

# Lecture 6

## Finance

Matti Sarvimäki

Economic History  
2 April 2018

# Outline of the course

1. Yesterday: Introduction, fundamental causes of growth
  - 1.1 Introduction and the Malthusian Model
  - 1.2 Luck, Geography and Culture
  - 1.3 Institutions I
2. Today: fundamental (con't), Innovations and crises
  - 2.1 Institutions II
  - 2.2 Technology
  - 2.3 **Finance**
3. Tomorrow: Unleashing talent
  - 3.1 Geographical and social mobility
  - 3.2 Marriage, family and work

# Commodity money

Persson (2010, Ch 7)

Money reduces transaction costs and risk through three functions

- means of payment
- store of value
- unit of account

Commodity money

- based on the intrinsic value of metal, shells, pearls, furs, salt, grains, cigarettes...
- can be anything that is easily recognizable and has a high value-to-weight ratio

Impractical for large transactions, long-distance trade...



Low value-to-weight ratio: Sweden issued copper-based coins in 1607. The intrinsic value of copper was very low and thus these *plåtmynt* ended up weighting up to 19.7kg. To deal with the practical problem of such heavy currency. Johan Palmstruch's Stockholms Banco issued the first European bank notes in 1661. See Lappalainen (2007): *Maailman painavin raha* for a wonderful account of this period.

# Paper money

Persson (2010, Ch 7)

## Bill of exchange

- initiated by Italian merchant bankers in the 13th century

## Banknote

- no chain of liability, only the reputation of the bank mattered

Paper money kept a link to commodity money until 1971

Banknotes issued by private banks until 20th century



618–907: Merchant receipts, China

960: first generally circulating notes, China

1657: Stockholms Banco's notes for copper

1690s: London banks start offering deposit facilities, discounting, clearing, note-issuing (e.g. Bank of England established in 1694)

1855: fully printed notes

The Moneychanger and his Wife by Marinus Claeszoon van Reymerswaele, 1539



# Usury and interest rates

Persson (2010, Ch 7), Ferguson (2007, Ch 1)

Early Christian thought: any positive interest rate is usury and thus Christians are not allowed to demand interest

The Church became more flexible around the 16th century

- pawnshops charged “rent for storage space”, lending fees
- opportunity cost became a legitime ground for an interest rate

Much of financial services provided by Jews

- reinforced by restrictions to work other occupations
- e.g. *ghetto nuovo* established in Venice in 1516

# The emergence of modern banking

Persson (2010, Ch 7), Ferguson (2007, Ch 1)

## Merchant banks

- slowly evolved from the medieval form to offer everything from underwriting bonds to originating foreign loans
- e.g. Rothschilds, Barings (late 18th century)

## Commercial banks and industrial investment banks

- joint stock banks allowed in Britain in 1858
- industrial investment banks more important in the continent

## Saving banks and cooperatives (late 18th century onwards)

- owned by their members who subscribe to a common fund
- saving device, banking services to low income people

## Postal banks

- starting in UK in 1861 (a cheap way to finance the public debt)

# Fractional reserve banking

Persson (2010, Ch 7), Ferguson (2007, Ch 1)

Example: Stockholms Banco was also a *Lanebank*

- money left on deposits could profitably be lent out to borrowers
- Ferguson: “since depositors were highly unlikely to ask *en masse* for their money, only a fraction of their money needed to be kept in the bank’s reserve at any given time”
- this is an example of fractional reserve banking (its origins are in the goldsmiths depositories)

# Fractional reserve banking

Persson (2010, Ch 7), Ferguson (2007, Ch 1)

Example: Stockholms Banco was also a *Lanebank*

- money left on deposits could profitably be lent out to borrowers
- Ferguson: "since depositors were highly unlikely to ask *en masse* for their money, only a fraction of their money needed to be kept in the bank's reserve at any given time"
- this is an example of fractional reserve banking (its origins are in the goldsmiths depositories)

Fractional reserve banking brought important benefits

- allowed the money supply to increase (money multiplier)
- maturity transformation: "borrowing short, lending long"

# Fractional reserve banking

Persson (2010, Ch 7), Ferguson (2007, Ch 1)

... and dangers

- in 1663 the depositors of Stockholms Banco *did* ask for their money *en masse* and the bank collapsed (Palmstruch imprisoned, the state took over and eventually the bank turned into the Riksbanken)
- many bank runs followed (more about this later in this lecture)

