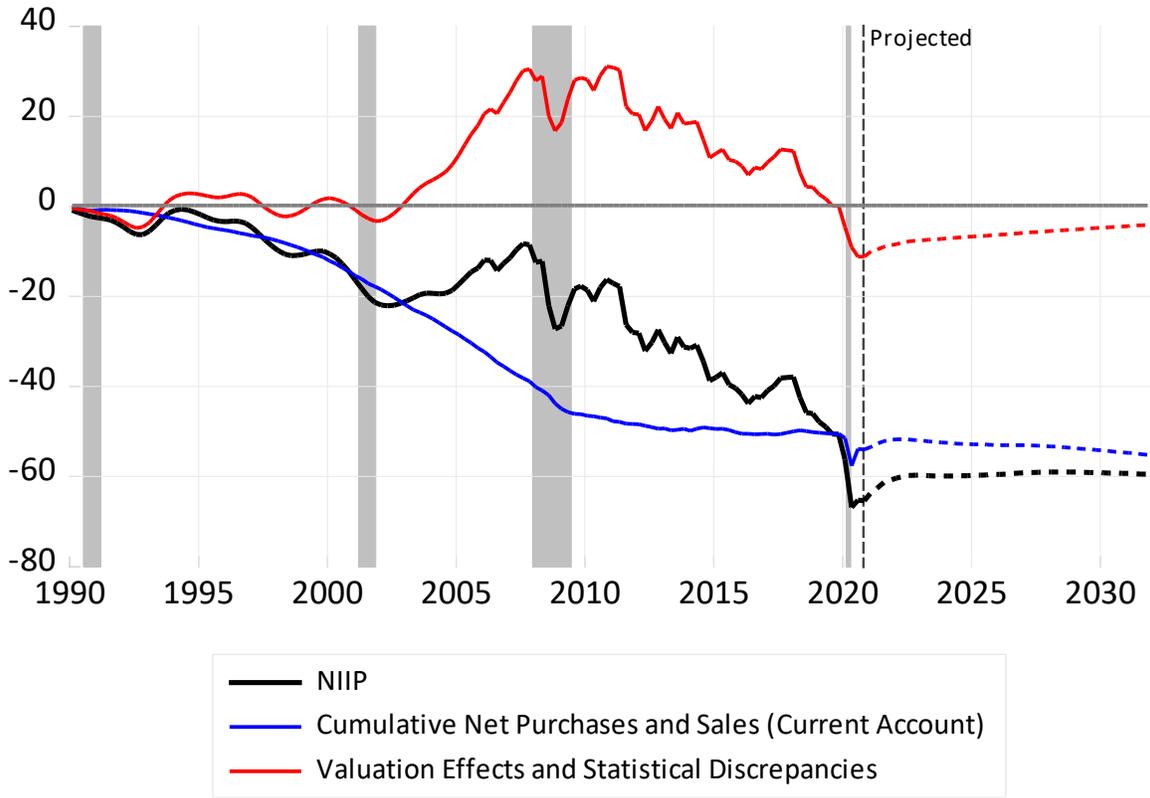
The portfolio equity yield differential is equal to the difference (in percentage points) between the yield on U.S. holdings of foreign portfolio equity assets and the yield on foreign holdings of U.S. portfolio equity assets. That yield differential has been small and positive over history, implying that U.S. investments in foreign portfolio assets have earned a higher yield than have foreign holdings of U.S. portfolio assets. The direct investment equity yield differential is equal to the difference (in percentage points) between the yield on U.S. holdings of foreign direct investment equity assets and the yield on foreign holdings of U.S. direct investment equity assets. That yield differential has been large and positive over history, implying that U.S. investments in foreign direct investment equity assets have earned a substantially higher yield than have foreign holdings of U.S. direct investment equity assets.

Figure 19. Gross International Asset Holdings
Percentage of U.S. GDP



Data sources: Bureau of Economic Analysis (international investment position tables, balance of payments data); Congressional Budget Office.

