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Development of Financial Markets and Institutions

XI. The Crisis of 2008 and other Financial Crises

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XI. THE CRISIS OF 2008 AND OTHER FINANCIAL CRISES

1. Crises from the Eighties to the Naughties
2. The Great Financial Crisis – USA
3. The Great Financial Crisis – Europe
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5. Literature



1. CRISES FROM THE EIGHTIES TO THE NAUGHTIES

THE END OF STAGFLATION

Taming High Inflation

- US Fed raised rates drastically in the early 1980s under Paul Volcker
- US inflation peaked at 14.8 percent in 1980
- Federal funds rate raised to 20 percent in June 1981
- Inflationary expectations and money growth curbed

New Situation

- Federal funds rate key policy rate until after GFC
 - Fed influences it by buying or selling financial assets, injecting or removing reserves
- Double-digit inflation ends – in US and most of the western world
- Stage set for expansion – or for a new boom?

BOOM IN THE 1980S

Boom

- Growth in the US money supply resumed in 1983
- Rate of growth in reserves 14.5 percent per year 1985-8, from \$25 to \$40 billion
- Addition of reserves fuelled credit expansion and boom
- At the same time, financial markets were partly deregulated, capital markets liberalized
- Credit expansion guided into new channels: financial markets

Crash of 1987

- Dow Jones Industrial Average index down 22.8 percent in one day – October 19
- Immediate Fed action: open market purchases, liquidity added
- \$17 billion in reserves added to the banking system October 20

THE GREENSPAN PUT

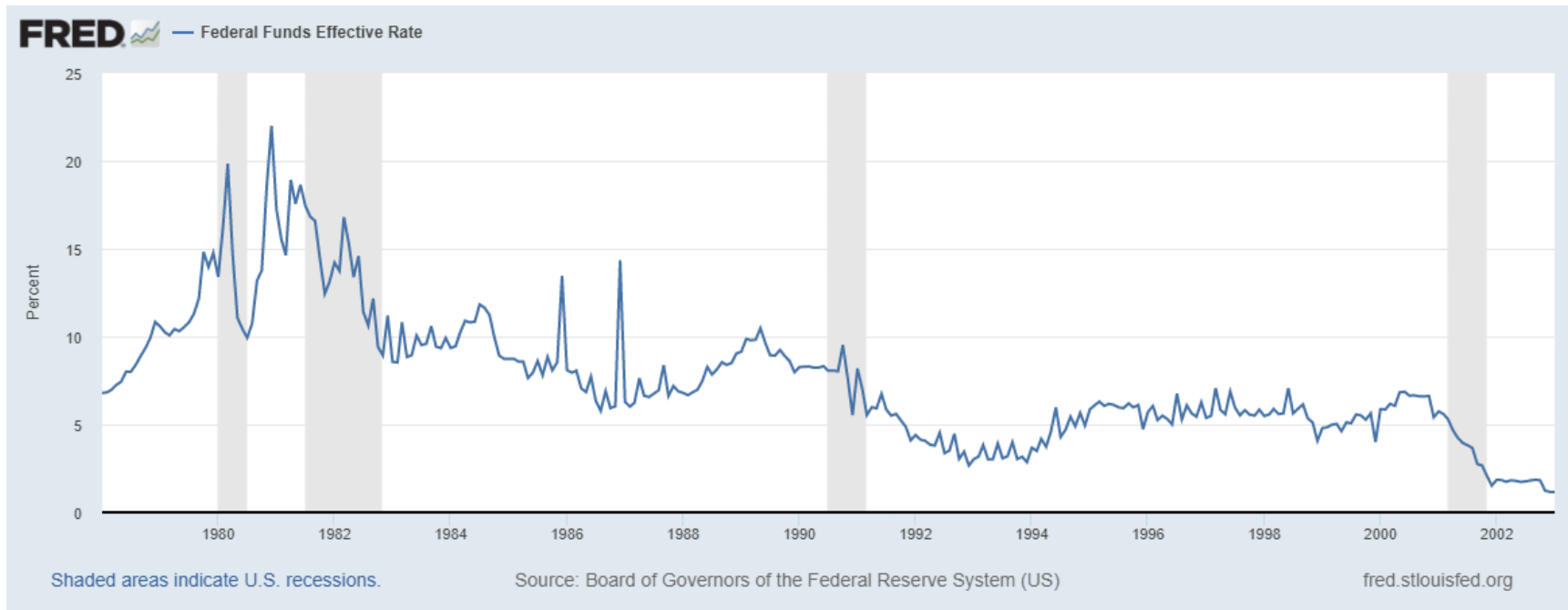
Background

- Put option: the right to sell an asset at a predetermined price
- Alan Greenspan was chair of the Federal Reserve 1987-2006

The Greenspan Put

- Beginning 1987, the Federal Reserve always prepared to bail out the financial system
 - Through injections of liquidity into financial markets
 - Open market operations supported asset prices, e.g., of Treasurys
 - Lower federal funds rate supported banks
- Repurchase agreement a new tool: short-term (daily) loans to financial sector that could be rolled over indefinitely

FEDERAL FUNDS RATE, 1978-2002



JAPANESE BOOM AND BUST IN THE EIGHTIES AND NINETIES

Background

- Financial market in Japan opened to foreign investors in the early 1980s
- The Plaza Accords, 1985: devaluation of US dollar against D-Mark, Yen

Japanese Monetary Policy

- Yen appreciation, Bank of Japan reduces dollar holdings
- Exchange rate: 250 Y / \$ in 1985 to 125 Y in 1988/9
- Bank of Japan wants to offset the effects in Japan: domestic easing, credit expansion
- Boom in the late 1980s, especially in Tokyo land prices and the Nikkei stock index
- Bubble burst 1989-90: Nikkei fell 35 percent, land prices began to fall
- Money supply growth slowed down in late 1990

JAPAN'S LOST DECADE(S)

