Global Financial Systems
Chapter 11
Currency Markets. Part a

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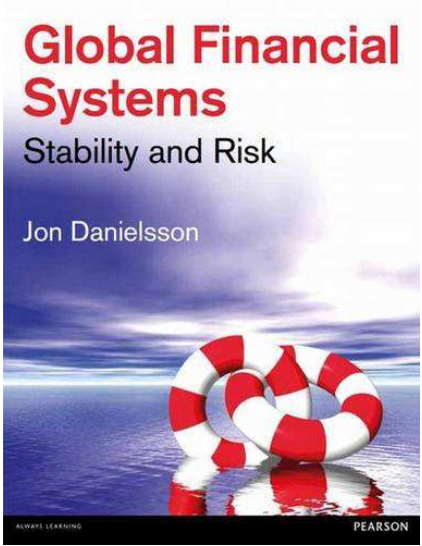
To accompany
Global Financial Systems: Stability and Risk
www.globalfinancialsystems.org/
Published by Pearson 2013

Version 11.0, August 2024

Book and slides



- Updated versions of the slides can be downloaded from the book web page `www.globalfinancialsystems.org`

The global economy

- Production, consumption, investing, and financing are global
- That means trade is global, much in USD
- A lot of economic activity is financed by borrowing from abroad
- A lot of investments are made abroad
- Especially in developing countries
- Exchange rates play a pivotal role

The variety

- There are around *180 currencies* in the world
- For most of monetary history, currencies were *fixed* to something with a constant value (silver, gold, the dollar)
- Flexible exchange rates on a broader scale started only *after* the break-down of the Bretton Woods agreement in 1973
- *Governments* are still heavily involved in the foreign exchange market (more on that later)

Banks and markets

- Historically, banks were the major source of global financing
- Now, it is increasingly the financial markets — like bond markets
- One reason is post-2008 regulations
- But also costs

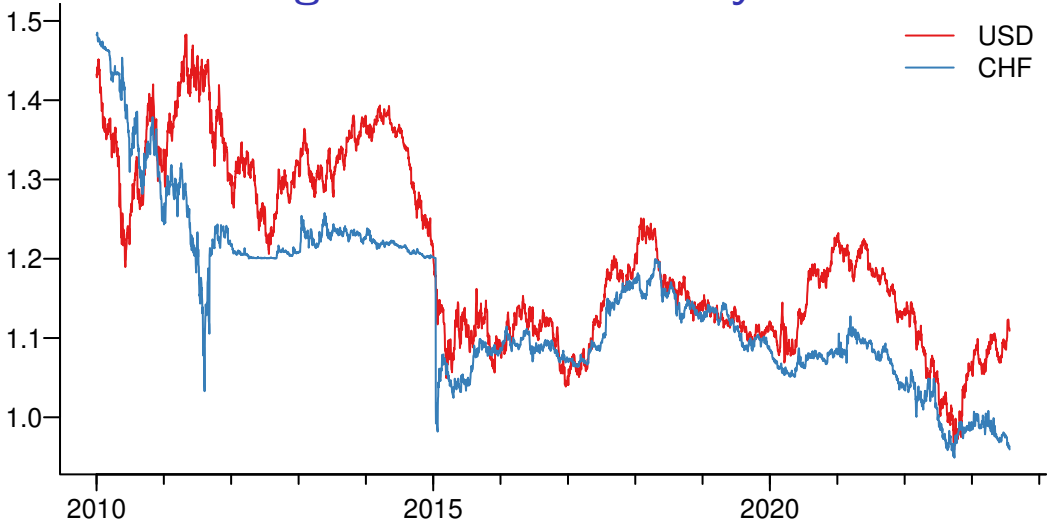
Pivotal role of the dollar (more on that later)

- The US dollar is the reserve currency
- Dollar trade *clears* via New York
- Most global trade is denominated and traded in dollars
- All making US monetary policy pivotal
- And then what happens when US monetary policy is done for the benefit of the US, not the rest of the world (think taper tantrum, discussed later)
- US financial markets have increased in importance
- Will something displace the dollar? Other currencies? Cryptocurrencies? Central bank digital currencies?

Risk

- Currency fluctuations create risks for firms that have a revenue source in one currency (euros, pesos, won, ...)
- But finance themselves abroad (dollars)
- Does it matter that global trade — think oil — is priced in dollars?
- No
- When it comes to risk, separate tail risk and daily volatility (next slide and later)

Euro exchange rates — Volatility vs. tail risk



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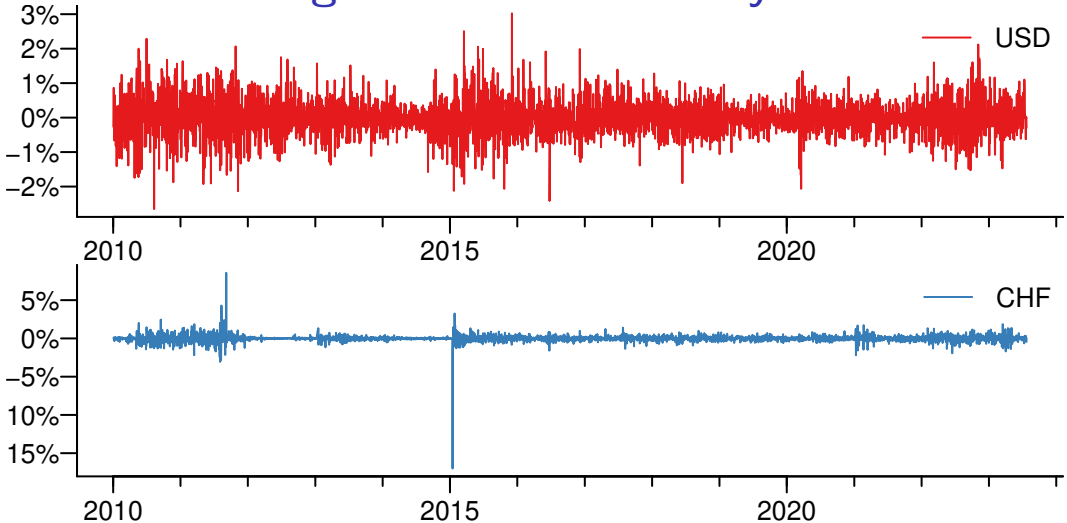

