

# Financial Stability\*

© by Antonio Mele

*USI Lugano, Swiss Finance Institute and CEPR*

Lecture notes, Fall Term 2022

\*These notes are prepared solely in support of these lectures and cannot be further distributed without the written consent of the author

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# Course overview

## Objectives

- This course equips the students with notions and tools that are useful to monitor adverse developments affecting both individual financial institutions and the whole financial system
- It includes
  - an overview of contemporary financial history whilst ...
  - describing the main mechanisms at the origins of critical events such as financial crises, bubbles, and other market dysfunctions
  - Finally, it reviews the main micro-prudential and macro-prudential tools to gauge the resilience of individual institutions and the global system to shocks hitting the real and financial spheres of the economy

## Description

- The course provides an introduction to themes regarding the ability of the financial system to withstand shocks with the potential of affecting the functioning of the whole economy
- By the end of the course, the students will be familiar with a variety of topics, including the main critical developments in contemporary financial history, the major sources of market dysfunctionalities, the feedbacks between financial and economic imbalances and, finally, an array of micro-prudential and macro-prudential tools that regulators use with the purpose of anticipating the collapse of individual financial institutions and the occurrence of financial crises.
- The course comprises three parts.

## Three parts

- Part I provides background and institutional details regarding the origins of major critical events in financial history along with policy responses and arrangements: from the Great Depression of the 1930s to the Bretton Woods system and its collapse; from the 1987 crash to the 'flash crashes' and related dysfunctions of the last decade; from the 1992-93 European speculative attacks to the 1997 Asian speculative attacks; from the 1998 collapse of LTCM to the internet bubble of the late 1990s; from the credit bubble of the 2000s to the subsequent Global Financial Crisis and European Debt Crisis. This part examines the role of the regulatory framework underlying these developments as well as slowly moving causes such as the 'global saving glut' and faster-moving explanations regarding the very microstructure of financial markets
- Part II provides the main explanations for many of the episodes learnt in Part I: 'bank runs', speculative attacks, pro-cyclicality and endogenous risk, feedback effects and market discontinuities, international imbalances, public debt, sovereign default, and bubbles
- Part III describes the main analytical tools that policymakers rely on to implement both micro-prudential and macro-prudential policies. It overviews the current regulatory framework while defining new measures of individual and systemic risk relying on (i) notions of market volatility such as the VIX on a variety of asset classes and (ii) measures of market and credit risk such as VaR, Credit VaR, marginal expected and capital shortfall, market connectedness, global systemically importance, Co-VaR. This part ends with a succinct overview of the main evaluation models of sovereign default.

## Emphasis of the course and prerequisites

- Some introductory courses in security evaluation and risk management
- Good understanding of (and passion for) the main principles of economics and finance
- The course emphasis is on
  - some critical developments in contemporary financial history (Part I) ...
  - ... some foundational issues arising in financial economics (Part II) ...
  - ... last but not least, some fundamental (and analytical) tools of modern prudential supervision (Part III)
- In its most technical parts, the course relies on the application of models, not the models' mathematical foundations
  - But it would be misleading to state this course is “mathematics-free.”
- However, the models we rely on are representative of the mainstream academic literature and/or the current best practice
- Many classes will be devoted to analyze real world “case studies”

## Sources for this course

- The source for this course is a comprehensive set of self-contained Lecture Notes, and so there is no required textbook.
  - The following references contain additional material, but are not mandatory:
    - \* Allen, F. and D. Gale (2007): *Understanding Financial Crises*. Oxford University Press.
    - \* Biais, D., M. Flood, A.W. Lo and S. Valavanis (2012): “A Survey of Systemic Risk Analytics.” *Annual Reviews* 4, 255-296.
    - \* Bordo, M.D. and C.M. Meissner (2016): “Fiscal and Financial Crises.” In J.B. Taylor and H. Uhlig (eds.): *Handbook of Macroeconomics*, Vol. 2A, Chapter 7, 355-412.
    - \* Brunnermeier, M.K. and M. Oehmke (2013): “Bubbles, Financial Crises and Systemic Risk.” In G.M. Constantinides, R. Stulz and M. Harris (eds.): *Handbook of Finance and Economics*, Vol. 2B, Chapter 18, 1221-1288.
    - \* Hull, J.C. (2010): *Risk Management and Financial Institutions*. Wiley. 5th edition.
    - \* Mele, A. (2022). *Financial Economics*. MIT Press.
    - \* Shin, H.S. (2010): *Risk and Liquidity*. Oxford University Press.



# Exam

40% Class participation

60% Compulsory oral examination (20 minutes)

- ▶ Please note that the exam is invalid without the performance of the oral examination

# Course outline

## Part I - Learning from History

- I.1 The Great Depression of the 1930s
  - I.2 The era of Bretton Woods
  - I.3 The 1992-93 European speculative attacks
  - I.4 1994: The Mexican crisis
  - I.5 A brief history of crashes
  - I.6 1997: The Asian crisis
  - I.7 1998: The LTCM collapse
  - I.8 The internet bubble of the late 1990s
  - I.9 The Global Financial Crisis
  - I.10 The European Debt Crisis
- References