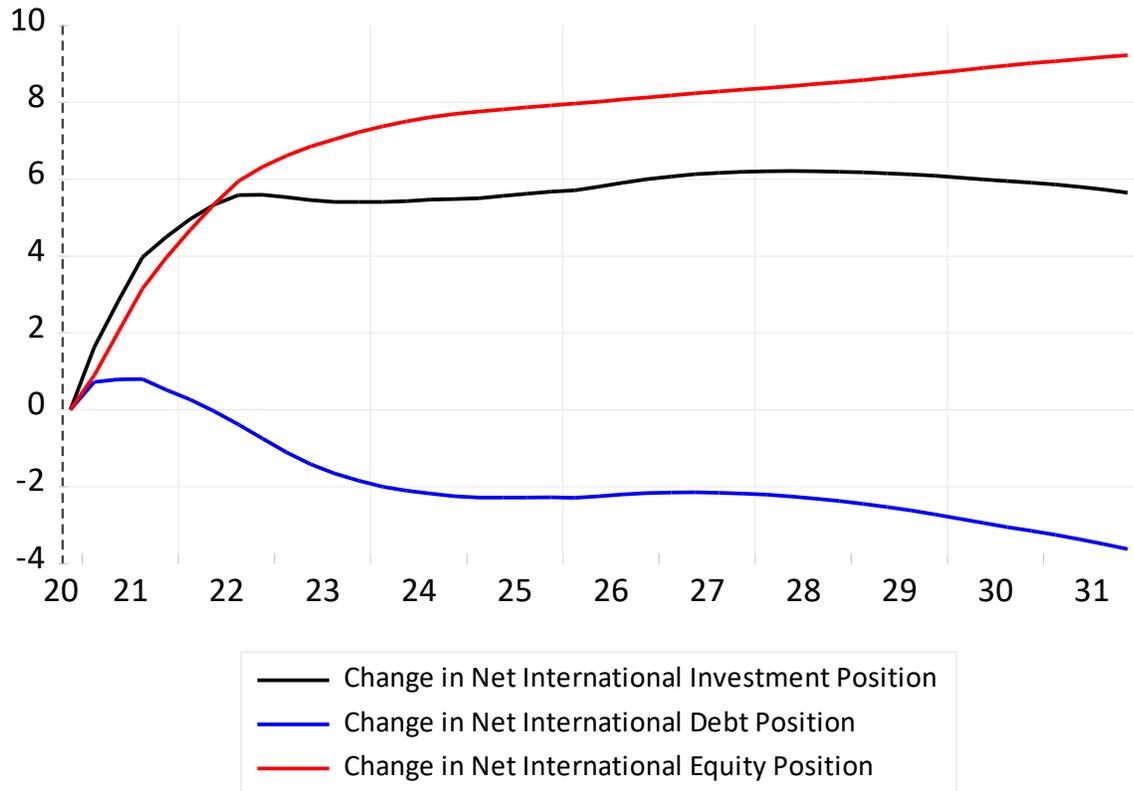
Figure 20. U.S. Net International Investment Position and Its Components
 Percentage of U.S. GDP



Data sources: Bureau of Economic Analysis (international investment position tables, balance of payments data); Congressional Budget Office.

In CBO’s projections, the roughly stable U.S. NIIP reflects offsetting changes in asset accumulation and valuation changes. Though the value of U.S. assets is projected to rise slightly relative to foreign assets (shown as “Valuation Effects and Statistical Discrepancies”), that rise is offset by CBO’s projection that growth of foreign holdings of U.S. assets will be stronger than growth of U.S. holdings of foreign assets.

