Lecture 1: Global Imbalances

The Balance of Payments, the Current Account and the NIIP

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Outline

Introduction

Why We Care

Countries trade intensively with one another. This raises a number of questions:

- How large are international transactions in goods, services and financial assets (for the advanced economies)?
- Do the United States, Europe and China run trade deficits or trade surpluses with the rest of the world?
- Are they net debtors or net creditors vis-à-vis the rest of the world?
- How have countries' trade balances and international investment positions evolved over time?

Why this matters for monetary policy

A current account deficit is financed by net capital inflows, and these depend on the gap between domestic and international interest rates. The exchange rate is the price that balances these flows. So a country's external position — what it owes the rest of the world, what it is owed, and in which currency — determines how exposed it is to movements in the exchange rate and in world interest rates, that is, how much room its central bank has to move. We will measure it with one number, the NIIP.

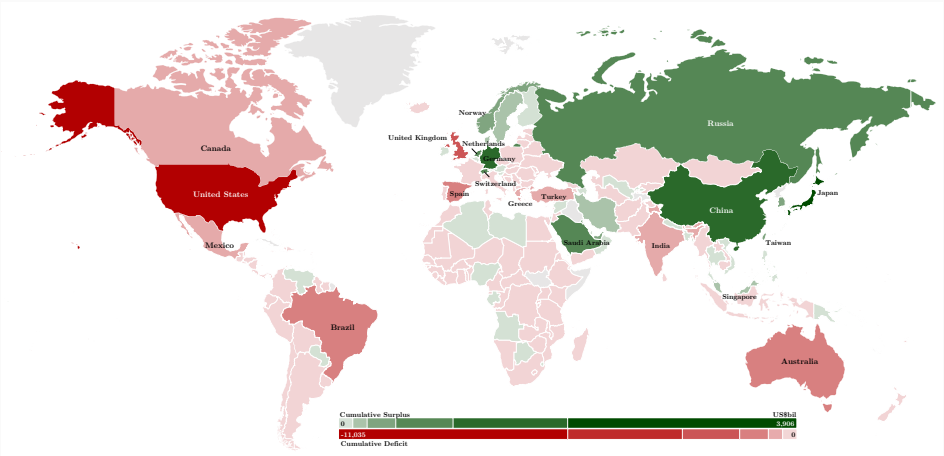
Overview

Today our focus is mainly descriptive. Later in the course we move to questions of positive analysis:

- Why do some countries run trade deficits in some years and trade surpluses in others?
- Why do countries borrow from abroad?
- Can countries borrow from abroad indefinitely?
- What determines the size of a country's external debt?

Geography

Cumulative Current Account Balances, 1980–2017



Billions of US dollars. Sum of current account balances 1980–2017; grey = no data. Labels mark the ten largest cumulative surpluses and deficits.

How to Read the Map

The map colours the cumulative current account balances between 1980 and 2017.

- Roughly, the current account is the difference between exports and imports of goods, services and factor income.
- A country's current account in a given year is approximately equal to the change in its net external debt (with the opposite sign): what it owes the rest of the world minus what it is owed.
- So summing current account balances from 1980 to 2017 gives the change in external debt over that period.

- Largest cumulative deficit (deepest red): the United States, \$11.0 trillion.
- Financing these deficits (deepest green): Japan (\$3.9 trillion), China (\$3.3 trillion), Germany (\$3.3 trillion) and the oil and gas exporters (OPEC members, Russia, Norway).

If all countries were in balance, the map would be almost white. Instead it is mostly fiery red or deep green: large global imbalances.

Balance of Payments

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 parts:

1. the current account (CA)
2. the financial account
3. the capital account — quantitatively negligible

We present each part in turn.

The Current Account

The current account (CA) is the sum of three accounts:

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

The Financial Account

The financial account records transactions in assets between residents and non-residents: foreign direct investment, portfolio investment (equity and bonds), other investment (loans, deposits) and changes in official reserves.

The balance-of-payments identity

$$\text{current account} + \text{capital account} = \text{financial account}$$

- The CA measures how much a country borrows from the rest of the world; the financial account measures how: by selling bonds, equity, real estate or firms, by taking out loans, or by running down reserves. Two sides of the same transaction.
- The capital account is the third, small part: capital transfers (debt forgiveness, investment grants) and non-produced non-financial assets. For the US it is almost zero, which is why we loosely say that the current account deficit is the net capital inflow; for Greece it is not, because of EU funds.
- The identity holds by definition, but not in the measured data: the two sides are collected from different sources (customs, surveys, bank data) and never add up exactly. The difference is the statistical discrepancy — and it is itself a signal of data quality: when it is large and persistently of the same sign, it usually hides unrecorded capital flows.

TB and CA

The Trade Balance

A key item in the ITA is the trade balance (TB), which measures the difference between exports of goods and services and imports of goods and services:

$$\begin{aligned} \text{Merchandise Trade Balance} &= \text{Exports of Goods} - \text{Imports of Goods} \\ \text{Service Balance} &= \text{Exports of Services} - \text{Imports of Services} \\ \text{Trade Balance} &= \text{Goods Balance} + \text{Service Balance} \end{aligned}$$

- Internationally traded goods: textiles, oil, cars, wheat.
- Internationally traded services: travel and tourism, education, medical care, consulting.

An export does not have to travel

A foreign tourist spending on hotels, restaurants and museums in Greece is a Greek export of services: the consumer comes to the producer.