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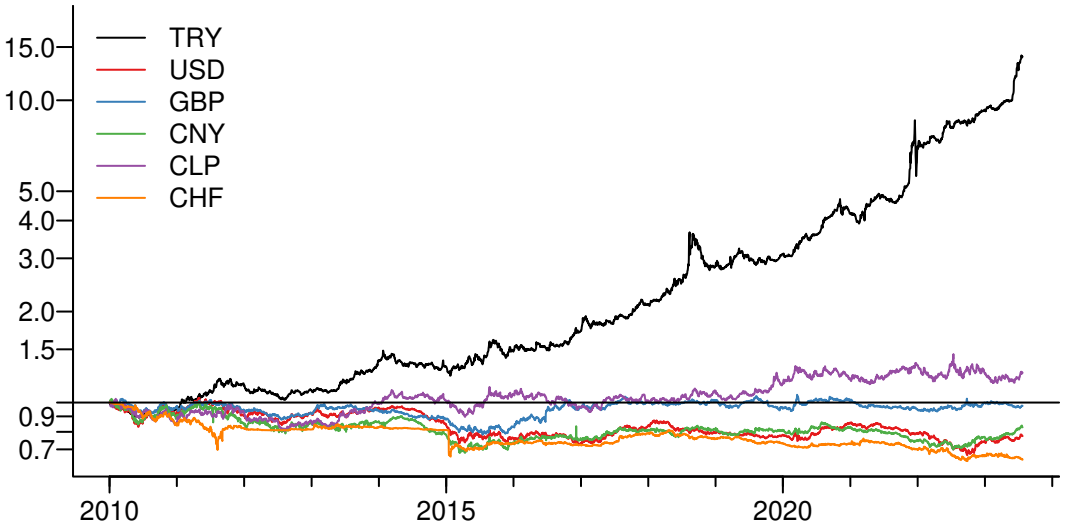
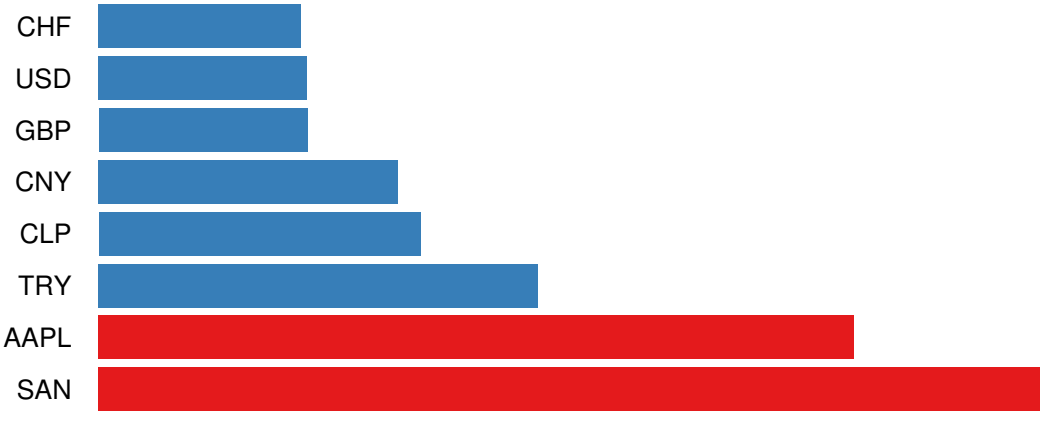


Euro exchange rate risk

Annual volatility of daily exchange rate returns and equities



What drives exchange rates

- Day-to-day it is real economy currency transactions — like trade
- Larger movements reflect changes in economic and political uncertainty
- So the bigger the exchange rate change, the more political it is
- We emphasize later the difference between day-to-day risk and tail risk in hedging

Challenge for firms

- Multinational corporations (MNCs)
- Some risk can be minimized by producing at home
- But then at the risk of low-cost foreign producers
- Moving production abroad — lower production costs, circumvention of trade barriers — creates FX risk
- Borrowing abroad is often cheaper than at home, especially in developing countries,
- It comes at significant risk (more on that later)

The unit of account is irrelevant

- Imagine a European airline buying Russian oil priced and paid for in dollars
- Does that present any disadvantage compared to an American airline that buys American oil paid for in dollars?
- No, because oil, like all commodities, is priced in a competitive global market
- And it makes no difference what the unit of account is
- The economic impact on the European vs. American airline is equivalent

Foreign exchange market

- Largest market market in the world
- Daily trading across all categories is $6 trillion — $1,000 per person
- Market includes spot and also various derivatives, like forwards, swaps, options, futures

Market participants

- Two tiers
  - Wholesale or interbank market
  - Retail or client market
- International banks who make the market
- Non-bank dealers, like mutual funds, pension funds, hedge funds
- Bank customers. MNCs, money managers, speculators
- FX brokers, who match orders and buy and sell for a fee but don't take positions
- Central banks, various interventions

Interbank market

- Banks maintain a network of correspondence relationships
- Holding demand deposits with another