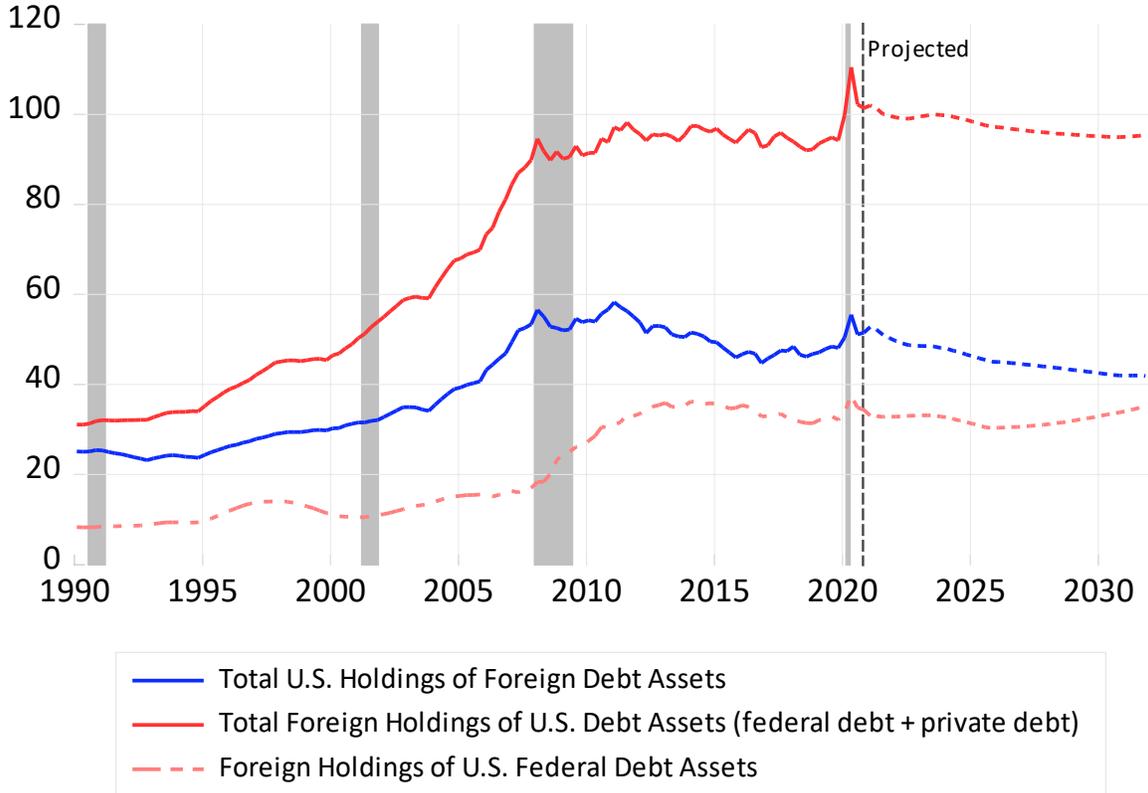
Figure 21. Projected Change in U.S. Net International Investment Position, by Asset Type
 Percentage of U.S. GDP



Data sources: Bureau of Economic Analysis (international investment position tables, balance of payments data); Congressional Budget Office.

The net international debt position is equal to U.S. holdings of foreign debt assets minus foreign holdings of U.S. debt assets. The net international equity position is equal to U.S. holdings of foreign equity assets minus foreign holdings of U.S. equity assets. The changes in those net positions are measured relative to their levels in the fourth quarter of 2020.