Where the Data Come From

- United States — BEA (*bea.gov*), International Transactions Accounts:
  - ITA Table 1.1 — US international transactions (main accounts)
  - ITA Table 3.1 — international trade in services, by type
  - IIP Table 1.1 — international investment position
  - NIPA Table 1.1.5 — GDP, for normalisation
- EU and euro area — Eurostat (*ec.europa.eu/eurostat*), BPM6 basis:
  - *bop_6* — balance of payments, international transactions
  - *bop_its6_det* — international trade in services, detailed
  - *bop_its6_tot* — total services, by partner country
- Euro area — ECB Data Portal (*data.ecb.europa.eu*): euro-area balance of payments and international investment position.
- Cross-country — IMF (*data.imf.org*): Balance of Payments and International Investment Position statistics; World Economic Outlook for GDP and forecasts.

See it live: IMF DataMapper: current account balance, % of GDP — click for the interactive world map.

The US 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, the country runs a trade deficit.

Is \$0.7 trillion a large or a small amount? We compare it with the size of the economy. In 2020 GDP was \$20.9 trillion. Denoting the trade balance by TB,

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

so the trade deficit was 3 percent of GDP.

We will soon see how accumulating deficits of this size — or even smaller — turned the US from a creditor in the 1980s into the world's largest debtor.

See it live: IMF DataMapper: current account balance, % of GDP

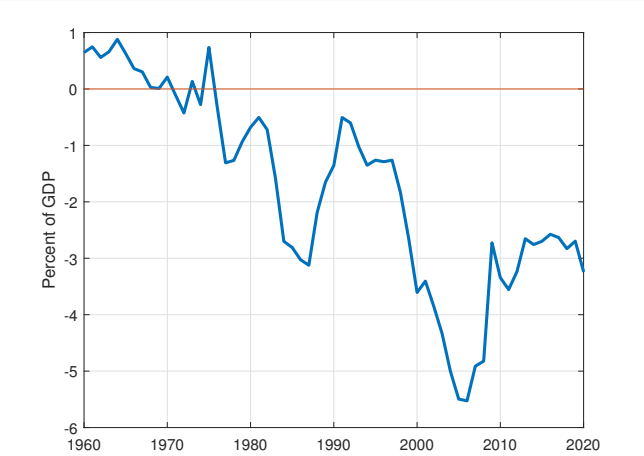
The US Trade Balance over Time

Is the 2020 deficit typical?

- The trade balance deteriorated steadily, from a surplus of about 3/4 of a percentage point of GDP to −6 percent by the onset of the 2007–2009 global financial crisis.
- The crisis appears to have halted the downward trend.
- In fact the crisis came with an improvement in the trade balance, to around −3 percent of GDP.
- A deficit of this size has persisted since.

So the 3 percent deficit of 2020 is typical of the last decade.
See it live: Trade Balance: Goods and Services, Balance of Payments Basis (BOPGSTB), U.S. Census Bureau and U.S. Bureau of Economic Analysis: click for the interactive data browser.

The US Trade Balance as a Percent of GDP, 1960–2020



Percent of GDP. Source: BEA — trade balance, ITA Table 1.1; GDP, NIPA Table 1.1.5.

The Income Balance

The second component of the current account is the income balance, which measures the difference between factor income received from the rest of the world and factor income paid to it. Net income is recorded separately for capital and labour.

- Net income from capital is Net Investment Income (NII): dividends, interest, profits.
- Net income from labour is Net International Payments to Employees: compensation of US residents working temporarily abroad and of foreigners working temporarily in the US.

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

In the US, net international payments to employees have historically been small and quantitatively negligible.

Net Unilateral Transfers

The third component of the current account is Net Unilateral Transfers, which record the difference between gifts received from the rest of the world and gifts given to it. These gifts may involve private individuals or governments.

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

Net unilateral transfers are negative in most years, because the US gives more gifts than it receives:

- US residents sending remittances to relatives abroad (personal remittances);
- the US government giving aid to foreign countries, or US citizens receiving social security pensions while living in the EU (government transfers).

The Current Account: 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 CA matters because, ceteris paribus:

- CA negative $\Rightarrow$ net external debt increases
- CA positive $\Rightarrow$ net external debt decreases.

The CA is a flow: how much we borrow from the rest of the world this year. Net external debt is a stock: what we owe right now, the accumulation of all past flows.

The US Current Account in 2020

Item	Billions of dollars	Percent 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

Source: BEA — ITA Tables 1.1 and 5.1; NIPA Table 1.1.5.

Observations on the US CA in 2020

- In 2020 the US ran a large current account deficit.
- Most of the deficit comes from a large trade deficit.
- A deficit in goods and a surplus in services: the US imports manufactured goods (mobile phones, computers, car parts) and exports human-capital-intensive services (higher education, research and development, health, consulting). This is the typical pattern, and 2020 was no exception.

Observations on the US CA in 2020 (continued)

- Net investment income is positive: US residents' investments in foreign assets yielded more interest, dividends and profits than foreigners' investments in US assets.
  - Net international payments to employees were negative but small.
- Net unilateral transfers were negative: the US gave more to the rest of the world than it received. These are mainly personal remittances by immigrants in the US to relatives abroad.

Keep this in mind

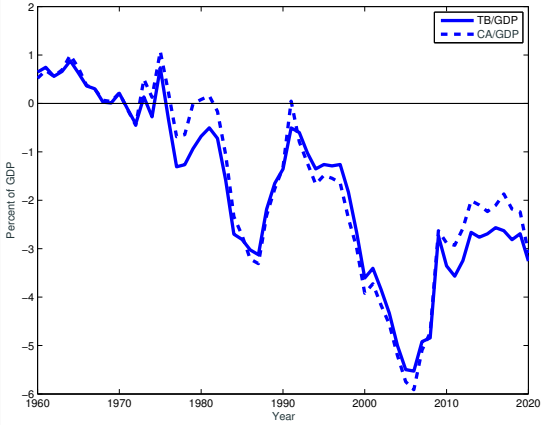
A negative net international investment position together with positive net investment income is a paradox. We return to it at the end of the lecture.

