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International Macroeconomics

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Slides for Chapter 1

Global Imbalances

Motivation

Countries trade significantly with other countries, and the United States is not exception. This fact elicits a number of questions, such as

• 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, or Latin America?

• Is the United State 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.

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

• Why and when are exports of goods and services larger or smaller than imports?

• Why and when do countries borrow from abroad?

• Can countries borrow forever?

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

The Balance of Payments

A country's international transactions are recorded in the Balance of Payments.

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

Trade Balance = Merchandize Trade Balance + Service Balance

Another item of the Balance of Payments is the **Income Balance**, which measures the difference between incomes received from the rest of the world and 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 dividends, interest, profits, etc. 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.

Income Balance = Net Investment Income
+Net International Payments
To Employees

A third item in the Balance of Payments 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:

$$\text{Net Unilateral Transfers} = \text{Private Remittances}$$
$$+ \text{Government Transfers}$$

The Current Account

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, the external debt falls.

The following table displays the values of the different components of the Balance of Payments in the United States in 2012.

The U.S. Balance-of-Payments Accounts in 2012

Item	Billions of dollars	Percentage of GDP
CURRENT ACCOUNT BALANCE	-475.0	-3.0
Trade Balance	-539.5	-3.4
Merchandise Trade Balance	-735.3	-4.7
Services Balance	195.8	1.2
Income Balance	198.6	1.3
Net Investment Income	206.2	1.3
Net International Payments to Employees	-7.6	-0.0
Net Unilateral Transfers	-134.1	-0.9
Private Remittances	-77.6	-0.5
U.S. Government Transfers	-56.5	-0.4

Observations on the Table

• In 2012, the United States run a large current account deficit.

• The bulk of the current account deficit is accounted for by a large trade balance deficit. The U.S. imports mostly low-tech. manufactured goods (textiles, electronics) and exports human-capital intensive services (higher education, R&D, health care, professional consulting)

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

• Net Unilateral Transfers were negative, which means that the United States gave more gifts to the rest of the world (mostly transfers of U.S. immigrants to foreign residents and government aid) than it received. This is typically the case.
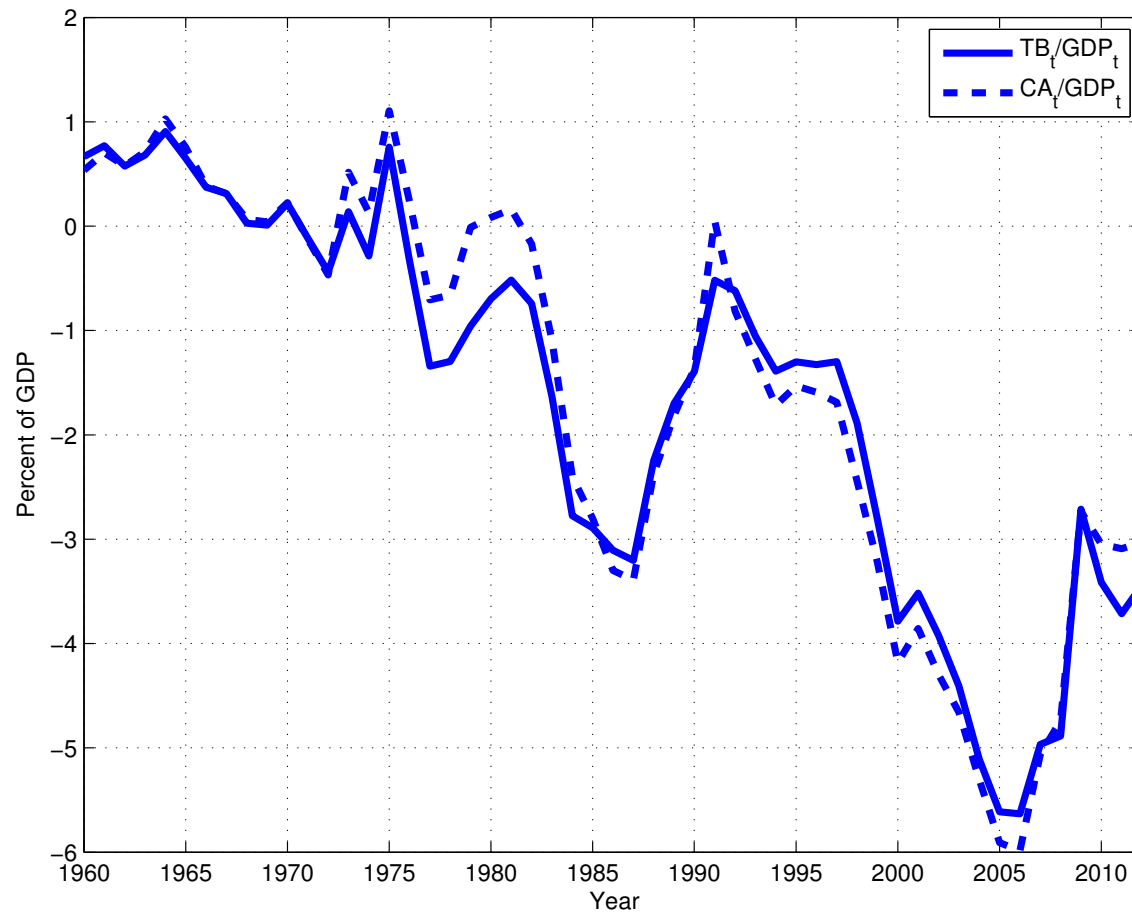
- **The U.S. Trade Balance and Current Account Move in Tandem Over Time**

The previous table shows that for the year 2012, the bulk of the U.S. current account is the trade balance. The following figure shows that this is indeed true all the time.

- **Large Deteriorations in U.S. Current Account and Trade Balances Over Time**

The next figure also shows that, in general, the trade imbalances of the United States have become larger over time for the past 40 years. During the recession of the early 1990s and the great contraction of 2007-2009, the external deficits temporarily shrunk.

# The U.S. Trade Balance and Current Account As Percentages Of GDP: 1960-2012

Source: http://www.bea.gov

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

The following figure shows the current account and the trade balance for different countries at one point in time.

