Macroeconomics B, EI060

Class 1

Introduction to open economy macro

Cédric Tille

February 19, 2025

What you will get from today class

- Presentation of the course, and some logistics.
- Understanding the Balance of Payments.
  - Flows: current account and financial accounts, with examples.
  - Stocks: international investment position, valuation effects.
  - Relation with national accounts.
- Some open economy stylized facts.
  - Evolution of capital flows.
  - Global imbalances, "exhorbitant privilege".
  - Exchange rates: nominal and real.
  - Crises

Purpose of the course

- Second of the two-course macroeconomics MIS sequence, foundations of open economy macroeconomics.
- Core themes in an open economy setting.
  - Electives macro courses focus on selected issues (e.g. financial crises).
- Two aims, with a mix of intuition and tools.
  - Gain an overview of the main issues in macroeconomics.
  - Become familiar with the standard analytical tools (dry, but necessary).

The logistics

- Instructor: Cédric Tille, cedric.tille@graduateinstitute.ch
  - Office hours: Tuesday, 16:00-17:30 (email me if you need to meet at another time). **DO** make use of the office hours.
- Assistant: Joshua Ostry, joshua.ostry@graduateinstitute.ch, weekly review session.
- Before each course documents are posted on the Moodle course page:
  - Slides.
  - Technical appendixes as needed. For your reference, you **don't** need to go through it in details.
  - Quiz for self-evaluation of economic intuition, with answers posted shortly after.
  - Short problems for self-evaluation, focused on technical derivations to get you used to them in preparation of problem sets.

Grading

- Two problem sets, focused on technical aspects. Each counts for 15 % of the grade.
  - First given on March 5, due on March 19.
  - Second given on April 16, due on May 7.
  - You can work in groups of up to 3-4 people. But each person submits their own answers sheet, indicating also the names of the other members of the group.

- One midterm exam and one final exam, focused on intuition (with some light technicalities). Each counts for 35 % of the grade.
  - Midterm exam on April 9.
  - Final exam on May 21, with question - answer session before.

Adjustment of time slots

- To limit overlaps of problem sets and exams among micro / macro / econometrics, we moved the schedule around.

Macroeconomics, Cédric Tille. Slot (unless indicated otherwise): Wednesday 10:15-12:00 room
Microeconomics, Dominicc Rohner. Slot (unless indicated otherwise): Tuesday, 10:15-12:00
Econometrics, Marki Mlikota. Slot (unless indicated otherwise): Monday 10:15-12:00

	Week of	Monday	Tuesday	Wednesday	Thursday	Friday
1	Feb 17 - 21	Econometrics class 1	Microeconomics class 1	Macroeconomics class 1		
2	Feb 24 - Mar 28	Econometrics class 2	Microeconomics class 2	Macroeconomics class 2	PS1 given	
3	Mar 3 -7	Econometrics class 3	Microeconomics class 3	Macroeconomics class 3 PS1 given		PS1 due (Sunday)
4	Mar 10 - 14	Econometrics class 4	Microeconomics class 4 PS1 solutions given	Macroeconomics class 4	PS2 given	
5	Mar 17 - 21	Econometrics class 5 Econometrics class 6 (*)	Microeconomics class 5	Macroeconomics class 5 PS1 due	PS3 given	PS2 due (Sunday)
6	Mar 24 - 28		Microeconomics class 6	Macroeconomics class 6		PS3 due (Sunday)
7	Mar 31 - Apr 4		Micro **midterm exam**	Macroeconomics class 7		
8	Apr 7 - 11	Econometrics **midterm exam**	Microeconomics class 7	Macro **miderm exam**		
9	Apr 14 - 18	Econometrics class 7	Microeconomics class 8	Macroeconomics class 8 PS2 given		
	Apr 21 - 25		Easter break			
10	April 28- May 2	Econometrics class 8		Macroeconomics class 9	PS 4 given	
11	May 5 - 9	Econometrics class 9	Microeconomics class 9	Macroeconomics class 10 PS 2 due		PS4 due (Sunday)
12	May 12 - 16	Econometrics class 10 Econometrics class 11 (*)	Microeconomics class 10 PS2 2 solutions given	Macroeconomics class 11	PS 5 given	
13	May 19 - 23		Microeconomics class 11	Macro **final exam**		PS5 due (Sunday)
14	May 26 - 30	Econometrics **final exam**		Microeconomics **final exam** (macro class slot)		

(*) class during review session time

PS: problem set

Plan of the course

- Concepts of balance of payments, stylized facts (Feb. 20).
- Real economy models.
  - Intertemporal approach of the current account (Feb. 27).
  - Relative prices (Mar. 5).
- Financial markets in open economies
  - Uncertainty (Mar. 12).
  - Friction (Mar. 19).
- Exchange rates and flexible prices.
  - Exchange rate determinations (Mar. 26).
  - Crises (Apr. 9).
- Exchange rate and real allocation under sticky prices.
  - Simple Mundell-Flemming model, exchange rate volatility (Apr. 16).
  - Micro-founded model and policy (Apr, 30).
  - Optimal policy, and financial accelerator (May 7).
- Policy trilemma (May 14).

BALANCE OF PAYMENTS : FLOWS

Structure of the Balance of Payments (BoP)

- Summarizes the interactions between a country and the rest of the world.
  - How do we earn / earn money with other countries: the current account.
  - How does money circulate between us and the rest of the world (financial account).
  - Flows without counterpart (capital account).
- Residency based concepts (as is GDP): an entity located in a country is part of it. Example: the Geneva affiliate of a French bank is a Swiss resident.
  - Growing body of research on nationality based (as is GNP). The bank in the example is a French entity.
- Data are imprecisely measured, leading to statistical errors.
  - Within a country (accounts that should add up to zero don't), for instance due do financial flows not seen by the statisticians.
  - Across countries (sum across countries is not zero).

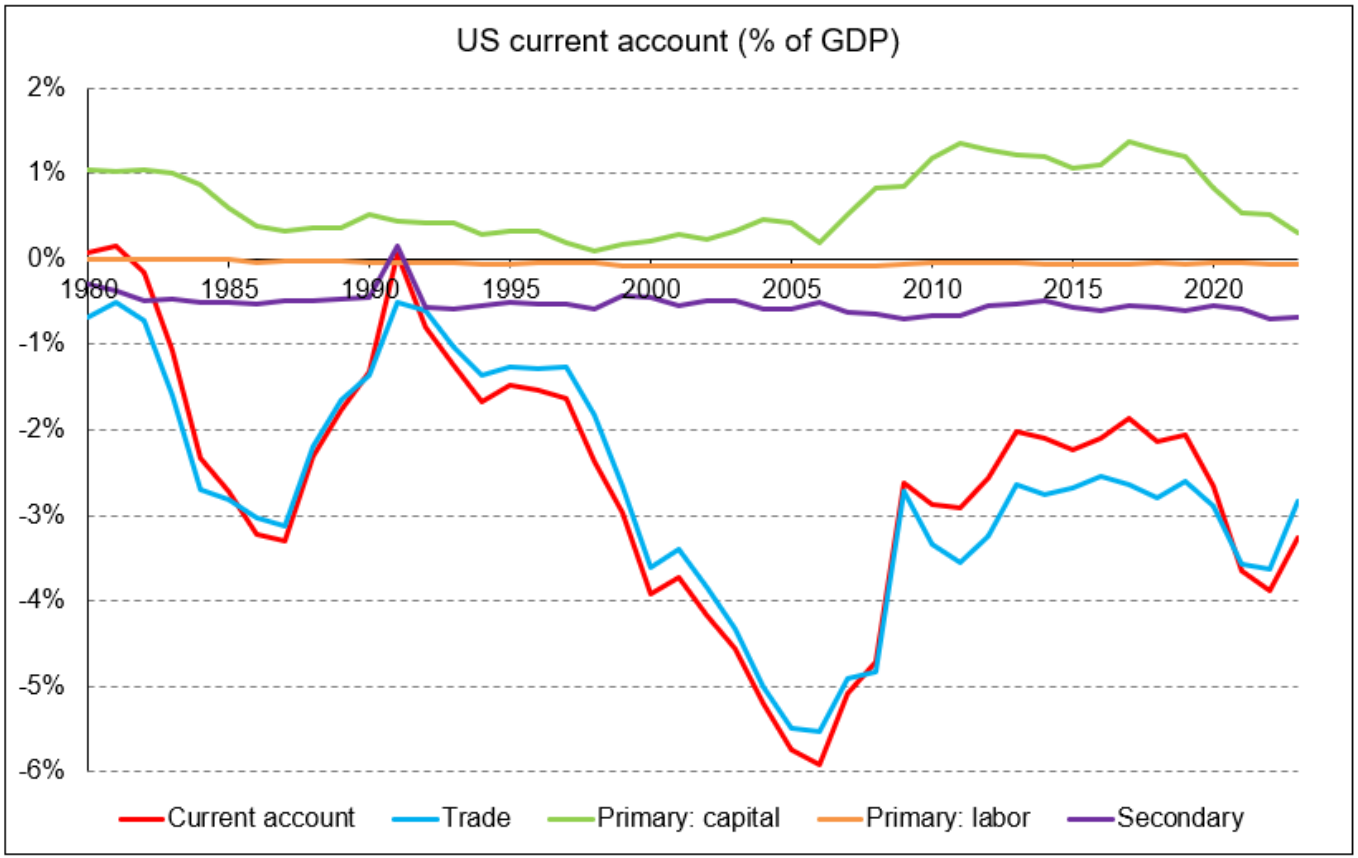
The current account

- We earn money by selling and buying from the world: trade.
- Earnings associated with investments abroad: interest and dividends ("primary account").
  - Also labor income of people living in the country by working abroad.
- Transfers, remittance from expatriates working and living abroad ("secondary account").