TB and CA Move Together

In 2020, most of the US CA was the trade balance.

The next chart shows that this is almost always true: in the US, the trade balance and the current account are of similar size and move together over time.

US TB and CA, 1960–2020



Percent of GDP. TB and CA denote the trade balance and the current account. Source: BEA — ITA Table 1.1; NIPA Table 1.1.5.

The Euro Area CA in 2020

Item	Billions of euros	Percent of GDP
Current Account	248	2.2
Trade Balance	379	3.4
Balance on Goods	343	3.0
Balance on Services	36	0.3
Primary Income	28	0.2
Secondary Income	−159	−1.4

Euro area (transactions with non-euro-area countries only), twelve months to December 2020. Euro amounts: ECB, euro-area balance of payments. Percent of GDP: own calculation. In BPM6 terminology, primary income is the income balance and secondary income is net unilateral transfers. Components may not add up exactly due to rounding.

Observations on the Euro Area CA in 2020

- The euro area ran a large current account surplus — the mirror image of the US.
- The surplus comes from goods, not services. The US has a deficit in goods and a surplus in services; the euro area has a surplus in both, and the goods surplus does almost all the work.
- Primary income (the income balance) is small and positive.
- Secondary income is strongly negative, -1.4 percent of GDP — twice the US figure in relative terms. It reflects contributions to the EU budget, development aid and migrant workers' remittances.

A Caution on Euro Area Figures

Which transactions count?

These are transactions with non-euro-area countries only. German exports to France are not euro-area exports — they net out within the aggregate, just as trade between Texas and California nets out within the US.

So the question "what is the relevant economic unit?" has already been answered by the statisticians, and the answer is the currency area, not the country.

Note: the figures refer to the euro area (not the EU), which in 2020 comprised 19 countries (EA19); Croatia joined in 2023 and Bulgaria in 2026.

Extra-euro-area only: transactions between euro-area members are removed from the total, so a country joining mechanically reduces measured exports and imports. The headline series use changing composition; fixed-composition series are also published.

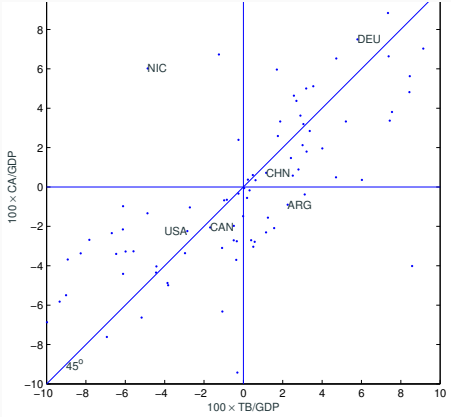
By Country

TB and CA by Country

The next chart plots the trade balance and the current account as shares of GDP, TB/GDP and CA/GDP, for 82 countries in 2019. Each dot is a country.

Most dots lie close to the 45-degree line. This clustering suggests that, as in the US, in many countries the trade balance is the dominant component of the current account.

TB and CA by Country, 2019



82 countries, percent of GDP; ISO country codes. Countries with balances beyond ±10 percent of GDP are excluded. Source: World Development Indicators.

Every Sign Combination Is Possible

The chart also shows that the CA and the TB need not have the same sign, and that the CA can be larger or smaller than the TB.

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

Percent of GDP, 2019. Sources: World Development Indicators; IMF Balance of Payments and International Investment Position dataset.

Observations on the Table

Recall that CA = TB + Income Balance + Net Unilateral Transfers. So the CA can lie above or below the TB — or have the opposite sign.

- Germany — the textbook creditor. $5.7 + 3.2 - 1.4 = 7.5$, so $\frac{\text{CA}}{\text{GDP}} > \frac{\text{TB}}{\text{GDP}} > 0$.
  A large trade surplus, plus income on the foreign assets bought with past surpluses. Both push the CA up.
- China — a creditor that pays investment income. $0.9 - 0.3 + 0.1 = 0.7$, so $\frac{\text{TB}}{\text{GDP}} > \frac{\text{CA}}{\text{GDP}} > 0$.
  China holds more abroad than foreigners hold in China — and yet it pays out more investment income than it receives. Its foreign assets are low-yield (reserves, US Treasuries); its liabilities are high-yield (foreign firms operating in China). A paradox we return to at the end.
- Nicaragua — a trade deficit paid for by its emigrants. $-4.3 - 3.7 + 14.0 = 6.0$, so $\frac{\text{CA}}{\text{GDP}} > 0 > \frac{\text{TB}}{\text{GDP}}$.
  Remittances worth 14 percent of GDP, mainly from the US, turn a trade deficit into a current account surplus.

Observations on the Table (continued)

- Argentina — a debtor whose interest payments swallow the trade surplus. $2.9 - 4.0 + 0.2 = -0.9$, so $\frac{\text{CA}}{\text{GDP}} < 0 < \frac{\text{TB}}{\text{GDP}}$.
  Argentina sells more goods and services than it buys, but it is a large net debtor, so interest and profit payments to foreigners more than wipe out the trade surplus. The exact opposite of China.

- Canada — cross-border workers, not capital. $-1.6 - 0.3 - 0.1 \approx -2.1$, so $\frac{\text{CA}}{\text{GDP}} < \frac{\text{TB}}{\text{GDP}} < 0$.
  A trade deficit made slightly worse by a negative income balance — here mainly wages paid by Canadian residents to US residents who cross the border to work.

