Slides for Chapter 1: Global Imbalances

Columbia University

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These are the slides for the textbook, "International Macroeconomics: A Modern Approach," by Stephanie Schmitt-Grohé, Martín Uribe, and Michael Woodford, Princeton University Press, 2022, ISBN: 9780691170640.

Motivation

Countries trade a lot with one another, and the United States is no exception. This fact elicits a number of questions:

- How big are international transactions in goods, services, and financial assets for the United States and other countries?

- Does the United States have a trade deficit or a trade surplus with the rest of the world? What about China, Europe, and Latin America?

- Is the United States an external debtor or an external creditor?

- How have the trade balance and the international asset position of the United States and other countries evolved over time?

This chapter addresses these and other related questions.

Overview

The main focus of the present chapter is descriptive. In later chapters, we will ask more positive questions such as

- Why do some countries run trade deficits in some years and trade surpluses in others?

- Why do countries borrow from abroad?

- Can countries borrow forever from abroad?

- What determines the size of a country's external debt?

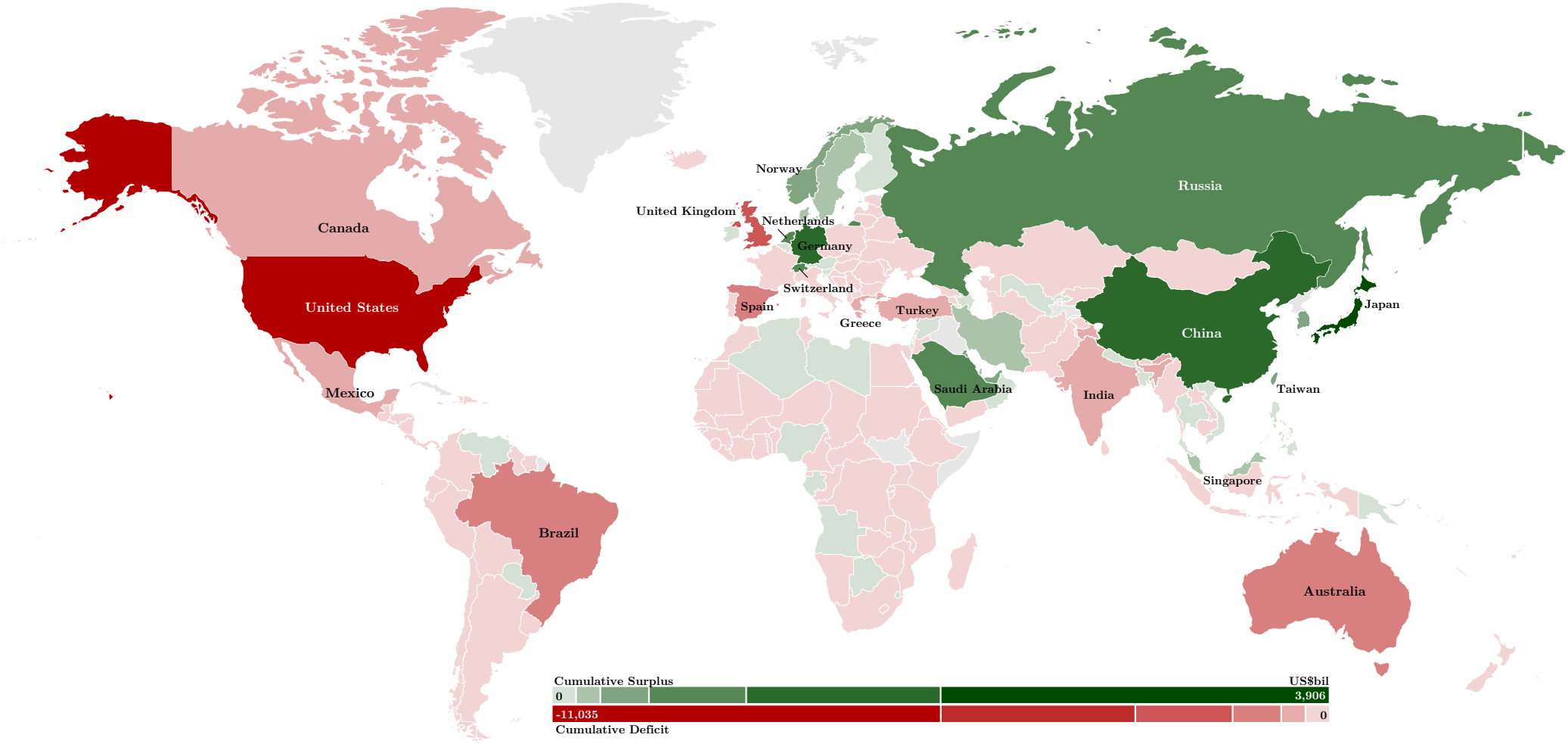
The Geography of External Debt

Take a look at the heat map on slide 5. It displays with colors the accumulated current account balances between 1980 and 2017. We will define current account balance more precisely below, but roughly speaking, it is the difference between exports and imports of goods, services, and factor payments. As a result a country's current account balance in a given year is about equal to the change in that country's net external debt. So if we add up a country's current account balances for the years 1980 to 2017, we get the change in its external debt between 1980 and 2017. The map shows that the country with the biggest accumulated current account deficit (brightest red) is the United States. Its cumulative deficit was \$11.0 trillion. The countries that have been financing these deficits (deepest green) are Japan (\$3.9 trillion), China (\$3.3 trillion), Germany (\$3.3 trillion), and oil and gas exporting countries (members of OPEC, Russia, and Norway).

Overall, the picture is one of unbalanced international trade, with some countries running protracted current account deficits and others running protracted surpluses. If all countries were in balance, the map would look pastel white. Instead, it looks mostly either flaming red or dark green, reflecting large *global imbalances.*

Cumulative Current Account Balances Around the World

1980-2017, in billions of U.S. dollars



Notes. The map shows for each country the sum of current account balances in billions of U.S. dollars between 1980 and 2017. The data source is Philip R. Lane and Gian Maria Milesi-Ferretti (2017), "International Financial Integration in the Aftermath of the Global Financial Crisis," IMF Working Paper 17/115. Data for former Soviet Union countries start in 1992. Countries for which no data are available appear in gray. Country names are displayed for the countries with the top 10 largest cumulated current account surpluses and deficits.

The International Transactions Accounts

In the United States, international transactions are recorded by the Bureau of Economic Analysis (www.bea.gov) in the *International Transactions Accounts* (ITA), also known as the *Balance of Payments*.

The balance of payments has three components:

1. current account
2. financial account
3. capital account (quantitatively unimportant)

In the following slides we will introduce each component.

The current account is the sum of three accounts:

$$\begin{aligned} \text{current account} \;=\; & \text{trade balance} + \\ & \text{income balance} + \\ & \text{net unilateral transfers} \end{aligned}$$

The Trade Balance and the Current Account

The Trade Balance

An important figure produced in the ITA is the *Trade Balance*, which measures the difference between exports of goods and services and imports of goods and services:

$$\text{Merchandise Trade Balance} = \text{Exports of Goods} - \text{Imports of Goods}$$

$$\text{Service Balance} = \text{Exports of Services} - \text{Import of Services}$$

$$\text{Trade Balance} = \text{Goods Balance} + \text{Service Balance}$$

Examples of internationally traded goods: textiles, oil, cars, and wheat.
Examples of internationally traded services: education, medical care, and consulting.

The U.S. Trade Balance in 2020

Exports of goods and services: \$2.1 trillion
Imports of goods and services: \$2.8 trillion

Trade balance = \$2.1 - \$2.8 = -\$0.7 trillion.
When the trade balance is negative, we say the country runs a *trade deficit.*

Is \$0.7 trillion a big or small number?

Let's relate it to the size of the U.S. economy. In 2020, GDP was \$20.9 trillion. Letting TB denote the trade balance, we have