## Part II - The Economics of Financial Crises

II.1 Bank runs

II.2 Industry runs

II.3 Three generations of currency crises models

II.4 Herding

II.5 Endogenous risk

II.6 Market crashes

II.7 (Public) debt crises

References

## Part III - Prudential Supervision: Micro & Macro

III.1 Current regulatory framework

III.2 Some foundational issues in risk management

III.3 Credit risk and correlation

III.4 Systemic risk and market volatility

III.5 Systemic risk gauges

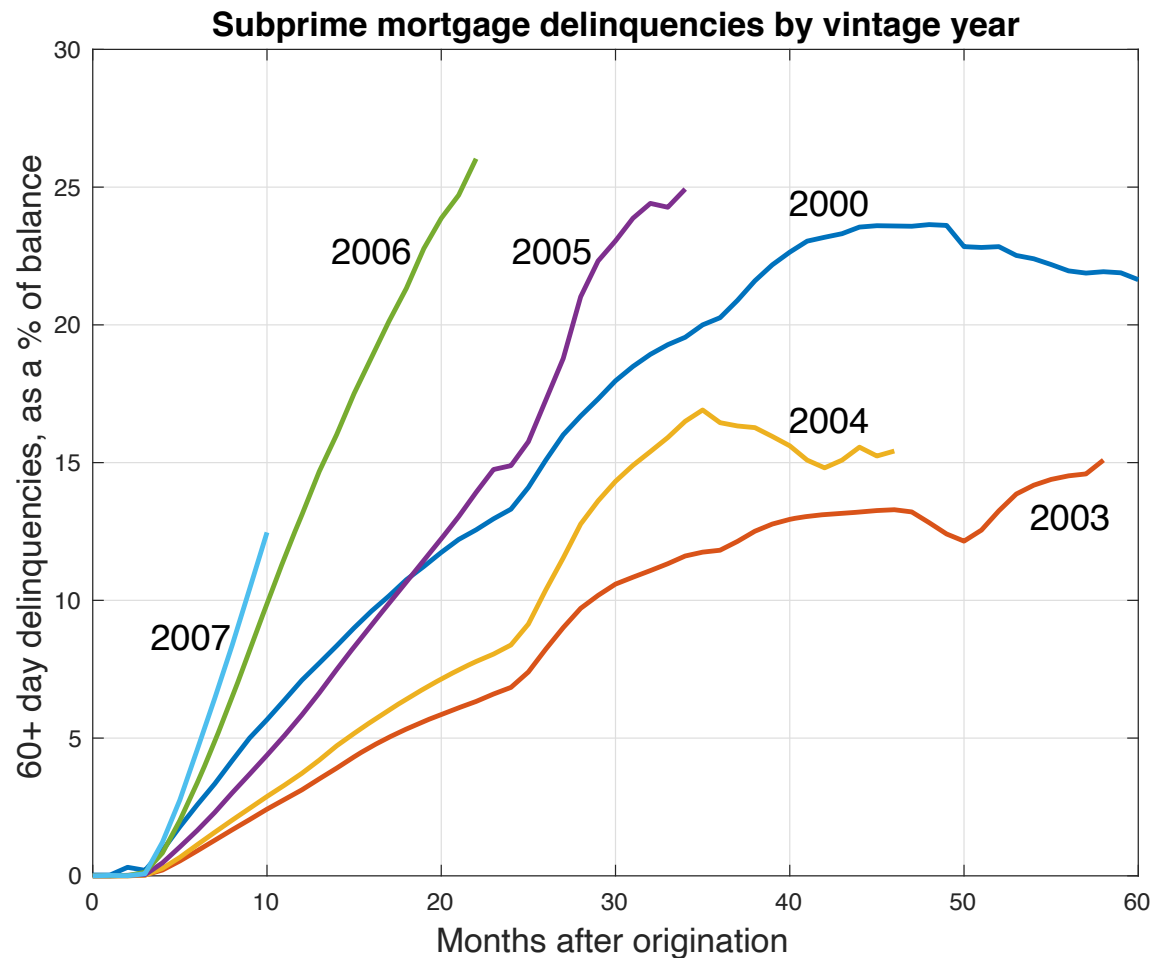
III.6 Monitoring sovereign default risk

References

## Some questions this course deals with

- People not necessarily perceive financial markets as being ordered, efficient and trustworthy
  - Should we trust financial products without being given enough information?
  - FINMA, ESMA + system of National Competent Authorities, SEC, ...
  - Shall be willing to invest in stocks just because others are doing it? —Without any research
    - \* Why would we do this?
    - \* What are the market-level implications of irrational behaviors? —Speculative enthusiasm
- Now let's go to the opposite side of the deal: let's wear the shoes of a financier. What do they do? Financial intermediaries should lend the money they borrow (from households) to
  - firms
  - governments
  - households
- Not an easy task. Things go pretty well when markets function very well
  - But markets don't function very well
    - \* Asymmetric information
    - \* Reflexivity and endogenous volatility

- We often see financial crises and oftentimes we are caught off guard



Delinquency rates for securities at the epicenter of the Global Financial Crisis of the late 2000s.

- 5th November 2008. Queen Elizabeth visited LSE to open the New Academic Building on Lincoln's Inn Fields. It was the first visit to LSE by a reigning monarch since her grandfather, George V, laid the foundation stone of the Old Building





“If these things were so large, how come everyone missed them?” “It’s awful”

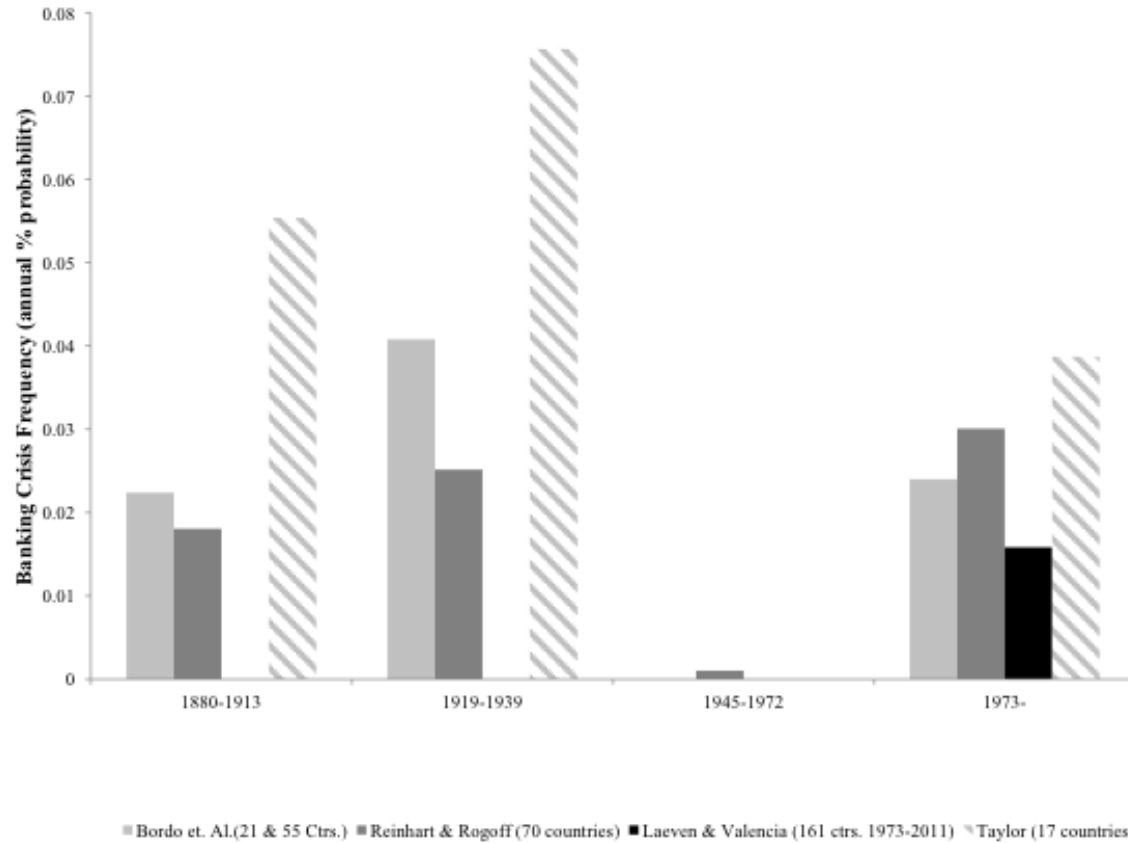


- Some notable historical instances
  - The Great Depression (a.k.a. “Great Contraction”) (1929-1933)
  - The collapse of Bretton Woods
  - Japan’s experience (1990–)
  - Scandinavian crises (1990-1991)
  - The crisis of the European exchange rate mechanism (1992)
  - Mexico (1994)
  - The Asian Crisis (1997)
  - The Russian crisis and the collapse of LTCM (1998)
  - Dotcom bubble (end of the 1990s)
  - Argentina (2001-2002)
  - Global Financial Crisis (2007-2009)
  - The European Debt Crisis (2010-2012)