# Fractional reserve banking

Persson (2010, Ch 7), Ferguson (2007, Ch 1)

... and dangers

- in 1663 the depositors of Stockholms Banco *did* ask for their money *en masse* and the bank collapsed (Palmstruch imprisoned, the state took over and eventually the bank turned into the Riksbanken)
- many bank runs followed (more about this later in this lecture)

Solution: central banks

- BoE, Riksbanken gradually developed public functions
- France (1800), Finland (1812), Germany (1875), USA (1913)
- Bagehot's dictum (1873): lenders of last resort



*Quid modo divitū, quid fulvi vāsta metalli  
 Congeries, nūmūmū arca repleta novū,  
 Vēl atq. hūc Sarcophagū, hūc in hūc in hūc in  
 Tū al omi agē hūc adit, hūc stridē en twisten.*

*Miliedres inter tantas, atq. agmina furum,  
 Inditum cunctis offerit, Sineus erit,  
 Al' hūc in hūc in hūc in hūc in hūc in hūc in  
 Datvōm vūrti qy dūc hūc hūc in hūc in hūc in.*

*Predā facit furem, seruens mala cūc ta ministrat  
 Impetū, et spōis apta rapina feris.  
 Mūc sōitū vōl dūc om' hūc in hūc in hūc in  
 Māc mēc fōmūc mūc hūc in hūc in hūc in.*

The Battle about Money, after 1570 Pieter van der Heyden after Pieter Bruegel the Elder

# Government loans (for warfare)

Poterba (2005), Ferguson (2007, Ch 2)

12th century Venice (later Florence): forced loans

- instead of taxes, the wealthy borrowed money to the state
- forced → interest was not usury
- active secondary market for these bonds

13th century France: annuities

- buyer gets a perpetual stream of annual payments
- seller could redeem the contract by paying back the principal

17th century Netherlands: annuities, lottery loans, tontines

(among many other financial instruments discussed later)

- there were more than 65,000 Dutch *rentiers* by 1650
- the financial innovations adopted in England after the Glorious Revolution (the financiers came with William of Orange)

# Age-related annuity pricing

Poterba (2005)

Suppose you are selling life-time annuity for a fixed-price

- would you rather sell it to someone in her 20s or someone in his 80s?

# Age-related annuity pricing

Poterba (2005)

Suppose you are selling life-time annuity for a fixed-price

- would you rather sell it to someone in her 20s or someone in his 80s?
- but how *much* more should she pay?

# Age-related annuity pricing

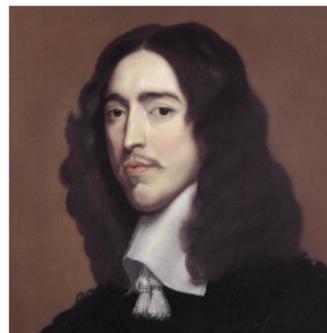
Poterba (2005)

Suppose you are selling life-time annuity for a fixed-price

- would you rather sell it to someone in her 20s or someone in his 80s?
- but how *much* more should she pay?

First answered by Jan de Witt. His work builded on three previous achievements

- discounting certain income streams
- development of formal probability theory
- collection of statistical information on births and deaths



Jan de Witt (1625–1672), a mathematician and key political figure in the mid-17th century Netherlands, published his *Value of Life Annuities in Proportion to Redeemable Annuities* in 1671

# Fibonacci and the Financial Revolution

Goetzmann (2005)

Fibonacci's *Liber Abaci* published in 1202

- famous for introducing Hindu–Arabic numbers to Europeans (and for the Fibonacci series)

In fact, it is almost entirely devoted to

- calculating present value
- compounding interest
- evaluating geometric series
- dividing profits
- pricing goods and monies (dealing with complex variety of weights, measures and currencies)



Leonardo of Pisa, known as Fibonacci, by unknown artist, Born c. 1170, died c. 1250.

# Probability and expected value

Ferguson (2007, Ch 4)

Probability theory has its roots in gambling

- the same applies to the early insurance industry

Pierre de Fermat and Blaise Pascal (1654)

- first formulation of expected value (not published)
- provoked by Chevalier de Méré

Christiaan Huygens (1657)

- first treatise on probability theory

Jakob Bernoulli (posthumous, 1713)

- Law of Large Numbers



Pierre de Fermat (top) and  
Blaise Pascal (bottom).