The pattern to keep

The composition of the current account tells you what kind of economy you are looking at: a mature creditor living partly off its assets, a debtor servicing its debt, or a country that exports labour rather than goods.

Components may not add up exactly due to rounding.

Three Euro Area Members, 2019

The same identity, the same year — within a single monetary union.
Recall that CA = TB + Income Balance + Net Unilateral Transfers.

- Greece — a goods deficit paid for by tourism and shipping. $-0.9 - 0.9 + 0.3 = -1.5$, so $\frac{\text{CA}}{\text{GDP}} < \frac{\text{TB}}{\text{GDP}} < 0$.
  The trade balance looks mild, but it hides a huge offset: goods -12.3 against services $+11.4$. Tourism and shipping recover almost everything Greece spends on imported goods.
- France — income from abroad turns a trade deficit into a surplus. $-0.6 + 3.0 - 1.9 \approx 0.6$, so $\frac{\text{CA}}{\text{GDP}} > 0 > \frac{\text{TB}}{\text{GDP}}$.
  Nicaragua's sign pattern for the opposite reason: France receives 3.0 percent of GDP in net investment income from abroad, while paying 1.9 percent in transfers (EU budget, aid, remittances).
- Italy — the two income balances cancel out. $3.2 + 0.8 - 0.8 = 3.2$, so $\frac{\text{CA}}{\text{GDP}} \approx \frac{\text{TB}}{\text{GDP}} > 0$.
  Primary and secondary income offset each other almost exactly, so the CA simply is the TB. And, unlike Greece, Italy's services balance is essentially zero — a goods surplus does all the work.

Percent of GDP, 2019, partner = rest of the world. Source: Eurostat, *bop_gdp6_q* (BPM6), accessed September 2026. Components may not add up exactly due to rounding.

Imbalances in US–China Trade

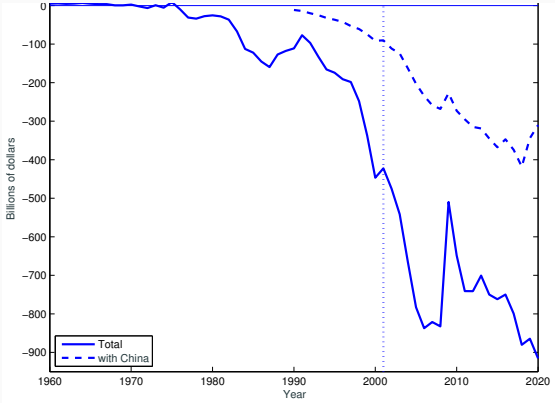
A large part of the US goods deficit is accounted for by trade with China.

- The share of the US goods deficit due to deficits with China widened steadily after China joined the World Trade Organization (WTO) in 2001 — from about 20 percent in 2000 to almost 50 percent by 2015.
- Towards the end of the sample the bilateral deficit fell considerably: in 2020 it accounted for 34 percent of the total US goods deficit.

Two candidate explanations for the decline:

1. more trade triangulation after the import tariffs imposed from 2018 onwards
2. the COVID-19 pandemic.

The US–China Goods Balance, 1990–2020



Billions of dollars. The vertical line marks 2001, the year China joined the WTO. Sources: BEA ITA Tables 1.1 and 1.3; OECD (*stats.oecd.org*) for 1990–2002.

What Happened after the Chart Ends

- The decline did not last. The bilateral deficit bounced back at once — $308 billion in 2020, $353 billion in 2021, $382 billion in 2022, close to the 2018 peak of $418 billion. The turn at the right end of the chart was mainly a COVID effect.
- Then it fell in earnest. $280 billion in 2023, $297 billion in 2024 and $203 billion in 2025 — a drop of almost a third in a single year. The first seven months of 2026 ran lower still.
- And yet the US deficit did not shrink. In the same year that the deficit with China fell by $94 billion, the total US goods deficit rose by $25 billion, to $1,241 billion. Goods and services together: $901.5 billion, against $903.5 billion in 2024 — essentially unchanged.
- It moved. Since 2018 the deficit with Vietnam has grown by about 350 percent, to $178 billion, and the deficit with Taiwan has roughly multiplied by nine. China's share of US imports fell from 21 percent in 2017 to about 9 percent in August 2025 — the share it had when it joined the WTO.

The lesson of the lecture, in two numbers

The bilateral balance improved by $94 billion. The total goods deficit rose.

U.S. Census Bureau (bilateral data); BEA, U.S. International Trade in Goods and Services, Annual 2025 (totals); Alfaro and Chor, VoxEU, January 2026.

Two Trade Wars: 2018 and 2025

- First round, 2018–2020. Jan. 2018 solar panels and washing machines; Mar. 2018 steel 25% and aluminium 10% (Section 232); Jul.–Sep. 2018 the three Section 301 lists against China; May 2019 escalation to 25%; Jan. 2020 the "Phase One" deal.
- Second round, 2025. Feb. 2025 IEEPA tariffs on Canada, Mexico, China; 2 April 2025 "Liberation Day", a 10% baseline tariff plus higher country-specific rates; Apr.–May 2025 escalation with China to 145% and de-escalation in Geneva; Aug. 2025 final rates take effect.
- 20 February 2026: the Supreme Court strikes them down. In Learning Resources v. Trump, 6–3, it holds that IEEPA does not confer tariff authority. Tariffs under Sections 232, 301 and 201 remain in force. Of the $166 billion collected, about $107 billion had been certified for refund by Aug. 2026. The administration rebuilt them under Section 122 (15% for 150 days), 232 and 301.
- Average effective tariff rate: 2.3% in Jan. 2025, 6.7% in Jul. 2026 — China 22.8%, steel and aluminium 40.5%.