## Which crisis

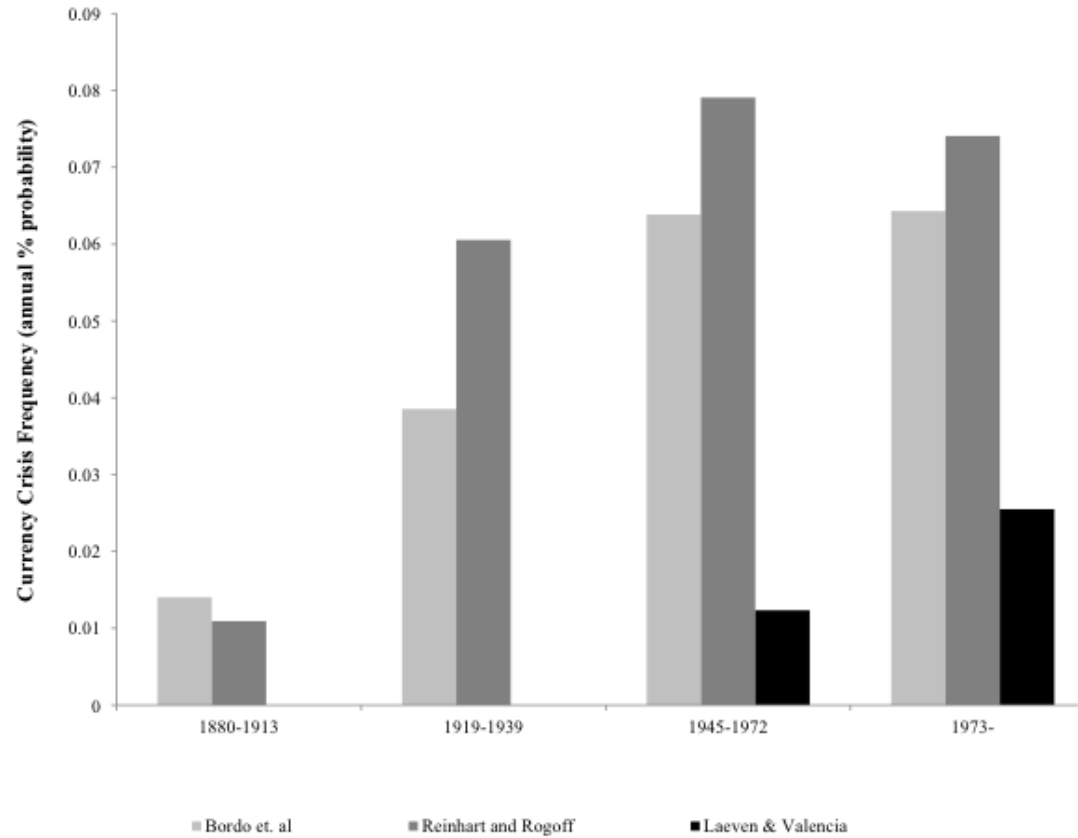
- Banking crisis?
- Currency crisis?
- Sovereign crisis?

## Banking Crisis freq.



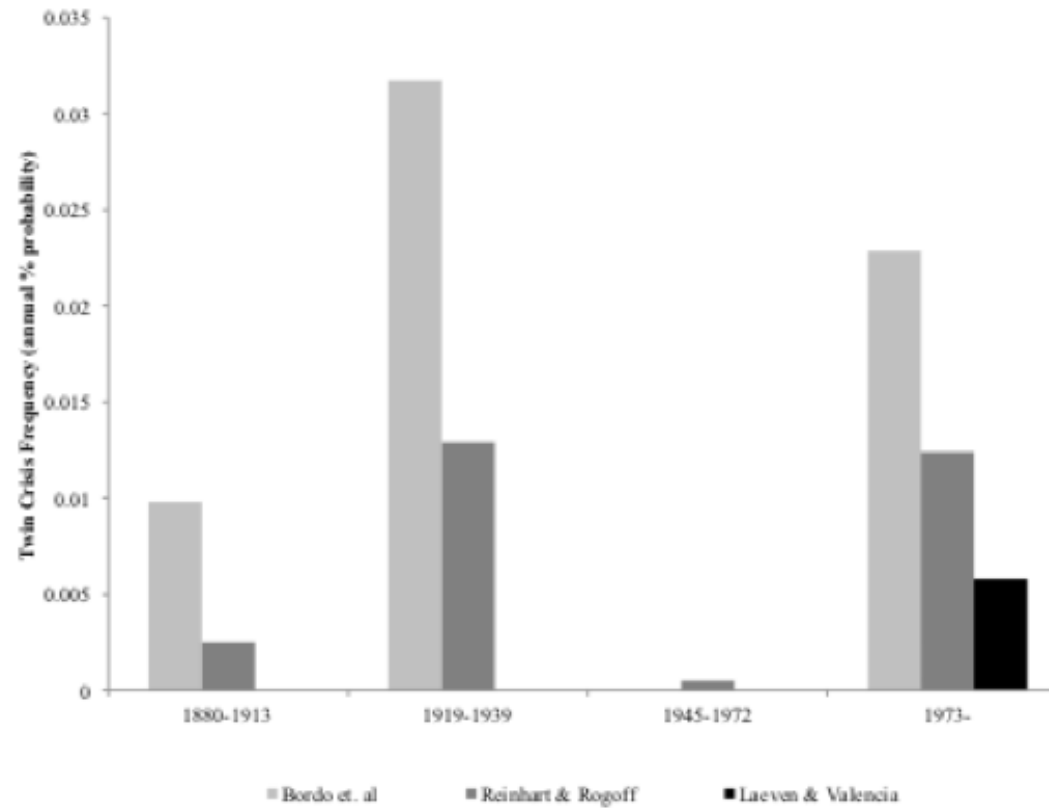
Source: Bordo and Meissner (2016)

## Currency Crisis freq.



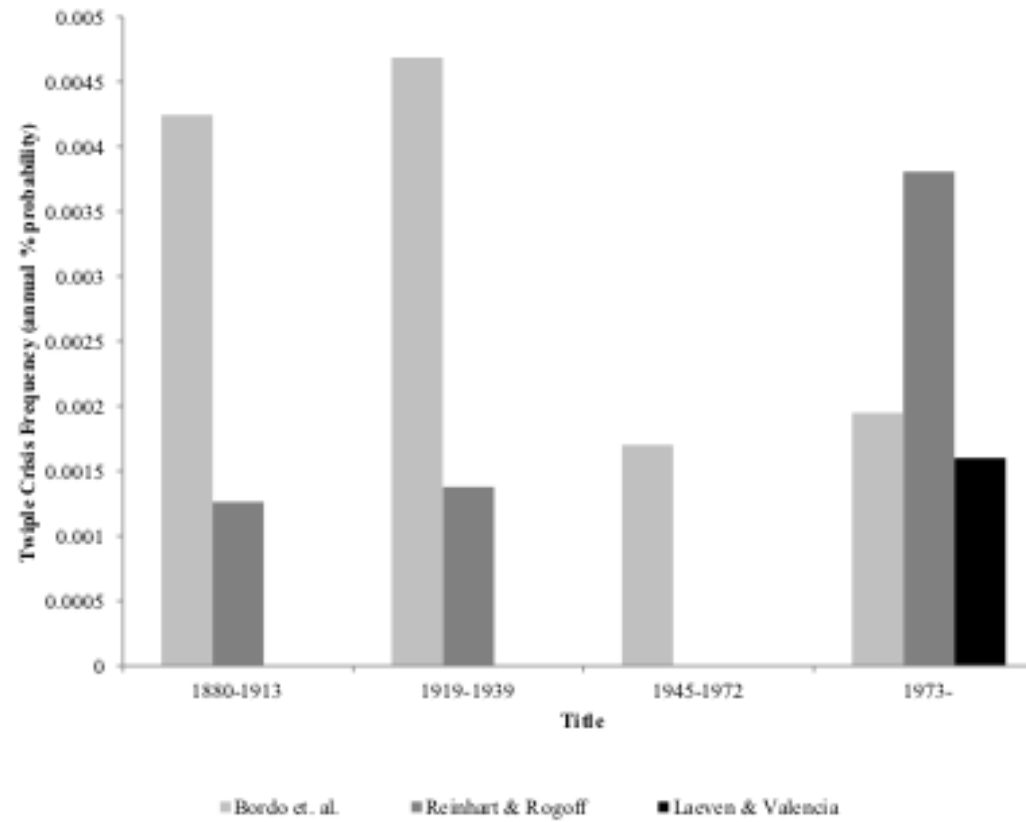
Source: Bordo and Meissner (2016)