$$\frac{TB}{GDP} = -\frac{0.7}{20.9} = -0.03$$

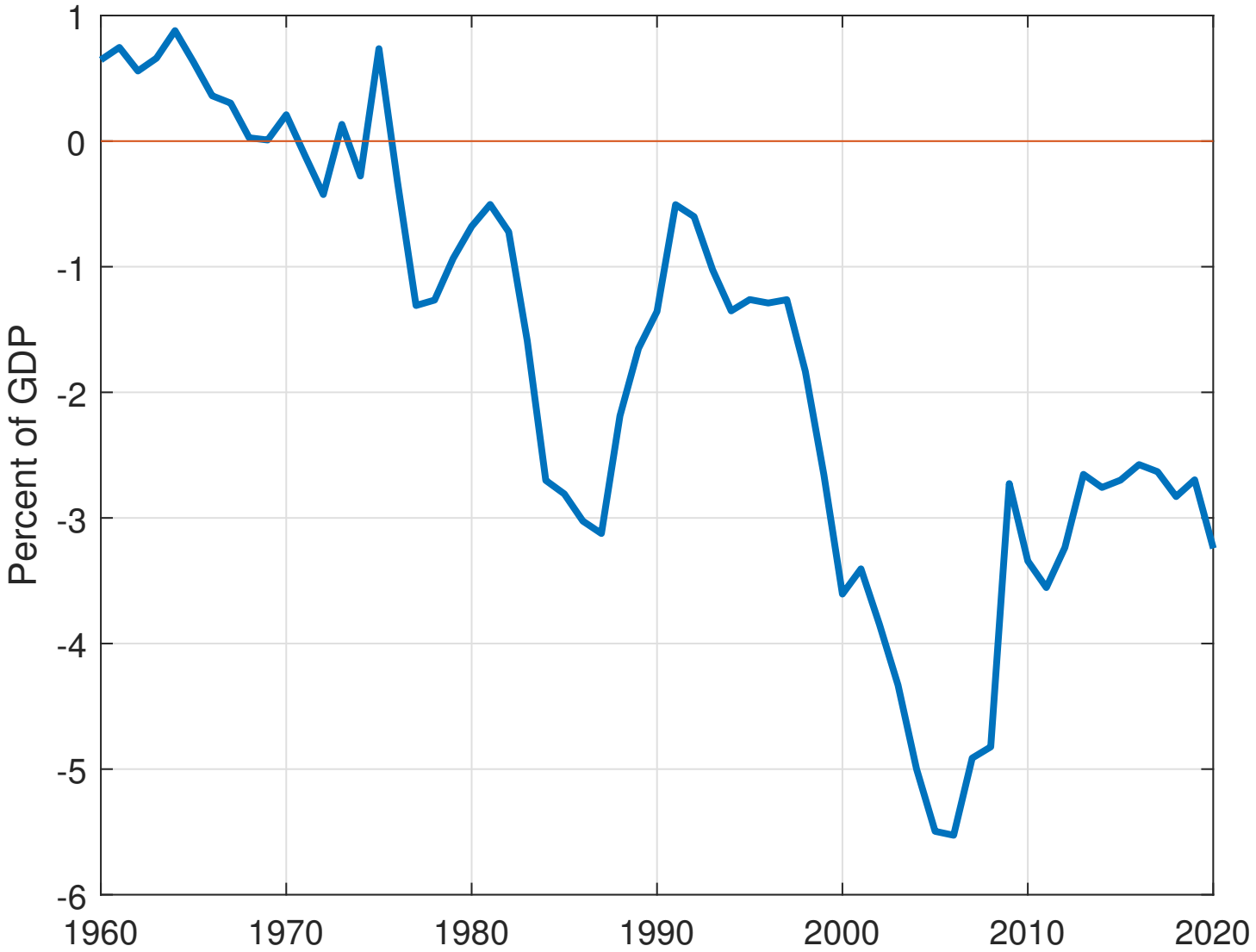
or the trade deficit was 3 percent of GDP. Now is this a small or a big number? Shortly, we will see how the accumulation of trade deficits of this magnitude or even smaller has turned the United States from a creditor in the 1980s to the world's largest debtor in a span of less than 20 years.

The U.S. Trade Balance Over Time

Is the size of the trade deficit in 2020 typical for the United States? Look at the graph on the next slide, which shows the trade balance since 1960 as a fraction of GDP.

The graph shows the trade balance had declined steadily from a trade surplus of 3/4 of a percent of GDP to -6 percent by the beginning of the global financial crisis of 2007–2009. The global financial crisis seems to have put a stop (at least for now) to the downward trend in the trade balance. In fact, the global financial crisis was associated with an improvement in the trade balance to around -3 percent of GDP. This size of trade deficit has persisted to the present (2020). Hence, the answer to the question of how typical the 2020 trade deficit of 3 percent is, would be that it is typical for the past decade.

The U.S. Trade Balance as a Share of GDP: 1960-2020



Data Source: BEA, bea.gov. TB data: ITA Table 1.1. GDP data: NIPA Table 1.1.5.

The Income Balance

Another component of the current account is the *Income Balance*, which measures the difference between factor incomes received from the rest of the world and factor incomes paid to the rest of the world. These net income payments are recorded separately for capital and labor.

• Net income from capital is called *Net Investment Income* and consists of payments such as dividends, interest, or profits.

• Net income from labor is called *Net International Payments to Employees* and records earnings of U.S. residents temporarily employed abroad and compensation payments to foreigners temporarily working in the United States. We then have

$$\begin{aligned}\text{Income Balance} &= \text{Net Investment Income} \\ &\quad + \text{Net International Payments To Employees}\end{aligned}$$

In the United States, net international payments to employees has been historically small and is quantitatively not important.

Net Unilateral Transfers

A third item in the current account is *Net Unilateral Transfers*, which keeps record of the difference between gifts received from the rest of the world and gifts given to the rest of the world. These gifts can involve private agents or governments.

$$\begin{aligned} \text{Net Unilateral Transfers} &= \text{Personal Remittances} \\ &\quad + \text{Government Transfers} \end{aligned}$$

Net unilateral transfers is negative in most years as the United States makes more gifts than it receives. The most relevant examples of net unilateral transfers include U.S. residents sending monetary gifts (personal remittances) to relatives living abroad and the U.S. government sending aid to foreign countries or to areas of the world suffering from natural disasters, endemic diseases, or armed conflicts (government transfers).

The Current Account

To recap, the current account is the sum of the trade balance, the income balance, and net unilateral transfers:

$$\begin{aligned} \text{Current Account} \;=\; & \text{Trade Balance} + \\ & \text{Income Balance} + \\ & \text{Net Unilateral Transfers} \end{aligned}$$

The current account is an important concept because if the current account is negative, all other things equal, the net external debt of the country goes up, and if the current account is positive, it falls.

The table on slide 16 displays the values of the three components of the current account in the United States in 2020.

The U.S. Current Account in 2020

Item	Billions of dollars	Percentage of GDP
Current Account	-647.2	-3.1
Trade Balance	-681.7	-3.3
Balance on Goods	-915.6	-4.4
Balance on Services	233.9	1.1
Income Balance	181.6	0.9
Net Investment Income	190.9	0.9
Compensation of Employees	-9.3	-0.0
Net Unilateral Transfers	-147.1	-0.7
Private Transfers	-127.1	-0.6
U.S. Government Transfers	-20.0	-0.1

Data Source: Authors' calculations based on data from ITA Tables 1.1 and 5.1. and NIPA Table 1.1.5. of the BEA.

Observations on the U.S. Current Account in 2020

• In 2020, the United States ran a large current account deficit.

• The bulk of the current account deficit stems from a large trade balance deficit.

• The country had a deficit in the trade balance on goods and a surplus in the trade balance on services. The United States imports manufactured goods (cellphones, computers, or vehicle parts) and exports human-capital-intensive services (higher education, R&D, health care, professional consulting). Thus, the United States typically runs a trade deficit in goods and a trade surplus in services. And 2020 was no exception in this regard.

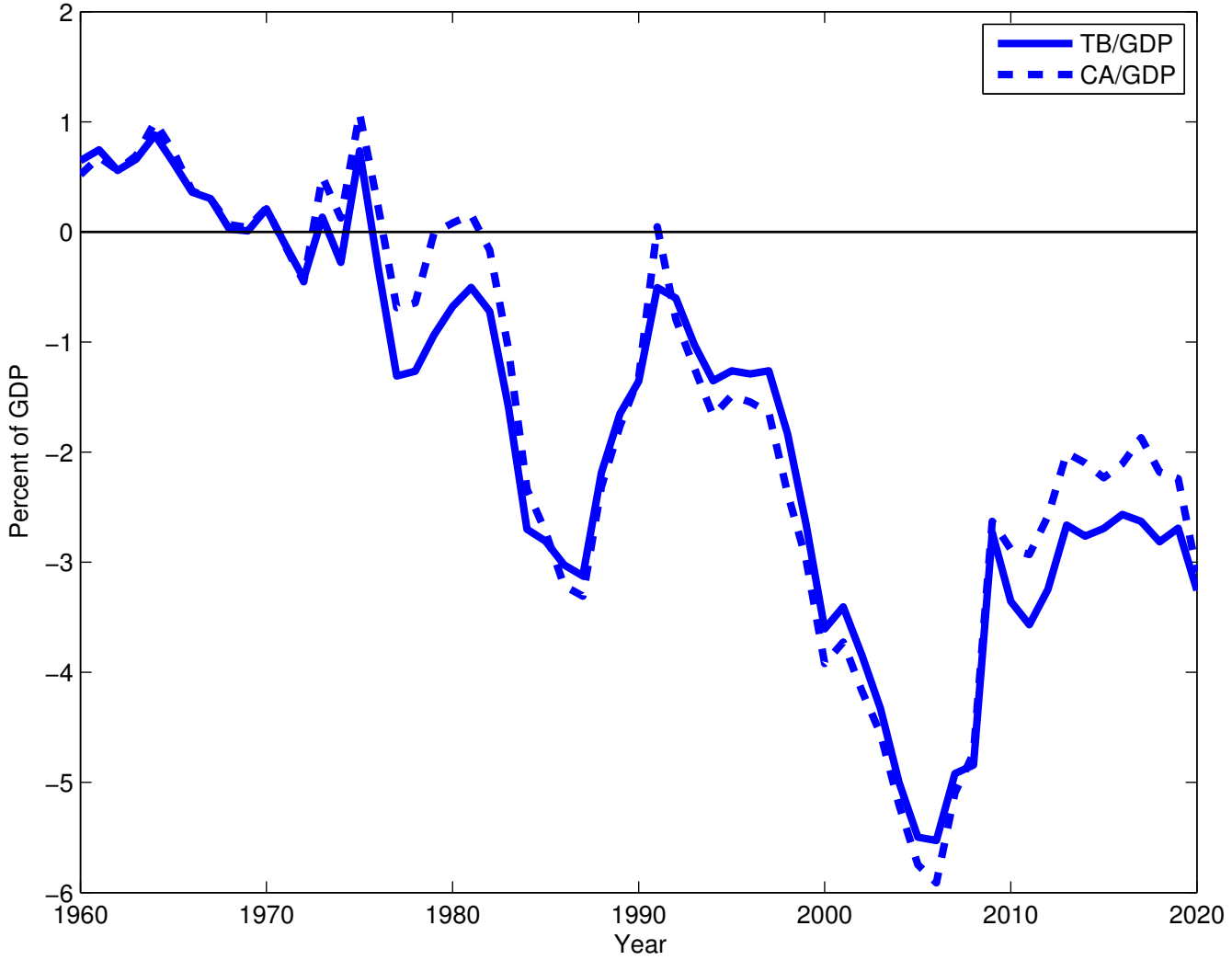
• Net investment income is positive, which means that investments of U.S. residents in foreign assets paid more in interest, dividends, and profits, than the investments of foreign residents in U.S. assets. Net International Payments to Employees was negative but small.