It shows that trade balances and current accounts comove closely across countries. Countries with larger trade balances tend to be countries with larger current account balances.

Trade Balances and Current Account Balances Across Countries in 2005
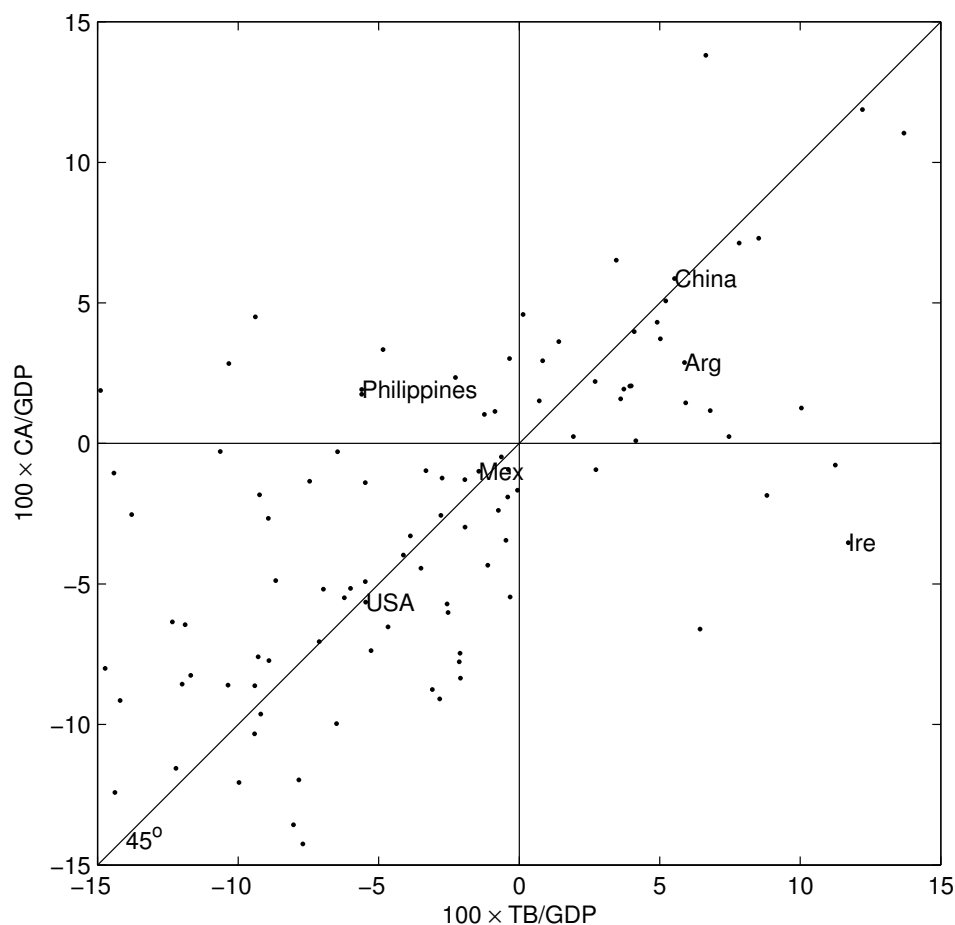
Data Source: World Development Indicators. Note: TB denotes the trade balance in goods and services and CA denotes the current account balance. There are 102 countries included in the sample. Countries with trade balances or current accounts in excess of ± 15 percent of GDP are not shown.

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The previous figure also shows that the current account and the trade balance need not both be negative as in the United States. Any sign pattern is possible, as shown in the following table.

Trade Balance and Current Account as Percentages of GDP in 2005 for Selected Countries

Country	TB/GDP	CA/GDP
Argentina	5.9	2.9
Ireland	11.7	-3.5
Philippines	-5.6	1.9
United States	-3.4	-3.0

Source: World Development Indicators.
Available online at `http://databank.worldbank.org`. Note: CA denotes current account, and TB denotes trade balance. Database accessed on January 26, 2014.

CA = TB + Income Balance + Net Unilateral Transfers

Argentina:
$\frac{TB}{GDP} > \frac{CA}{GDP} > 0$ because Income Balance < 0 (net debtor)

Ireland:
$\frac{TB}{GDP} > 0 > \frac{CA}{GDP}$ because Income Balance is -15.2% of GDP!

Philippines:
$\frac{TB}{GDP} < 0 < \frac{CA}{GDP}$ because Personal Remittances, which are part of Net Unilateral Transfers, are 13% of GDP!

Who Trades With The United States?

The next figure shows that a large fraction of the U.S. current account deficit is accounted for by its trade with China.

The fraction of the U.S. current account deficit explained by deficits with China has increased steadily since the 1980s, reaching around 70 percent in recent years.