## Twin Crisis freq.



Source: Bordo and Meissner (2016)

## Triple Crisis freq.



Source: Bordo and Meissner (2016)

# “This time is different”

## *Anatomy of crises*

- The process begins with an expansion of money and/or credit — triggered, sometimes, by “financial liberalization”
  - Capital flows freely and is invested in projects that wouldn’t deliver what they promise
    - \* and/or invested in assets with fixed supply (real estate, stocks)
  - Process continues as long as the central bank does not perceive any of the following two
    - \* inflationary pressures
    - \* *too much* financial speculation (that is, “speculative enthusiasm”) and “bubbles”
  - Central bank is concerned about inflation and/or speculation/bubbles and interrupts the process
    - \* Then it may be too late
    - \* System collapses
    - \* When capital flows are from abroad ... “twin crises” (banking + currency)
  - Alternatively, central banks do not perceive anything, but assets don’t deliver and/or bubble bursts
    - \* The process would be the same, that is,
    - \* System collapses
    - \* When capital flows are from abroad ... “twin crises” (banking + currency)

- Government debt. It's still puzzling
  - Default
  - Strategic default
  - Political economy mechanisms
- Currency crises
  - Fixed X-rates poorly calibrated and/or too much diversity in the fundamentals of the countries adopting the pegs
  - Currency boards
  - Dollarization



## What to watch out

(This is Part III of this course)

- Credit/GDP
- Money expansion
- Public debt
- Fixed income derivatives data
- Credit derivatives data
- Stock market volatility
- Interest rate volatility
- “Flows identity” // “Global saving glut” ↘

$$\text{net savings} \equiv \text{savings} - \text{investments} = \underbrace{\text{primary deficit}}_{=G-T} + \underbrace{\text{trade surplus}}_{X-M}$$

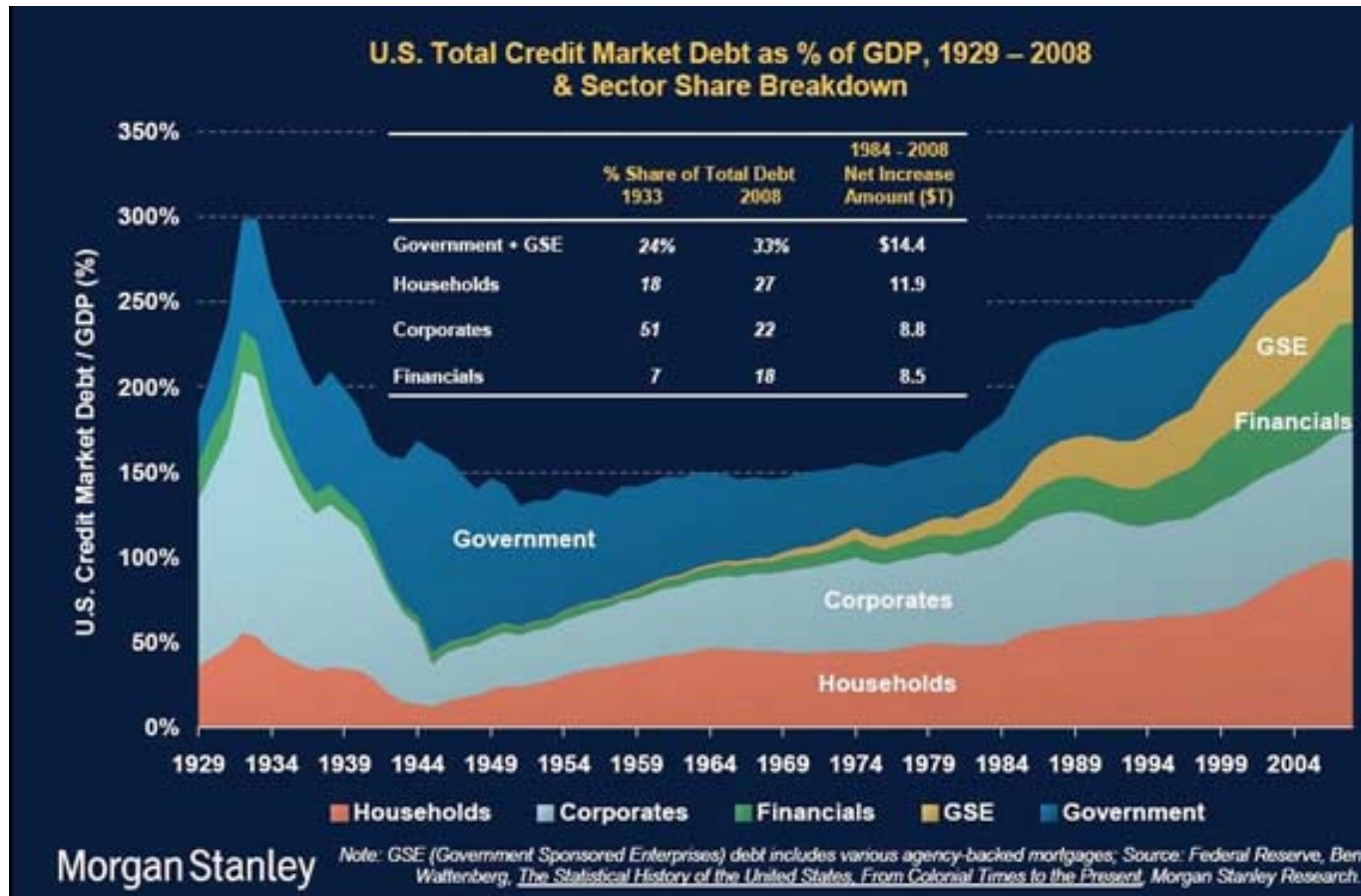
⇔

$$\underbrace{\text{primary deficit}}_{=G-T} - \text{net savings} = \underbrace{\text{trade deficit}}_{M-X}$$

- Suggestions?