• Net unilateral transfers were negative, which means that the United States gave more gifts to the rest of the world than it received. These gifts are largely personal remittances of immigrants in the U.S. to relatives living abroad.

In the United States, the Trade Balance and the Current Account are Similar in Size and Move in Tandem Over Time

We saw in the previous table that for the year 2020, the bulk of the U.S. current account was the trade balance. The figure on slide 19 shows that this is indeed true pretty much all the time.

The U.S. Trade Balance and Current Account as Percentages of GDP, 1960–2020



Notes. TB and CA stand for trade balance and current account, respectively. Authors' calculations based on data from ITA Table 1.1 and NIPA Table 1.1.5 of the BEA.

Trade Balances and

Current-Account Balances

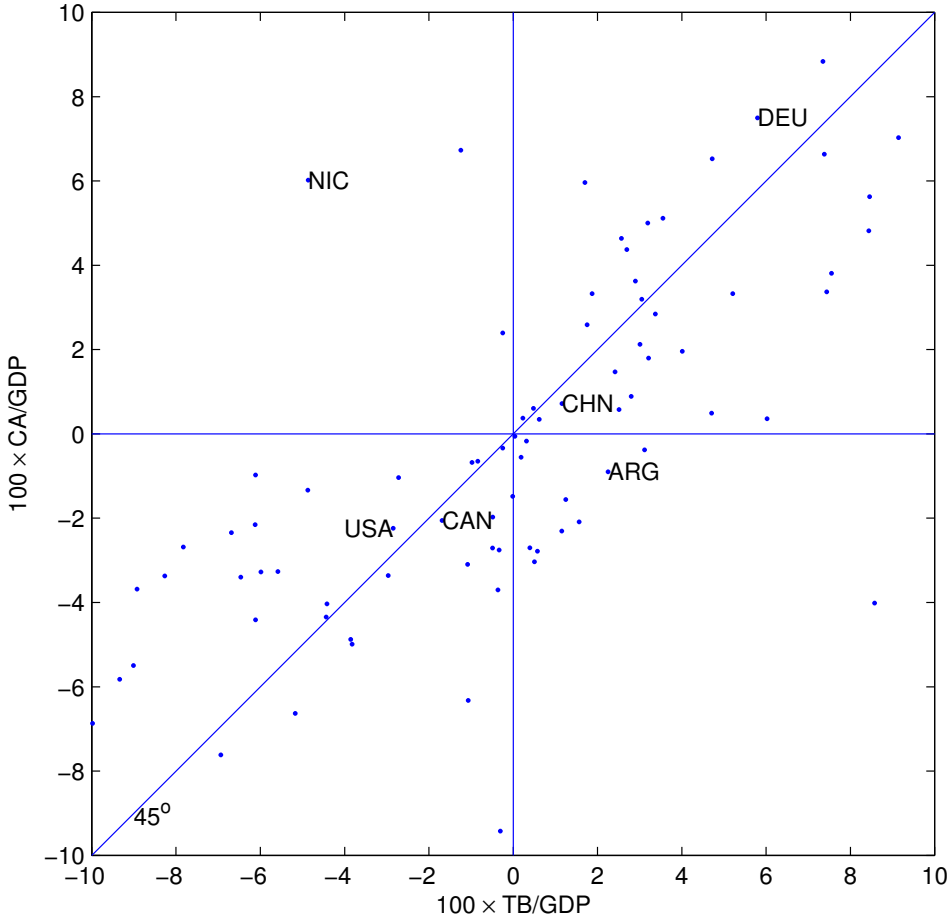
Across Countries

The Trade Balance and the Current Account Also Often Move in Tandem in Other Countries

The figure on the following slide plots the trade balance and the current account as percentage of GDP, denoted TB/GDP and CA/GDP, for 82 countries in 2019. Each dot is a country.

Most dots fall around the 45-degree line. The clustering around the 45-degree line suggests that, as in the United States, in many countries the trade balance is the dominant component of the current account.

Trade Balance and Current Account as Percentage of GDP across Countries in 2019



Notes. TB denotes the trade balance and CA denotes the current account balance. The data source is World Development Indicators (WDI). There are 82 countries included in the figure. Country names are shown using ISO abbreviations. Countries in the WDI database with trade balances or current account balances in excess of ± 10 percent of GDP were excluded.

The previous figure also shows that the current account and the trade balance need not have the same sign (as is the case in the United States) and that the current account can be either larger or smaller than the trade balance. Any sign pattern is possible, as shown in the following table.

The Current Account of Selected Countries as Percentage of GDP in 2019

Item	ARG	CAN	CHN	DEU	NIC	USA
Current Account	-0.9	-2.1	0.7	7.5	6.0	-2.2
Trade Balance	2.9	-1.6	0.9	5.7	-4.3	-2.7
Income Balance	-4.0	-0.3	-0.3	3.2	-3.7	1.1
Net Investment Income	-4.0	-0.1	-0.3	3.2	-3.7	1.2
Compensation of Employees	-0.0	-0.3	0.0	0.0	0.0	-0.1
Net Unilateral Transfers	0.2	-0.1	0.1	-1.4	14.0	-0.7
Private Transfers	0.0	-0.3	0.1	-0.6	14.0	-0.6
Government Transfers	0.2	0.2	-0.0	-0.8	0.0	-0.1

Notes. The table presents the current account of Argentina, Canada, China, Germany, Nicaragua, and the United States in 2019 expressed as a percentage of GDP. Data Sources: Authors' calculations based on data from World Development Indicators and the IMF's Balance of Payments and International Investment Position Dataset.

Observations on the table

Recall: CA = TB + Income Balance + Net Unilateral Transfers

China:
$\frac{\text{TB}}{\text{GDP}} > \frac{\text{CA}}{\text{GDP}} > 0$ because Income Balance < 0. China receives negative net investment income on a positive net foreign asset position.

Germany:
$\frac{\text{CA}}{\text{GDP}} > \frac{\text{TB}}{\text{GDP}} > 0$ because Income Balance > 0. Germany receives positive net investment income on a positive net foreign asset position.

Nicaragua:
$\frac{\text{CA}}{\text{GDP}} > 0 > \frac{\text{TB}}{\text{GDP}}$ because Net Unilateral Transfers > 0. Nicaragua receives remittances equal to 14 percent of GDP, mostly from the United States.

Canada:
$\frac{\text{CA}}{\text{GDP}} < \frac{\text{TB}}{\text{GDP}} < 0$ because Income Balance < 0. Negative balance on net international compensation to employees stemming mainly from wages paid by Canadian residents to U.S. residents who commute to work in Canada.

Argentina:
$\frac{\text{CA}}{\text{GDP}} < 0 < \frac{\text{TB}}{\text{GDP}}$ because Income Balance < 0. Argentina is a large net debtor, so it makes interest payments to the rest of the world.