Penn Wharton Budget Model, Effective Tariff Rates and Revenues, Sep. 2026; Learning Resources, Inc. v. Trump, 20 February 2026.

What They Did to the Balances

- The bilateral balance moved — both times. The goods deficit with China: a record $419 billion in 2018, $345 billion in 2019, $297 billion in 2024, $203 billion in 2025.
- The total did not follow. In 2018 the total goods deficit rose to a record $891 billion (from $808 billion). In 2025 again: $1,241 billion, up by $25 billion, in the year the China deficit fell by $94 billion. Trade did not disappear, it relocated.
- The CA barely noticed. 2017: $449 billion, 2.3% of GDP. 2018: $489 billion, 2.4%. In 2025 it closed at 3.6%, down from 4.0% in 2024, but with an extreme within-year path: a huge Q1 from front-loaded imports ahead of the tariffs, 2.4% in Q4.
- The NIIP moved a lot — for a different reason. 2018: from −$7.73 to −$9.72 trillion; of the $1.99 trillion deterioration, only $0.52 trillion was transactions and $1.47 trillion was valuation. 2025: from −$26.54 to −$27.54 trillion, with valuation helping by $0.21 trillion.

The lesson

The bilateral balance is a trade-policy choice. The total CA is saving minus investment — and tariffs do not touch it. The NIIP is moved by asset prices, not by container ships.

BEA — ITA Table 1.1, IIP Table 1.1; U.S. Census Bureau for bilateral data. The 2017–18 CA figures are as published at the time.

The World Map of Current Account Balances

If the US runs a large current account deficit, some other countries must run surpluses. Why? Because necessarily

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

where ROW is the rest of the world.

Which countries, then, run the large cumulative surpluses? Looking again at the heat map, the ten largest cumulative current account surpluses over 1980–2017 were, in order:

Japan, China, Germany, Switzerland, the Netherlands, Russia, Saudi Arabia, Taiwan, Norway, Singapore.

NIIP

The Net International Investment Position

A country's net international investment position (NIIP) is the difference between its foreign assets (A) and its foreign liabilities (L):

$$\text{NIIP} = \text{A} - \text{L}.$$

- If NIIP < 0 (A $<$ L), the country is a net debtor to the rest of the world.
- If NIIP > 0 (A $>$ L), the country is a net creditor.

In 2020 the US ran a deficit of \$647.2 billion: to finance it, it must reduce A or increase L, so the deficit reduces the NIIP.

The flow–stock relationship

$$\underbrace{\text{NIIP}_t - \text{NIIP}_{t-1}}_{\text{change in the stock}} = \underbrace{\text{CA}_t}_{\text{the flow}} \qquad \text{equivalently} \qquad \text{NIIP}_t = \text{NIIP}_{t-1} + \text{CA}_t.$$

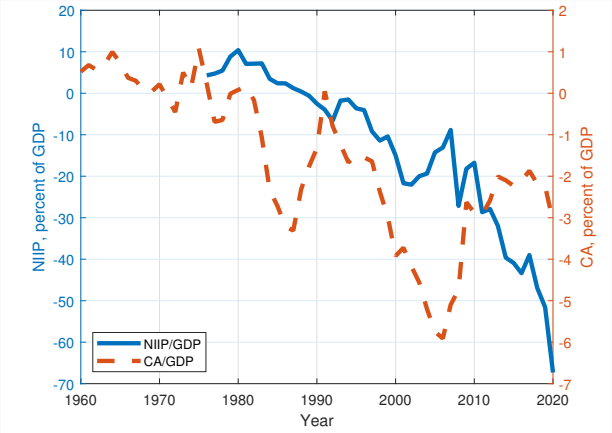
In Part II we write the NIIP as B_t: that is, $\text{B}_t - \text{B}_{t-1} = \text{CA}_t$.

US CA and NIIP: the Story in Six Lines

- The NIIP was positive at the start of the sample (1976).
- The large current account deficits of the 1980s pushed the NIIP into negative territory.
- Even larger deficits followed in the 1990s, and the US ended the decade as the world's largest external debtor.
- Deficits kept widening until the onset of the global financial crisis in 2007, reaching 6 percent of GDP.
- During the crisis the deficits narrowed, while remaining sizeable, at around 3 percent of GDP.
- At the end of 2020 the NIIP stood at −\$14.1 trillion, or −67 percent of GDP.
- And after 2020 it deteriorated rapidly. With current account deficits of around 3–4 percent of GDP and large valuation losses, the NIIP reached about −\$27.5 trillion at the end of 2025, close to −80 percent of GDP — almost doubling in five years.

A natural question — and the subject of Part II — is whether these deficits are sustainable.

US Current Account and Net International Investment Position



Percent of GDP. CA: 1960–2020 (right axis). NIIP: 1976–2020 (left axis). Source: BEA — ITA Table 1.1, IIP Table 1.1, NIPA Table 1.1.5.

US CA and NIIP through 2025

Percent of GDP, 2000–2025. Both the current account and the NIIP deteriorate after 2020. Source: BEA — ITA Table 1.1, IIP Table 1.1, NIPA Table 1.1.5.

Valuation Changes

Look again at the previous chart. Not every year with a negative CA is a year in which the NIIP falls — this is especially visible just before the global financial crisis. In general, changes in the NIIP are not always equal to the current account.

The CA is not the only source of changes in the NIIP. The NIIP also changes when the market value of a country's foreign assets or liabilities changes, because of movements in stock prices, bond prices or exchange rates. These are known as valuation changes.

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

where valuation changes are changes in the market value of the country's foreign asset and liability positions — due to currency appreciation or depreciation, changes in stock prices, and so on.