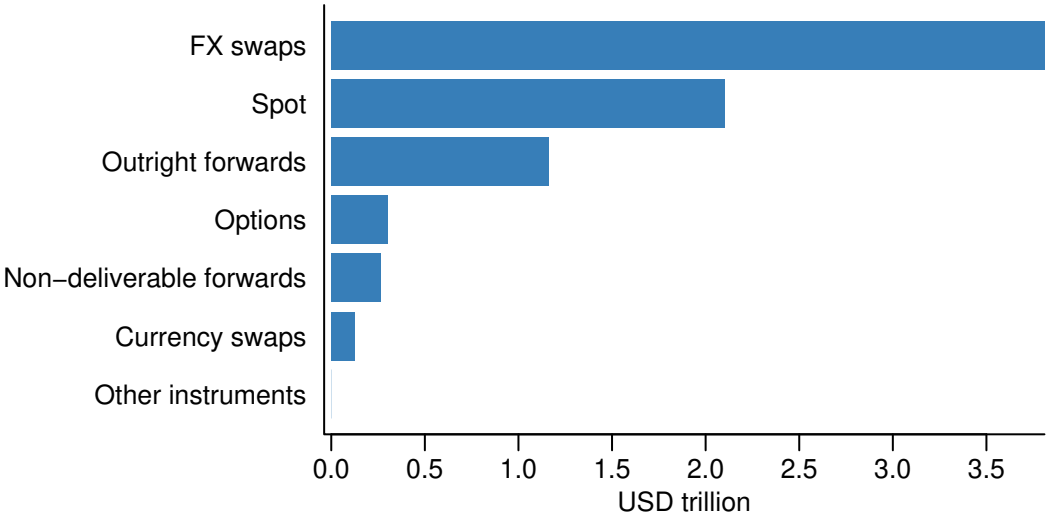
Example

1. Spanish firm buys $ million of goods from a US firm
2. Contracts Spanish bank for $\$1.21/€1.0$
3. Spanish bank debits importer account €830,000=$ 1,000,000 $\times$ $€0.83/\$1$
4. Spanish bank instructs US correspondence bank to debit its US account $ million and credit it to exporter account

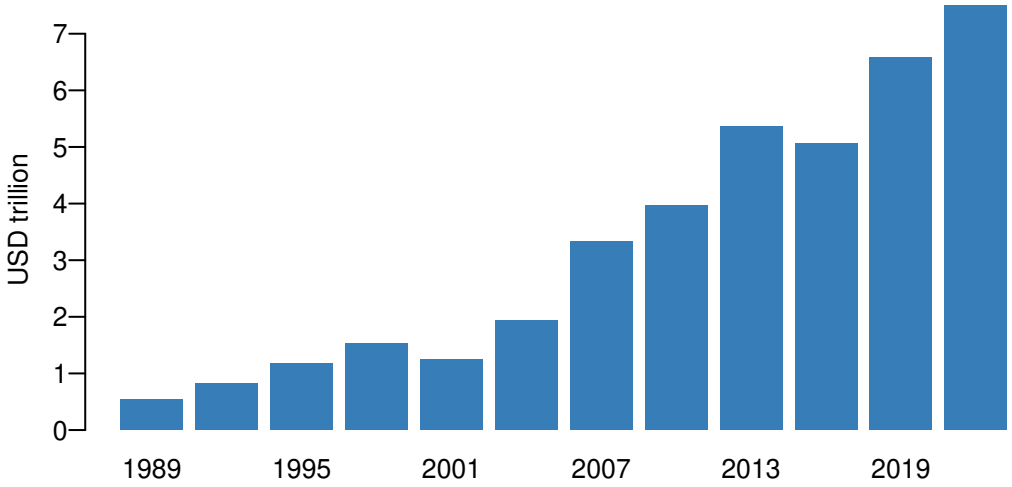
BIS tri-annual FX survey

- https://www.bis.org/statistics/rpfx22.htm
- The Bank for International Settlements (BIS)
- (the central banks' central bank)
- Conducts surveys every three years on FX volume

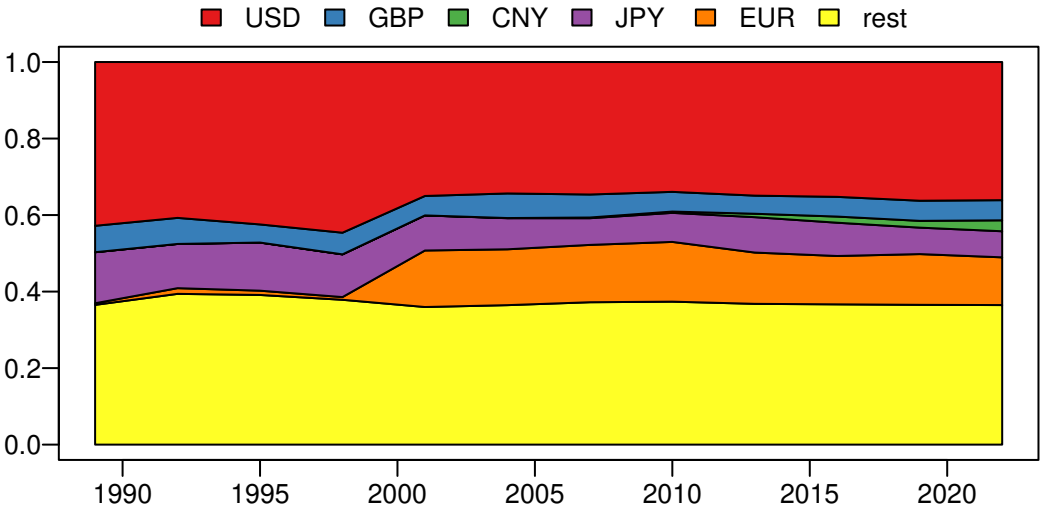
Daily volume by instrument in USD trillions — 2022