US 2023 (% GDP)	
Current account total	-3.27
Trade	-2.83
Primary: investment	0.31
Primary: labor	-0.07
Secondary	-0.68

Historical evolution

- Widening deficit in the 1980's, and more pronounced and persistent since the late 1990's.
- Driven by trade deficit. Surplus on primary investment income, since late 2000's (but back to zero in 2024).



Relevance of primary income

- While we often focus on trade, primary income can play a large role.
- For many countries, the primary income balance is larger than the trade balance.

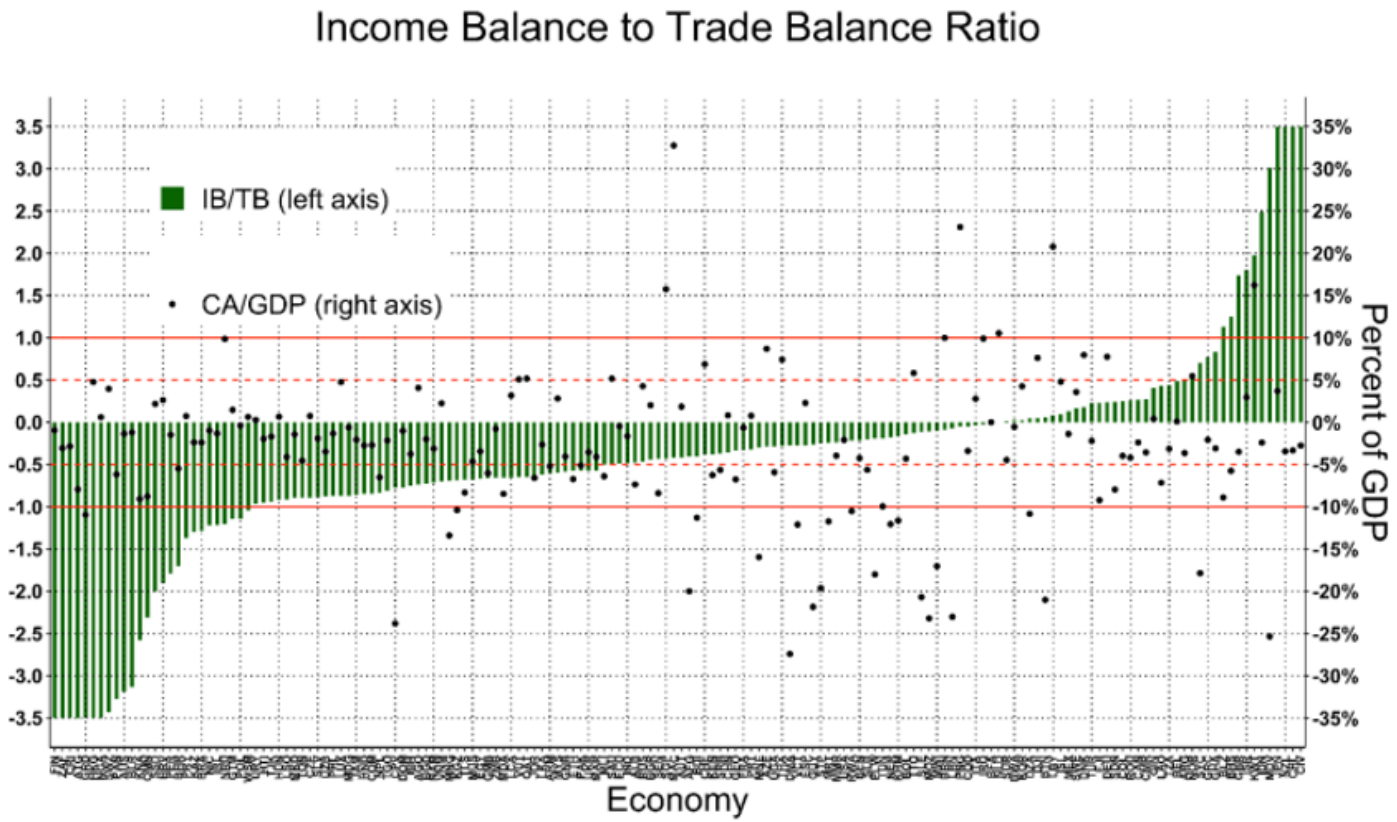


Figure I-1: The ratio of IB to TB, the average of the 2017 to 2019 period. The solid red lines show +/- 1.0 ratios, and the dashed red lines are +/- 0.5 ratios. We have winsorized values at +/- 3.5.

Behar, Alberto, and Ramin Hassan (2022). "The Current Account Income Balance: External Adjustment Channel or Vulnerability Amplifier?", IMF working paper 22/106
https://www.imf.org/en/Publications/WP/Issues/2022/05/30/The-Current-Account-Income-Balance-External-Adjustment-Channel-or-Vulnerability-Amplifier-518456

Secondary income

- For most countries it is a small component.
- Many countries, especially poorer ones, have large expatriate populations, and secondary income is a large source of revenue.

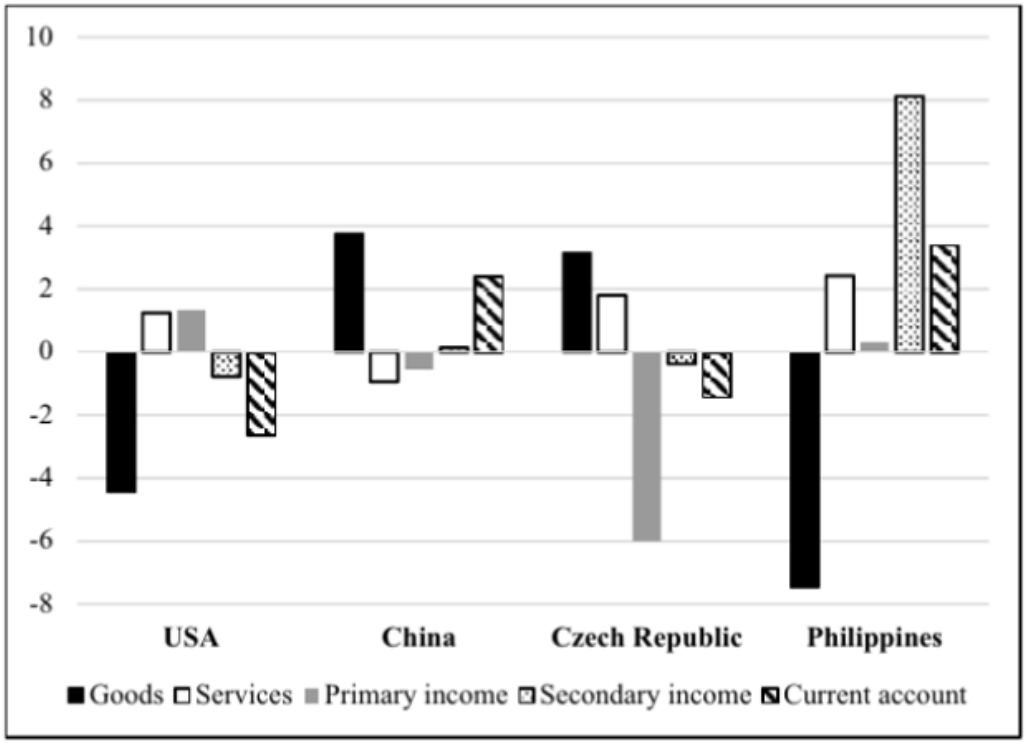


Figure 2.2: Components of the current account for selected countries (in percent of GDP, average values for the years 2010 – 2014). Source: IMF (Balance of Payments Statistics and International Financial Statistics).

Philipp Harms (2016). *International Macroeconomics*. 2nd edition.