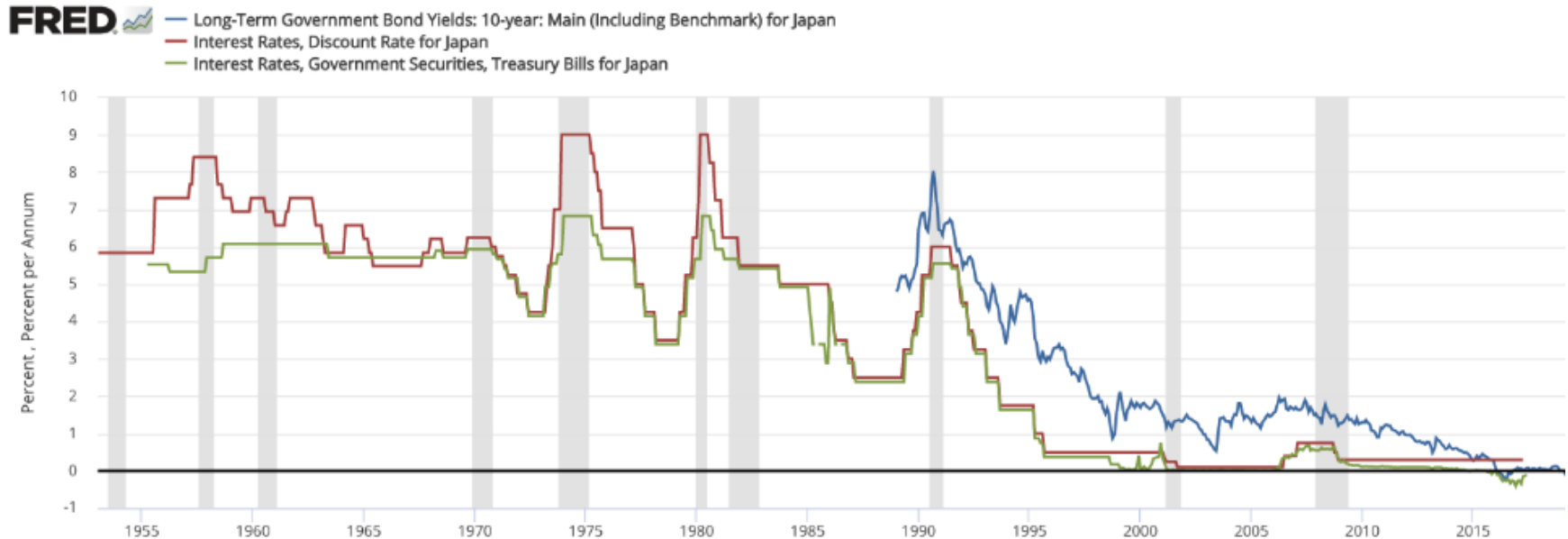
Stagnation for Decades

- GDP growth of around 1 percent per year
- Falling real wages
- “Deflation” – low price inflation
- Low to zero interest rates
- Collapse of savings rate (Mayer and Schnabl 2019)

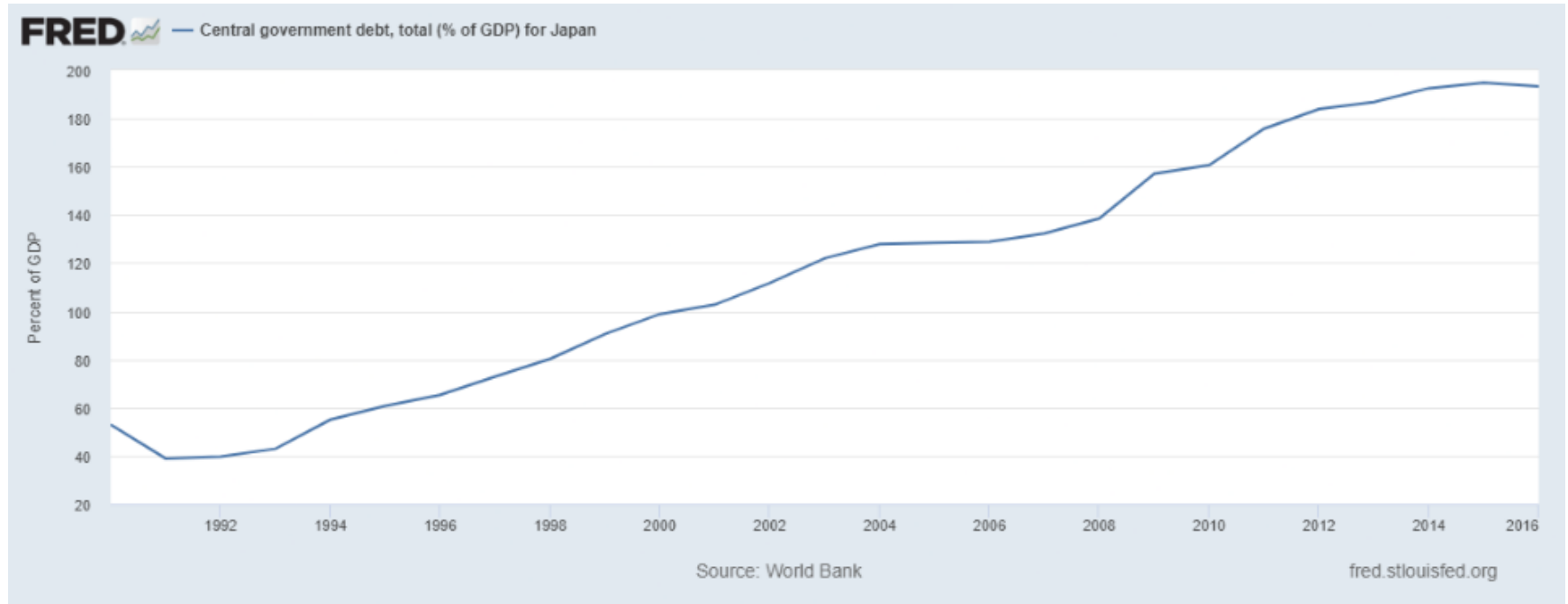
Policies

- Initial contraction of the money supply quickly replaced by expansionary policies
- Very low interest rates, fiscal and monetary expansion
- Japanese bond markets and savings portfolios are dominated by government bonds

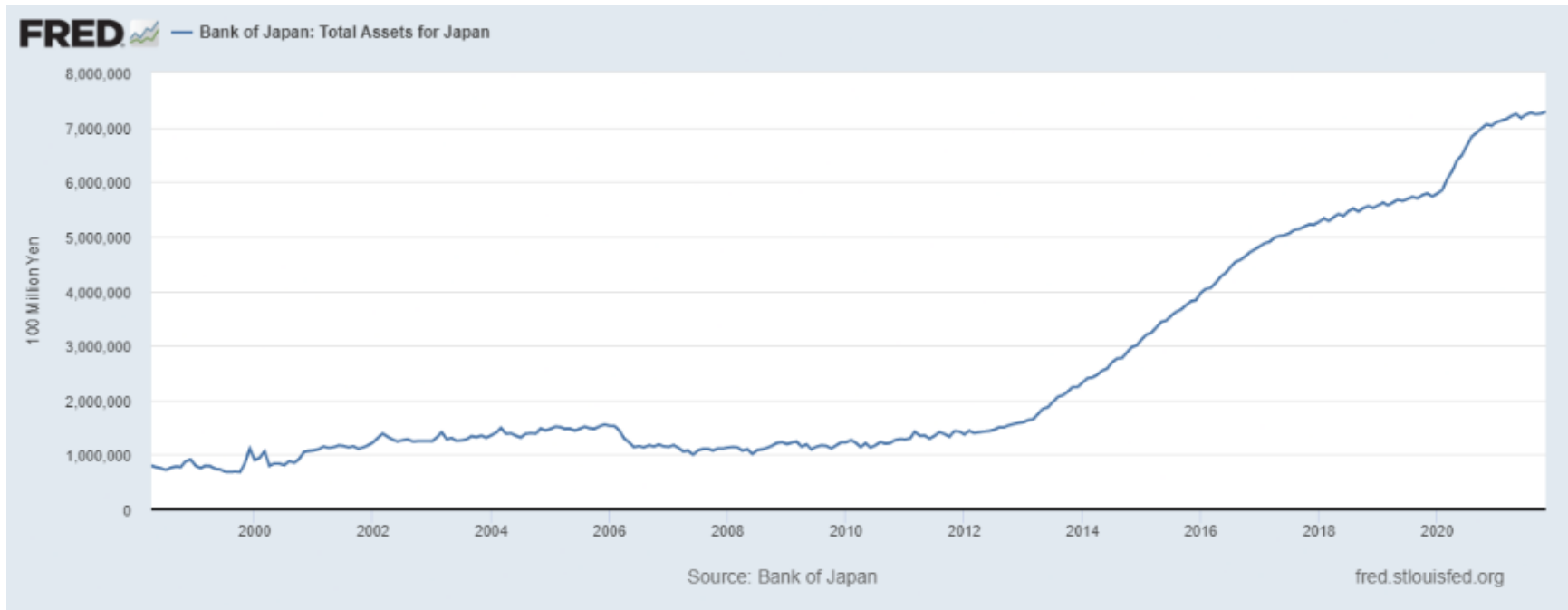
JAPANESE INTEREST RATES, 1950-2020



JAPANESE GOVERNMENT DEBT, 1990-2016



BANK OF JAPAN BALANCE SHEET EXPANSION



THE ASIAN CRISIS

Southeast Asian Boom in the 1990s

- Currencies pegged to the dollar
- Inflows of “hot money” – partly from Japanese banks
- Dollar appreciation redirected capital flows
- Credit expansion and currency pegs became untenable in SE Asia – bust inevitable