Example: the Starting Point

- Foreign assets (A): 25 shares of the Italian carmaker Fiat. Each share costs 2 euros. The exchange rate is 2 dollars per euro.

$$\text{A} = 25 \times 2 \times 2 = 100 \text{ dollars.}$$

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- Foreign liabilities (L): 80 US bonds held by foreigners, priced at 1 dollar each.

$$\text{L} = 80 \times 1 = 80 \text{ dollars.}$$

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$$\text{A} = 25 \times 2 \times 2 = 100 \text{ dollars.}$$

- Foreign liabilities (L): 80 US bonds held by foreigners, priced at 1 dollar each.

$$\text{L} = 80 \times 1 = 80 \text{ dollars.}$$

- Therefore

$$\text{NIIP} = \text{A} - \text{L} = 100 - 80 = 20 \text{ dollars.}$$

The country is a net creditor.

Example: the Euro Depreciates

Suppose now that the euro depreciates to 1 dollar per euro.

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

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- $A = 25 \times 2 \times 1 = 50$ dollars.
- $L = 80$ dollars — unchanged, because the US bonds are in dollars.
- $NIIP = A - L = 50 - 80 = -30$ dollars.

Conclusion

Purely because of a change in the exchange rate, the country went from creditor to debtor of the rest of the world.

Example: Foreign Stock Prices Rise

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

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

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- L $= 80$ dollars, unchanged.

Example: Foreign Stock Prices Rise

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

- $A = 25 \times 7 \times 1 = 175$ dollars.
- $L = 80$ dollars, unchanged.
- $NIIP = A - L = 175 - 80 = 95$ dollars.

The country went from net debtor ($-\$30$) to net creditor ($+\$95$) simply because the Italian stock market rose — and independently of any change in the current account.

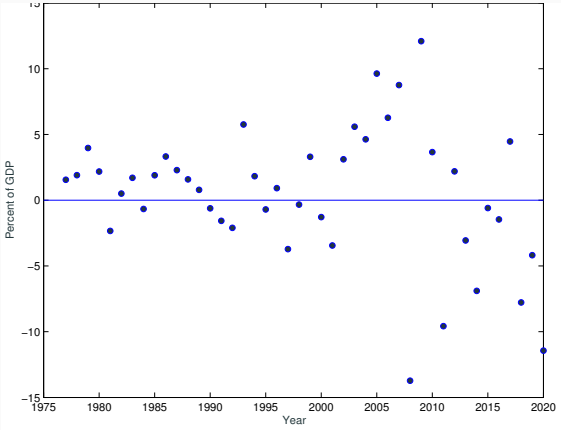
Conclusion

A country's net international investment position can swing widely because of movements in asset prices or exchange rates. This is also true in the actual data, as we see next.

Valuation Changes in the US

- Valuation changes can be large: we have seen changes of up to ±15 percent of GDP. They are also a recent phenomenon — until 2003 the typical change was around ±3 percent of GDP.
- Before the crisis (2002–2007). The cumulative current account deficit was $3.9 trillion (32 percent of GDP), and yet the NIIP improved by $80 billion: valuation gains of almost $4 trillion ($3.98 trillion exactly). Two causes: (i) the dollar depreciated by 20 percent, and US foreign assets are mostly in foreign currency while its liabilities are mostly in dollars; (ii) foreign stock markets outperformed (cumulative return of 190 versus 90 percent), raising the net equity position from $0.04 trillion in 2002 to $3 trillion in 2007.
- After the crisis (2008–2025). The gains stopped abruptly in 2008: valuation changes of −15 percent of GDP, from the collapse of foreign stock markets. Since 2010 the US has suffered mainly valuation losses (−$7.2 trillion by 2020), because US stocks outperform: a rise on Wall Street raises US portfolio equity liabilities, so the net position falls.
- 2020–2025. The pattern intensified: with US stocks strongly outperforming, cumulative valuation losses exceeded the current account deficits, and the NIIP collapsed from −$14.1 trillion to about −$27.5 trillion — valuation, not trade, explains most of it.

Valuation Changes in the US NIIP, 1977–2020



Annual changes in the US net international investment position due to valuation changes, percent of GDP. Source: BEA — ITA Table 1.1, IIP Table 1.1, NIPA Table 1.1.5.

A Hypothetical NIIP without Valuation Changes

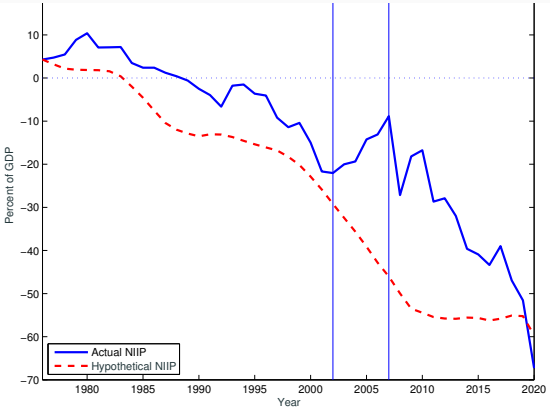
To see the cumulative effect of valuation changes, we compare the actual NIIP with a hypothetical NIIP from which we remove them.

For a given year $t > 1976$, we start from the NIIP of the initial year and add all subsequent current account balances:

$$\text{Hypothetical NIIP}_t = \text{NIIP}_{1976} + \text{CA}_{1977} + \text{CA}_{1978} + \cdots + \text{CA}_t.$$

The next chart plots the actual and the hypothetical position for 1976–2020, as a percent of GDP.

Actual and Hypothetical US NIIP, 1976–2020



Percent of GDP. The hypothetical NIIP is the 1976 NIIP plus the cumulative sum of current account balances from 1977 onwards. The vertical lines mark 2002 and 2007. Source: BEA — IIP Table 1.1, ITA Table 1.1, NIPA Table 1.1.5.