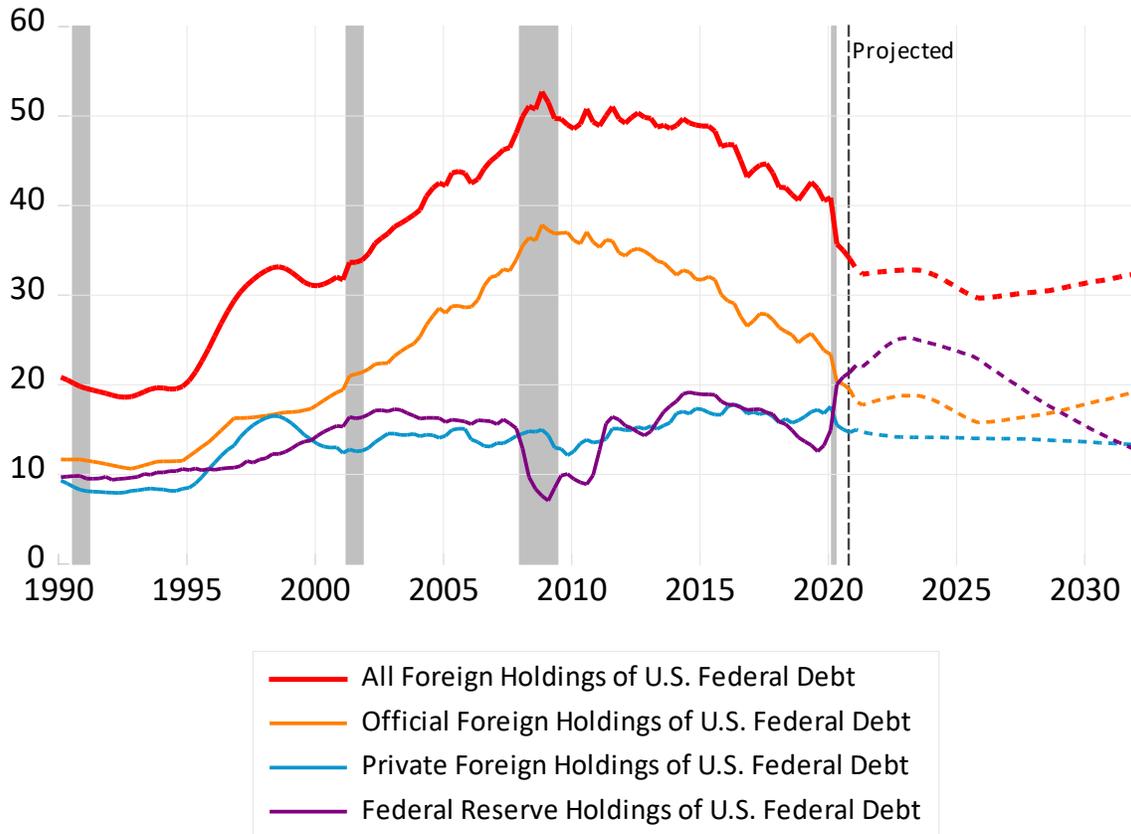
Figure 22. Gross International Debt Holdings
Percentage of U.S. GDP



Data sources: Bureau of Economic Analysis (international investment position tables); Congressional Budget Office.