Let's have a look at some examples ↻

# Credit (U.S.)

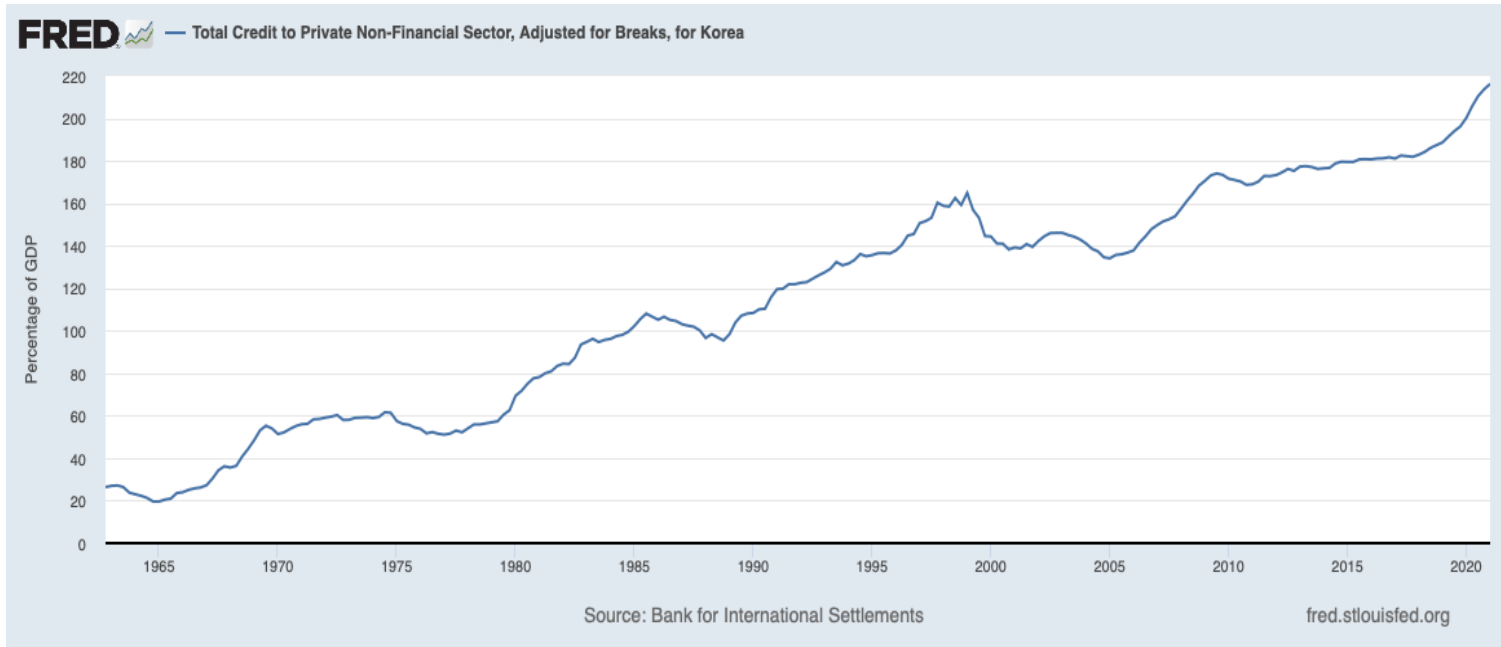


# Stock market (U.S.)

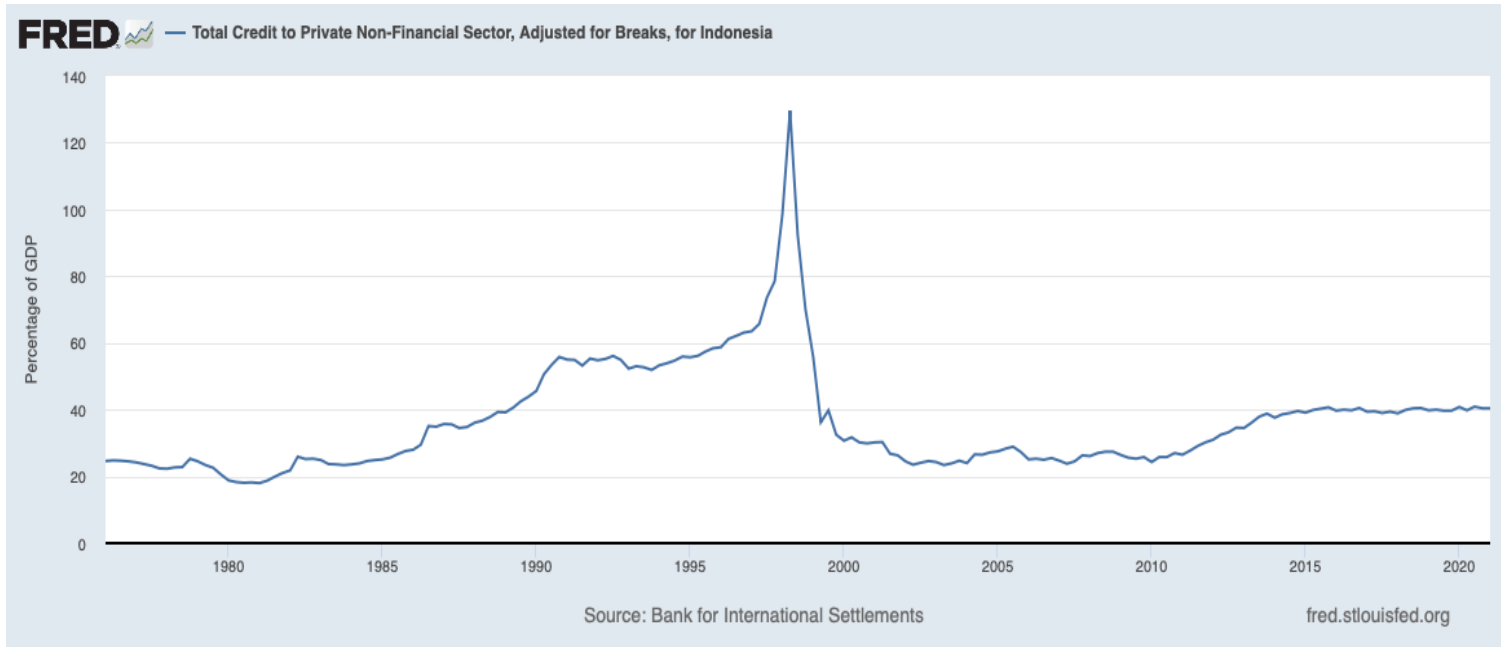


S&P 500: Day zero on the chart is the final high of the S&P 500 at market close, before the bear market began. Source: ig.com