Observations on the Hypothetical NIIP

- Until 2002 the actual and the hypothetical NIIP did not differ much ⇒ valuation changes were small.
- From 2002 the hypothetical NIIP falls faster, while the actual one rises ⇒ large valuation gains. Without this good luck, the 2007 NIIP would have been −46 percent of GDP instead of the actual −9 percent.
- After the crisis US stock markets outperformed, leading to valuation losses and closing the gap: by 2019 it had shrunk to 4 percent of GDP, similar to the level before the "euphoric" five years of 2002–2007. During the pandemic valuation losses reached 11.4 percent of GDP.
- In 2020 the hypothetical NIIP fell below the actual one, meaning that since 1976 the US has suffered a cumulative valuation loss.

This calls into question the view that the US benefits, on average, from positive valuation changes.

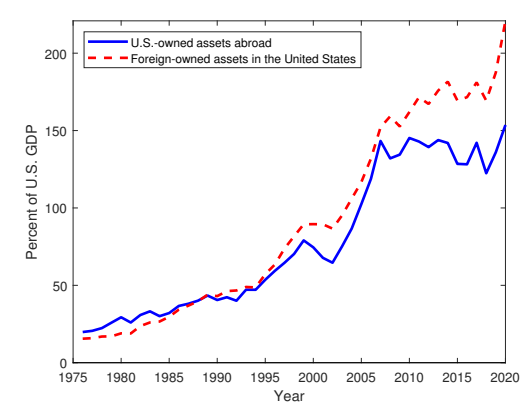
Gross Positions and Valuation Changes

Gross positions — foreign assets and foreign liabilities — have expanded dramatically since the 2000s. This is one reason why valuation changes have become so large in absolute size.

A simple example

- In country x, A = L = 1; in country y, A = L = 1000.
- GDP is 100 in both countries. So in both, NIIP = 0 percent of GDP.
- Suppose now that the value of foreign assets A rises by 10 percent in both.
- The NIIP goes from 0 to 0.1 in country x and from 0 to 100 in country y.
- That is, the NIIP rises to 0.1 percent of GDP in x and to 100 percent of GDP in y.

US Assets Abroad and Foreign Assets in the US



Percent of US GDP, 1976–2020. Gross positions in foreign assets and in foreign liabilities have grown sharply since the mid-1990s. Source: BEA — IIP Table 1.1, NIPA Table 1.1.5.

NII Paradox

A Paradox

Suppose you carry an unpaid balance on your credit card. Would you expect to receive interest from the card company, or to pay interest to it?

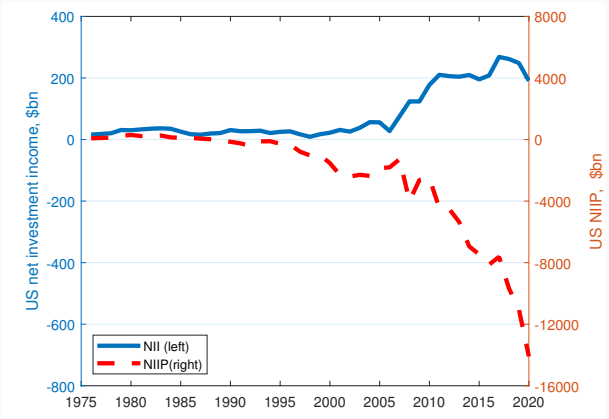
Most likely the latter.

Well — that is not what happens with the US. Although it is the world's largest external debtor, it receives investment income from the rest of the world: NII > 0.

How can this be? Two proposed explanations:

1. Dark matter
2. Return differentials

NII and NIIP, US 1976–2020



Solid line: net investment income (NII), income receipts on US assets abroad minus income payments on foreign assets in the US (left scale, $ billion). Dashed line: net international investment position, A − L (right scale, $ billion). Source: BEA — IIP Table 1.1, ITA Table 1.1.

Explanation I: Dark Matter

The dark matter hypothesis holds that the US net international investment position is in fact positive, but the statistical agency does not fully record it: US direct investment abroad embodies intangible capital — entrepreneurial capital, reputational capital — whose value is not properly captured in the official balance of payments. The income this intangible capital generates, however, is recorded.

Notation: TNIIP = the "true" net international investment position; NIIP = the observed position (−\$11.1 trillion at the start of 2020); NII = net investment income (\$0.1909 trillion in 2020). NII is the return on the true position; with r the capitalisation rate,

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

for r = 5 percent per year. Dark matter is the gap between the true and the recorded position:

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

Dark Matter: Is It Plausible?

According to the dark matter hypothesis, then, in 2020 the US did not owe $11.1 trillion to the rest of the world. On the contrary — the rest of the world owed $3.8 trillion to the US.

$14.9 trillion of dark matter looks like far too large an amount to go unnoticed by the statistical agency (and by the tax authority!).

A note on r: it is not an observed quantity. It is the rate at which we capitalise the income flow to find the stock of wealth that generates it. The choice of r drives the result: a lower r means more dark matter. This is also the main weakness of the argument.

Explanation II: Return Differentials

This explanation stems from the composition of the two sides of the balance sheet:

- the US gross international position in assets consists mainly of risky, high-yield assets — foreign equity and foreign direct investment;
- the US gross international position in liabilities consists mainly of safe, low-yield assets — US government bonds and Treasury bills.

This observation is known as the exorbitant privilege.