Crisis Summer of 1997

- Countries forced to devalue
- Companies that had borrowed in foreign currencies hit hard
- Contagion: collapse of US hedge fund LTCM 1998
 - Bailed out with \$3.625 billion loan organized by New York Fed

THE DOT-COM BUBBLE

Background

- Deregulation of telecommunication industry opened it for investment, development
- Greenspan “puts” continued to boost markets

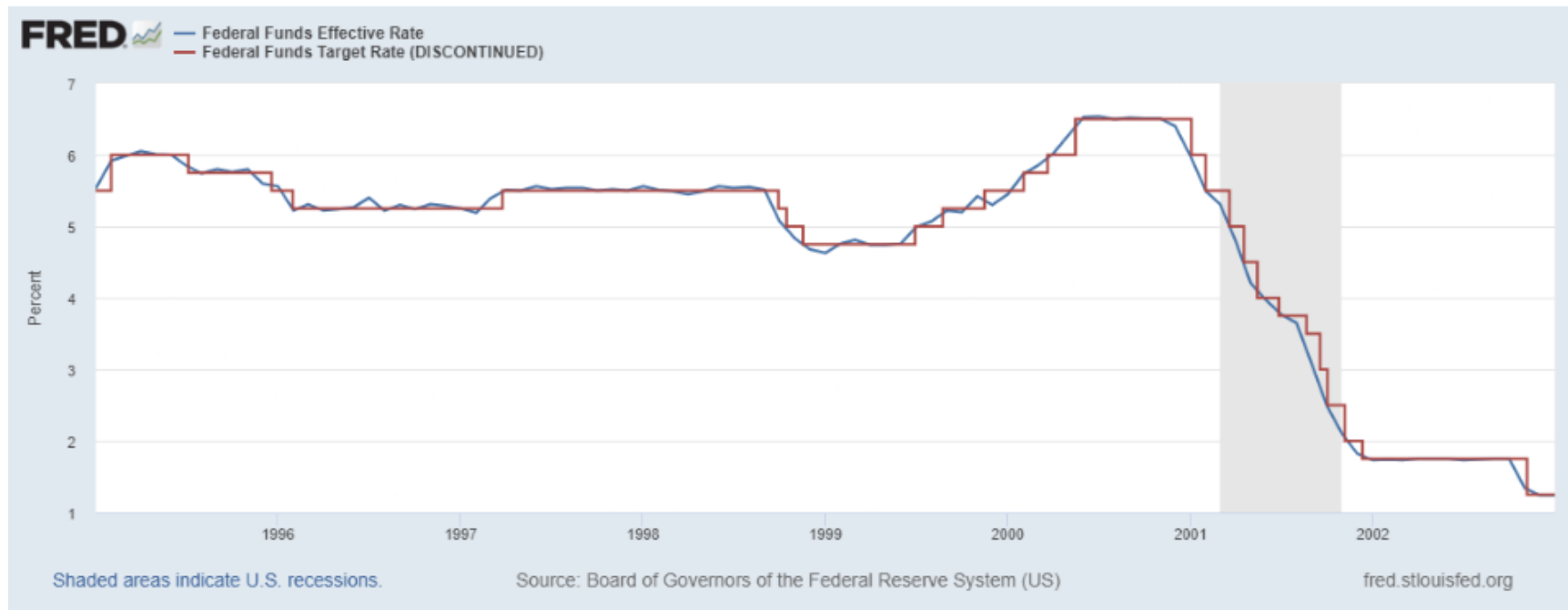
Boom

- Tech stocks started rising mid-90s – along with expansion of digital economy
- Nasdaq stock index rose 400 percent 1995-2000
- Credit plentiful: investment banks eager to organize IPOs for new tech companies

Crash in 2000

- Only 48 percent of dot-com companies survived to 2004
- Greenspan to the rescue: Federal funds rate cut from high of 6.5 percent in Dec. 2000 to 2 percent in Dec. 2001 and 1.25 percent in Dec. 2002

FEDERAL FUNDS RATE, 1995-2002



THE FINANCIAL MELTDOWN ... ONE YEAR LATER

AND HAVE
YOU LEARNED
YOUR LESSON
BECAUSE YOU
REWOUND UP SO
STUBBLY?



2009
WALTER TRUENE
CORRECTIONS.COM

2. THE GREAT FINANCIAL CRISIS – USA

TIMELINE OF CRISIS

- March 2008: investment bank Bear Stearns fails
 - Federal Reserve guarantees its bad loans, Bear Stearns is taken over by JPMorgan Chase
- September 15 2008: investment bank Lehman Brothers goes bankrupt
 - Federal Reserve refuses to guarantee its loans
- September 16 2008: Federal Reserve takes over insurance giant AIG
- September 17 2008: huge withdrawals from money market funds
- September 19 2008: the Federal Reserve steps in to insure the money market funds
- Calls on US government to authorize a \$700 billion fund to acquire “toxic” mortgages
- October 3 2008: Legislation authorizing the bailout fund is signed into law
- December 2008: US government extends assistance to Chrysler and General Motors

THE CAUSES OF THE BOOM

Inflow of Reserves

- Federal funds rate below 2 percent until December 2004
- Rising rate to 5.25 percent in July 2006
 - This is consonant with rising real rates, as factor prices are bid up
 - Demand for funds drive up money rate of interest

Implied Bailout Guarantee

- The Greenspan put leads to moral hazard, riskier investment, balance sheet expansion

Regulation

- Basel rules make it possible for banks to hide “risky” assets to appear sounder
- Mortgages increasingly moved off balance sheet into unregulated entities

BASEL REGULATIONS AND BANK BEHAVIOUR

Consequences of the Basel Rules

- Led to less resilient, robust financial sector, underestimation of credit risk
- Banks moved mortgage loans off their balance sheet (Jablecki and Machaj 2009)
- This lowered their capital requirements
- And they still received income from mortgage originations and payments

The Role of SIVs

- Mortgages unloaded into SIVs funded by short-term asset-backed commercial paper
- Banks then invested in “riskless” Treasuries
- They then made a swap with the SIV: they exchanged the payments from the Treasuries with the payments from the mortgage-backed securities

SECURITIZATION

Transforming the Financial Landscape

- Securitization: transforming loans into marketable securities
- Government-sponsored securitizers Fannie Mae and Freddie Mac favoured
 - Per Basel rules, these were less risky
- Offloading securities into SIVs allowed banks to maintain income via swap agreements
- This process shrunk bank balance sheets, increasing their free capital

Securitization and Credit Expansion

- Securitization reduces the amount of mortgages on the balance sheet
 - Increasing the Basel capital ratio
- The bank can again extend credit – and its balance sheet no longer reveal the amount of credit in the economy

BANKS AND SECURITIZATION

- Banks fund assets through deposits and loans
- US banks had to hold \$5 of equity for \$100 of mortgages to maintain 10% cover and be “well-capitalized”
- Reducing the amount of mortgages by \$20, the capital ratio grows to 12.5 percent
- The bank can now again originate \$20 of mortgages – and be well-capitalized

| assets | | liabilities | |
|--------|-------|-------------|-------|
| cash | \$10 | capital | \$5 |
| loans | \$90 | deposits | \$95 |
| Total | \$100 | Total | \$100 |

| benchmark scenario | | | | securitization scenario | | | |
|--------------------|-------|-------------|------|-------------------------|------|-------------|------|
| assets | | liabilities | | assets | | liabilities | |
| mortgages | \$100 | deposits | \$95 | mortgages | \$80 | deposits | \$75 |
| | | equity | \$5 | | | equity | \$5 |