The Bilateral Current Account Deficit of the United States With China
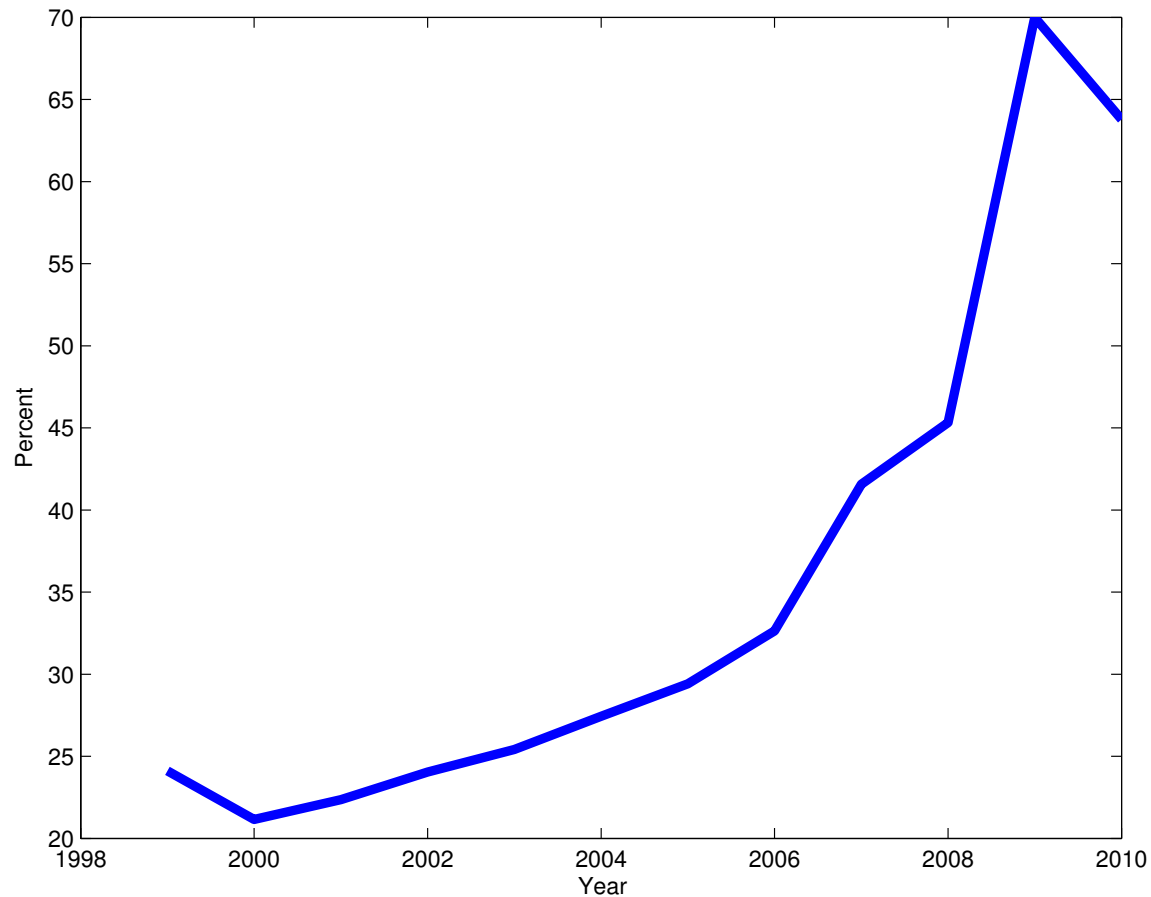
Source: http://www.bea.gov. Note: The U.S. current account deficit with China is expressed as a fraction of the total U.S. current account deficit.

## The World Map of Current Account Deficits and Surpluses

If the United States is running a large current account deficit, some other countries must run a current account surplus. We just saw that this is the case with China. But China does not explain all of the U.S. deficit. So there must be other countries running current account surpluses. Why? Because it must be the case that:

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

where ROW stands for rest of the world.

So who is running big current account surpluses against the United States? Look at the map on the next page.

Cumulative Current Account Balances Around the World: 1980-2012, billions of U.S. dollars.
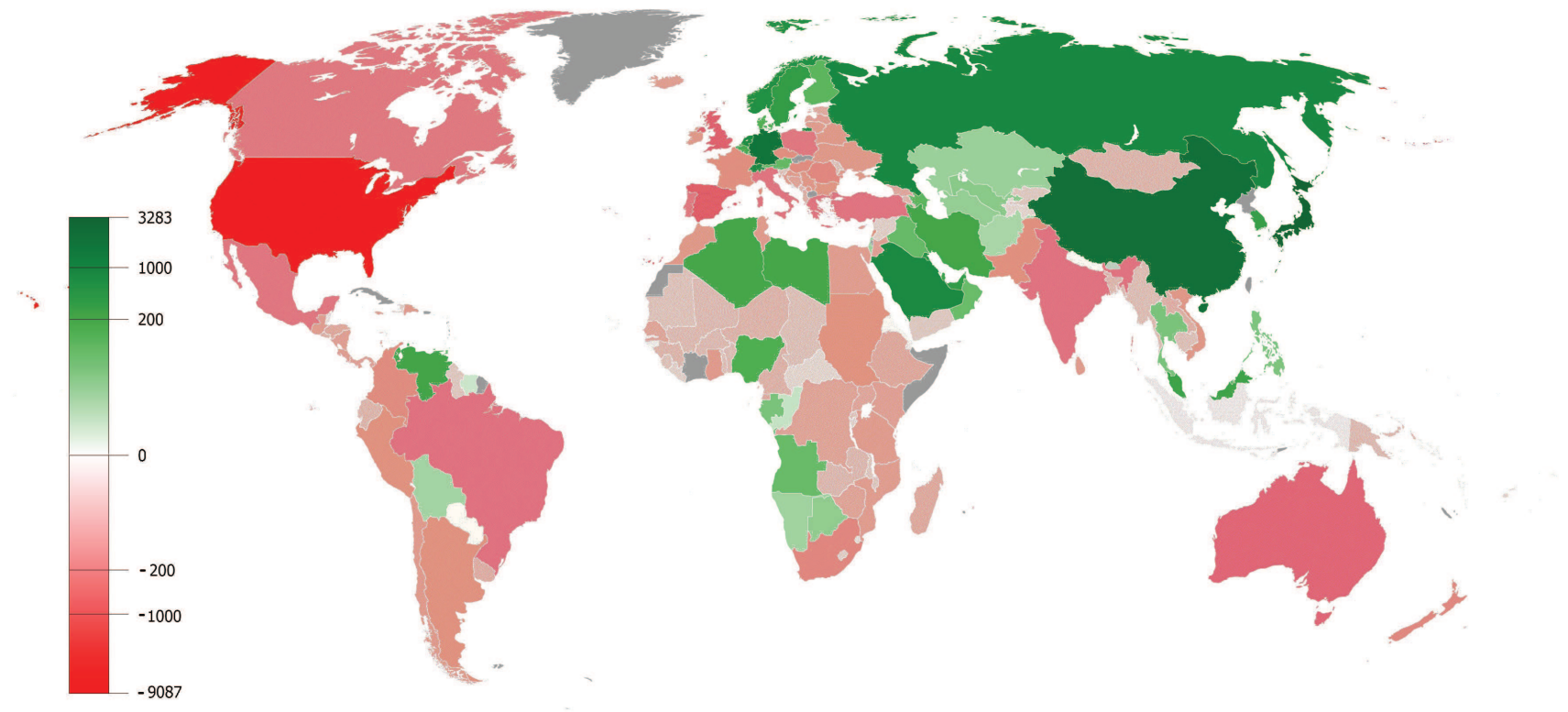
Observations on the Map

The map reflects not the current account of countries in a particular year, but the accumulated current accounts between 1980 and 2012. Clearly, the country with the biggest accumulated current account deficit (bright red) is the United States. The countries that have been financing these deficits (green) are China, Japan, Germany, and oil exporting countries (Russia, members of OPEC, and Norway).