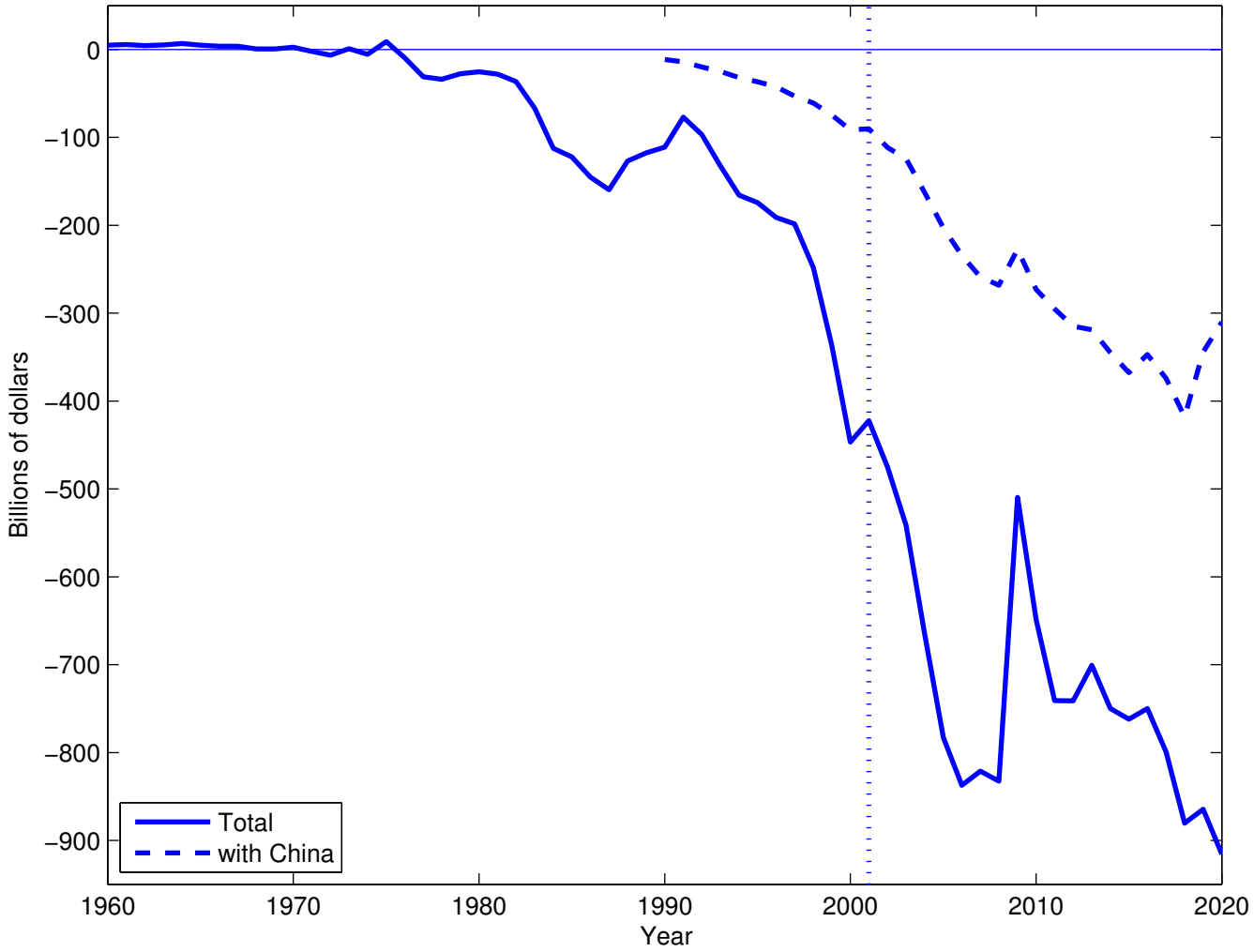
Imbalances in U.S. Trade with China

The figure on the next slide shows that a sizable fraction of the U.S. merchandise trade deficit is accounted for by its trade with China.

The fraction of the U.S. merchandise trade deficit accounted for by deficits with China has widened steadily since China's accession to the WTO 2001 from about 20 percent in 2000 to near 50 percent by 2015.

By the end of the sample, the bilateral trade deficit fell significantly. In 2020 it stood at 34 percent of the overall U.S. merchandise trade deficit. Two candidate explanations for this narrowing of the bilateral trade imbalances are an increase in trade triangulation after the imposition of import tariffs by the Trump administration starting in 2018 and the COVID-19 pandemic.

The U.S. Merchandise Trade Balance with China, 1990–2020



Notes. The data source for the U.S. merchandise trade balance is ITA Table 1.1. The data source for the bilateral merchandise trade balance between the United States and China is the OECD, http://stats.oecd.org for the period 1990 to 2002 and ITA Table 1.3 for the period 2003 to 2020. The vertical line marks the year 2001, when China became a member of the World Trade Organization.

The World Map of Current Account Balances

If the United States is running a large current account deficit, some other countries must be running current account surpluses. Why? Because it must be the case that:

$$CA^{\text{US}} + CA^{\text{ROW}} = 0,$$

where ROW stands for rest of the world.

So who is running big cumulative current account surpluses? Look again at the heat map in slide 5.

The 10 largest cumulative current account surpluses over the period 1980 to 2017 were observed in Japan, China, Germany, Switzerland, Netherlands, Russia, Saudi Arabia, Taiwan, Norway, and Singapore, in that order.

The Current Account and the Net International Investment Position

A country's net international investment position (NIIP) is the difference between its foreign asset position (A) and its foreign liability position (L)

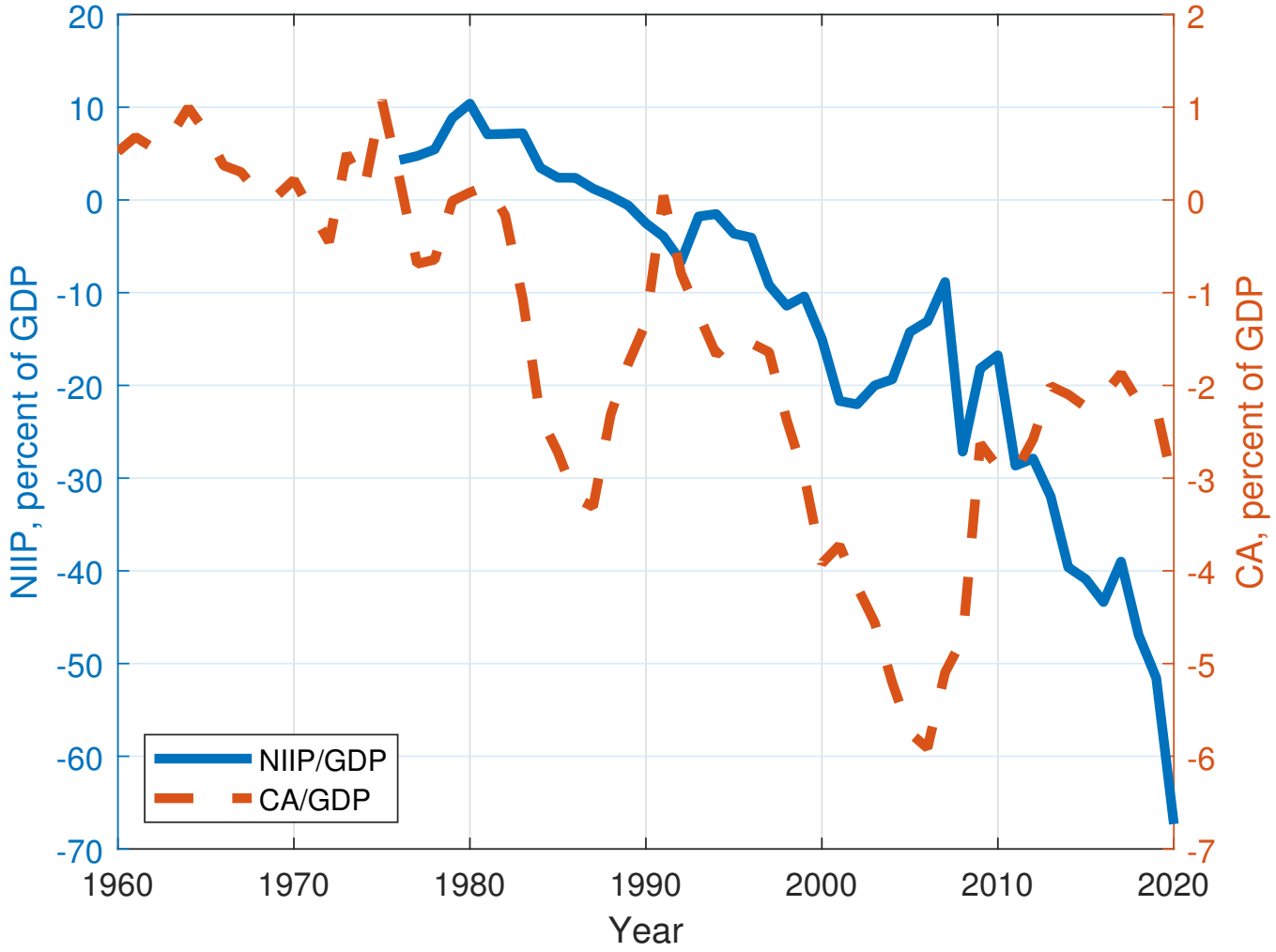
$$NIIP = A - L.$$

–If the NIIP is negative ($A < L$), then the country is a net debtor to the rest of the world.
–And if the NIIP is positive ($A > L$), the country is a net creditor to the rest of the world.

The concept of current account balance is economically important because it reflects a country's net borrowing needs. For example, in 2020 the United States ran a current account deficit of $647.2 billion (see slide 16). To pay for this deficit, the United States must either reduce its international asset position (A) or increase its international liability position (L), or both. That is, a current account deficit reduces the NIIP and a current account surplus increases it.

• Look at the figure on slide 30. It shows the U.S. current account (CA) for the period 1960 to 2020 and the U.S. net international investment position (NIIP) for the period 1976 to 2020, both in percent of GDP.
• The NIIP was positive at the beginning of the sample (1976).
• The large CA deficits of the 1980s brought the NIIP to negative territory.
• Even larger CA deficits occurred during the 1990s, and the United States ended that decade as the world's largest external debtor.
• The CA deficits continued to increase until the onset of the global financial crisis (GFC) in 2007, reaching 6% of GDP.
• During the GFC, the CA deficits became smaller, but still sizable at around 3% of GDP.
• By the end of 2020, the NIIP stood at -$14.1 trillion or -67 percent of GDP.
• A natural question (addressed in Chapter 2) is whether the U.S. CA deficits are sustainable over time.