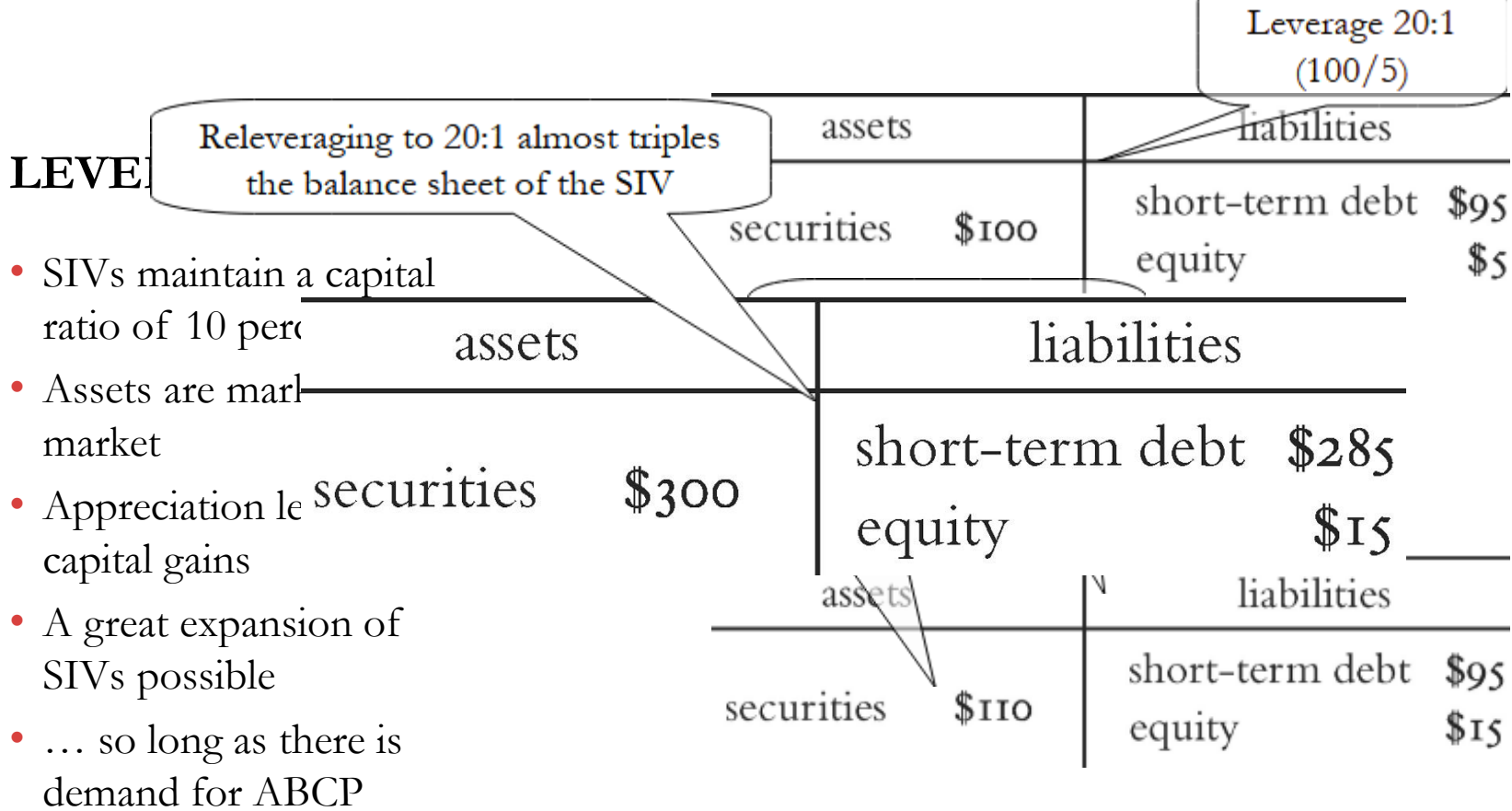
SIVS AND LEVERAGE

Funding

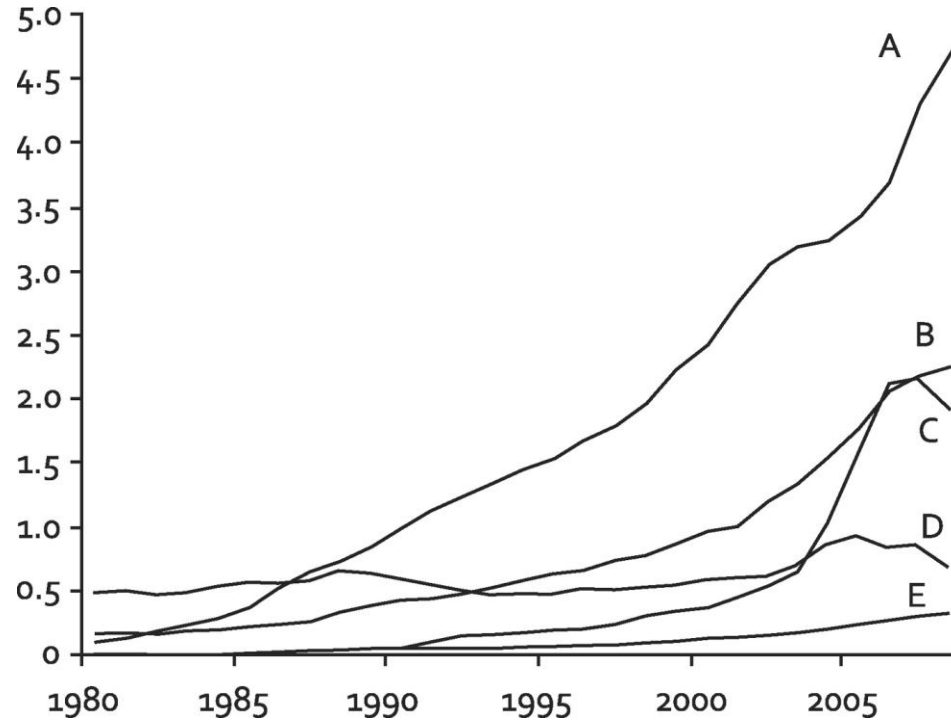
- SIVs were primarily funded through issuing short-term debt
 - asset-backed commercial paper, ABCP
- Especially money market funds held ABCP from SIVs – considered safe
- Money creation, inflow of liquidity, expanded demand for ABCP, CP

Valuation

- SIV assets were valued according to “fair value” principles
 - meaning mark-to-market, not historic cost
- If their assets appreciated, their leverage ratio declined
- They could therefore “safely” expand their balance sheet



US MORTGAGE ASSET HOLDINGS (\$ TRILLION)



US MORTGAGE ASSET HOLDINGS

Stocks of residential mortgages, 1980-2008

- A. GSE and other agency-backed residential mortgages
- B. Assets or privately issued RMBS (residential mortgage-backed securities) held by commercial banks
- C. Assets held by private RMBS securitizers
- D. Assets held by savings institutions
- E. Assets held by credit unions

RUN ON THE MONEY MARKET

Money Market Funds and the SIVs

- ABCP used to finance SIVs usually 90-day paper, MMFs invested due to high liquidity
- The “run” on MMFs in September 2008 triggered by collapse of Lehman Brothers
- Implicitly a run on the SIVs – and the whole credit system
- SIVs could no longer find a market for their paper as the rates on ABCP rose