Overall, the picture is one of unbalanced accumulated trade, with some countries running protracted current account deficits and some running protracted surpluses. If all countries were in balance, the map would look pastel white. Instead, it looks mostly either red or green.

The Net International Investment Position

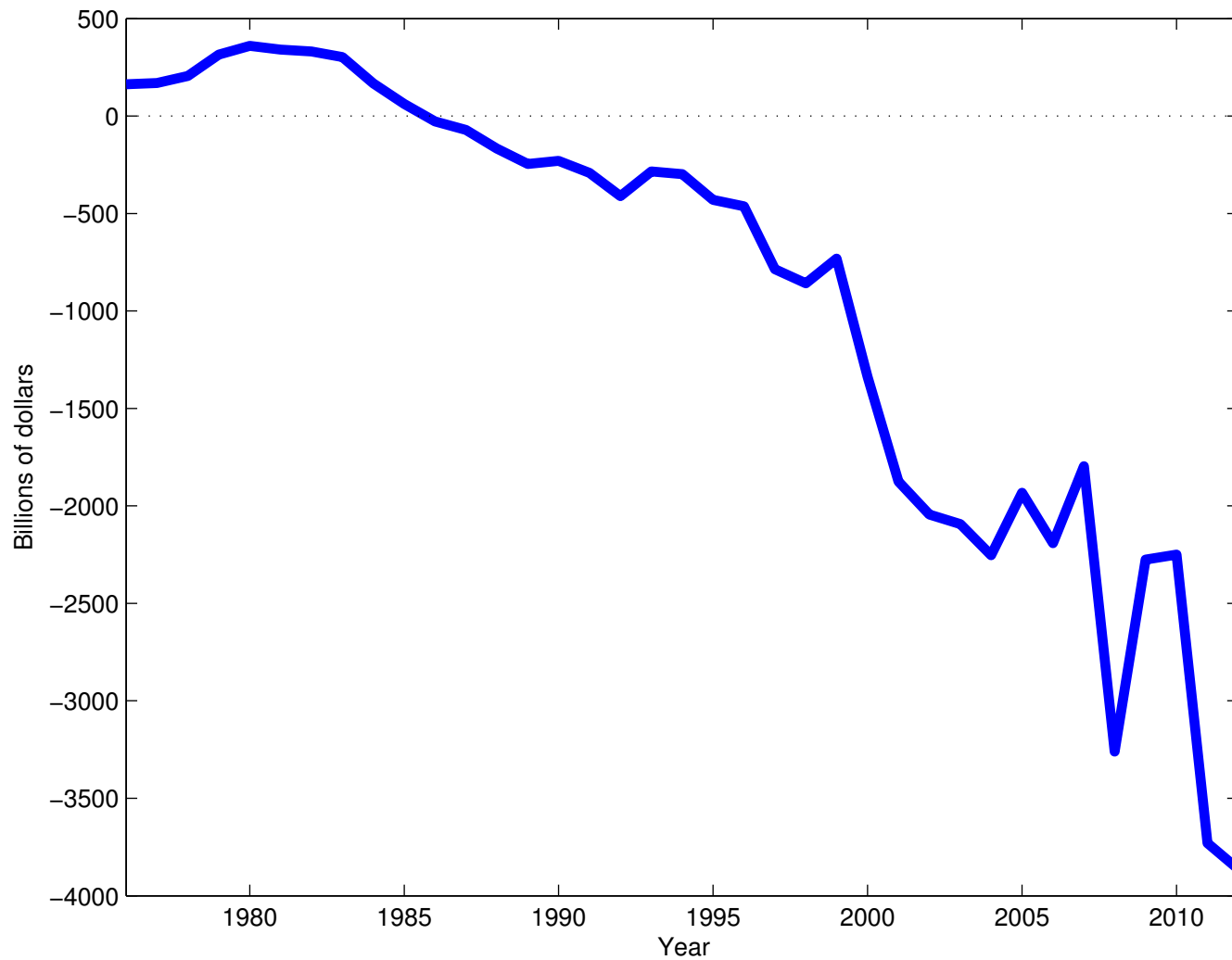# The Net International Investment Position (NIIP)

NIIP = Difference between a country's foreign assets and its foreign liabilities. In other words, if the NIIP is negative, then the country has an external debt, and if the NIIP is positive, the country is a net creditor to the rest of the world.

$$\text{NIIP} = \text{U.S. owned foreign asset} - \text{foreign owned U.S. assets}$$

Look at the next two figures. They show that the United States was:

– A net creditor of the rest of the world until the late 1980s

– A net external debtor since the late 1980s.

• The NIIP has been falling both in levels and as a fraction of GDP.

• The United States became the largest external debtor in the world in the 1990s.