The financial account

- Reflects capital flows.
  - "Net acquisition of foreign assets by residents": purchases (minus sales) of financial assets abroad by the country's resident. Also called "gross outflows".
  - "Net incurrence of foreign liabilities by residents": purchases (minus sales) of financial assets of the country by investors residing abroad. Also called "gross inflows".
  - Balance of financial account: gross outflows - gross inflows = net outflows.
- Flows into several categories.
  - Foreign direct investment: investment in a company that gives a degree of control (more than 10% of the equity capital), essentially holdings of multinationals in their affiliates.
  - Portfolio investment: stocks and bonds.
  - Other investment: essentially bank loans (mostly to other banks).
  - Foreign exchange reserves: by the central bank or the Treasury. Most relevant in emerging economies, and some advanced (Switzerland).
  - Derivatives.

Adding up

- Current account (NX_t: net exports, BPI_t: balance primary income , BSI_t: balance secondary income):

$$CA_t = NX_t + BPI_t + BSI_t$$

- Financial account (FA_t: financial account, FA_t^{NR}: financial flows excluding reserves, ΔIR_t: net purchases of reserves)

$$FA_t = FA_t^{NR} + \Delta IR_t$$

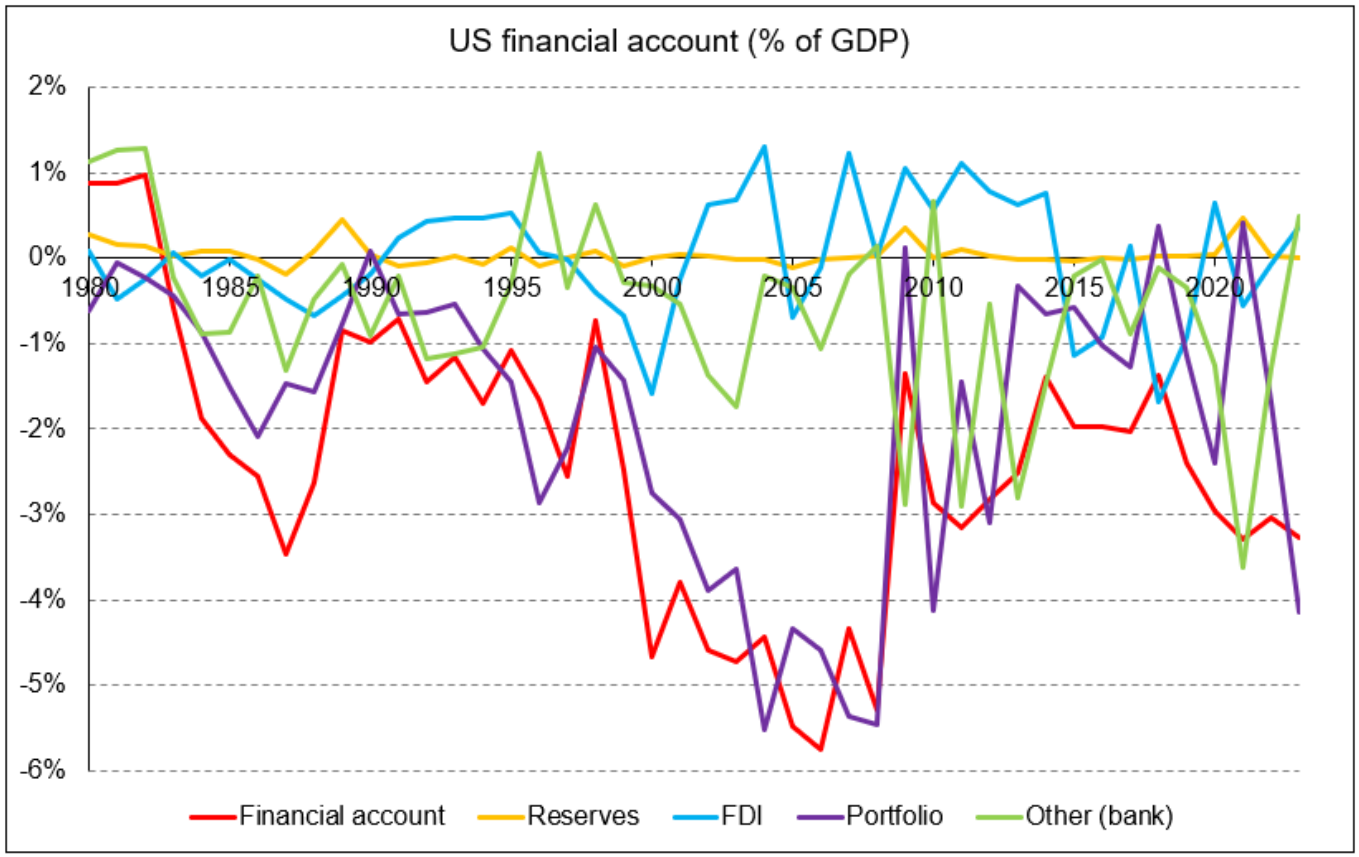
- Balance of payments (KA_t: capital account, NEO_t: net errors & omissions):

$$CA_t + KA_t - FA_t + NEO_t = 0$$

US 2023 (% GDP)			
Financial account	-3.32	Current account	-3.27
FDI	0.38	Capital account	-0.02
Portfolio	-4.15	Financial account	-3.32
Other	0.49	Errors and omissions	-0.04
Reserves+derivatives	-0.06		

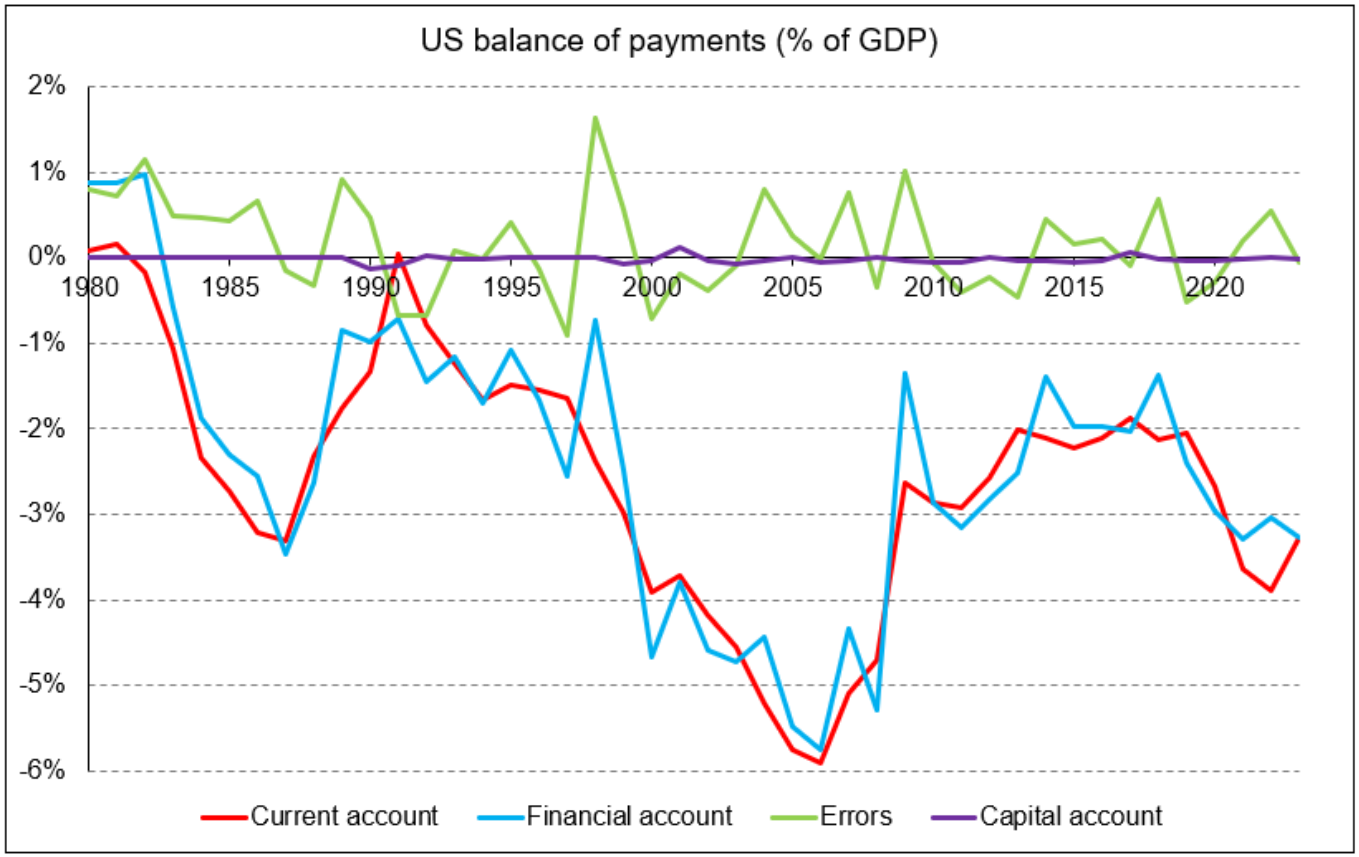
Historical financial account

- Financial account is quite volatile. Beware of analysis at a quarterly level (better to average over 2-4 quarters).
- Driven by net portfolio inflows, mostly in terms of bonds (US Treasury plays a large role).