# Credit (S. Korea)



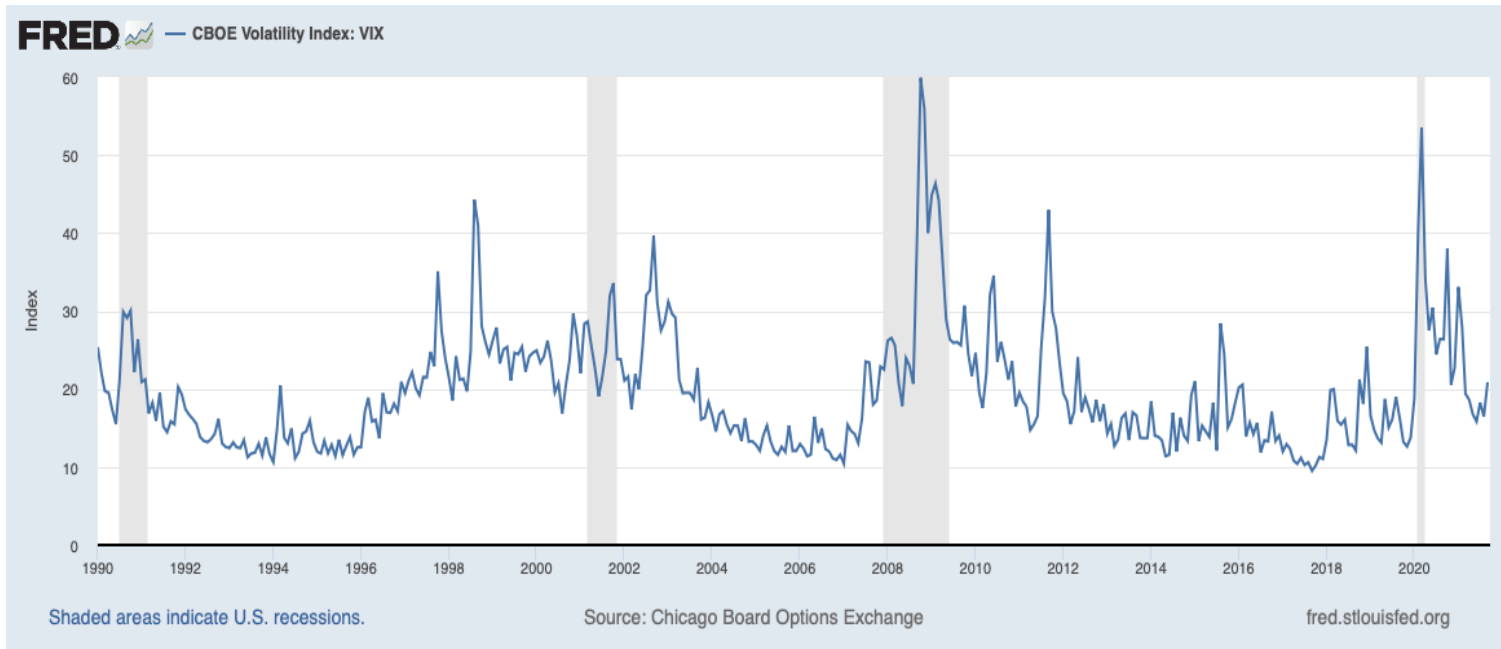
# Credit (Indonesia)



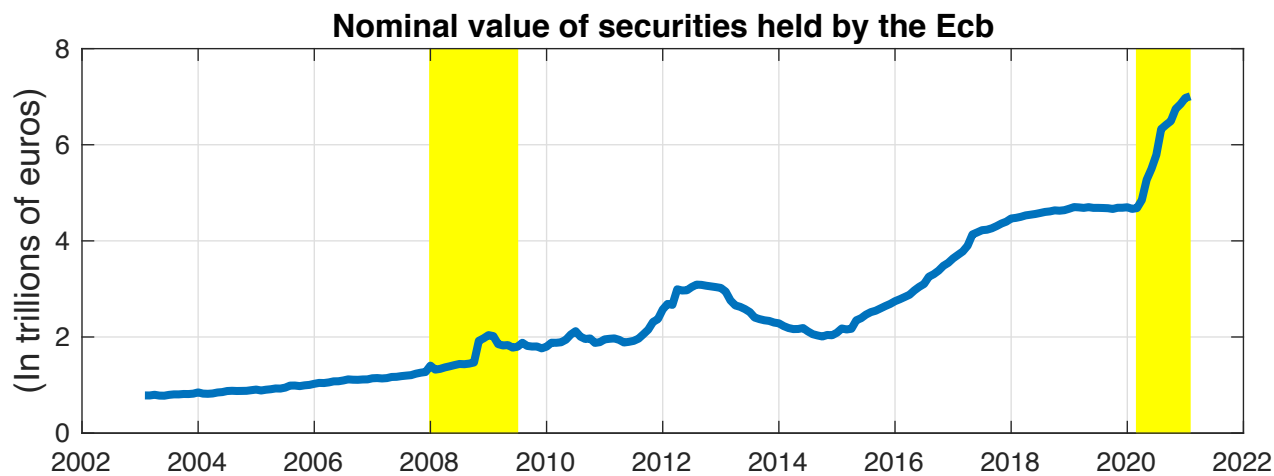
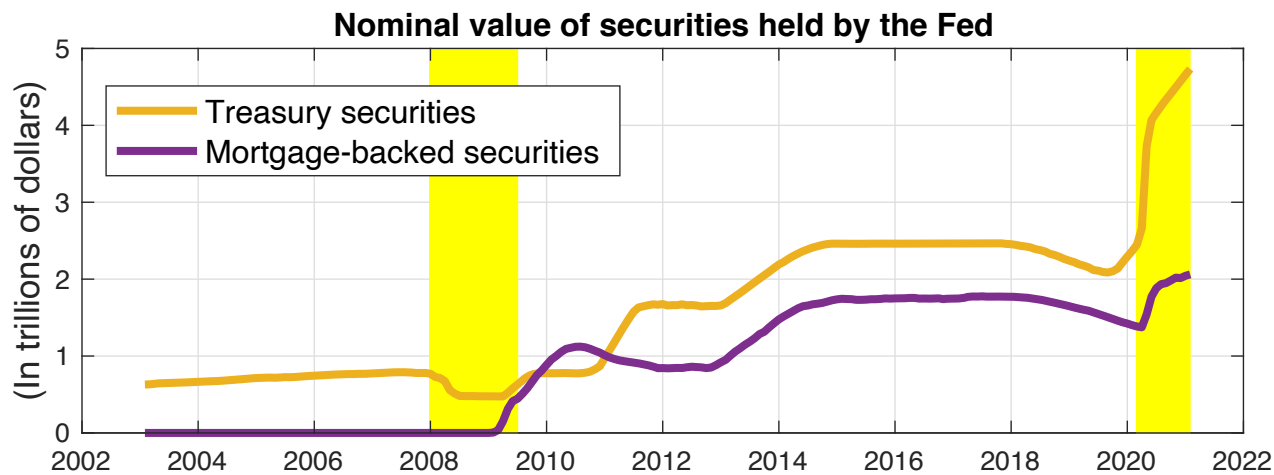
# Nasdaq