Crisis Spreads

- SIVs’ capital became too low due to rising financing costs and falling asset prices
- Banks were forced to take SIVs back onto their balance sheet
- Problems spread to the banks: falling asset prices, rising costs, declining capital ratio
- This only revealed the crisis – it was not the cause

ABCP AND CP, 2002-9



BOOM AND BUST BEYOND HOUSING

The Classic Business Cycle and the 2002-08 Boom (Salerno 2012)

- There is a boom in investment spending, especially the higher stages
- At the same time, consumption booms

Indicators of the classic boom mechanic

- Consumer spending reached new heights
- Malinvestments in housing, paper profits on financial assets
- Derived boom in construction of new housing

Financial Origins of the Boom and Bust

- Debt service rose to 15 percent of disposable income, from 11 percent in the 1990s
- Household net worth plunged in the crisis: from 450 percent to 350 percent of GDP in early 2009

3. THE GREAT FINANCIAL CRISIS – EUROPE



EUROPEAN BOOM AND BUST

Parallel and Connected to America

- The financial crisis in Europe had similar causes as the American
- Some clear connections
- But it was not simply a case of contagion from the US!

Causes of Crisis

- Basel regulations affected European banking
- Moral hazard from national central banks
- The European Central Bank created its own moral hazard

THE CORE PROBLEM OF BASEL REGULATIONS

Financial Regulations

- Banking and finance is one of the most regulated industries in the modern economy
- Financial regulation is a case of the classic dynamic of interventionism (Mises 1998)

The Interventionist Spiral

- Privileges for banking, central banking, lead to moral hazard, perverse incentives
- Business cycles result, banks blamed for being reckless, engaging in too risky behaviour
- Governments then step in to regulate banking, impose capital requirements etc.
- Banks eventually again overextend themselves; regulations are then tightened and so on
- Unless broken, the spiral results in completely bureaucratized, de facto nationalized banking and finance

THE CORE PROBLEM OF BASEL REGULATIONS

Unfortunately, obeying a rule designed to minimize risk is not the same thing as minimizing risk. It is adherence to a bureaucratic requirement, nothing more. And even if excessive risk could in fact be tamed by tighter regulations, the overall effect of regulation may be to diminish the regulated entity's incentive to regulate itself. This is especially true when it is widely expected that fiscal and monetary policy will be used to guarantee the stability of the financial system by rescuing from imprudence firms that are deemed too big to fail.

- Jablecki and Machaj (2009)

THE PROBLEMS OF THE EURO (BAGUS 2010)

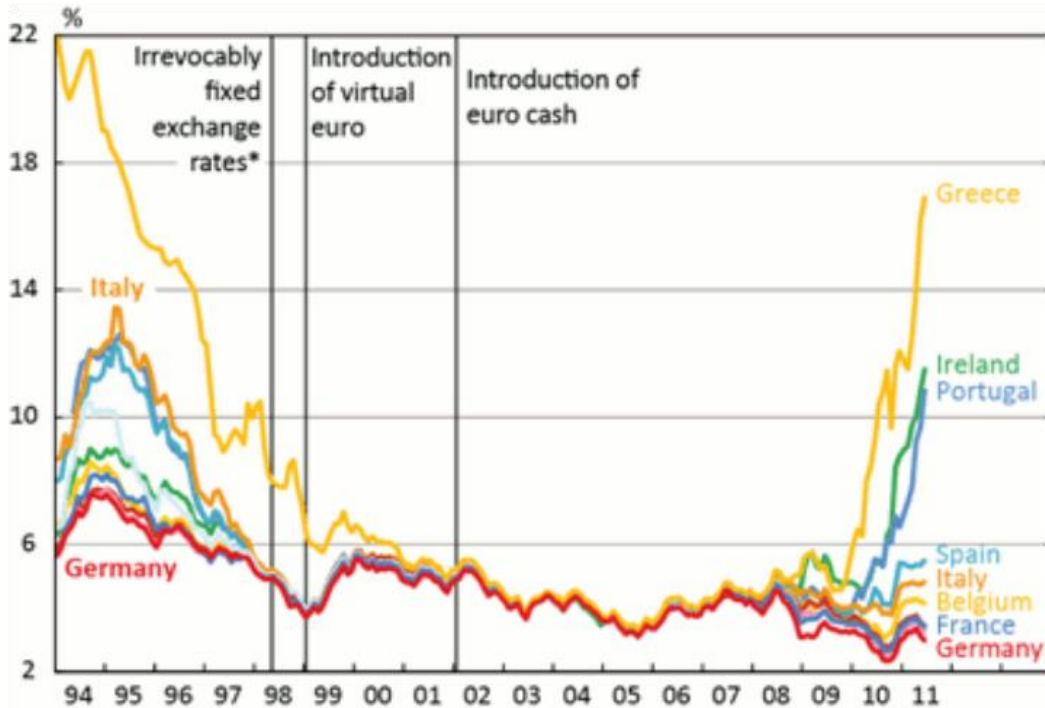
Tragedy of the Commons

- When a common resource is not owned or regulated, everyone has an incentive to exploit it as much as possible in the present
- No one has a property in the resource, or an interest in its long-term sustainable use – no one owns its capital value

The Eurosystem as a Tragedy of the Commons

- In the eurosystem, the common resource is the euro
- New euros are created as loans secured on good collateral, i.e., on government bonds
- Each national government has an incentive to have its own national banking system create money first and allocate it to itself and its own citizens

INTEREST RATE ON 10-YEAR BONDS



THE EURO-AREA BOOM

- General European real-estate boom

Euro-Area Boom

- Southern countries had large growth in imports, financed through the euro system
- Boom in export industries in other euro countries (e.g., Germany)

Public Sector Boom

- Interest rates declined and states could now lend very cheaply
- Booming economy led to larger tax receipts

EUROPEAN CRASH

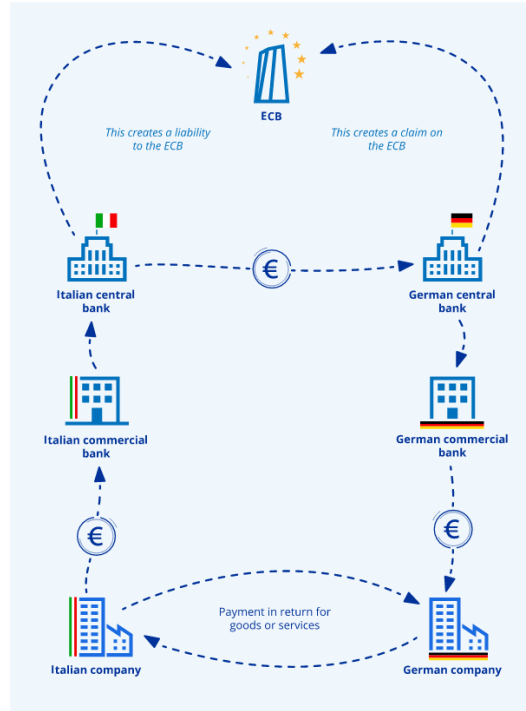
First Indications 2007

- BNP Paribas refuse withdrawals from its hedge funds in August 2007
- Run on Northern Rock in the UK, September 2007
- Sharp initial contraction in US financial (CP, ABCP) markets at the same time