Balance of payments identity

- Financial account much more volatile than current account.
- Errors and omissions volatile, but average around zero. Reflect financial flows being put on a quarter not aligned with the current account transaction.



BALANCE OF PAYMENTS : STOCKS

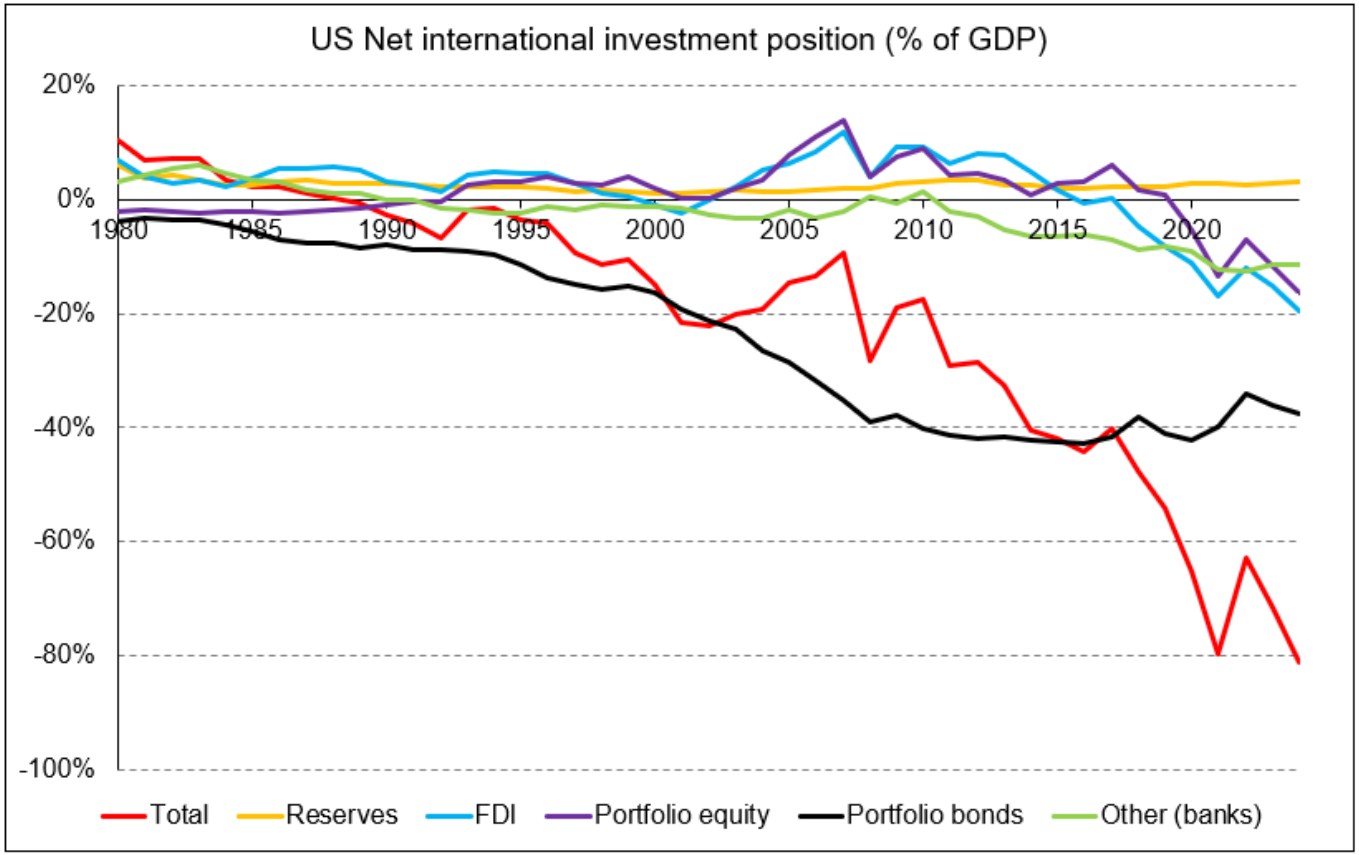
International investment position

- The financial account shows the financial flows during a period (quarter, year).
- The international investment position shows the corresponding stock at a given point in time.
  - Similar to list of transactions, and end of period balance, for a bank statement.
- Some categories as for the financial account.

US Q3 2024 (% GDP)	
Net international investment position	-81.3
FDI	-19.4
Portfolio: stocks	-16.3
Pporetfolio: bonds	-37.6
Other	0.5
Reserves	3.2

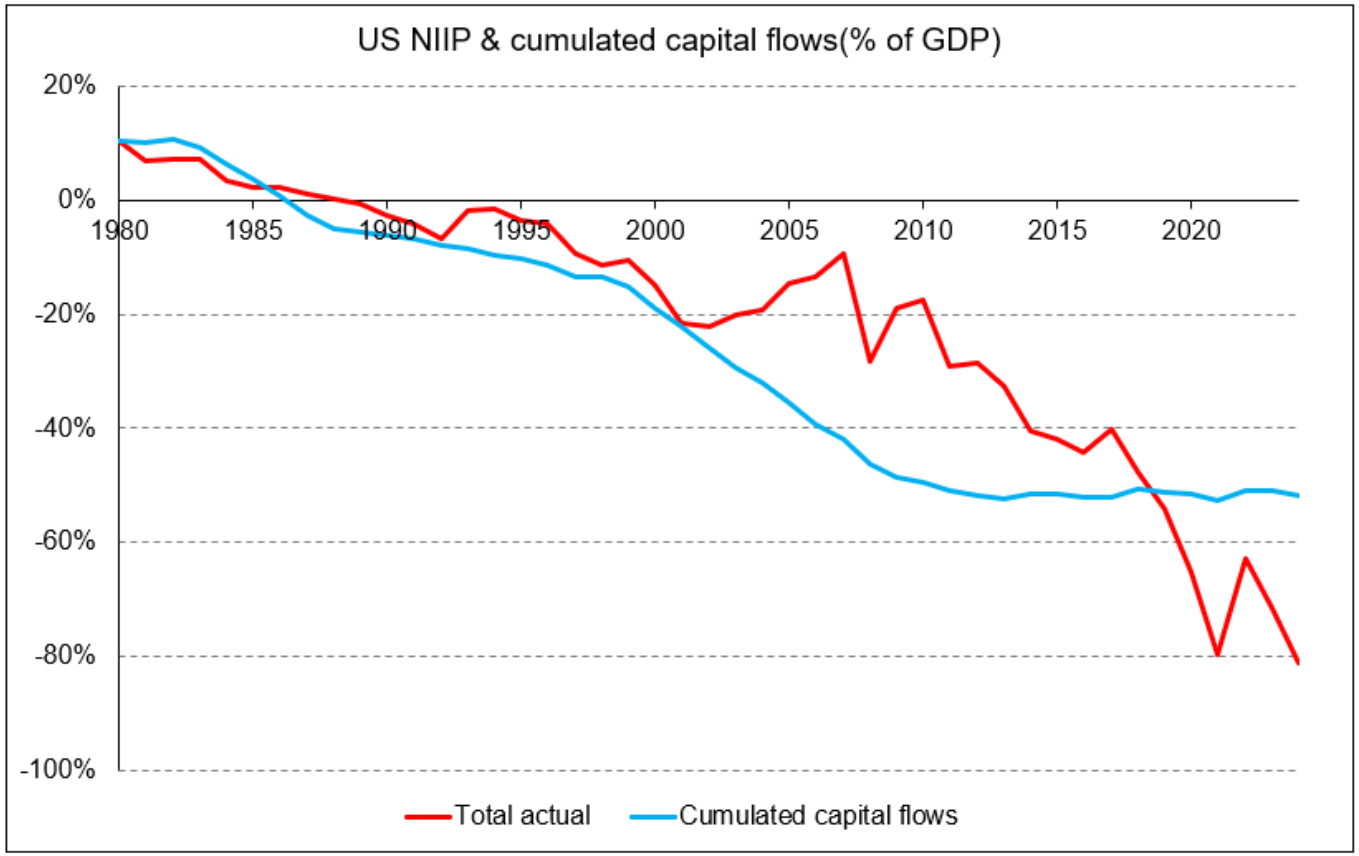
Historical evolution

- The US is a net debtor, primarily driven by portfolio bonds.
- The FDI and portfolio equity have turned from positive to negative in recent years.