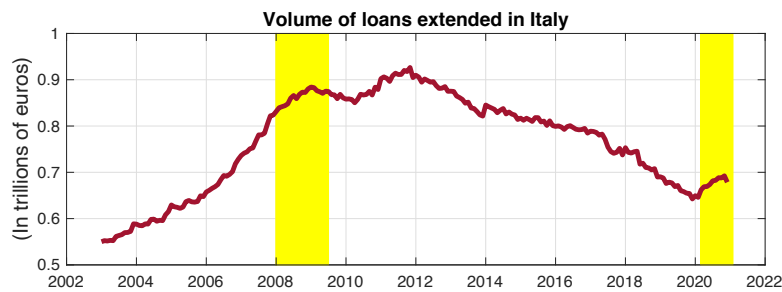
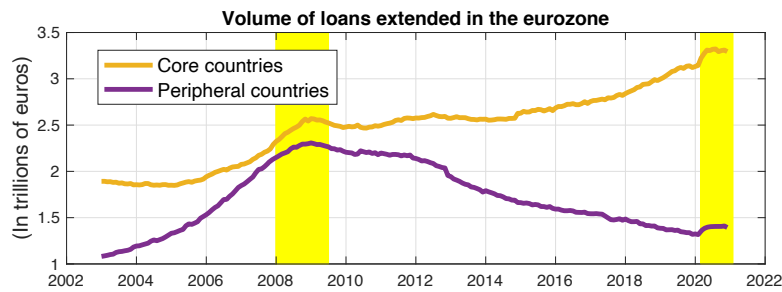
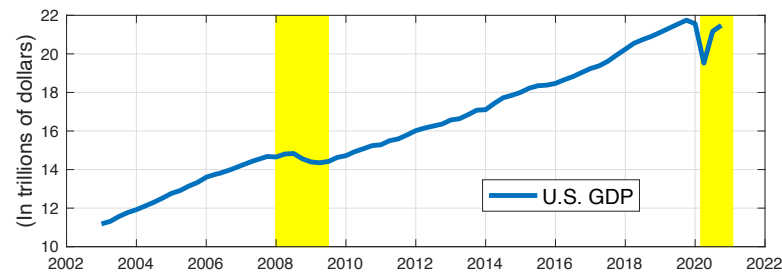
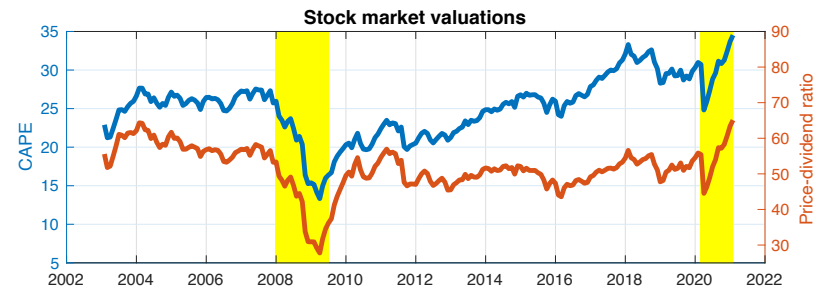
# Stock market volatility



# Quantitative easing



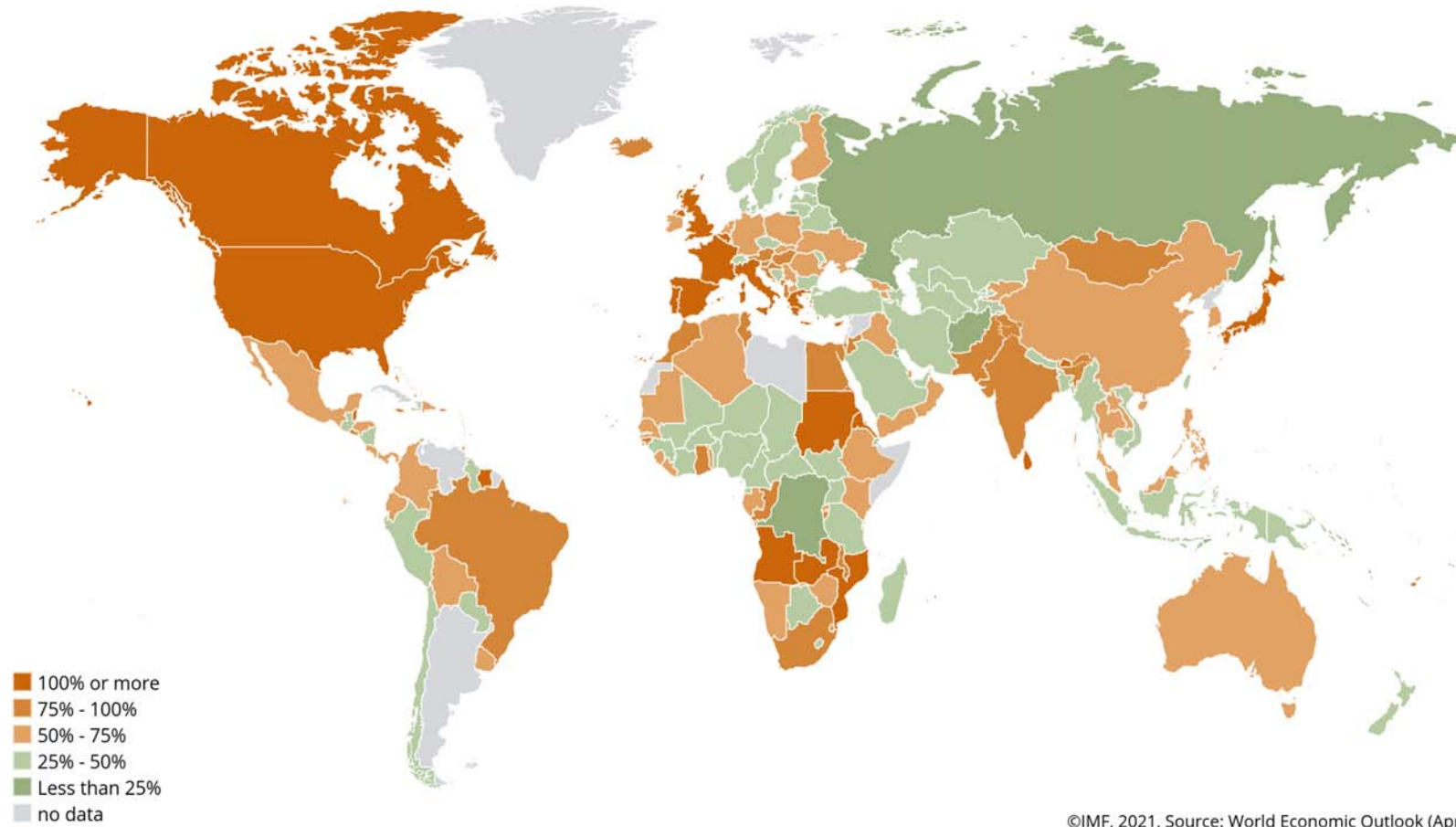




# Government debt around the world

IMF DataMapper

General government gross debt (Percent of GDP, 2021)