The U.S. Current Account and Net International Investment Position



Notes. CA, NIIP, and GDP stand for current account, net international investment position, and gross domestic product, respectively. The sample period for CA is 1960 to 2020 and for NIIP 1976 to 2020. Authors' calculations based on data from ITA Table 1.1, IIP Table 1.1, and NIPA Table 1.1.5 of the BEA.

The CA is a Flow and the NIIP a Stock

All else equal, the net international investment position increases when the current account is positive and decreases when the current account is negative. Thus, the current account is a flow variable and the net international investment position a stock variable.

To understand the difference between a flow and a stock variable in this context, think of a water tank. The level of water in the tank (a stock) is the net international investment position of the country. The current account is the flow of water that might enter or leave the tank through pipes. When the flow of water that enters the tank through pipes is larger than the flow of water that leaves the tank, the current account is positive, and the stock of water in the tank, the NIIP, rises over time. By contrast, when the flow of water that leaves the tank is larger than the flow of water that enters the tank, the current account is negative, and the level of water in the tank, the NIIP, falls over time.

The CA is a Flow and the NIIP a Stock (cont)

As we saw earlier, in the United States the current account is similar in size to the trade balance. So in the analogy of the tank, periods in which the flow of water entering the tank through pipes is smaller than the flow of water leaving the tank typically represent periods in which imports of goods and services are larger than exports of goods and services.

(Of course, other components of the current account, such as net investment income and net unilateral transfers are also part of the flows of water affecting the level of water in the tank (the NIIP).)

Valuation Changes

Look again at the figure on slide 30. Notice that not all years in which the current account is negative correspond to years in which the NIIP falls. This is particularly evident just before the beginning of the global financial crisis in 2007. In general, changes in the NIIP are not always exactly equal to the changes in the CA.

This is because the current account is not the only source of changes in the net international investment position. The NIIP can also change when the market value of a country's international assets or liabilities changes due to movements in stock prices, bond prices, or exchange rates. This source of changes in the NIIP is known as valuation changes.

Valuations Changes (cont.)

The Net International Investment Position changes for two reasons, surpluses or deficits in the current account and valuation changes:

$$\Delta NIIP = CA + \text{valuation changes}$$

with

valuation changes = changes in the market value of the country's foreign asset and liability positions (due to currency appreciations or depreciations changes in stock prices, etc.)

Let's analyze by means of an example how valuation changes can affect the NIIP.

Example

• International assets (A): 25 shares in Italian carmaker Fiat. The price of each share is 2 euros. The exchange rate is 2 dollars per euro. Then
$A = 25 \times 2 \times 2 = 100$ dollars.

• International liabilities (L): 80 U.S. bonds held by foreigners. Price 1 dollar per unit. Then
$L = 80 \times 1 = 80$ dollars.

• $NIIP = A - L = 100 - 80 = 20$ dollars.

Example (cont.)

- **A depreciation of the euro**

Now suppose that the euro depreciates to 1 dollar per euro. Then,

- $A = 25 \times 2 \times 1 = 50$ dollars.

- $L = 80$ dollars (unchanged because U.S. bonds denominated in dollars)

- $NIIP = A - L = 50 - 80 = -30$ dollars.

- Conclusion: Just because of a change in the exchange rate, the country went from being a creditor to being a debtor of the rest of the world.

Example (concluded)

• **An Increase in Foreign Equity Prices**

Suppose now that the price of the Fiat share jumps to 7 euros. Then,

• $A = 25 \times 7 \times 1 = 175$ dollars.

• $L = 80$ dollars is unchanged.

• $NIIP = A - L = 175 - 80 = 95$ dollars

• $\Rightarrow$ A change in stock prices has an effect on the country's NIIP: the country went from net debtor (-\$30) to net creditor (+\$95) just because the Italian stock market went up and independently of any changes in the current account.

• **Conclusion:** The above hypothetical examples illustrate how a country's net international investment position can display large swings because of movements in asset prices or exchange rates. This is indeed the case in actual data as well, as we will see next.

Valuation Changes in the United States

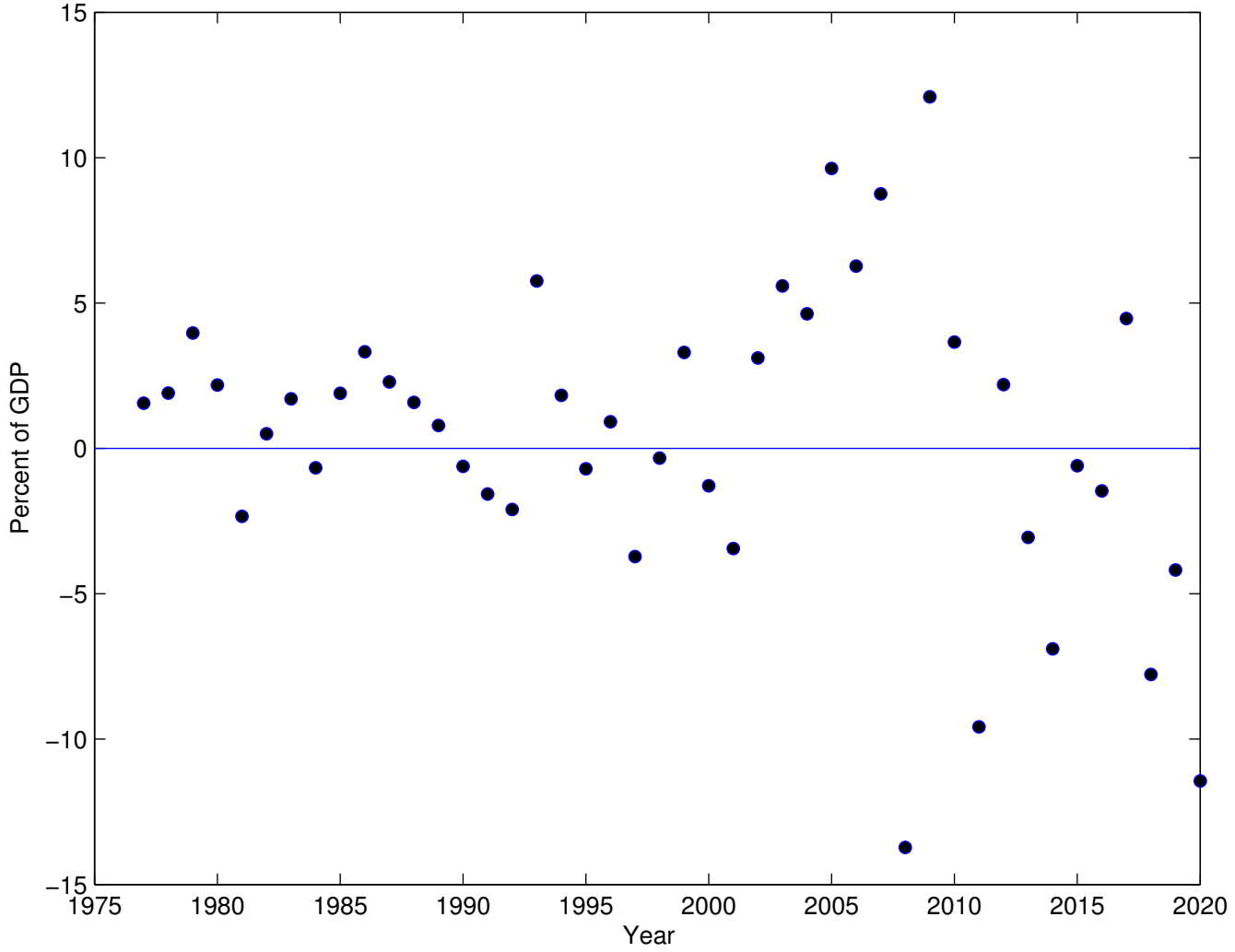
Look at the figure in slide 39, which plots valuation changes in the United States since 1976. It shows that

• Valuation changes can be large. We have observed valuations changes as large as ± 15 percent of GDP.

• Over the period 2000 to 2010 mostly valuation gains for the US, since then mostly valuation losses.

• Large valuation changes are a recent phenomenon. Until the year 2003, the typical valuation change was ± 3 percent of GDP.

Valuation Changes in the U.S. Net International Investment Position, 1977–2020



Notes. The figure shows year-over-year changes in the U.S. net international investment position arising from valuation changes expressed in percent of GDP. Authors' calculations based on data from ITA Table 1.1, IIP Table 1.1, and NIPA Table 1.1.5 of the BEA.

Valuation Changes Before the Global Financial Crisis (2002 to 2007)

• From 2002 to 2007, the U.S. cumulative CA deficit was $3.9 trillion (32% of GDP).

• Yet, the NIIP improved by $80 billion, $0.08 trillion.

• This means that valuation changes during this period amounted to almost $4 trillion, $3.98 trillion to be exact. The main drivers were:

(1) The dollar depreciated by 20%. This causes large positive valuation changes because U.S.-owned foreign assets are mostly in foreign currency, whereas U.S. liabilities are mostly in dollars.

(2) The stock markets in foreign countries significantly outperformed the U.S. stock market: cumulative return from 2002 to 2007, 190% abroad versus 90% in the United States. As a result, the U.S. net equity position went from $0.04 trillion in 2002 to $3 trillion in 2007.

Valuation Changes After the Global Financial Crisis (2008–2020)

• Large positive valuation changes came to a sudden stop in 2008 (look at the figure in slide 39): that year, valuation changes were -15% of GDP, mostly from an enormous drop in foreign stock markets.