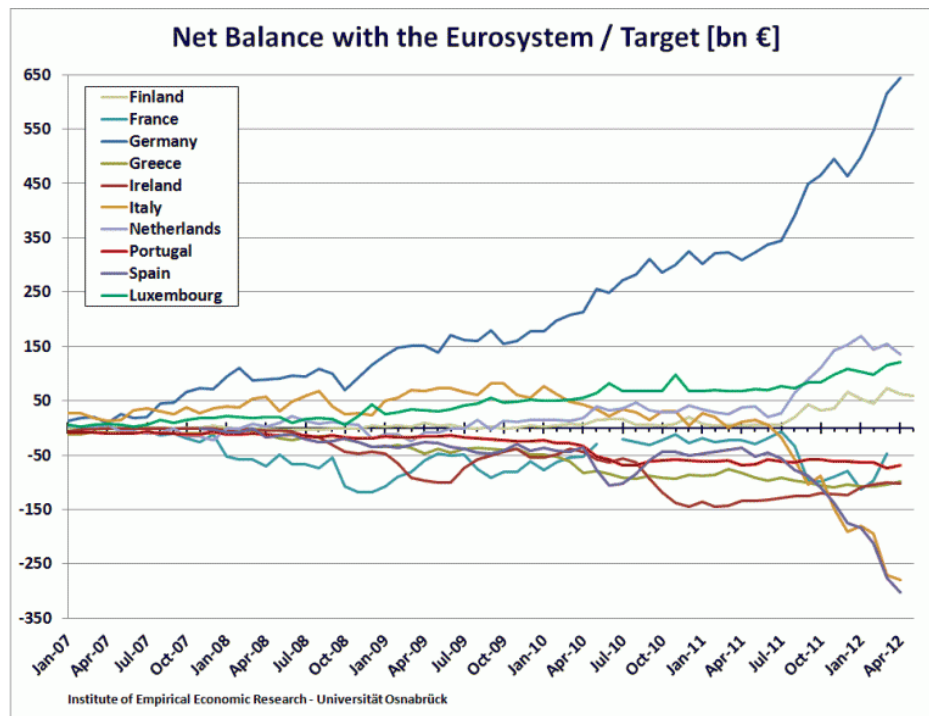
2008-09

- Substantial falls on European stock exchanges
- Sharp contraction in consumption, employment
- At this point, the crisis transformed into a sovereign debt crisis
- Government bonds fall, deficit countries faced increasing interest rates
- Transfers to Germany to escape risk of devaluation of new, weaker currencies, bail-in

TARGET 2 SYSTEM



TARGET2 IMBALANCES, 2008-2012



SOVEREIGN DEBT CRISIS – GREECE

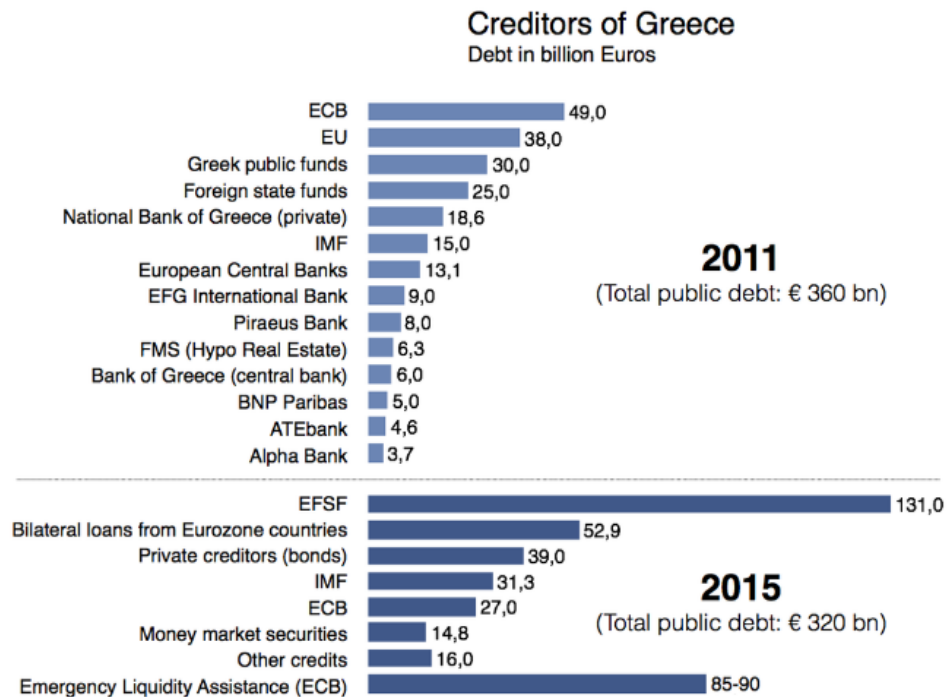
The First Bailout

- Debt-to-GDP had been around 100 percent since 2000
- GDP collapsed 2007-9, ratio shut up
- Several bailouts and loans from the ECB and IMF followed 2010-12
- Also a bailout of the holders of Greek debt: European private banks and public entities

Austerity Measures

- Imposed as conditions for loans
- Balancing the budget through tax raises and spending cuts
- Wise crisis policy?

CHANGING COMPOSITION OF GREECE'S CREDITORS



SOVEREIGN DEBT CRISIS – IRELAND

- Irish banks received guarantee 2008
- Depositors could unload risk onto the Irish central bank – and did so
- Bailout needed to avoid bankruptcy of the financial system – and the Irish central bank
- Irish government bailed out in November 2010
- Unemployment at peak of crisis 14 percent (2010)
- Note the role of Ireland as European headquarters for many international companies
- Tax revenues fall when trade contracts
- Employment, activity in general more sensitive to global trends

SOVEREIGN DEBT CRISIS – SPAIN

Major Housing Bubble in the 2000s

- Estimate of close to one million excess housing units
- Tax revenues had been bolstered in the boom
- Low debt-to-GDP ratio, about 50-60 percent
- Property bust in the crisis, as funding for mortgages dried up
- GDP fell
- Public revenues fell – hence, more public borrowing
- Banks bailed out in the bust, and again in 2012
- Spike in interest on Spanish government bonds to 7 percent June 2012
- Bailout package of €100 billion

4. RESPONSES TO THE CRISIS

ETS



€-DAY

GENERAL TRENDS

- Central bank intervention
- Increased liquidity in markets
- Policy rates lowered – and from there, market rates
- Quantitative easing – central bank balance sheet expansion
- Increased regulation – the interventionist dynamic
- “Austerity” – in practice, almost always higher taxes