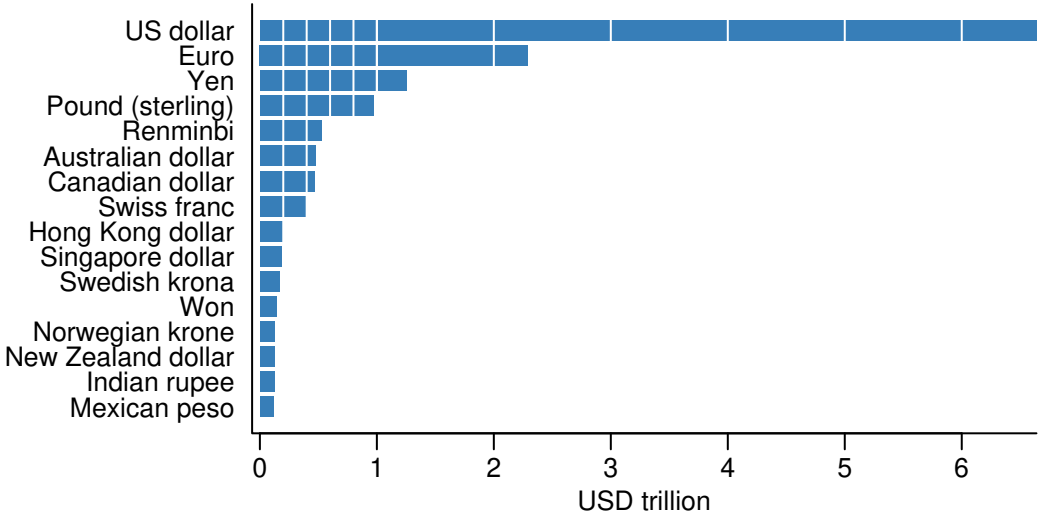
FX volume



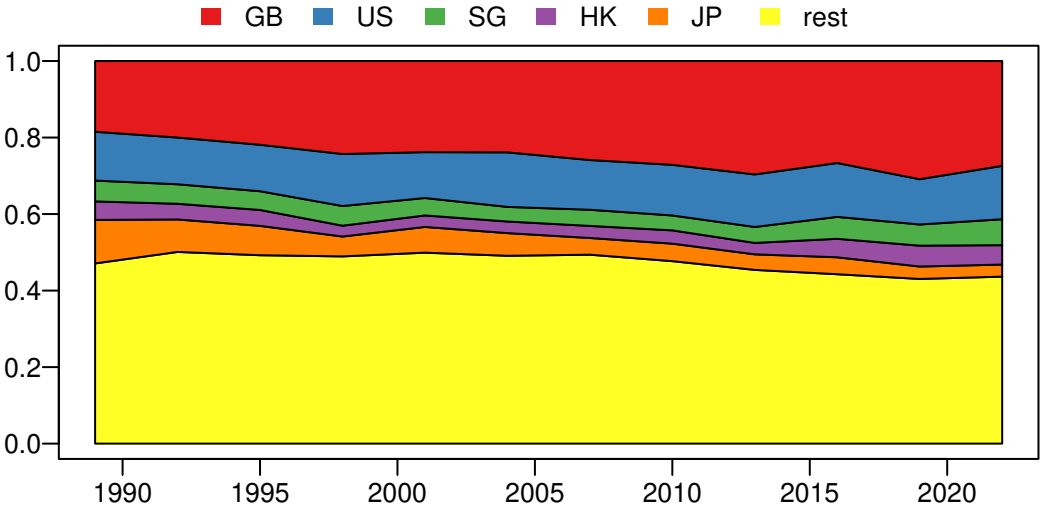
Relative FX volume by currency



FX volume by currency 2022



Where trade takes place



How we trade FX

- Until 15 years ago, trading was by voice
- In the early 2000's banks could trade electronically — brokers eliminated
- From the late 2000s algorithms could trade
- From the late 2000s, hedge funds got direct access to trading systems
- Takes place via large platforms

FX Regimes

Currency regimes

Currency union

Unilateral adoption/currency substitution

Single/basket currency peg/fixed exchange rate

Crawling peg

Currency board

Target zones — bands

Managed float

Free float

Currency union

- Where a country, or a group of countries, use the same currency
- Euro, dollar, ...
- Panama, Kosovo — Foreign central bank

Unilateral adoption — currency substitution

- Were a country unilaterally adopts a foreign currency
- Without the services of the foreign central bank
- Ecuador, Montenegro
- Difficulty in ensuring convertibility of all forms of money

Peg

- Where currency is fixed to a foreign currency
- To a single currency or basket
- Need to be ready to intervene on demand for it to be credible
- Problem with correct FX

Currency board

- A country fixes its currency to a foreign currency
- And keeps full reserves of the foreign currency
- Argentina
- Try to achieve maximum credibility
- But Argentina lost control over local government debt

Target zones

- Currency floats inside a lower and upper limit
- KHD, RMB, European currencies before Euro
- Same issues of credibility as a peg

Managed float

- Currency floats freely but is subject to interventions
- Either direct or indirect
- Most currencies in the world

Fully free float

- Currency flows freely on the market
- Government does not intervene
- No currency falls into this category

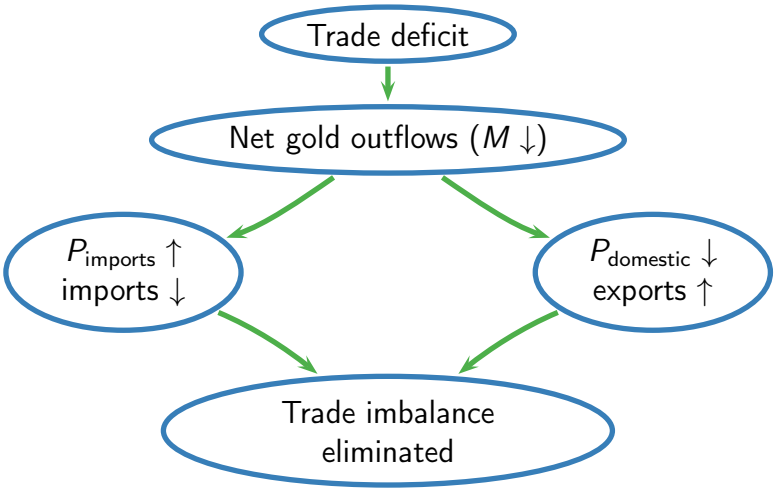
Gold standard

- The world's most successful FX regime
- In effect from the 1870s to 1914 (and before and after)
- Benefited capital exporters and the wealthy classes
- Agricultural exporters and the poor lost
- Reason is deflation
- Speculation is stabilizing (next slides)
- Ultimately undermined by several factors, such as universal suffrage (next slide) and asymmetric economic fortunes