The U.S. Net International Investment Position (NIIP): 1976-2012

The U.S. Net International Investment Position (NIIP) as a Share of GDP: 1976-2012
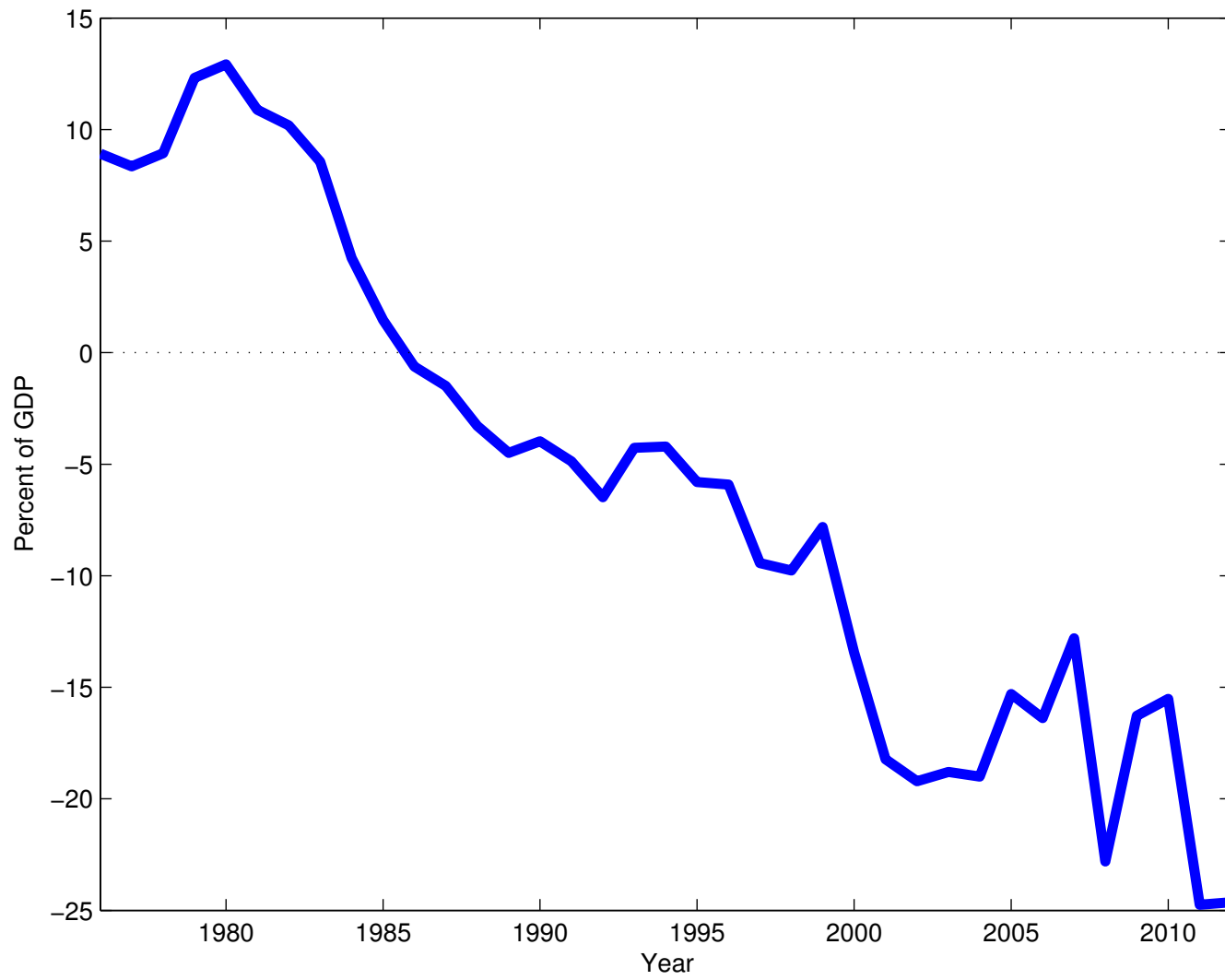
NIIP changes for 2 reasons

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

− CA: The Current Account

− 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.)

We already looked at the U.S. current account data. We saw that the current account was in deficit since the early 1980s. These current account deficits should have resulted in a large deterioration of the NIIP.

Next let's look at: **Valuation Changes**

In the United States

—**Valuation changes** > 0 **or** < 0 **on average?**

—**Size of valuation changes relative to the current account.**

The Importance of Valuation Changes I

Recall that the NIIP can change either because of a CA deficit or surplus or because of valuation changes.

Look at the next figure. It plots the U.S. CA as a fraction of GDP on the x axis and the change in the NIIP also as a fraction of GDP on the y axis. It also displays the 45-degree line.

Points above the 45-degree line correspond to years in which the NIIP fell by less than the CA deficit. These are years in which the U.S. got lucky: Changes in asset prices benefited relatively more (or hurt relatively less) the U.S. asset position than its liability position.

Note that there are quite a few points above the 45-degree line. Especially noticeable are the years prior to the great contraction of 2008.

Particularly amazing are points located in the northwest quadrant of the figure (for example, 2005, 2007 and 2009). They correspond to years in which even though the U.S. run a CA deficit, it managed, thanks to valuation changes, to reduced its external debt!