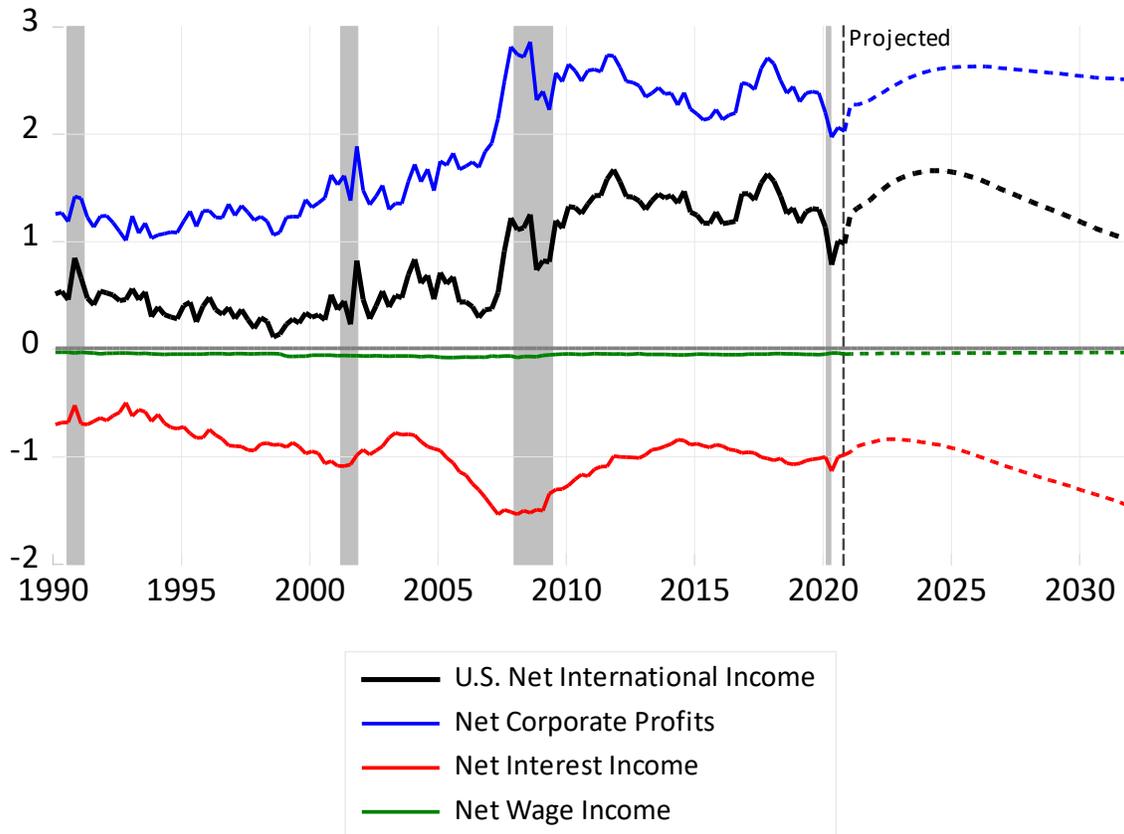
Figure 23. Foreign Holdings of U.S. Federal Debt as a Share of All U.S. Federal Debt Held by the Public

Percent



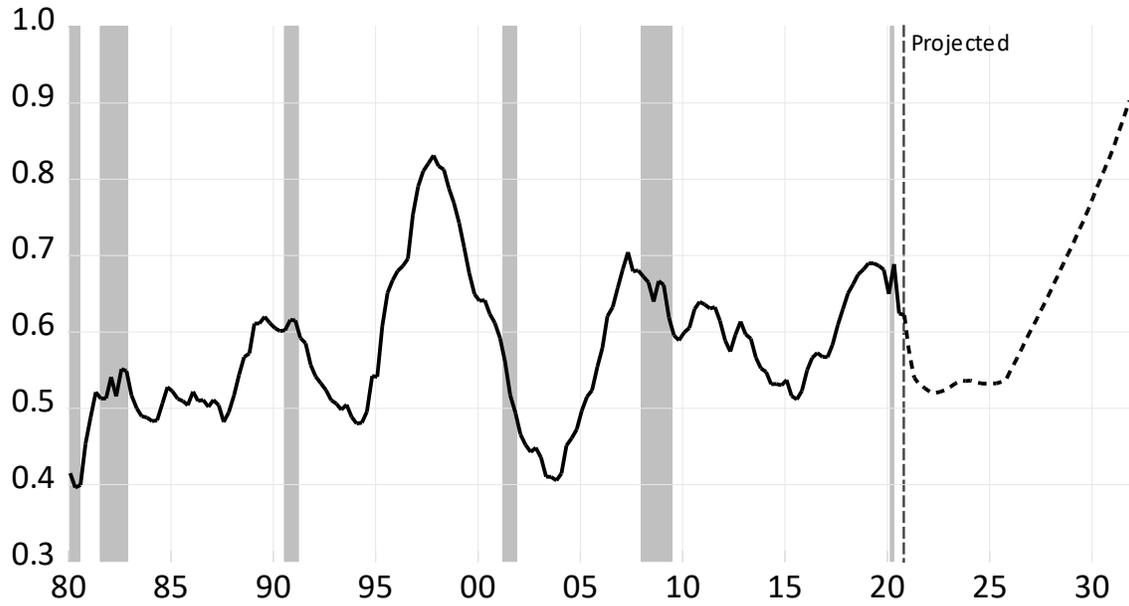
Data sources: Bureau of Economic Analysis (international investment position tables); Board of Governors of the Federal Reserve System; Congressional Budget Office.