Importance of universal suffrage

- The most important currency in the world until the 1920s was the British pound
- Underpinned by the gold standard
- Key reason for the stability of the gold standard was the lack of universal suffrage (that is, only relatively wealthy property owners could vote)
- When suffrage became universal in 1927, the gold standard was unsustainable
- Because it means transfers from the poor who work to the wealthy who own assets

Speculation is stabilizing under the gold standard



Impossible trinity

- Given a choice between fixing exchange rates, allowing money to flow freely between countries and having an independent monetary policy
- A country cannot opt for all three
- It has to pick two out of three
- What is known as the *impossible trinity*

Impossible trinity — Examples

	Fixed Exchange Rates	International capital mobility	Independent monetary policy
Gold Standard	✓	✓	×
Bretton Woods	✓	×	✓
EU/US	×	✓	✓
China	✓	×	✓

Sources of instability

- Start with a country in equilibrium and fixed FX
- If the country then embarks on an expansionary monetary policy or simply loses control of inflation, the money supply is increasing
- In this case, speculators can borrow the country's currency and exchange it for foreign money — *carry trade*
- Such a trade is likely to attract a large number of market participants
- In order for the government to maintain the exchange rate, it has two choices
  1. continue selling its foreign currency reserves until it runs out, at which time the regime will collapse
  2. imposes capital controls

Carry trades

- Exploiting differences in yields
- We focus on foreign exchange carry trades
- Borrow money in a country with low interest rates exchange it for a currency with high interest rates
- Profit from interest differential and the resulting foreign–exchange appreciation
- Very controversial because it leads to excessive inflows of *hot money* and inability to manage exchange rates (we discuss this in detail later)
- Japan August 2024 example discussed later

Speculative attack

- Suppose a county's exchange rate is massively overvalued
- But the government is refusing to realign
- A speculator attack is where speculators short-term borrow large amounts of a country's currency and immediately exchange it for all the currency, like dollar
- Because the more speculators who join in, the more beneficial it is to it all, it is like blood in the water attracts sharks
- Three questions: how, who does it, and who benefits

Mechanics of a speculative attach

- Suppose the country under attack is A
- An attacker borrows large amounts in the currency of A
- And is ready to exchange that for the currency of country B
- Because there are benefits in many attackers joining in, many will do the same — strategic complementarities
- At the time when they think the country is particularly vulnerable, they all sell their holdings of A's currency on the open market
- That makes the currency fall
- They sell the foreign currency, now for a higher price, and repay the loans
- The difference in the two exchange rates times the amount is profit

Who does speculative attacks?

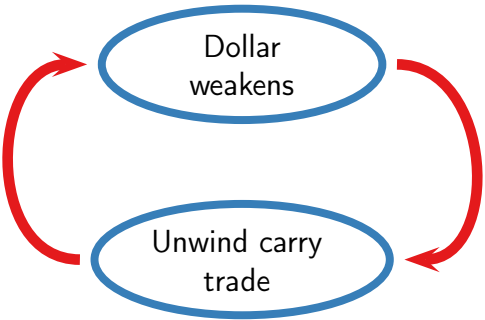
- In the common narrative, it is foreign speculators, perhaps based in New York
- But the empirical evidence shows that it is usually well-connected local families
- After all, who knows more about the country's fortunes than the president and his family

Who benefits?

- Does a speculative attack hurt a country?
- Empirical evidence shows that there is a positive economic benefit to a country from a speculative attack
- The reason is that the exchange rate becomes more realistic, so the economy benefits
- it would be much better if the government saw reality earlier and didn't waste money on defending

Endogenous risk feedback in unwinding

up by the escalator and down by the elevator (lift)



Carry trades as a source of contagion

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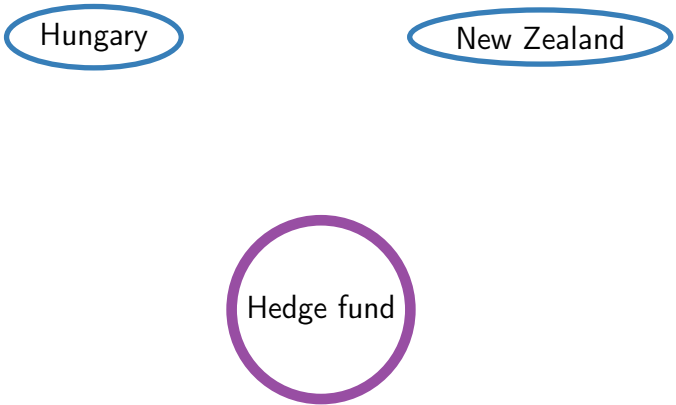

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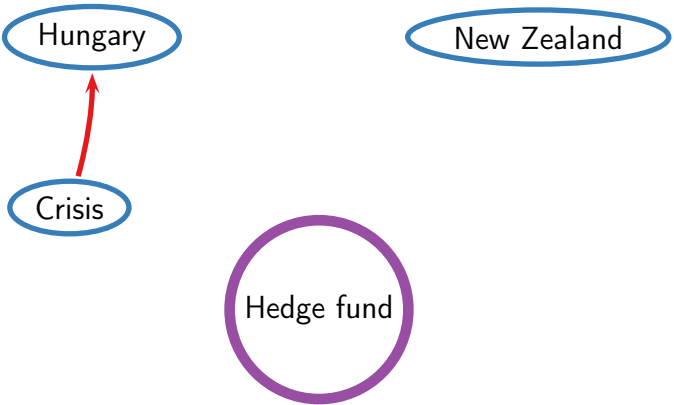