# The U.S. CA and Changes in the NIIP: 1977-2012
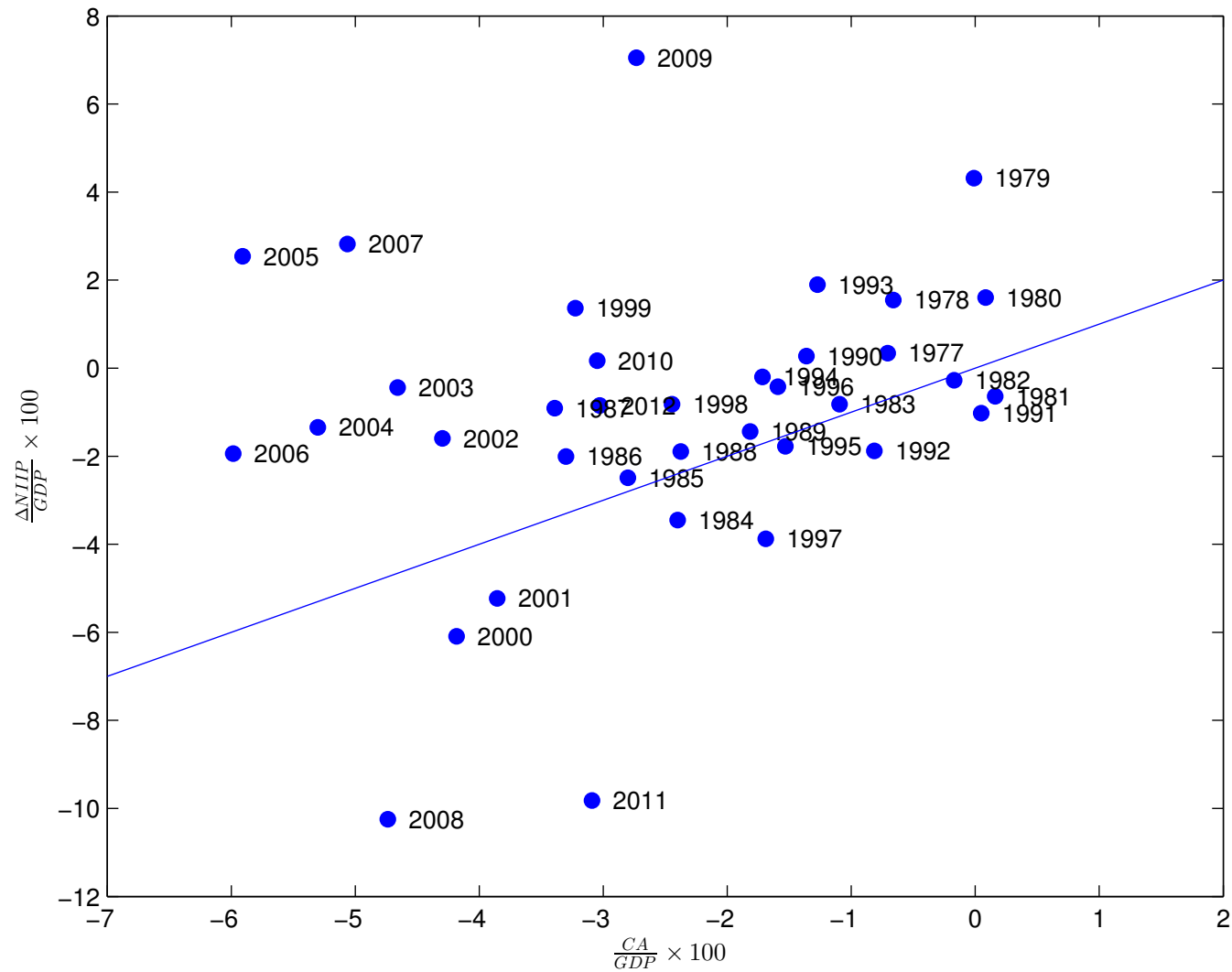
Let's look at the valuation changes over time …

The next figure shows that

- since 1976 the U.S. had mostly positive valuation changes

- large valuation changes are a recent phenomenon. Until the year 2000, the typical valuation change was between -2 and +4 percent of GDP. Since 2000, we have observed valuations changes as large as ± 10 percent of GDP.

For the U.S. mostly valuation gains since 1976:

Valuation Changes as Share of GDP
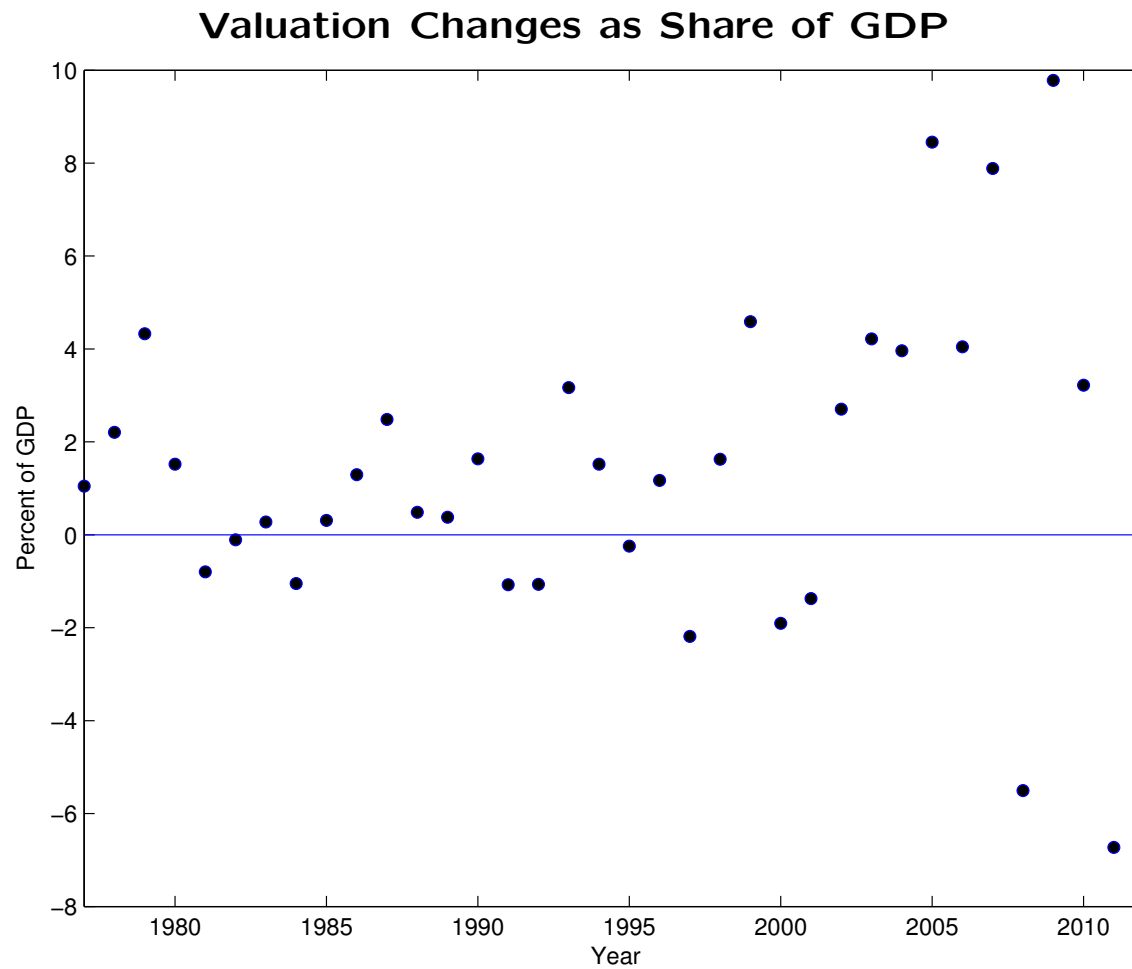
The Importance of Valuation Changes II

How big would the U.S. external debt be today if it had not benefited from large valuation changes?