Relation stocks - flows

- Persistent current account deficits (negative net capital inflows) add up to a debt net position.
- True, but the two are not so closely related.



What drives assets and liabilities?

- In addition to capital flows (including earnings of dividend and interest), take account of capital gains on assets and liabilities.
- *Flows* are financial flows, i is the yield (dividends or interest), kg is the rate of capital gains, r is the total return: $i + kg$:

$$\begin{aligned}
A_t &= A_{t-1} + Flows_t^A + kg_t^A A_{t-1} \\
&= A_{t-1} + exports_t + \left(i_t^A + kg_t^A\right) A_{t-1} \\
&= A_{t-1} + exports_t + r_t^A A_{t-1} \\
L_t &= L_{t-1} + Flows_t^L + kg_t^L L_{t-1} \\
&= L_{t-1} + imports_t + \left(i_t^L + kg_t^L\right) L_{t-1} \\
&= L_{t-1} + imports_t + r_t^L L_{t-1}
\end{aligned}$$

In net terms

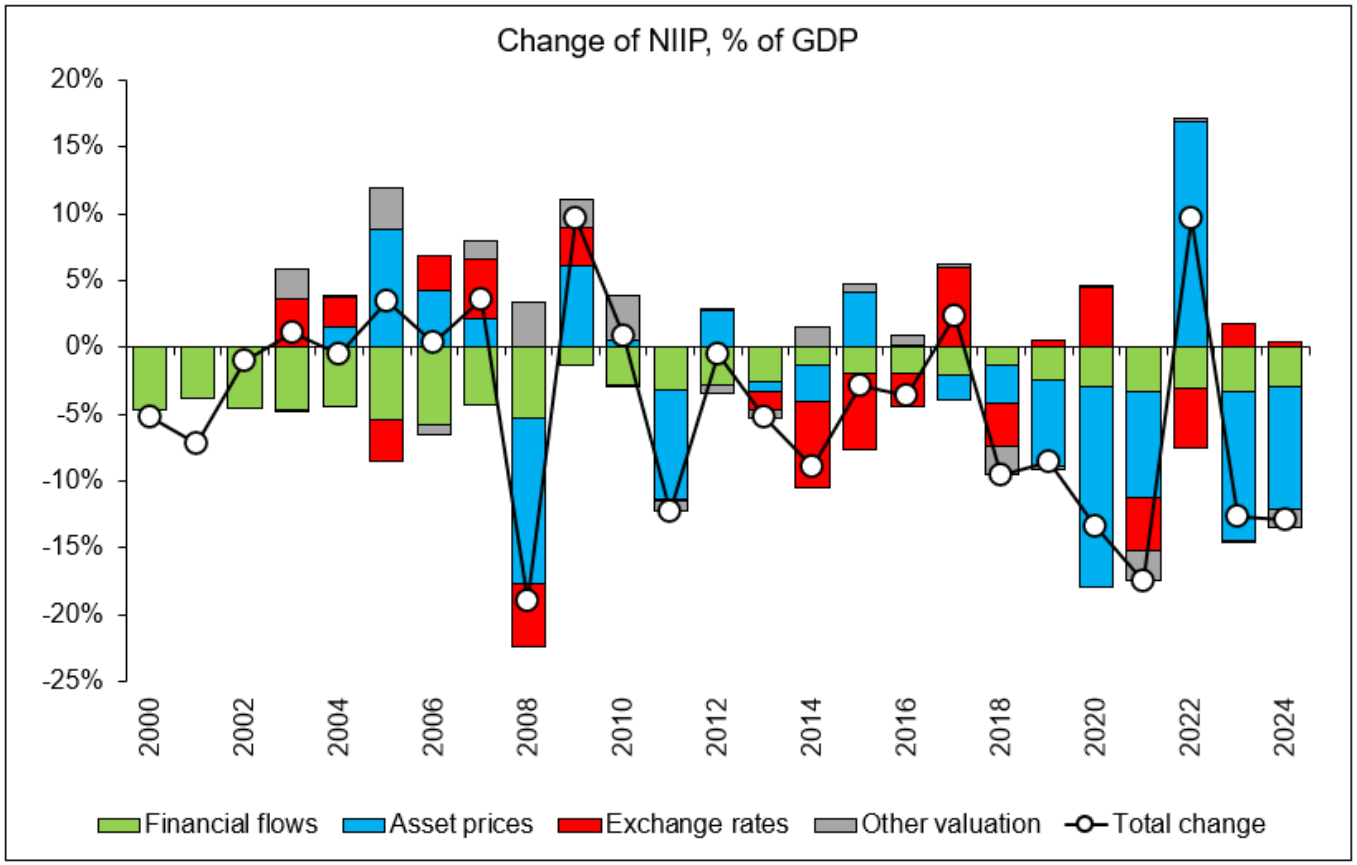
- Net International Investment Position $N = A - L$, current account $CA = Flows^A - Flows^L$, trade balance $TB = exports - imports_t$.
- Large gross holdings magnify different returns between assets and liabilities:

$$\begin{aligned} N_t &= N_{t-1} + CA_t + \frac{kg_t^A + kg_t^L}{2} N_{t-1} + \left(kg_t^A - kg_t^L\right) \frac{A_{t-1} + L_{t-1}}{2} \\ &= N_{t-1} + TB_t + \frac{r_t^A + r_t^L}{2} N_{t-1} + \left(r_t^A - r_t^L\right) \frac{A_{t-1} + L_{t-1}}{2} \end{aligned}$$

- Capital gains drive a large wedge between stock dynamics and flows. A model with only one asset has nothing to say about this.
- Example of different rates of returns: exchange rate, with assets in foreign currencies and liabilities in domestic currency.

The US case

- Valuation effects play a large role.
  - Asset prices tend to have a negative effect (the US markets perform better than foreign markets).
  - Years with a dollar depreciation show a valuation gain (many assets denominated in foreign currency).



CONNECTION WITH NATIONAL ACCOUNTS

GDP and BoP connection

- GDP consists of private consumption, government spending, investment, and net exports (trade balance):

$$Y_t = C_t + I_t + G_t + NX_t$$

- Government spending includes consumption and investment components ($G_t = C_t^{pub} + I_t^{pub}$). Define total consumption ($C_t^{tot} = C_t + C_t^{pub}$) and investment ($I_t^{tot} = I_t + I_t^{pub}$):

$$Y_t = C_t^{tot} + I_t^{tot} + NX_t$$

- Gross national income is GDP plus primary and secondary incomes:

$$Y_t^{GNI} = Y_t + BPI_t + BSI_t$$

- Savings are income minus consumption. For the private and public sector (T_t denotes taxes, S_t^{pub} is the opposite of the budget deficit):

$$\begin{aligned} S_t^{priv} &= Y_t^{GNI} - T_t - C_t \\ S_t^{pub} &= T_t - C_t^{pub} \end{aligned}$$

Savings, investment, and current account

- Combining the identities, the current account is savings net of investment:

$$
\begin{aligned}
CA_t &= NX_t + BPI_t + BSI_t \\
CA_t &= NX_t + Y_t^{GNI} - Y_t \\
CA_t &= Y_t^{GNI} - C_t^{tot} - I_t^{tot} \\
CA_t &= Y_t^{GNI} - C_t - C_t^{pub} - I_t^{tot} \\
CA_t &= \left(Y_t^{GNI} - C_t - T_t\right) + \left(T_t - C_t^{pub}\right) - I_t^{tot} \\
CA_t &= S_t^{priv} + S_t^{pub} - I_t^{tot} \\
CA_t &= S_t^{tot} - I_t^{tot}
\end{aligned}
$$