## *Data and interactive maps*

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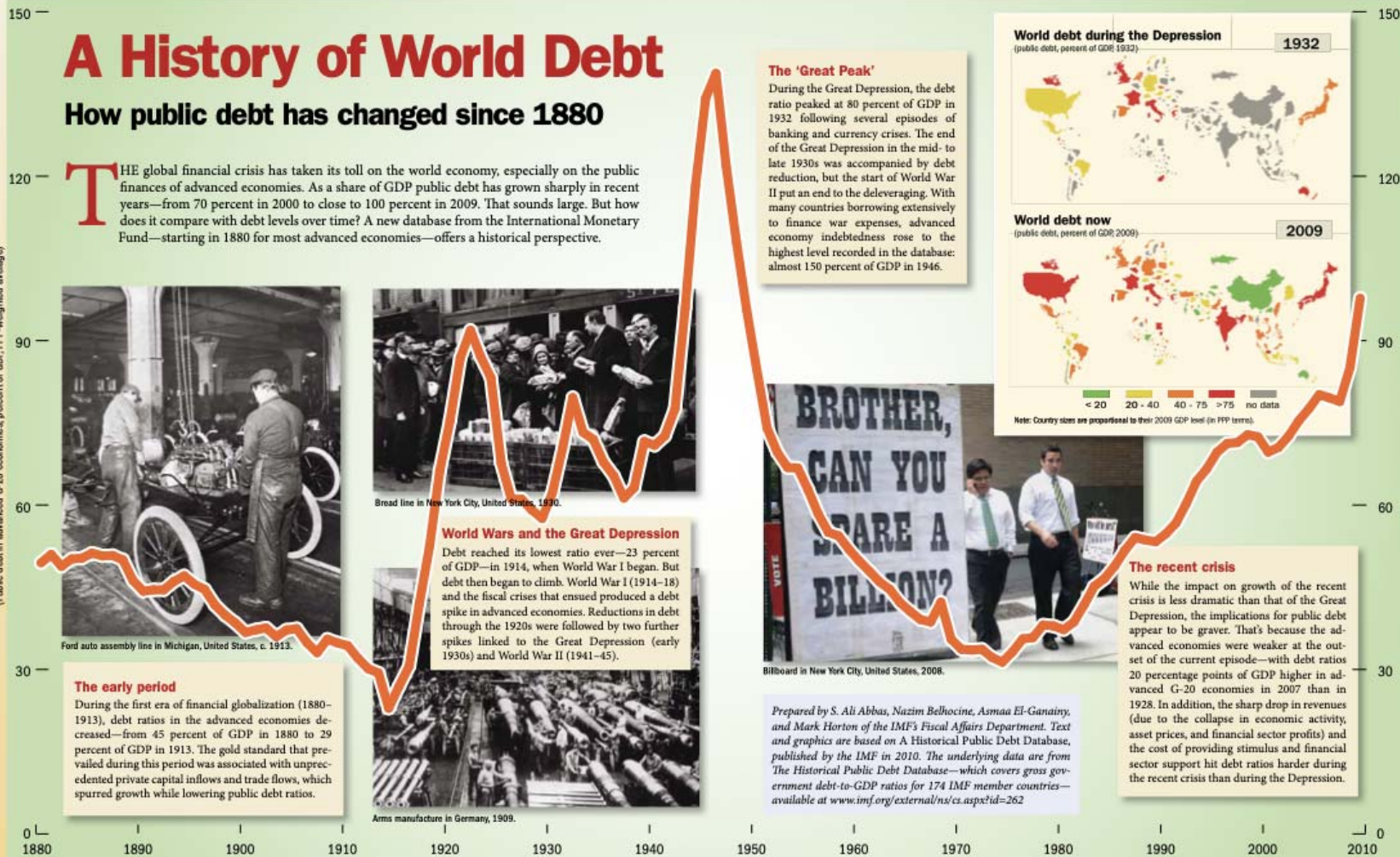
- IMF history & datamappers
  - <https://data.imf.org/?sk=806ED027-520D-497F-9052-63EC199F5E63>
  - [https://www.imf.org/external/datamapper/GGXWDG\\_NGDP@WEO/OEMDC/ADVEC/WEOWORLD/](https://www.imf.org/external/datamapper/GGXWDG_NGDP@WEO/OEMDC/ADVEC/WEOWORLD/)
- The Economist global debt clock (copy & paste the following link)
  - [https://www.economist.com/content/global\\_debt\\_clock](https://www.economist.com/content/global_debt_clock)

# A History of World Debt

## How public debt has changed since 1880

**T**HE global financial crisis has taken its toll on the world economy, especially on the public finances of advanced economies. As a share of GDP public debt has grown sharply in recent years—from 70 percent in 2000 to close to 100 percent in 2009. That sounds large. But how does it compare with debt levels over time? A new database from the International Monetary Fund—starting in 1880 for most advanced economies—offers a historical perspective.

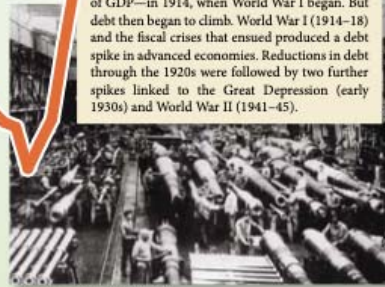
Public debt in advanced G-20 economies, percent of GDP, PPP-weighted average



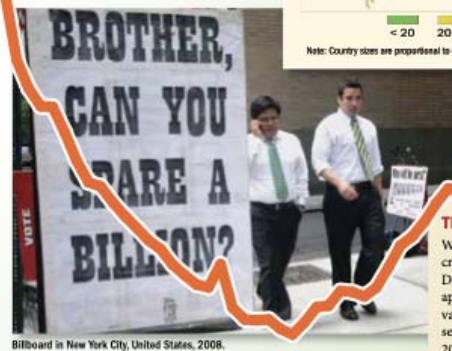
**The early period**  
During the first era of financial globalization (1880–1913), debt ratios in the advanced economies decreased—from 45 percent of GDP in 1880 to 29 percent of GDP in 1913. The gold standard that prevailed during this period was associated with unprecedented private capital inflows and trade flows, which spurred growth while lowering public debt ratios.



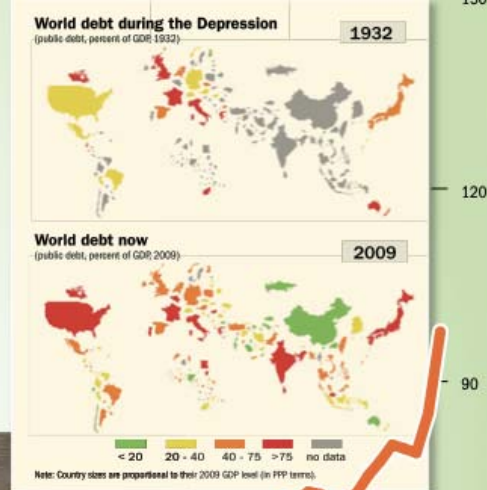
**World Wars and the Great Depression**  
Debt reached its lowest ratio ever—23 percent of GDP—in 1914, when World War I began. But debt then began to climb. World War I (1914–18) and the fiscal crises that ensued produced a debt spike in advanced economies. Reductions in debt through the 1920s were followed by two further spikes linked to the Great Depression (early 1930s) and World War II (1941–45).



**The 'Great Peak'**  
During the Great Depression, the debt ratio peaked at 80 percent of GDP in 1932 following several episodes of banking and currency crises. The end of the Great Depression in the mid- to late 1930s was accompanied by debt reduction, but the start of World War II put an end to the deleveraging. With many countries borrowing extensively to finance war expenses, advanced economy indebtedness rose to the highest level recorded in the database: almost 150 percent of GDP in 1946.



Prepared by S. Ali Abbas, Nazim Belhocine, Asmaa El-Ganainy, and Mark Horton of the IMF's Fiscal Affairs Department. Text and graphics are based on A Historical Public Debt Database, published by the IMF in 2010. The underlying data are from The Historical Public Debt Database—which covers gross government debt-to-GDP ratios for 174 IMF member countries—available at [www.imf.org/external/ns/cs.aspx?id=262](http://www.imf.org/external/ns/cs.aspx?id=262)



**The recent crisis**  
While the impact on growth of the recent crisis is less dramatic than that of the Great Depression, the implications for public debt appear to be graver. That's because the advanced economies were weaker at the outset of the current episode—with debt ratios 20 percentage points of GDP higher in advanced G-20 economies in 2007 than in 1928. In addition, the sharp drop in revenues (due to the collapse in economic activity, asset prices, and financial sector profits) and the cost of providing stimulus and financial sector support hit debt ratios harder during the recent crisis than during the Depression.