• Since 2010, and especially during the COVID-19 pandemic, the U.S. NIIP has suffered mostly valuation losses, total -$7.2 trillion. One reason is that for most years since 2010 U.S. stocks have outperformed foreign stocks. Every time the U.S. stock market goes up, the value of U.S. portfolio equity liabilities (U.S. stocks held by foreign investors) goes up. And when the foreign stock market goes up, the dollar value of the U.S. portfolio equity asset position (foreign stocks held by U.S. investors) goes up. If U.S. stocks outperform foreign stocks, as they did in most years since 2010, the value of the U.S. net foreign portfolio equity position goes down, that is, the U.S. suffers valuation losses.

A Hypothetical NIIP That Excludes Valuation Changes

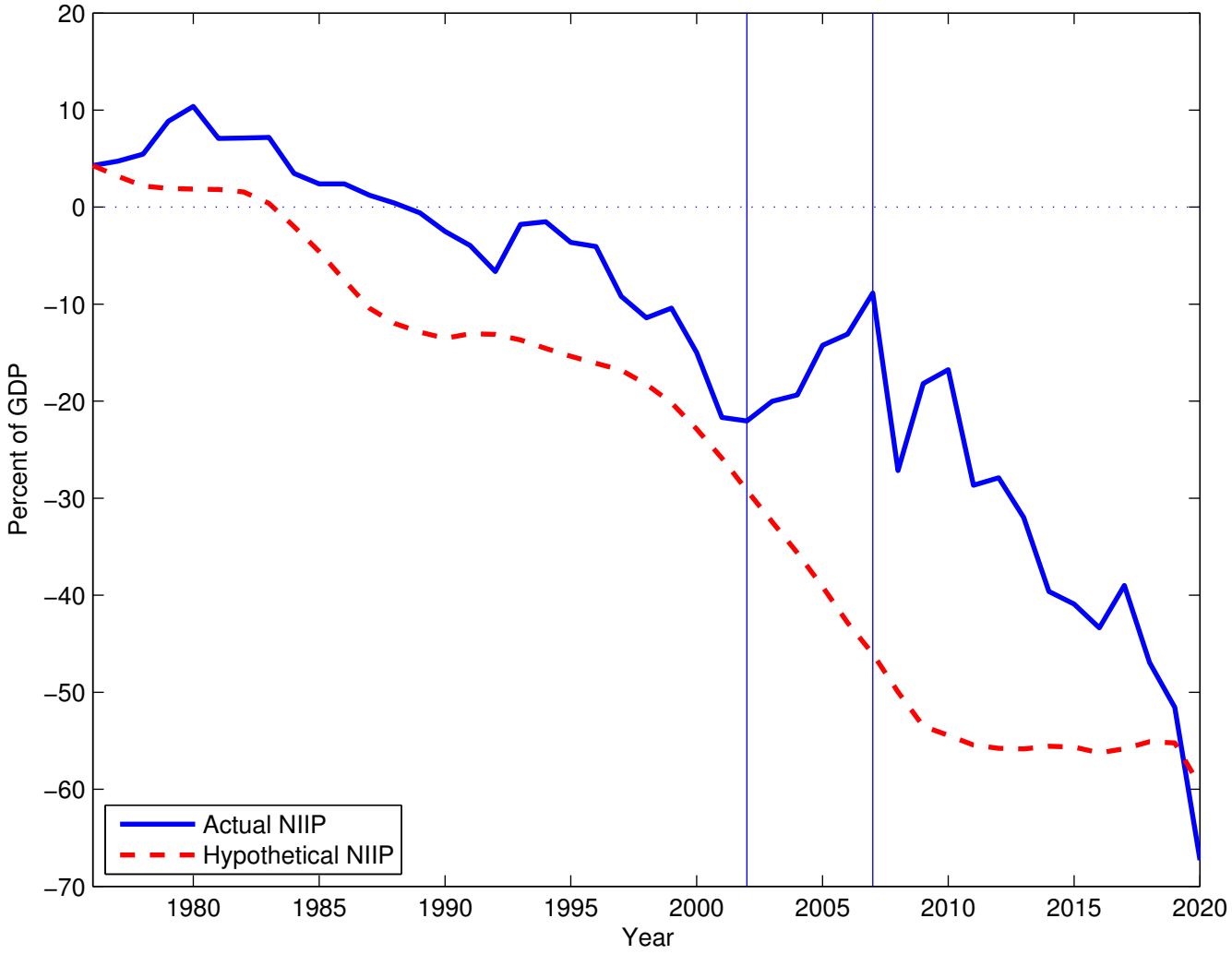
The figure on slide 43 shows the cumulative impact of valuation changes on the NIIP. It plots the actual U.S. NIIP since 1976 and a hypothetical NIIP constructed by removing valuation changes from the actual NIIP.

To construct the hypothetical NIIP for a given year $t > 1976$, start with the NIIP of the initial year, $NIIP_{1976}$, and add all of the CA balances from 1977 until the year of interest.

$$\text{Hypothetical } NIIP_t = NIIP_{1976} + CA_{1977} + CA_{1978} + \cdots + CA_t.$$

The figure on slide 43 plots the actual and hypothetical net international investment positions over the period 1976–2020 in percent of GDP.

Actual and Hypothetical U.S. NIIP in Percent of GDP, 1976–2020



Notes. The hypothetical NIIP for a given year is computed as the sum of the NIIP in 1976 and the cumulative sum of current account balances from 1977 to the year in question. The vertical lines indicate the years 2002 and 2007, respectively. Authors' calculations based on data from IIP Table 1.1, ITA Table 1.1, and NIPA Table 1.1.5 of the BEA.

Observations on the Hypothetical NIIP

• Until 2002, the actual and hypothetical NIIP were not significantly different from each other $\Rightarrow$ valuation changes were small.

• In 2002 the hypothetical NIIP starts to fall at a faster pace but the actual NIIP rises. $\Rightarrow$ large positive valuation changes.

• Without this lucky strike, the NIIP in 2007 would have been -46% of GDP instead of the actual -9% .

• In the years following the global financial crisis, US equity markets outperformed foreign stock markets, leading to valuation losses and closing the gap between the hypothetical and actual NIIP. By 2019 the gap had shrunk to 4 percent of GDP, similar to the value prior to the exuberant quinquennial 2002-2007.

• During the COVID-19 pandemic the U.S. stock markets continued to outperform foreign markets leading to valuation losses of 11.4 percent of GDP.

• In 2020 the hypothetical NIIP fell below the actual NIIP, indicating that since 1976 the U.S. has experienced a cumulative valuation loss. This calls into question the view that the United States *on average* benefits from positive valuation changes.

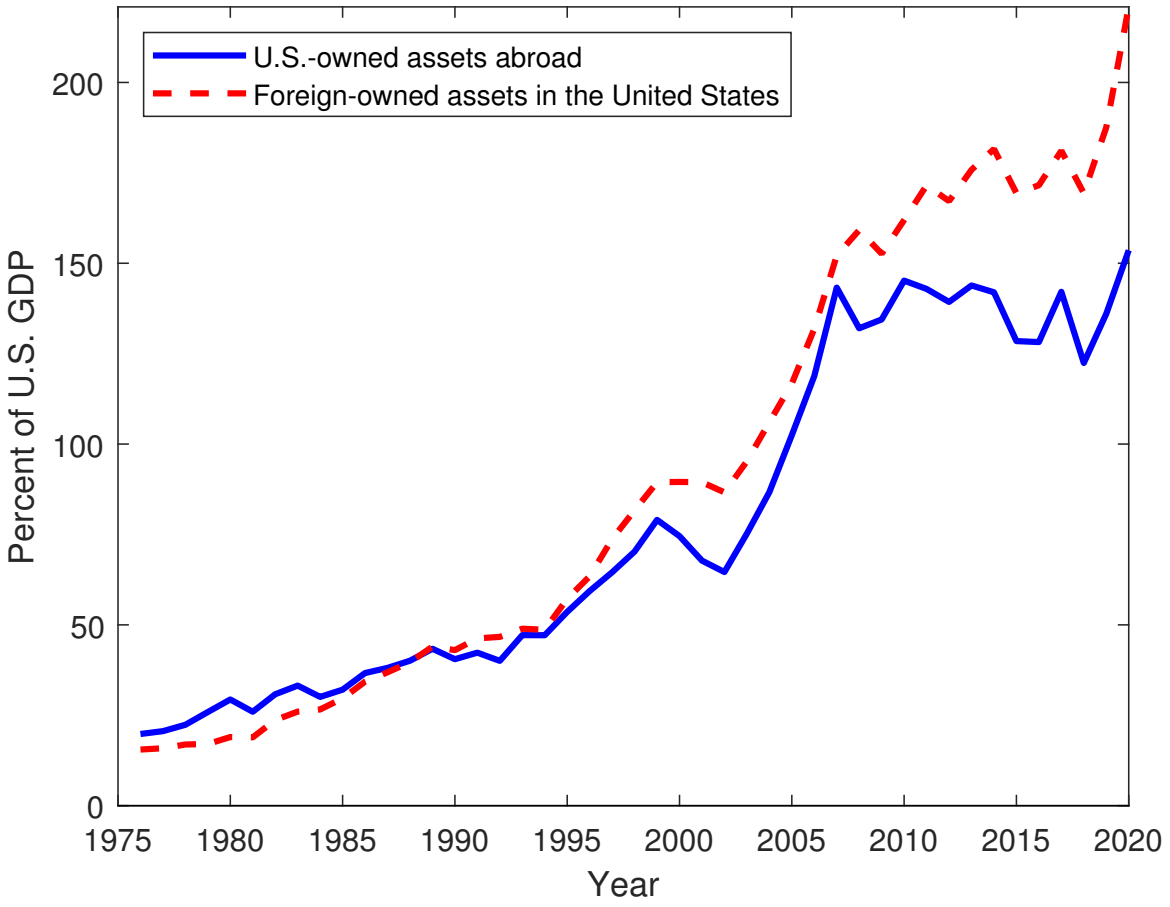
Gross Positions and Valuation Changes

Take a look at the figure in the next slide. It shows that gross positions (international assets and international liability positions) have expanded enormously since the 2000s.