Figure 24. U.S. Net International Income and Its Components
Percentage of U.S. GDP



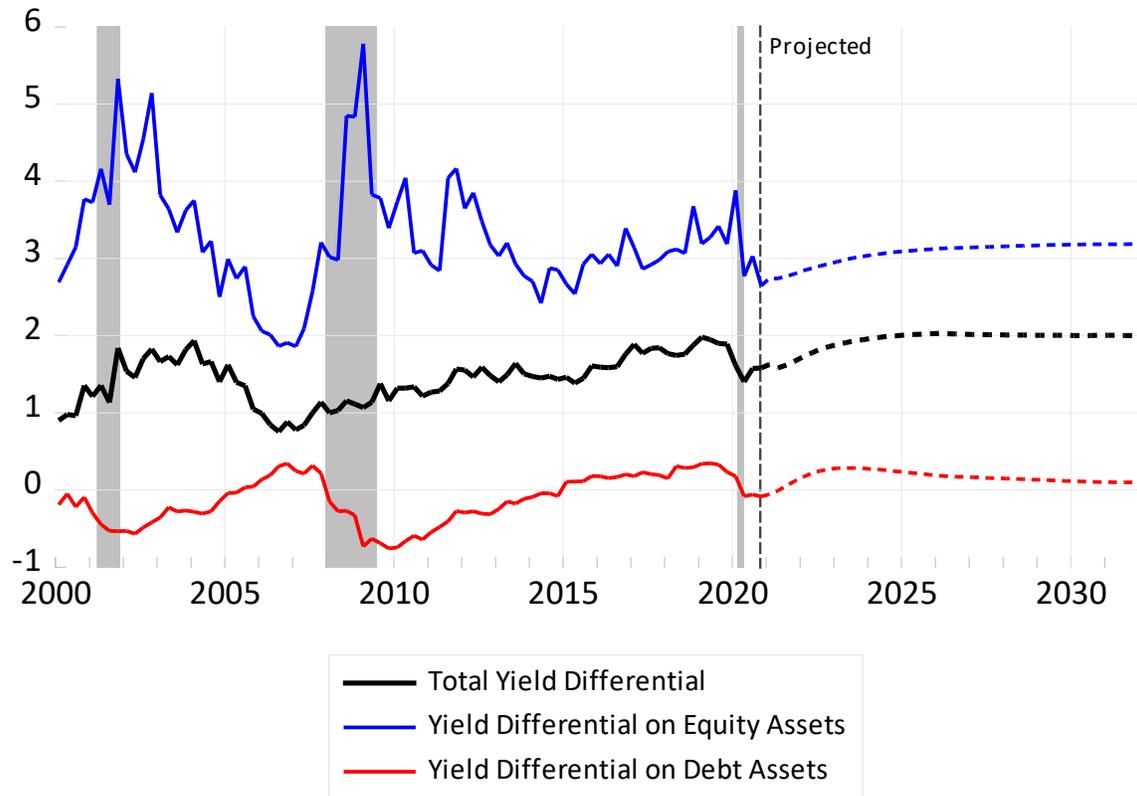
Data sources: Bureau of Economic Analysis (national income and product accounts, balance of payments data); Congressional Budget Office.

Figure 25. U.S. Federal Interest Payments to Foreign Investors
Percentage of U.S. GDP



Data sources: Bureau of Economic Analysis (national income and product accounts, balance of payments data); Congressional Budget Office.

Figure 26. Yield Differentials on International Assets
 Percentage Points



Data sources: Bureau of Economic Analysis (international investment position tables, national income and product accounts, balance of payments data); Congressional Budget Office.

The near-term rise in the total yield differential reflects an increase in the yield differentials on both debt and equity assets. Beyond 2025, the continued gradual rise in the yield differential on equity assets is offset by a decline in the yield differential on debt assets.