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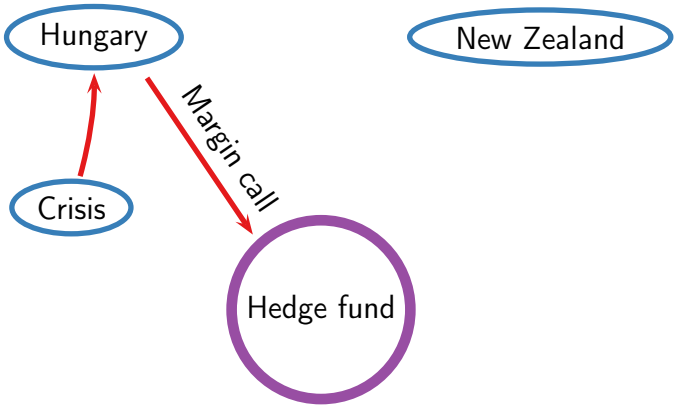
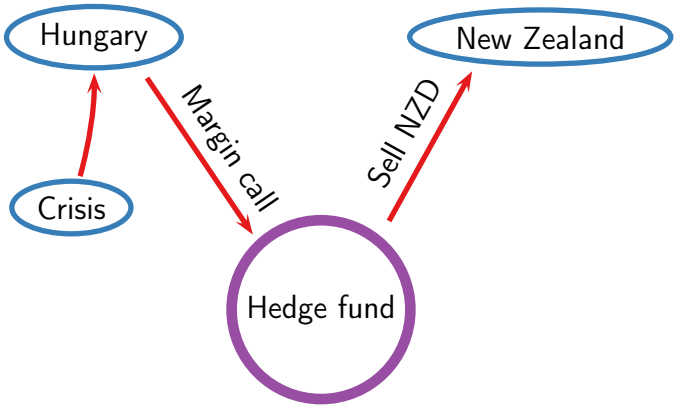
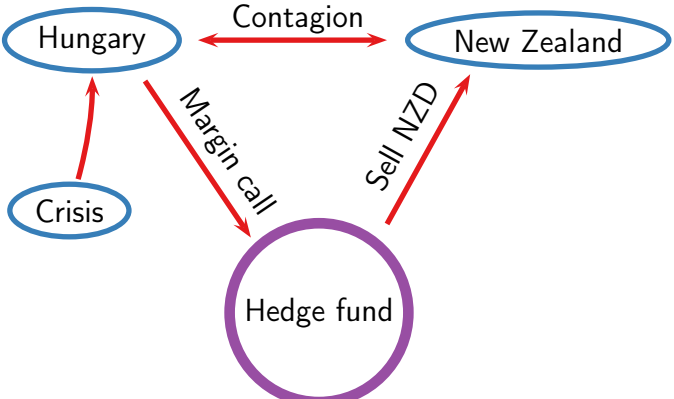


Carry trades as a source of contagion



Carry trades as a source of contagion



Japan August 2024

- Yen fell against USD in first part of 2024
- Speculative investors held over 180,000 contracts betting on a weaker yen, more than $14 billion, at the start of July
- By August those positions had been cut to around $6 billion
- The yen's 7.5% surge pummeled carry traders
- Margin calls, forced to buy yen to cover their previous positions, pushing the currency higher and triggering even more margin calls

The European Exchange Rate Mechanism (ERM) I 1979-1999

(Euro is ERM II)

- Part of the European Monetary System, the precursor of the euro
- A target zone exchange rate regime
- The European Currency Unit (*ECU*), an artificial unit of account, was created
- Exchange rates for each currency against the ECU were established
- The system allowed a *fluctuation band* of $\pm 2.25\%$ around this central rate
- Member countries had to *intervene* to ensure their currencies stayed within *the band*

Dominant role of Germany

- Effectively, the bands were maintained against the *most stable currency*, the Deutschmark (*DM*), which became the unofficial *reserve currency*
- The Bundesbank was *supposed* to lend DM to countries whose currencies came under depreciatory pressure
- Therefore, Germany was the only country with *discretion* over its own monetary policy

Reunification of Germany

- Amalgamation of a large, rich economy with a smaller, poorer economy
- Germany embarked on a massive *fiscal expansion* to transfer resources to the east
- East German marks were converted to DM at a rate of *1.8:1*
- The government deficit rose from 5% to 13.2%
- Bundesbank concerned about high inflation pursued a *contractionary* monetary policy, by raising interest rates

Adverse impacts

- High interest rates and *appreciation* of DM hurt other countries
- *UK* was in a recession, with unemployment levels over 10%
- Same was true of *Italy, Spain, Sweden*
- Those countries *couldn't* use expansionary monetary policy or a weaker currency to stimulate their economy
- Speculators figured the system was not *sustainable*

Speculative attacks

- September 16, 1992 is nicknamed "Black Wednesday"
- In the morning, *BoE* raised rates from 10% to 12%, a few hours later, to 15% but could not stop the massive selling of pounds
- Eventual loss for the UK of £3.3 billion
- Sterling left the ERM that evening, followed by the Italian lira
- Eventually, on August 3, 1993, the size of the bands was widened from $\pm 2.25\%$ to $\pm 15\%$
- Basically a free float

So

- Market sentiment gradually turned and was casting doubt on whether governments would stay firmly committed to the ERM
- Governments were *weighting* the costs involved in staying in the ERM (loss of monetary independence) against the benefits (monetary union)
- Investors started to believe that the costs for some governments in the ERM had become too high, and they were no longer committed to the peg
- Countries with the *weakest fundamentals* were the first to be attacked and the first to abandon the ERM

Parallels with today

1. Devalue
   - The countries that devalued/left were in a short-term recession
   - Devaluation helped them to recover — long-term benefits
   - Is that needed today?
2. Be stable
   - Currency crises and devaluations and inflation costly
   - Stability valuable
   - Hence, common currency

- Should Italy leave the Euro? We discuss later

Currency inflows

- Countries can suffer/enjoy a high influx of foreign currency for three main reasons
  1. it is seen as a safe haven in turbulent times (Switzerland)
  2. the carry trade is profitable (e.g. Japan)
  3. domestic companies borrow abroad (many countries)