Let r^A be the return on A and r^L the return on L. How large must the difference $r^A - r^L$ be to explain the paradox? We start from $NII = r^A A - r^L L$. In 2020: A = \$32.2 trillion, L = \$46.3 trillion, NII = \$0.1909 trillion, and the average real return on US Treasury bills — our proxy for r^L — was 0.37 percent per year. Solving for r^A:

$$r^A = \frac{NII + r^L L}{A} = \frac{0.1909 + 0.0037 \times 46.3}{32.2} = 0.0112 \quad \Longrightarrow \quad r^A - r^L = 0.75 \text{ percent per year}.$$

This does not look like an excessive premium.

Return Differentials: Refining the Calculation

The analysis so far assumes that foreign investors hold only US bonds. This was a good simplification until about 2010. Since then the ratio of equity to bonds in US foreign liabilities has been close to 1 — roughly half and half.

Suppose the return on equity is the same inside and outside the US. Then $r^L = \frac{1}{2}\left(r^A + r^B\right)$ with $r^B = 0.0037$ as before, and

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

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$$\mathrm{NII} = \mathrm{r}^{\mathrm{A}}\mathrm{A} - \tfrac{1}{2}\left(\mathrm{r}^{\mathrm{A}} + \mathrm{r}^{\mathrm{B}}\right)\mathrm{L}.$$

With the actual numbers,

$$0.1909 = \mathrm{r}^{\mathrm{A}} \times 32.2 - \tfrac{1}{2}\left(\mathrm{r}^{\mathrm{A}} + 0.0037\right) \times 46.3 \quad \Longrightarrow \quad \mathrm{r}^{\mathrm{A}} = 3.06\%,$$

so the implied equity premium over government bonds is $\mathrm{r}^{\mathrm{A}} - \mathrm{r}^{\mathrm{B}} = 3.06\% - 0.37\% = 2.69$ percent — more plausible.

The Other Side of the Paradox

We split the world into two groups, the US (US) and the rest of the world (RW). The rest of the world must display the inverted paradox — a positive net foreign asset position and negative net investment income. Indeed,

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

and

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

Let us look at China. Why China?

1. China has accumulated large current account surpluses over the last quarter century, so it is a likely candidate for a positive NIIP.
2. In 2019 its net investment income was negative — the telltale sign.

The Other Side: China

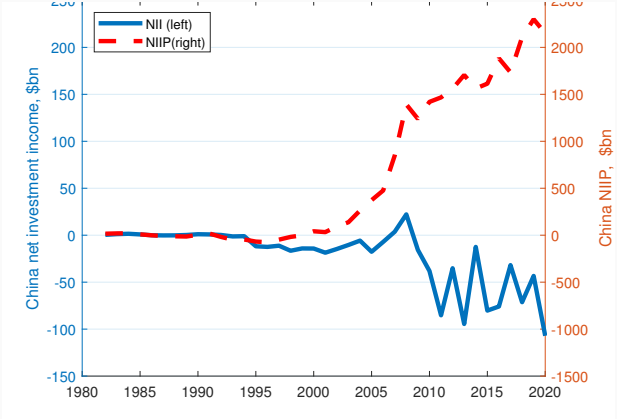
- Before joining the WTO in 2001, China's NIIP was close to zero; since then it has grown rapidly, reaching \$2.2 trillion by 2020.
- Net investment income was close to zero before 2001 and has since been mostly negative, fluctuating around −\$50 billion.

So China displays the inverted paradox: a positive NIIP and a negative NII.

A possible explanation

China saves mainly in safe, low-yield assets, such as US government securities, while its foreign liabilities are mainly high-yield items, such as foreign direct investment.

NII and NIIP, China 1982–2020



NII (left scale, $ billion) and NIIP (right scale, $ billion). Since joining the WTO in 2001 — except in the crisis years 2007 and 2008 — China has recorded a positive NIIP and a negative NII. Sources: IMF International Financial Statistics; Lane and Milesi-Ferretti for the NIIP, 1982–2017.

Summary

Summary (1/3)

- Worldwide, the distribution of external debts and credits is not even. Some countries, such as the US, are large net external debtors; others, such as Germany, Japan and China, are large net external creditors. This pattern is known as global imbalances.
- The balance of payments records a country's international transactions and has three accounts:
  - the current account, which records transactions in goods, services, income and unilateral transfers between residents and non-residents;
  - the financial account, which records transactions in financial assets between residents and non-residents;
  - the capital account, quantitatively negligible.
- The current account has three components: the trade balance, the income balance and net unilateral transfers.

Summary (2/3)

- For most countries, including the US, the trade balance is the largest component of the current account.
- In the US the TB and the CA move closely together over time.
- The US has run large current account deficits since the early 1980s.
- Current account deficits worsen a country's NIIP, the difference between its position in foreign assets and its position in foreign liabilities.
- Because of its large deficits, the US went from net external creditor in the early 1980s to the world's largest net external debtor by the late 1990s.
- A second source of changes in the NIIP is valuation changes, which arise from changes in exchange rates and in the prices of the financial instruments that make up the country's asset and liability positions.

Summary (3/3)

- In the US, valuation changes became large in the early 2000s, reaching ±15 percent of GDP in a single year. They were mostly positive between 2001 and 2010 and mostly negative between 2011 and 2020. On net, from 1976 to 2020, positive and negative valuation changes roughly cancelled out.
- The NIIP–NII paradox refers to the fact that the US has a negative net international investment position, NIIP < 0, and positive net investment income, NII > 0.
- Two interpretations try to explain it: the dark matter hypothesis and the return differential hypothesis.
- The US paradox must have an inverted counterpart in the rest of the world. China has had a positive NIIP and a negative NII since the 2000s, so it displays the inverted paradox.

Current Account Sustainability

Can a country borrow from abroad indefinitely?