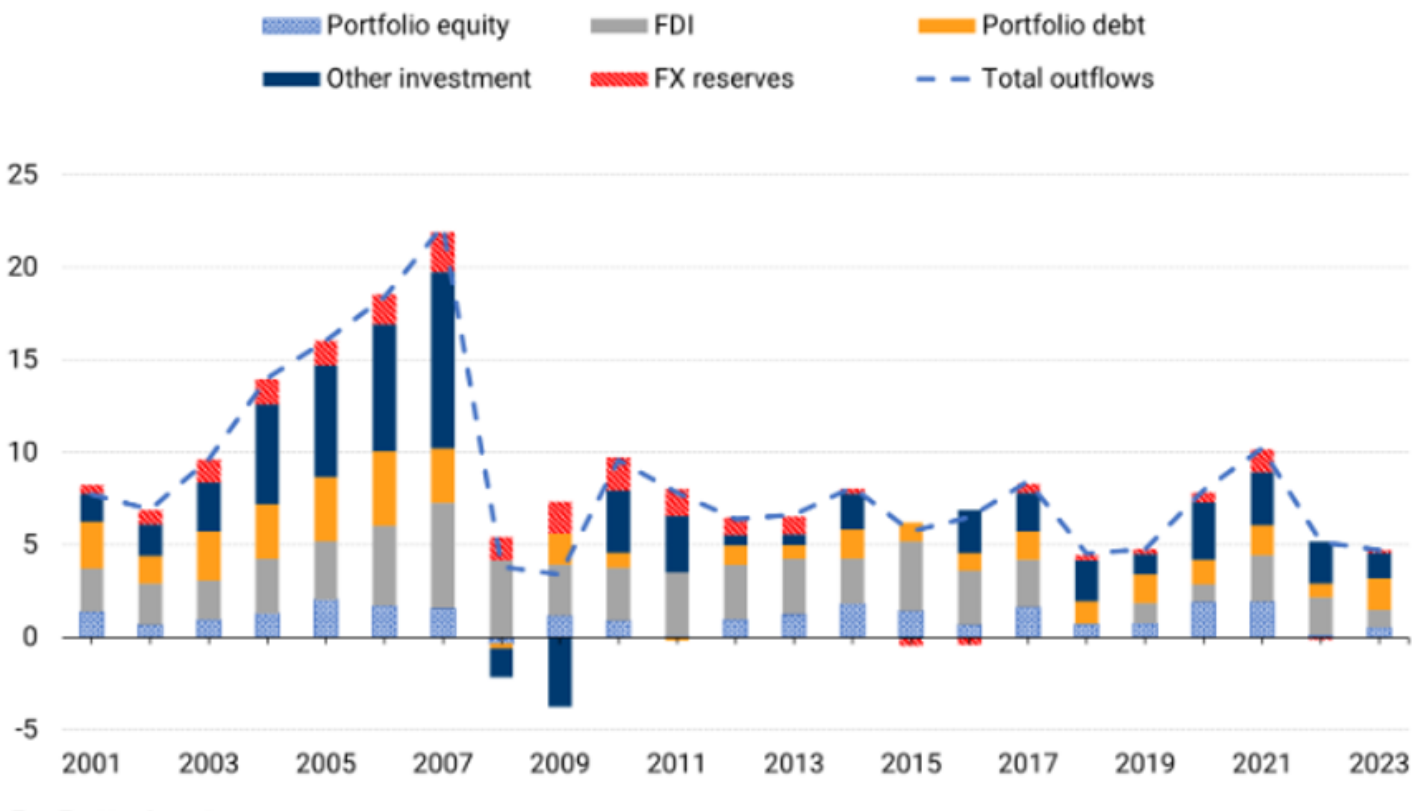
- Intertemporal view: a country runs a surplus when it saves more than it invests domestically.

SOME STYLIZED FACTS

Evolution of capital flows

- Capital flows surged before the 2007-2008 crisis, mostly in banking (other investment).
- Sharp subsequent fall, then stabilization, additional fall in 2022-23.

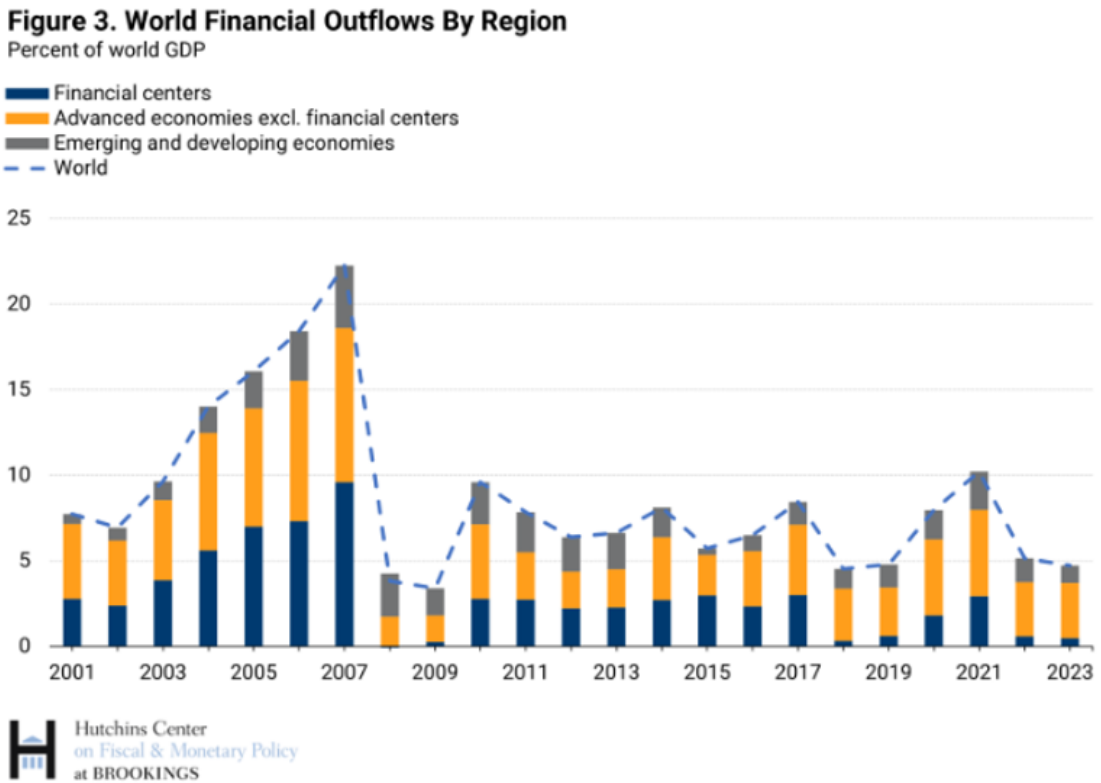
Figure 2. World Financial Outflows
Percent of world GDP



Milesi-Ferretti, Gian Maria (2025). "External Wealth of Nations complete update, 2023" Brookings

Flows by regions

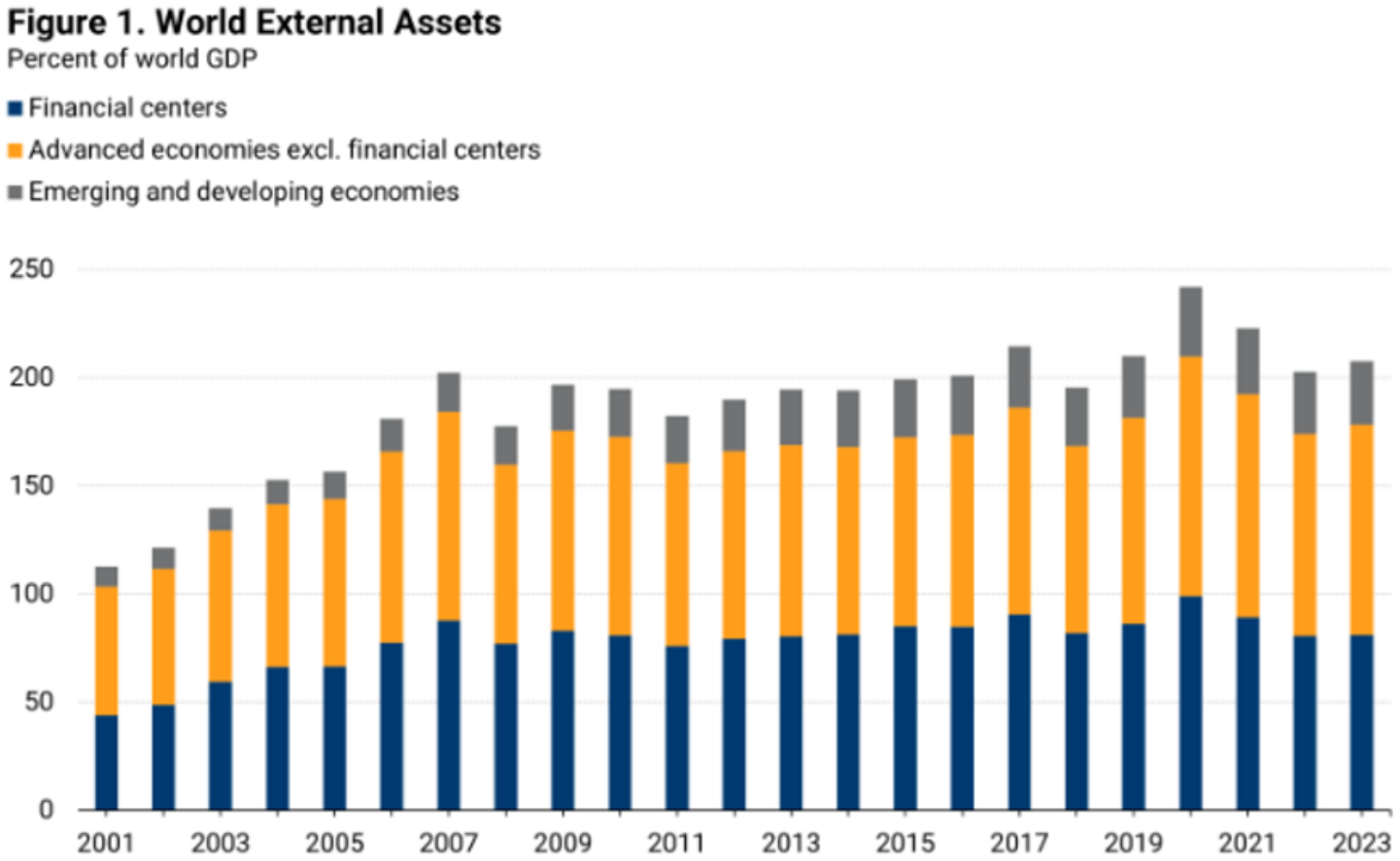
- The boom-bust cycle until 2009 was driven by advanced economies and financial centers.
  - A sizable share is within-group flows (sum of countries' outflows without netting out).
- Emerging centers account for a smaller part of flows.