Problems

- Makes currency very strong, hurts domestic companies
- Bigger risk of a sudden stop/currency crisis/speculative attack
- If households and companies borrow in foreign currency, they are highly vulnerable to any fall in the exchange rates
- So when the inevitable correction comes, serious economic and political crises

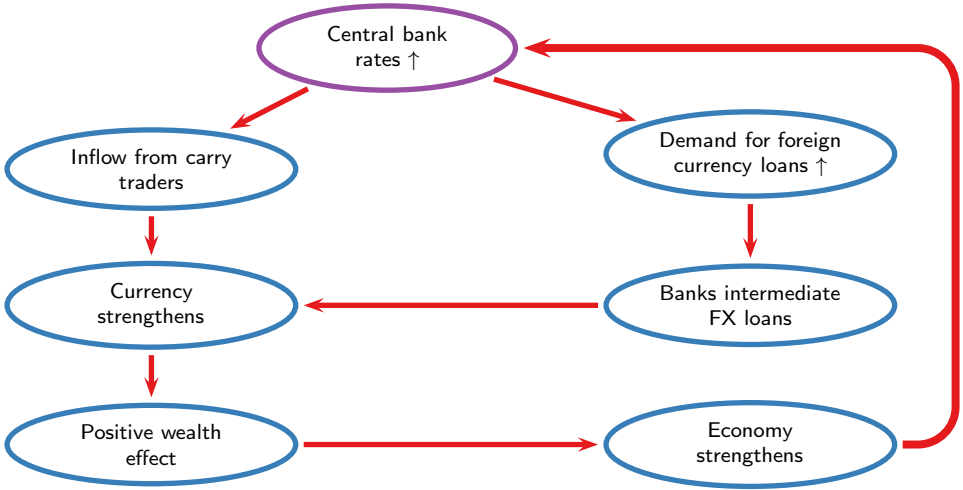
Hot money

- Large inflows of short–term foreign currency — which then can leave very quickly
- When the money comes in, it makes the currency appreciate
- Creating the conditions for economic difficulties
- Which then makes the hot money leave
- Collapsing the currency in the process
- Often related to *carry trades*

Policy options

- Very popular — expansionary, foreign goods become cheaper, economy stimulated
- Strong pressures for foreign borrowing
- So what is the CB to do?
  - raise interest rates (see next plot)
  - inflow capital controls
  - restricts who can borrow in foreign currency

The risk-taking channel of the currency appreciation



Capital Controls

Capital controls

- Control the flow of foreign currency
  - taxes on transactions
  - outright prohibitions on buying/selling a foreign currency
- *Strict capital controls* were common in many countries
- Capital controls *(2.0)* of a different form now popular

Traditional capital controls

- The nations during the gold standard allowed free capital mobility
- Capital controls were introduced at the start of WWI and common until the end of Bretton Woods (next section) or later
- Increasingly seen as damaging
- Always quite leaky
- Encouraged corruption
- Most major countries had abolished capital controls by the mid–1970s

OECD study on capital controls

Country	Year	Country	Year	Country	Year
Australia	1978	Greece	1980	Portugal	1992
Austria	1980	Iceland	1993	Spain	1985
Belgium		Italy	1984	Sweden	1986
Canada		Japan	1979	Switzerland	1979
Denmark	1983	Luxembourg		Turkey	1985
Finland	1991	Netherlands		United Kingdom	1971
France	1986	New Zealand		United States	1974
Germany	1980	Norway	1989		

Capital controls 2.0

- Share the name "capital controls" but are fundamentally different from the traditional type. Can call them *Capital controls 2.0* — I am open to suggestions for a better name
- Impose restrictions on hot money inflows
  - e.g. Brazil, Chile, Colombia, Iceland, Korea
- Objective to prevent the adverse impacts of hot money flows and avoid distortions caused by capital controls
- Targeted at a specific problem
- Surprisingly, IMF recently in favour
  - In the 1950s, the IMF was intimately connected to the use of capital controls
  - But after that, it changed its view and advocated free capital flows

Bretton Woods — 1944–1972

Fixed exchange rates, independent monetary policy and capital controls

- A system of pegged but *adjustable* exchange rates
  - dollar fixed at $35 per ounce of gold
  - other currencies fixed to the dollar
- With capital controls as a substitute for an adjustment mechanism
- IMF surveillance, extend financing to countries at risk
- Par values could be changed to correct a "fundamental disequilibrium" *after* approval from IMF

Liquidity

- The dollar becomes the anchor, and countries accumulate dollars, enabling the US to run payments deficits
- Triffin dilemma:
  - Bretton Woods system *dynamically unstable*
  - if foreign dollar balances exceed US gold reserves
  - and all countries try to convert dollars into gold, with a similar effect as a bank run
- Creation of *special drawing rights* (SDR) which act as another reserve asset

The SDR has popped up in public discussions recently. Why?

International cooperation

- Lack of effective adjustment mechanism
- Capital controls difficult to enforce — corruption
  - Easy to under– or over–invoice trade
- Parity changes were rare *(but disastrous)*
  - Intentions might be leaked to the market, inducing capital outflows
  - Frequent small adjustments might be destabilizing
- System survived because of international cooperation
  - Gold pool
  - Lines of credit

Domestic priorities

- Governments were fully committed to domestic policies — *growth* and *full employment*
- *Philips curve*
- Britain adopted a *"Stop–Go"* policy
- France had to combine devaluation with fiscal discipline to overturn its deficit
- US (see next slide)
- Germany and Japan vs. the weak countries

The main reason we cannot have globally fixed exchange rates is that some countries will perform better than others — Think challenges to the euro

The collapse

Balassa–Samuelson Effect

- Lack of monetary discipline in the US
  - Vietnam war
  - Spending on welfare
- Not sufficient for the US to match the inflation rates of other countries
- Fast-growing countries (e.g. Germany and Japan) can afford to run higher inflation
- Limits to the extent of support from foreign governments