This explosion in gross positions represents one reason why valuation changes have become so large in absolute value over the past two decades. To see this, consider the following example:

- Suppose in country x $A = L = 1$ and in country y $A = L = 1000$.
- Suppose GDP is 100 in both countries.
- Then, in both countries NIIP=0% of GDP.
- Suppose the value of foreign assets (A) increases by 10% in both countries.
- This causes the NIIP to go from 0 to 0.1 in country x, and from 0 to 100 in country y. Thus, the NIIP increases to 0.1% of GDP in country x and to 100% of GDP in country y.

U.S.-Owned Assets Abroad and Foreign-Owned Assets in the United States, 1976–2020



Notes. The figure shows that the gross U.S. foreign asset position and the gross U.S. foreign liability position have risen sharply since the mid 1990s. Authors' calculations based on data from IIP Table 1.1 and NIPA Table 1.1.5 of the BEA.

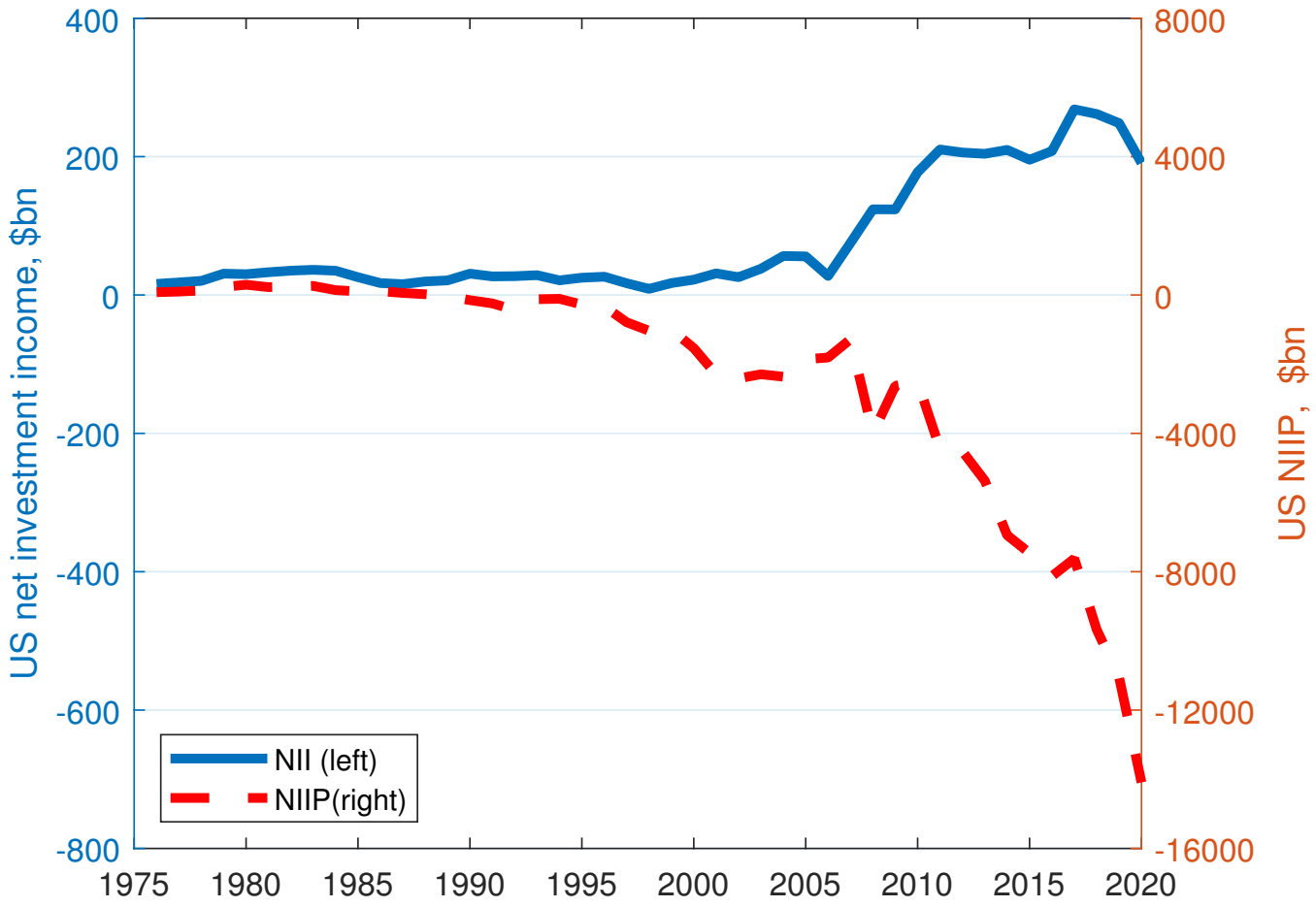
The Negative-NIIP-Positive-NII Paradox

Suppose you had a balance on your credit card. Would you expect to receive interest payments from your credit card company or to have to make payments to your credit card company? Most likely the latter.

Well, that is not what happens with the United States. Look at the figure on the next slide. Even though the U.S. is the largest external debtor in the world, it *receives* investment income from the rest of the world (NII$>$0).

How can this paradoxical situation happen? Here are two suggested explanations: *Dark Matter* and *Return Differentials*. After the next figure, we will spell them out.

Net Investment Income and the Net International Investment Position, United States 1976 to 2020



Notes. Authors' calculations based on data from IIP Table 1.1 and ITA Table 1.1 of the BEA.

What is plotted?

Solid (blue) line: Net Investment Income (NII), which are income receipts on U.S.-owned assets abroad (dividends, interest, or profits) minus income payments on foreign-owned assets in the United States. [left scale, $bn]

Broken (red) line: Net International Investment Position (NIIP), given by international assets (A) minus international liabilities (L). [right scale, $bn]

Sample: 1976 to 2020.

Explaining the NII-NIIP Paradox: (I) Dark Matter

The Dark Matter hypothesis maintains that in reality the U.S. net international investment position is positive but that the Bureau of Economic Analysis fails to account for all of it. The source of the underestimation according to this explanation is that U.S. foreign direct investment contains intangible capital, such as entrepreneurial capital and brand capital, whose value is not correctly reflected in the official balance of payments. At the same time, the argument goes, this intangible capital invested abroad may generate income for the United States, which is appropriately recorded.

Assuming this theory is valid, how much dark matter is there in the NIIP? Let's make a simple calculation. First some notation:

TNIIP = the 'true' net international investment position.

NIIP = the observed net international investment position (-$11.1 trillion at the start of 2020).

NII = net investment income ($0.1909 in 2020).

Dark Matter (cont.)

Net investment income is the return on the True Net International Investment Position. So, letting r denote the interest rate, we have

$$NII = r \times TNIIP$$

Let's take a value of r of 5% per year. Then solving for TNIIP we have

$$TNIIP = \frac{NII}{r} = \frac{0.1909}{0.05} = \$3.8 \text{ trillion}$$

Dark matter is the difference between the true and the recorded NIIPs, or

$$\begin{aligned} \text{Dark Matter} &= \text{TNIIP - NIIP} \\ &= 3.8 - (-11.1) \\ &= \$14.9 \text{ trillion} \end{aligned}$$

Dark Matter (concluded)

So, according to the dark matter hypothesis, in 2020 the United States didn't owe $11.1 trillion to the rest of the world. On the contrary, the rest of the world owed $3.8 trillion to the United States.

$14.9 trillion of dark matter seems like a big figure to go unnoticed by the BEA (and the IRS!).

Explaining the NII-NIIP Paradox: (II) Return Differentials

This second explanation is motivated by the observation that the gross international asset position of the U.S. is predominantly composed of risky but high-return assets, such as foreign equity and foreign direct investment, whereas its gross international liability position is mainly composed of safer low-return assets, such as U.S. government bonds (e.g., T-bills).

This observation is referred to as the *exorbitant priviledge*.

Let A continue to denote the U.S. international asset position and L its international liability position. Then $NIIP = A - L$. Let r^A be the return on A, and r^L the return on L.

The question is how large does the interest rate differential on assets and liabilities, $r^A - r^L$, have to be to explain the paradox.

Start by noting that the NII must equal the difference between investment income and investment payments, that is,

$$NII = r^A A - r^L L. \tag{1}$$

Interest rate differentials (continued)

Now let's put some numbers. In 2020, the U.S. gross international asset position was \$32.2 trillion, and its gross international liability position was \$46.3 trillion. In addition, the average real rate of return on U.S. T-bills, which we will use as a proxy for r^L, was 0.37% per year. (Data from the FRB.) Finally, as we mentioned earlier, NII was \$0.1909 trillion. Thus, we set $A = 32.2$, $L = 46.3$, $NII = 0.1909$, and $r^L = 0.0037$.