The next figure answers this question. It plots the actual U.S. NIIP and a hypothetical NIIP constructed by removing valuation changes from the actual NIIP.

To construct the hypothetical NIIP for a given year, start with the NIIP of the initial year, $NIIP_{1976}$, and add all of the CA balances from 1977 until the year of interest. For example, for 2002, the hypothetical NIIP is given by

hypothetical $NIIP_{2002} = NIIP_{1976} + CA_{1977} + CA_{1978} + \cdots + CA_{2002}$

If the U.S. hadn't been lucky, its external debt in 2012 would have been \$9.0 trillion (or 57% of GDP) instead of the actual \$3.9 trillion (or 25% of GDP)!

The U.S. NIIP and the Hypothetical NIIP with No Valuation Changes Since 1976

← NIIP

Cumulative CA balances since 1976 →

Billions of dollars

Year
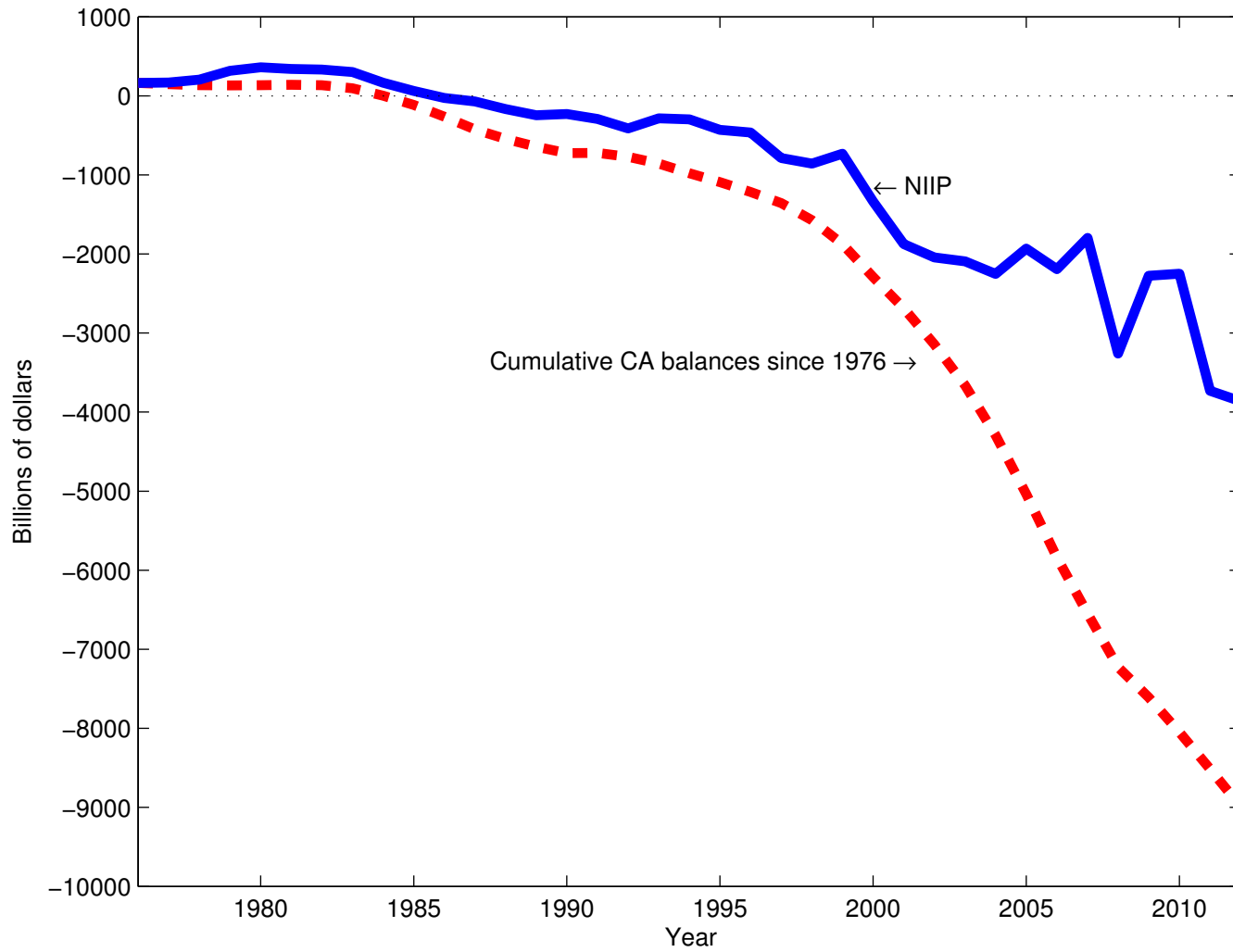
The Importance of Valuation Changes III: The Surprising Pre-Crisis Period: 2002-2007

Accumulated current account deficits: 4 trillion (or 32% of GDP)

Change in the Net International Investment Position: +0.1 trillion.

⇒ In spite of large CA deficits, the U.S. reduced its external debt. How did this happen?

− Large depreciation of the U.S. dollar (20%). Most of the U.S. foreign liabilities are in dollars, whereas most of the U.S. holdings of foreign assets are in foreign currency.

− Large gains from stock market: $1 invested in foreign stock markets in 2002 returned $3 in 2007, whereas $1 invested in the U.S. stock market in 2002 yielded $2 in 2007.

A free lunch?

# The Negative-NIIP-Positive-NII Paradox

Suppose you had a negative 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? Probably the latter.

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

In 2010, the U.S. net international investment position stood at $-2.5 trillion, and its net investment income was $+0.17 trillion.