Fixed or Floating

In favor of fixed

- *Wrong–rate* argument
- The market is inefficient
- It does not make use of available information
- Prone to destabilizing speculation
- Attaches too high a probability on a devaluation or appreciation, not usually justified by economic fundamentals
- Speculators may deliberately manipulate the rate to profit from the resulting volatility

After all

- High–frequency FX volatility is very high
- Whilst economic fundamentals move slowly
- So intervention is useful to get the "correct" rate
- Benefits society though low transaction costs and risk
- Encouraging trade and investment

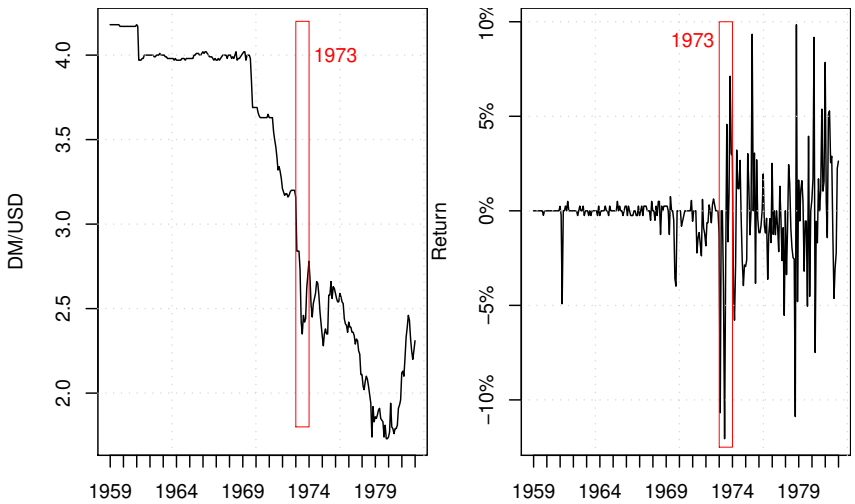
In favor of floating

- Authorities incapable of identifying the correct FX
- May want a wrong rate for political reasons
  - overvalued currency to make voters feel artificially wealthy
  - undervalued to help industry
- Costs of incorrect rate are high
- Interventions are distortionary
- Speculators may undermine the interventions

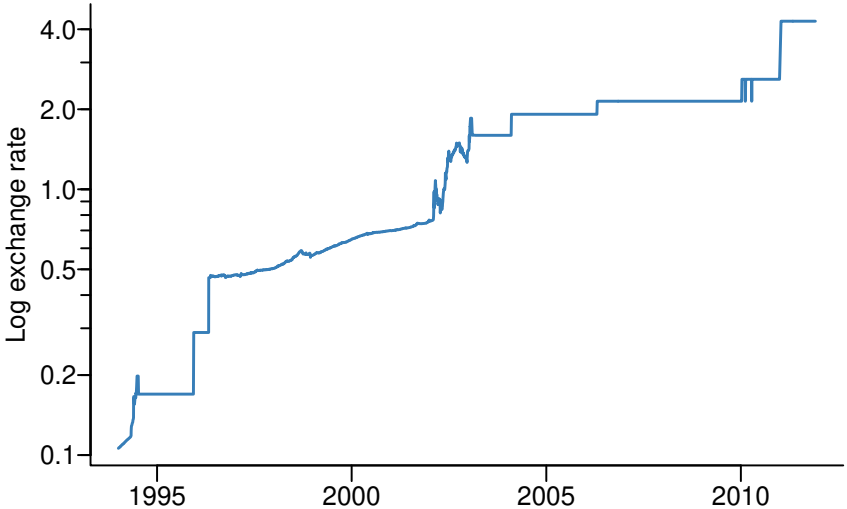
So...

- Floating may not be less stable
- Are we trading *volatility for jumps*?
  - See DM/USD plot below, or Venezuelan bolivar FX
- Allows for an independent monetary policy
- So the speculators attacking a fixed regime are doing the country a favor

Dollar crisis



Venezuelan bolivar to the dollar



Conclusion

- Both compelling elements
- Countries alternate, never happy
- No exchange rate regime is perfect
- *All* governments think some interventions are necessary
- Academic economists are often vocal in their opposition to FX interventions, those actually in charge disagree

Official intervention

- The *government* chooses the exchange rate regime
- In no other asset market do governments interfere as strongly
- Fixing an exchange rate means that the government must always be willing and able to trade its currency with investors at this rate — unless capital controls
- Fixing an exchange rate means that the government *gives up* independence of its monetary policy
- Governments have actually intervened *more heavily* with (officially) flexible exchange rates

Central bank balance sheet

Assets	Liabilities
Net foreign currency bonds	Monetary base
Net domestic currency bonds	————————
Foreign currency reserves	Net worth
Gold	

Spot market — S

- The buying or selling of a currency on the spot — no derivatives of any type
- Immediate delivery of both currencies, no risk
- Notation

S	Spot price
$S^{¥/\$}$	How many yen a dollar buys
$S^{i/j}$	How many units of currency i, one j buys

Example of a sterilized intervention

- Suppose exchange rate is $S^{¥/\$} = 100$ and the BoJ would like it to fall
- It prints ¥100 billion and receives \$1 billion
- The yen M0 increases by 100 billion and hence is inflationary
- BoJ sells ¥100 billion of JGB
- Which reduces M0 by ¥100 billion
- Money supply does not change in intervention

- Sterilization may lead to an increase in *domestic interest rates*
- As a result, money flows into profit from the higher rates, leading to an appreciation of the currency
- For sterilization to be effective, *capital controls* often need to be implemented (as in emerging markets)
- Sterilization is a useful tool in the *short term* for countries that accumulate reserves to ease *inflationary pressures*
- But creates problems in the *longer run* by introducing economic distortions and impeding corrections of global imbalances
- Sterilization increases interest rates, attracting investors to domestic assets — strengthening FX
- Easier in developing countries
- China in the last decade sterilized 80% of its intervention