We wish to find the value of r^A that solves the paradox. To this end, solve equation (1) for r^A and evaluate

$$r^A = \frac{NII + r^L L}{A} = \frac{0.1909 + 0.0037 \times 46.3}{32.2} = 0.0112$$

That is, $r^A = 1.12\%$, or an interest rate differential between the U.S. foreign assets and liabilities of $r^A - r^L = 1.12 - 0.37 = 0.75\%$ per year. This doesn't look like an exaggerated premium.

Interest rate differentials (continued)

The analysis thus far assumes that foreign investors hold only U.S. bonds in their international asset portfolio. This is a good simplification of reality until 2010. But since then, the ratio of equity to bonds in the U.S. international liability position is closer to 1; that is, roughly half is in equity and half in bonds. Suppose that the return on equity (r^A) is the same domestically and abroad. Accordingly, the rate of return on U.S. foreign liabilities, r^L, is $r^L = \frac{1}{2}(r^A + r^B)$, where $r^B = 0.0037$ as before.

$$NII = r^A A - r^L L = r^A A - \frac{1}{2}(r^A + r^B)L.$$

Evaluating this expression using actual numbers gives

$$0.1909 = r^A \times 32.2 - \frac{1}{2} \times (r^A + 0.0037) \times 46.3,$$

which gives

$$r^A = 3.06\%$$

The corresponding premium of equity over government bonds is 2.69 percent ($r^A - r^B = 3.06\% - 0.37\%$), which is more plausible.

The Flip Side of the NIIP-NII Paradox

If we divide the world into two groups, the United States (US) and the rest of the world (RW), then the rest of the world must display the flipped paradox—that is, a positive net foreign asset position and negative net investment income. Note that

$$NIIP^{US} = A^{US} - L^{US} = L^{RW} - A^{RW} = -NIIP^{RW}$$

and

$$NII^{US} = r^A A^{US} - r^L L^{US} = r^A L^{RW} - r^L A^{RW} = -NII^{RW}.$$

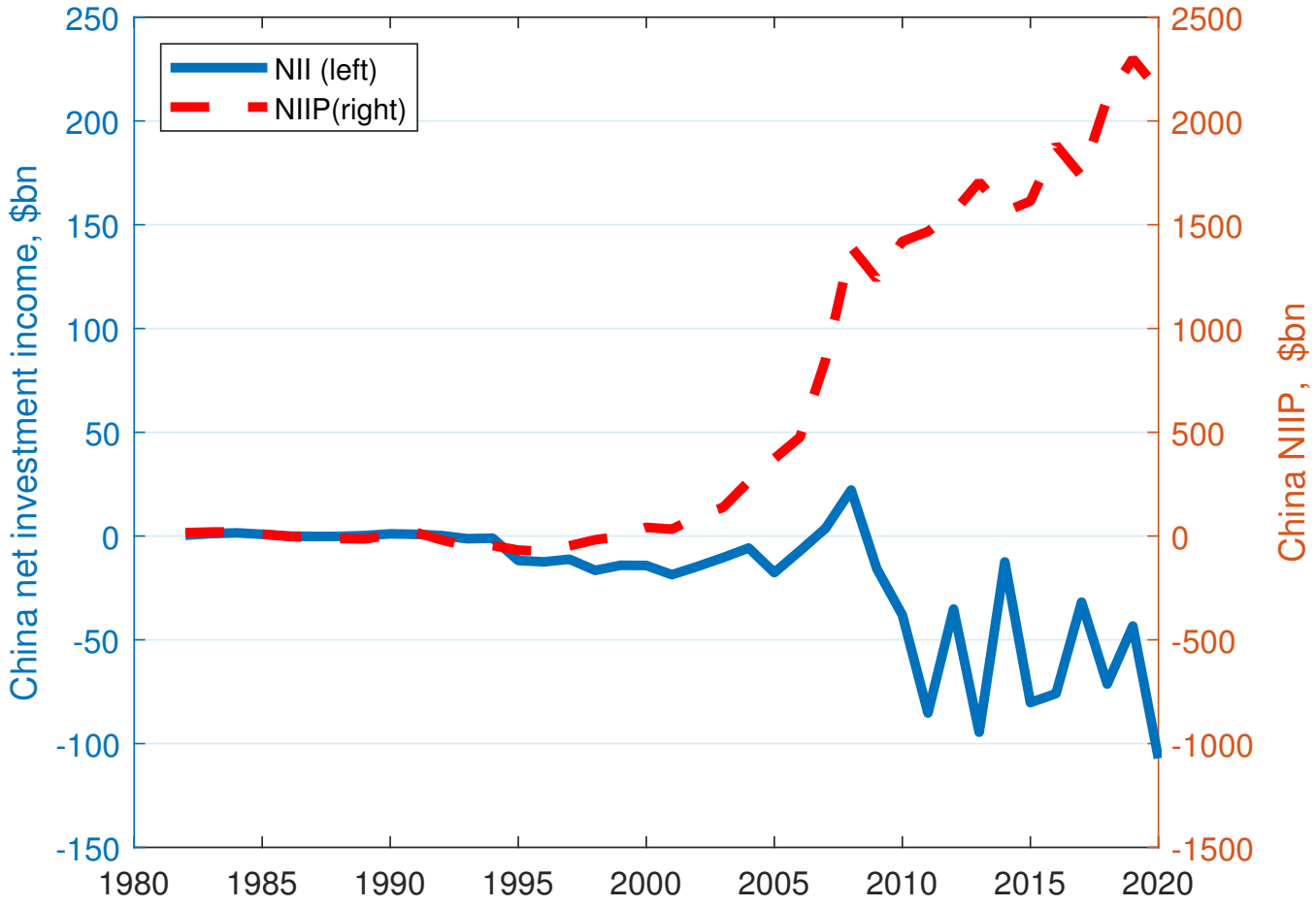
Let's look at a particular country, namely, China. Why China? First, as we observed when discussing global imbalances (see the heat map in on slide 5), China has been accumulating large current account surpluses for the past quarter century, so it is a likely candidate to have a positive NIIP. Second, the table on slide 23 shows that in 2019 its NII was negative, so that could be the smoking gun.

The Flip Side of the NIIP-NII Paradox (continued)

The figure on the next slide plots the NIIP and NII of China for the period 1982 to 2020. Prior to accession to the WTO in 2001, the NIIP was near zero, thereafter it grew rapidly, reaching $2.2 trillion by 2020. Net investment income, NII, was close to zero prior to 2001 but then became mostly negative, fluctuating around -$50 billion. Thus, China displays the flipped NIIP-NII paradox, a positive NIIP and a negative NII.

A possible explanation of the Chinese flipped paradox is that China saves largely in safe, low-return assets, such as U.S. Treasury securities, while China's foreign liabilities are predominantly in the form of high-return assets, such as foreign direct investment.

Net Investment Income and the Net International Investment Position, China 1982–2020



Notes. The figure shows that China displays the flipped NIIP-NII paradox. Since accession to the WTO in 2001, with the exception of the global financial crisis years (2007 and 2008), China recorded a positive NIIP and a negative NII. Data Sources: NIIP for 1982 to 2017 is from Lane and Milesi-Ferretti, op. cit., and for 2018 to 2020 from International Financial Statistics (IFS). NII is from IFS.

Summing Up

• Worldwide, the distribution of external debts and credits is not even. Some countries, like the United States, are large net external debtors and some, like Germany, Japan, and China, are large net external creditors. This pattern is known as global imbalances.

• The balance of payments keeps record of a country's international transactions.

• The balance of payments has two accounts, the current account and the financial account.

• The current account records transactions in goods, services, income, and unilateral transfers between residents and nonresidents.

• The financial account records transactions involving financial assets between residents and nonresidents.

• The current account has three components: the trade balance, the income balance, and net unilateral transfers.

• For most countries, including the United States, the trade balance is the largest component of the current account.

• In the United States, the trade balance and the current account move closely together over time.

• The United States has been running large current account deficits since the early 1980s.

• Current account deficits deteriorate a country's NIIP, which is the difference between a country's international asset position and its international liability position.

• Due to its large current account deficits, the United States turned from being a net external creditor in the early 1980s to being the world's largest net external debtor since the late 1990s.

• A second source of changes in a country's NIIP is valuation changes, originating from changes in exchange rates and in the price of the financial instruments that comprise a country's international asset and liability positions.

• In the United States, valuation changes became large in the early 2000s, reaching values as high as plus or minus 15 percent of GDP in a single year. Valuation changes were mostly positive between 2001 and 2010 and mostly negative between 2011 and 2020. On net, between 1976 and 2020, positive and negative valuation changes have roughly offset each other.

• The NIIP-NII paradox refers to the phenomenon that the United States has a negative net international investment position, NIIP$<$0, and positive net investment income, NII$>$0.

• Two stories that aim to explain the NIIP-NII paradox are the dark matter hypothesis and the rate-of-return differential hypothesis.

• The NIIP-NII paradox in the United States must have a flipped paradox in the rest of the world. China has had a positive NIIP and negative NII since the 2000s, so it displays the flipped NIIP-NII paradox.