CHANGES TO US MONEY AND FINANCE

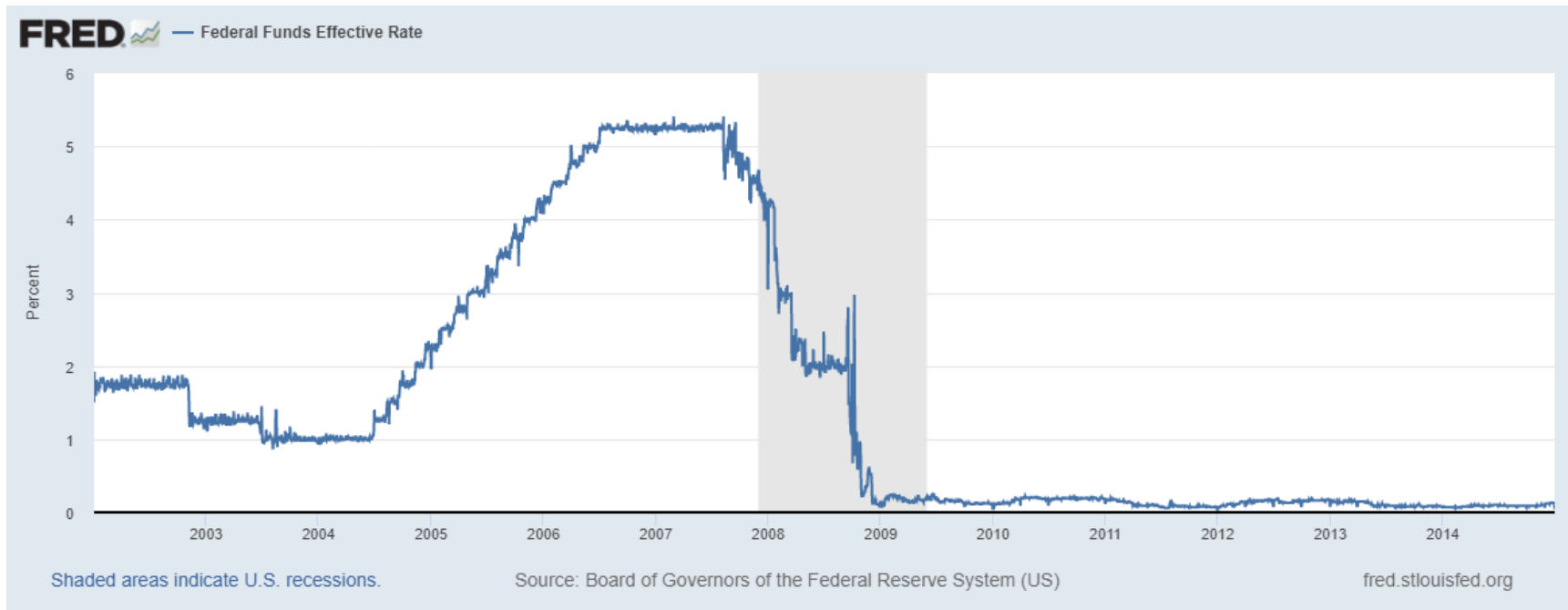
Federal Reserve Expansion

- The federal funds rate reached 0 in 2008 – the market flooded with liquidity
- Fed funds market no longer the key to US monetary policy

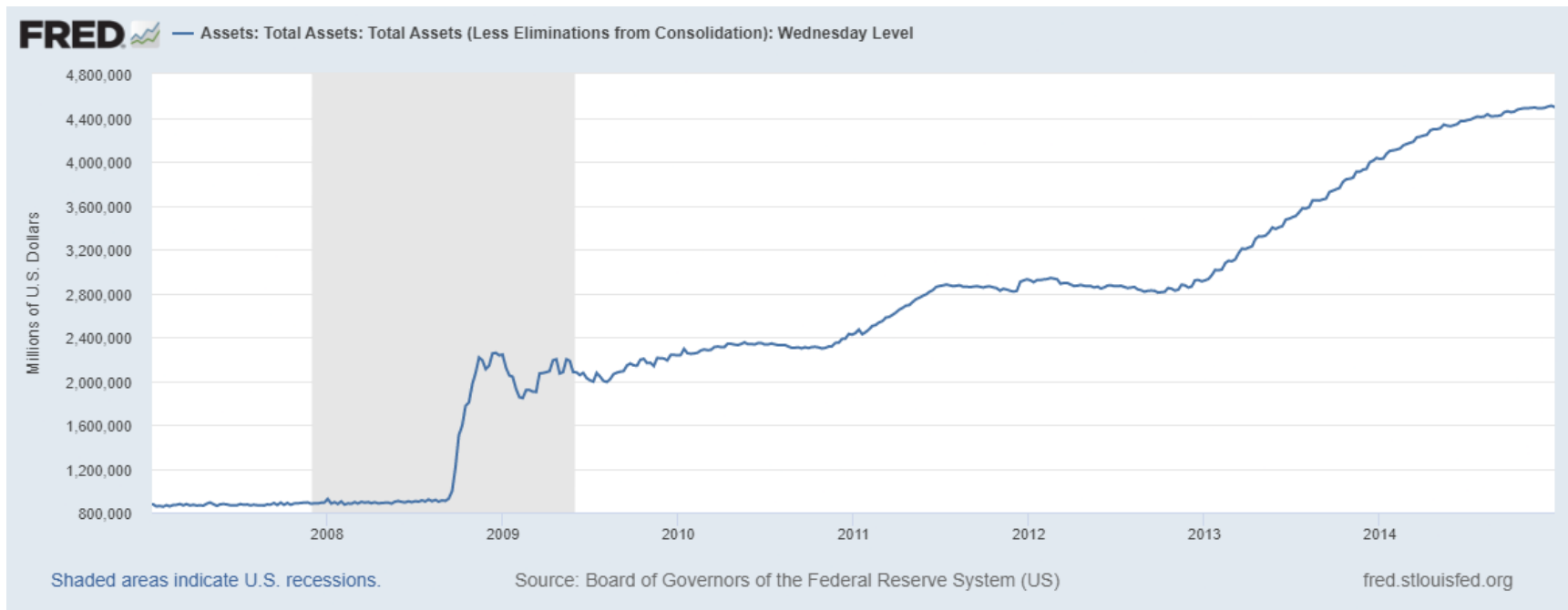
Quantitative easing (QE)

- To increase the supply of liquidity, the Fed purchased securities from September 2008
- Its balance sheet expanded to \$4.5 trillion by the end of 2014
- However, banks simply accumulated reserves – they didn't increase lending
- Fed started paying interest on excess reserves
- Banks flooded with liquidity – and encouraged to keep it at the Federal Reserve