Milesi-Ferretti, Gian Maria (2025). "External Wealth of Nations complete update, 2023" Brookings

External assets

- Large increase since 2007, the stabilization and moderate increase.
- Financial centers play a large role for FDI and banking. Reserves are a large share in emerging economies.



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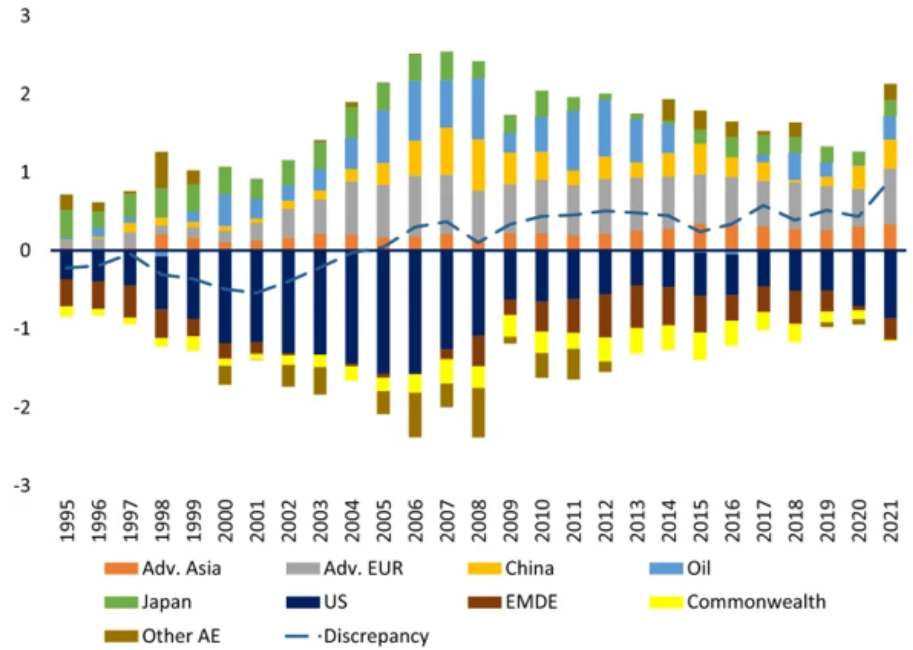
Current account imbalance

- Countries in surplus tend to remain so (as do countries in deficit). The dispersion has decreased since 2008.
- Advanced Europe has gained prominence as a surplus region. Values don't add up across countries (global discrepancy).

Fig. 1



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

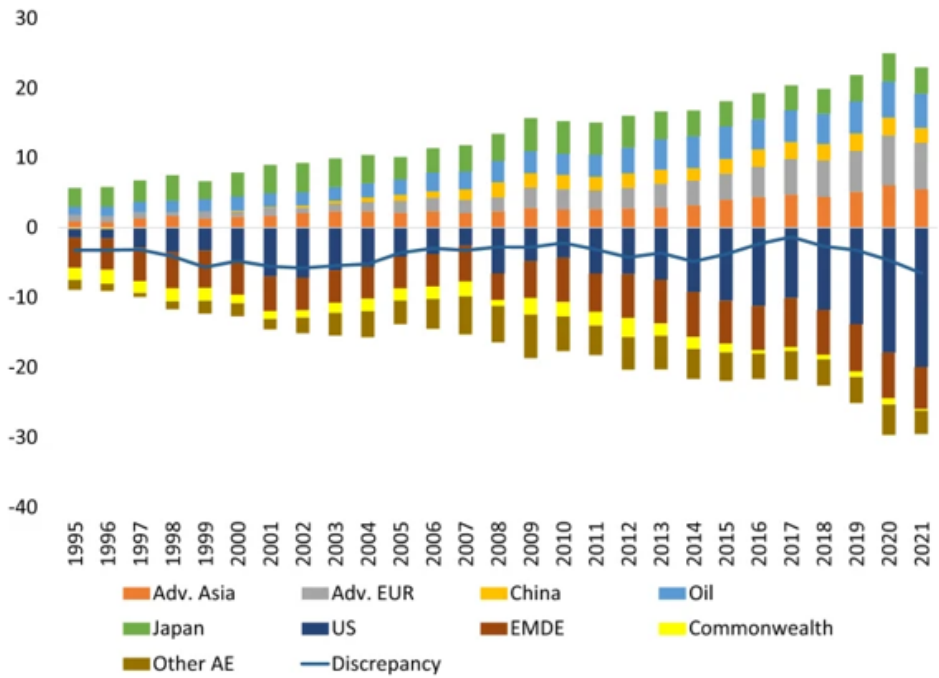
Global Current Account Balances (percent of world GDP). *Note:* See Section II for the definition of country groups.

Milesi-Ferretti, Gian Maria (2023). "Many Creditors, One Large Debtor: Understanding the Buildup of Global Stock Imbalances After the Global Financial Crisis" *IMF Economic Review* 72, pp. 509-553

Net position imbalance

- Similar pattern of persistent positions.
- Widening dispersion (unlike flows), in large part due to valuation increases.

Fig. 2



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

Global Net International Investment Positions (percent of world GDP). *Note:* See Section II for the definition of country groups.

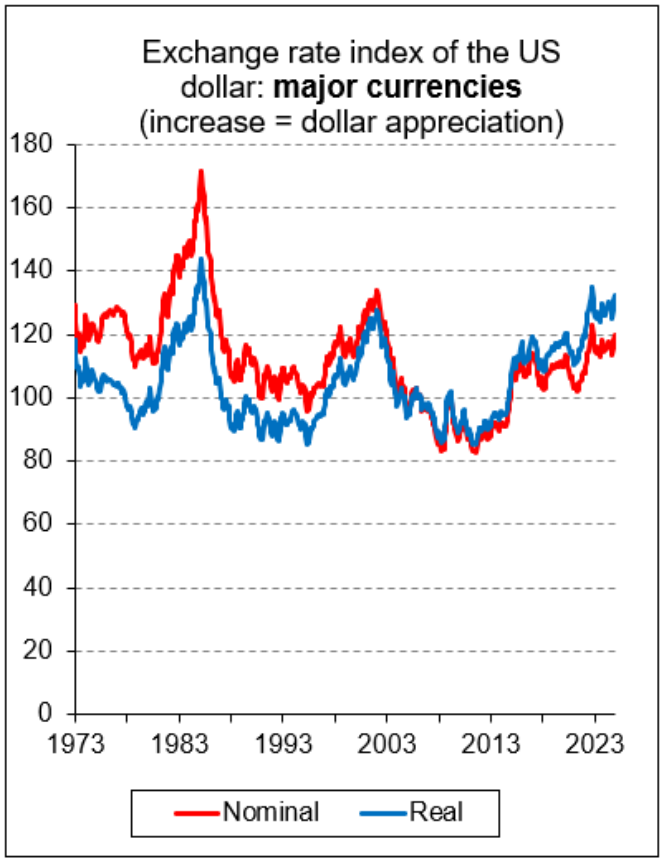
Milesi-Ferretti, Gian Maria (2023). "Many Creditors, One Large Debtor: Understanding the Buildup of Global Stock Imbalances After the Global Financial Crisis" *IMF Economic Review* 72, pp. 509-553