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

Positive Net Investment Income And Negative NIIP: A Paradox?
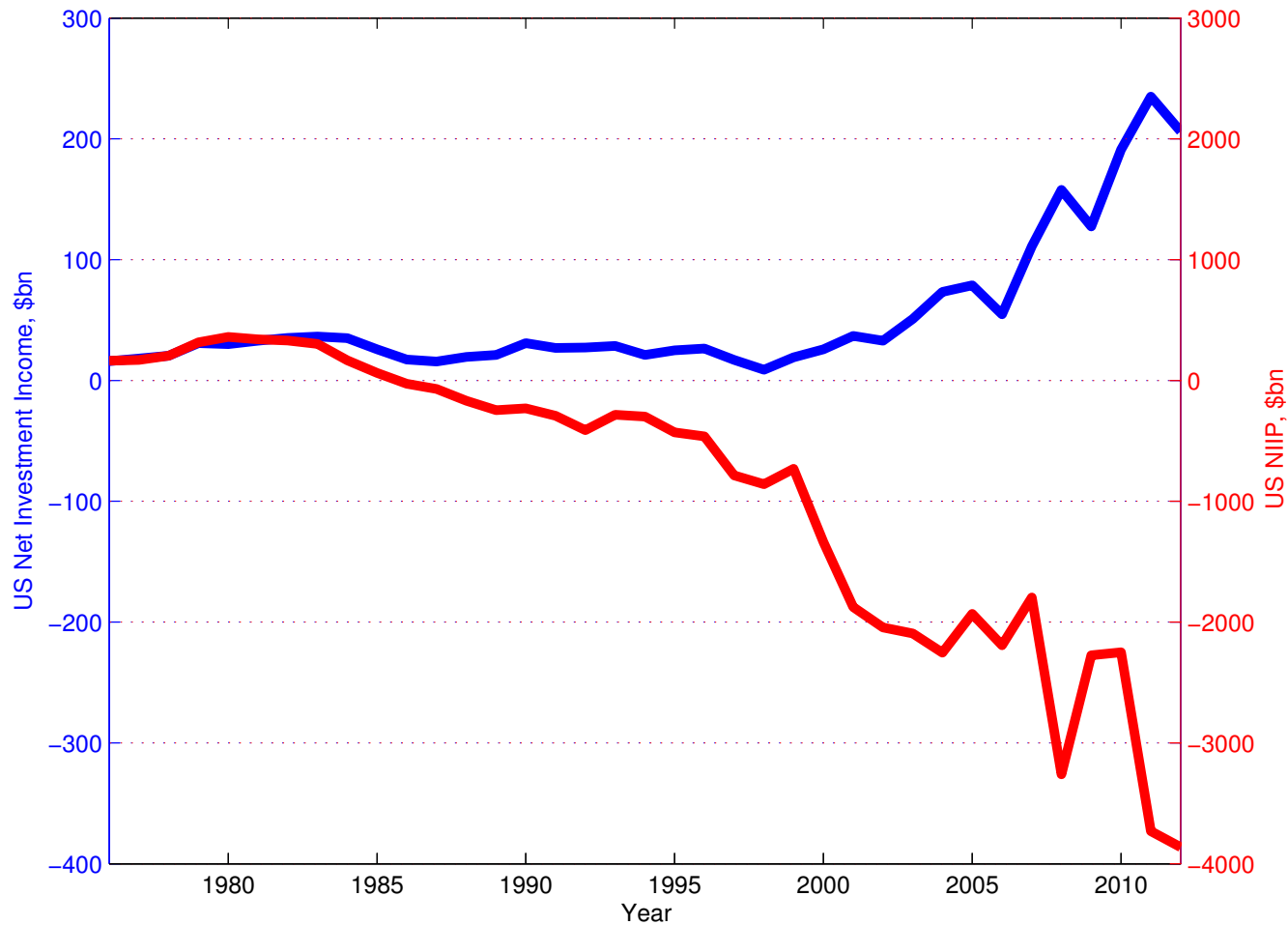
Data Source: Bureau of Economic Analysis.

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.

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,$ -4 trillion in 2012.

NII = Net investment income, $0.2 trillion in 2012.

$r =$ the rate of return on the net international investment position, say 5% per year.

Dark matter is simply the difference between the true and the recorded NIIPs

dark matter $=$ TNIIP - NIIP.

Then, we must have that NII is the income received as a yield from the TNIIP, or

$NII = r \times TIIP$ or $0.2 = 0.05 \times TNIIP$. Solving for TNNIP yields that TNIIP=$4 trillion.

Finally, dark matter $=$ TNIIP-NIIP $=$4-(-4)=$8 trillion!

So according to the dark-matter theory, the U.S. doesn't owe 4 trillion to the rest of the world. No, the rest of the world owes 8 trillion to the U.S.

Well, 8 trillion dollars simply seems too big a number to go unnoticed by the BEA.

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

This second explanation is motivated by the observation that the gross international asset position of the U.S. is mostly composed of risky but high-return assets, such as foreign stocks, whereas its gross international liability position is composed of safer low-return assets, such as U.S. T-bills.

Let A 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,

$$NII = r^A A - r^L L.$$

Now let's put some numbers. In 2012, the U.S. gross international asset position was \$21 trillion, and its gross international liability position was \$25 trillion. In addition, the average real rate of return on U.S. T-bills, which we will use as a proxy for r^L, is low, around 2% per year. Finally, as we mentioned earlier, NII was \$200 billion (or 0.2 trillion). Thus, we set $A = 25$, $L = 21$, $NII = 0.2$, and $r^L = 0.02$.

We wish to find the value of r^A that solves the paradox. To this end, we plug these numbers in the above formula to get

$$0.2 = r^A \times 21 - 0.02 \times 25.$$

Solving for the interest rate on assets yields $r^A = 3.3\%$, or an interest rate differential between the U.S. foreign assets and liabilities of 1.3% per year. This doesn't look like an exorbitant premium.

Why is it that a small interest rate differential suffices to explain the NII-NIIP paradox?

Take a look at the next figure. It shows that gross asset and liability positions have exploded in past 30 years. They have roughly doubled every decade.

Hence just a small rate of return differentials can lead to a positive NII eventhough the NIIP is negative.

Gross Positions Have Exploded over the past 20 Years
U.S.-Owned Assets Abroad (A) and Foreign-Owned Assets in the U.S. (L)