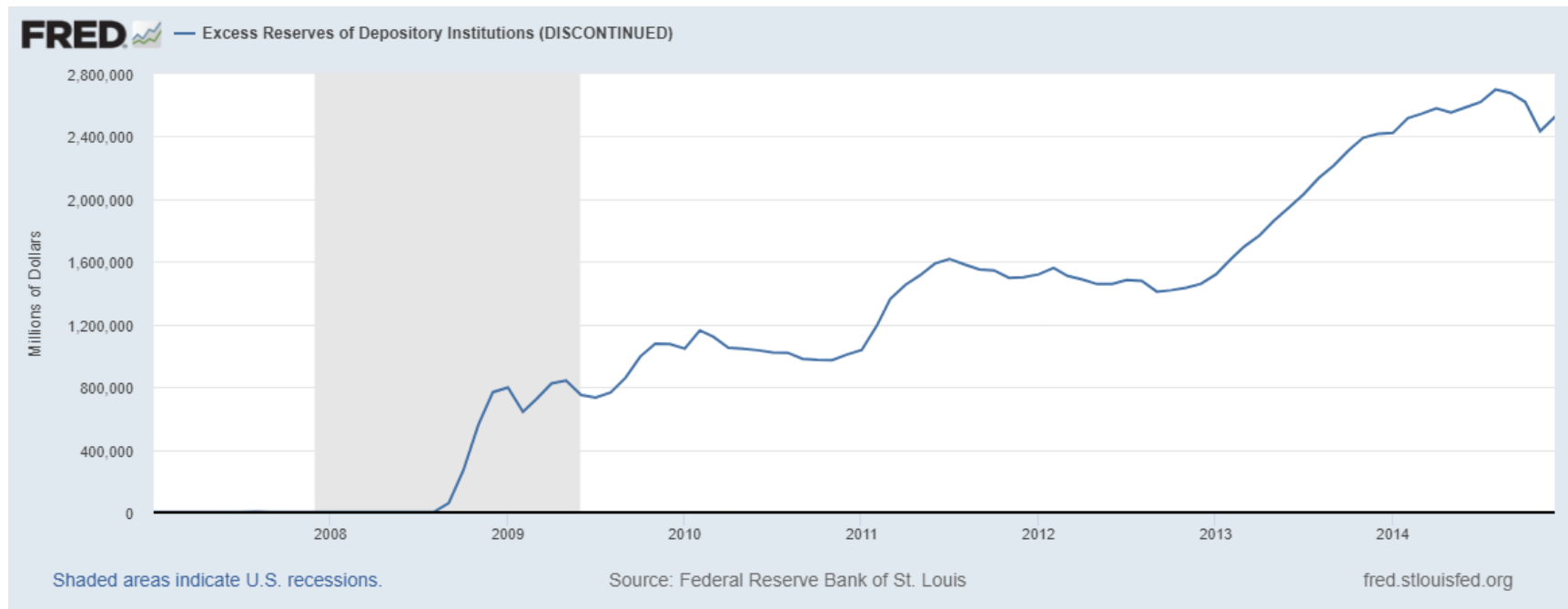
FEDERAL FUNDS RATE, 2002-14



FED BALANCE SHEET, 2007-14



EXCESS RESERVES, 2007-14



NEGATIVE INTEREST RATES

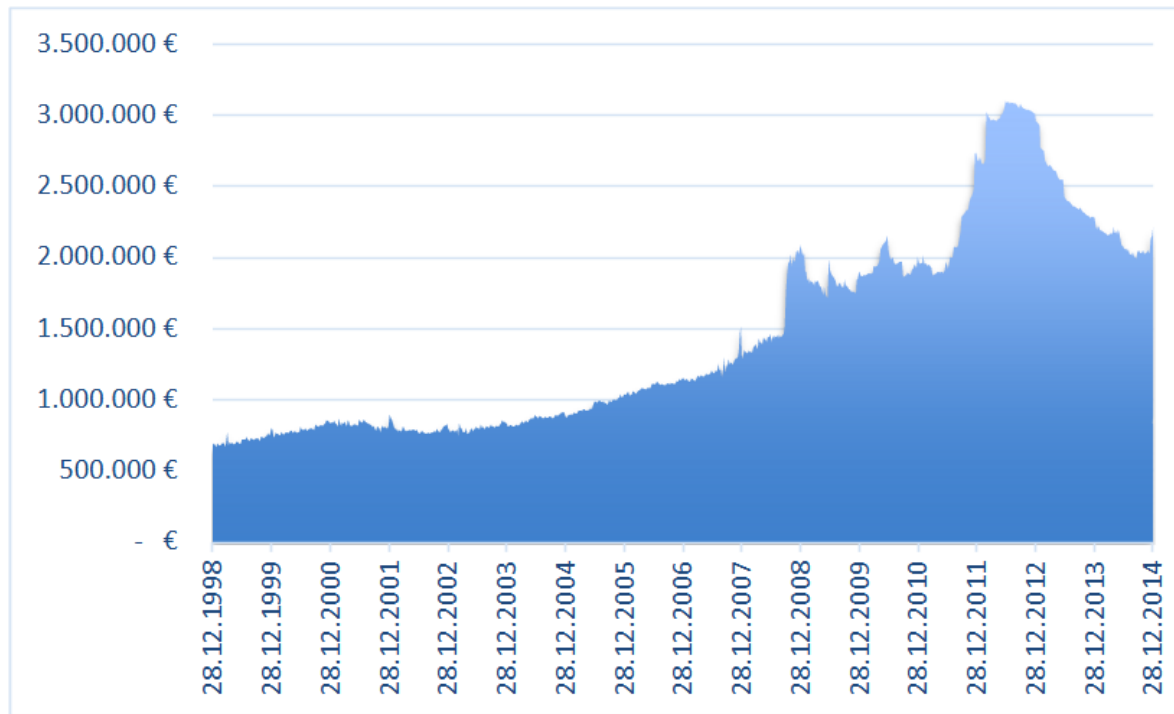
European Quantitative Easing

- QE was more moderate, but here too rates down to zero, lending slowed down
- Lending always sluggish in crisis, depression periods
- Increased regulation also lowered demand
- Established companies had best access but lower rates did not stimulate expansion

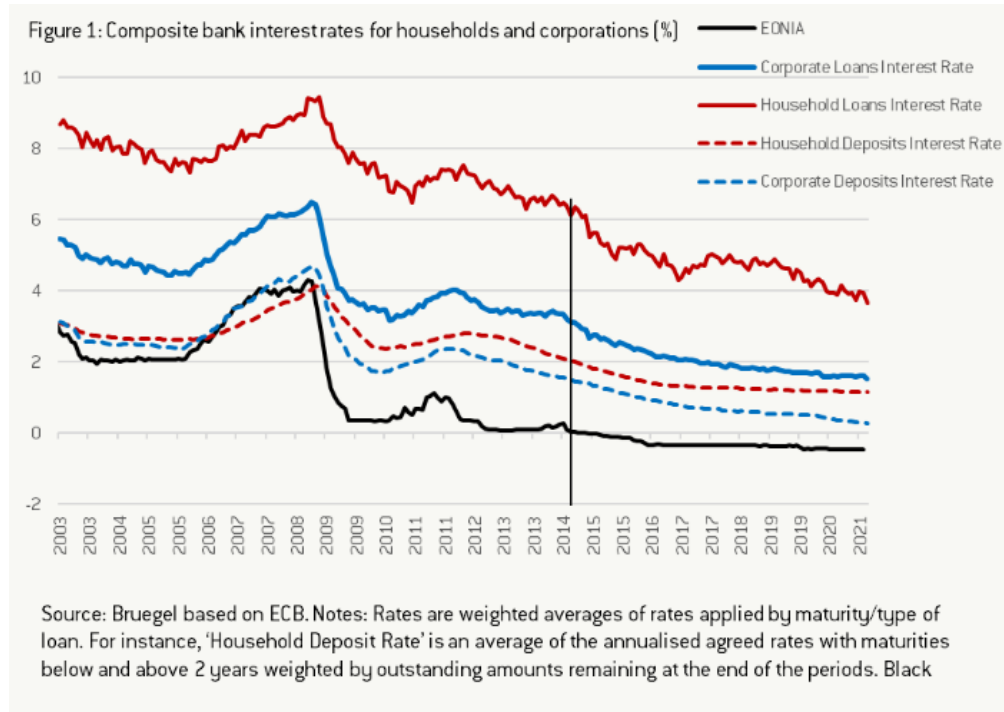
Negative Interest Rates 2014

- Banks now had to pay to deposit funds at the ECB
- Notice the difference to the US:
 - American bank went from paying interest on reserves to receiving it
 - European banks went from receiving interest to paying it

ECB BALANCE SHEET, 1999-2015



NEGATIVE INTEREST RATES IN EUROPE



THE PROBLEM OF THE ZERO LOWER BOUND

Central Bank Orthodoxy

- The interest rate is the key policy tool
- In a crisis, lowering the rate of interest stimulates borrowing and economic activity
- Central banks run into the problem of the zero lower bound (Goodfriend 2000)
- They cannot lower interest rates (much) below 0 – people will then simply keep their money in the form of physical cash

QE and the Zero Lower Bound

- QE was an attempt to overcome this problem – but failed
- There is a “liquidity trap” problem (Baeriswyl 2015)
- Demand for credit does not expand in response to an increase in the supply of (outside) money

NEW BASEL REGULATIONS

Basel III

- Basel III regulations were agreed in 2010
- Full implementation post-poned to 2019
- Tighter capital ratios and liquidity ratios
- Same principle of risk-weighted assets to capital maintained, however

Problems

- Bureaucratically defined risk, not market-based assessments
- International accounting standards: fair (market) value replaces traditional principle of historical cost
- Financial bloat: financial assets likely rise in value in an inflationary environment

5. LITERATURE



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