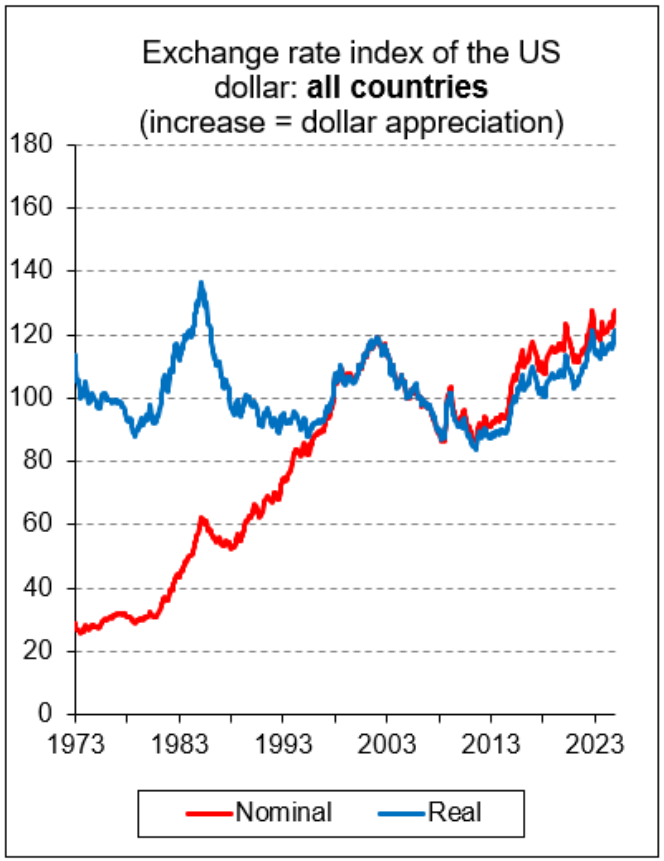
The exorbitant privilege

- Until recent years, the United States had a net position more favorable than the cumulated capital flows.
- Driven by favorable valuation gains. In other words: higher return on assets than on liabilities.
- Rich literature on why this is the case, with recent update (Bertaut et al. 2024).
  - Favorable (for the US) return gap in tranquil times, but opposite in crisis times. US akin to a global insurer.
  - More frequent crises in recent years imply a detrimental return gap.
  - US tends to be long in risky assets (FDI equity) and short in safer bonds.

Exchange rates

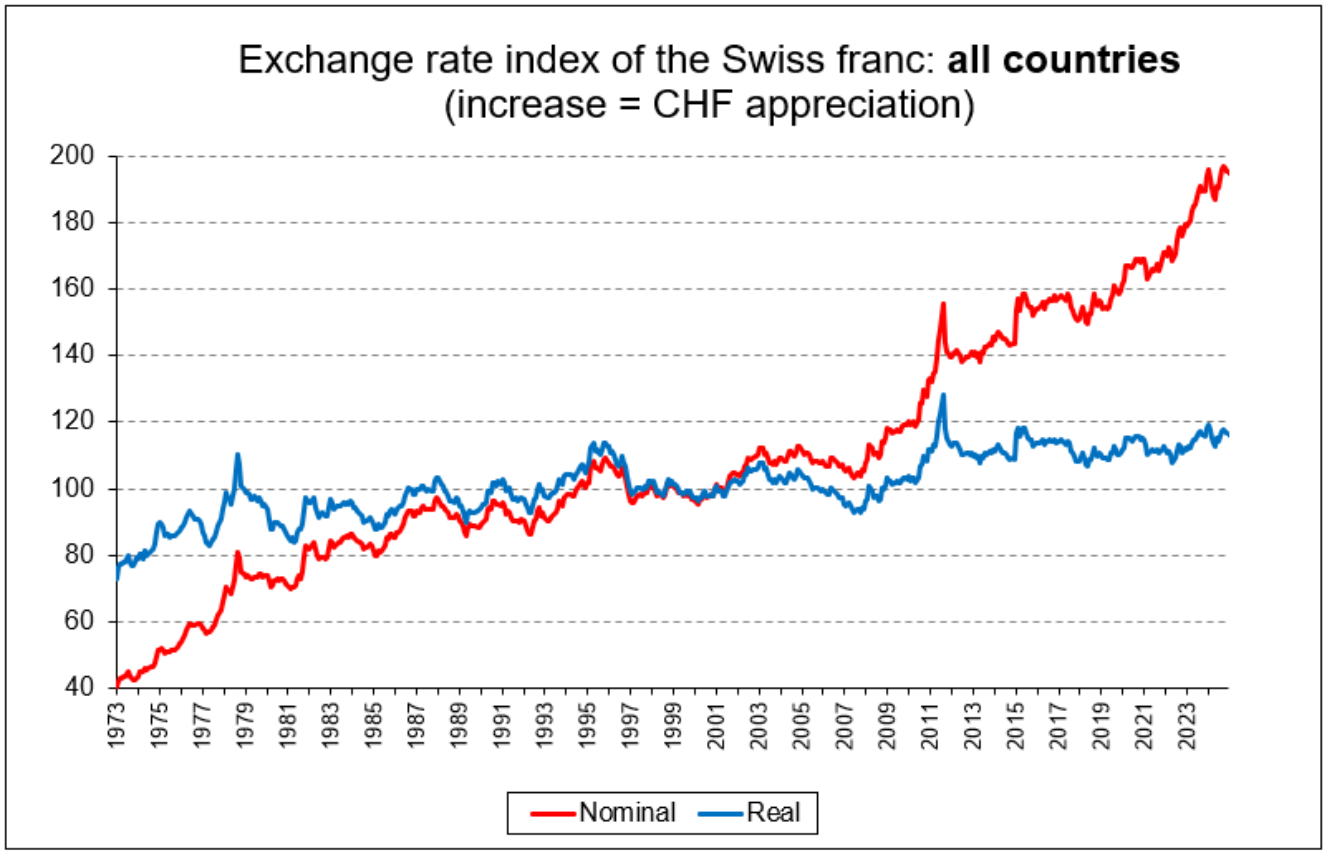
- Large movements in the external value of currencies.
- Over long periods, this reflects inflation differentials (less trend in real exchange rates than in nominal ones). Over short periods, this is not the case.





The case of an appreciating currency

- The Swiss franc has regularly gained strength in nominal terms, especially against the euro.
- Trend primarily reflects the low Swiss inflation. No trend in real terms.



Crises

- Exchange rate movements are often large, but not that much.
- At times, exchange rate depreciate suddenly, leading to sharp economic contractions.

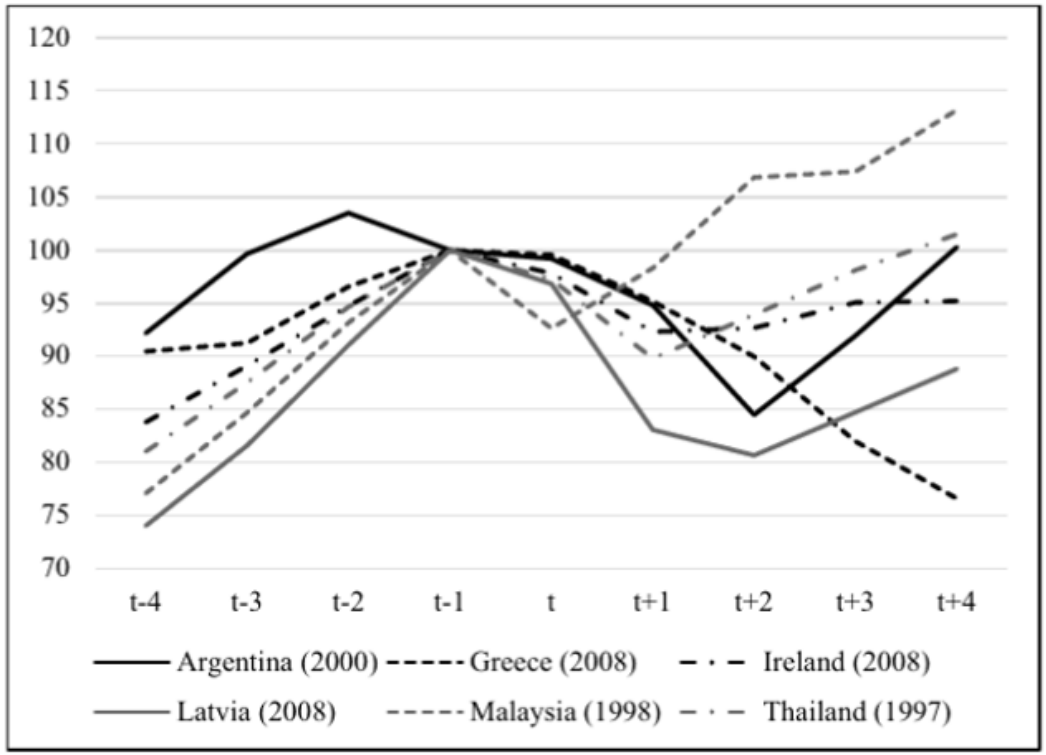


Figure 1.8 : Real GDP before and after an international financial crisis (with GDP normalized to 100 in the year *t*-1 that preceded the start of the crisis). Source: International Monetary Fund (World Economic Outlook database).

Philipp Harms (2016). *International Macroeconomics*. 2nd edition.