# Life tables

Poterba (2005)

## Early work

- Jan Hudde: mortality rates using 1,500 annuities sold by Amsterdam in the 1580s
- John Graunt: estimates of births, deaths, and population size in London

Halley (1693): An estimate of the degrees of the mortality of mankind, drawn from curious tables of the births and funerals at the city of Breslaw; with an attempt to ascertain the price of annuities upon lives. *Philosophical Transactions* 17: 596-610.

- analysis of 1,238 births and 1,174 deaths in Breslau



Edmond Halley (1656–1742), an English astronomer, geophysicist, mathematician, meteorologist, and physicist. He also made the critical breakthrough in constructing life tables and thus enabled life insurance and (correctly priced) annuity markets.

# Life insurance: Scottish Widows

Ferguson (2007. Ch 4)

These innovations also enabled life insurances

- annuities are really just “reverse life insurance”

Scottish Ministers' Widows Fund (1743)

- founded by minister Alexander Webster and Robert Wallace (with the help of professor of mathematics Colin Maclaurin)
- provided life insurance to Scottish ministers (universities of Edinburgh, Glasgow and St Andrews joined right away)

Novelties

- probabilities of members deaths carefully estimated
- invested the annual premiums

Served as a model for other life insurance funds

- by mid-19th century England “being insured was as much a badge of respectability as going to Church on Sunday”

# Other insurance

## Maritime and fire insurance

- origins in the maritime loans (Antiquity, 14th century Italy)
- 1680: first fire insurance company in London
- 1774: Society of Lloyd's (pay-as-you-go, unlimited liability for underwriters)

## Social insurance in Bismark's Germany

- Sickness Insurance Law (1883), Accident Insurance Law (1884), Old Age and Disability Insurance Law (1889)

## Social insurance in Finland

- Accidence insurance (1898), unemployment insurance (1934), national pension (1937), health insurance (1964)

# Joint-stock companies: early examples

Malmendier (2005), Ferguson (2007, Ch 3)

## *Publicanis* in Roman Republic

- ran large-scale companies all over Rome's territory
- mostly public works and services for the government (construction. management of mines. army supplies. collection of taxes)
- reached their height during the last two centuries BCE

## *Société des Moulins du Bazacle*, Toulouse 1250

- 96 shares traded at a value that depended on the profitability of the mills the society owned

## Stora, Sweden 1288

- documented stock transfer for 1/8 of the company

# Duch East India Company

Ferguson (2007, Ch 3)

VOC established in 1602

- merged six smaller, limited term companies
- (British East India Company established in 1600)

Novelties of the structure of VOC

- limited liability
- subscription open to all residents, no upper limit → unprecedented scale (8×capital of the English East Indian Company)
- company board (*Heeren XII*), stock holders had little power
- shares tradeable on the Amsterdam Stock Exchange ... leading to a lively forward market in VOC stock

This led to the establishment of the *Bourse* and the Amsterdam Exchange Bank

- provided a foundation for a new kind of economy
- interestingly there never were a VOC bubble

# Joint-stock companies and political conflict

Jha (2015)

## Early 17th century England

- the Parliament constrained the Crown domestically ... but the Crown controlled “sovereignty” rights overseas
- first joint-stock company to trade directly with Indies (1552)
- no limited liability, no secondary markets

# Joint-stock companies and political conflict

Jha (2015)

## Early 17th century England

- the Parliament constrained the Crown domestically ... but the Crown controlled “sovereignty” rights overseas
- first joint-stock company to trade directly with Indies (1552)
- no limited liability, no secondary markets

## English Civil War

- summoning of the Long Parliament in 1641 → a manifesto aimed at instituting parliamentary authority over Crown rights → civil war (1642–48; appr. 200,000 dead out of 5m)

# Joint-stock companies and political conflict

Jha (2015)

## Early 17th century England

- the Parliament constrained the Crown domestically ... but the Crown controlled “sovereignty” rights overseas
- first joint-stock company to trade directly with Indies (1552)
- no limited liability, no secondary markets

## English Civil War

- summoning of the Long Parliament in 1641 → a manifesto aimed at instituting parliamentary authority over Crown rights → civil war (1642–48; appr. 200,000 dead out of 5m)

## Jha's paper

- shares allowed non-merchants to benefit from new overseas opportunities → aligned incentives of a broad coalition
- MPs owning overseas shares were 23 %-points more likely to rebel than other MPs who had similar gentry status, parental background, wealth and constituency characteristics

# This time is different (again)

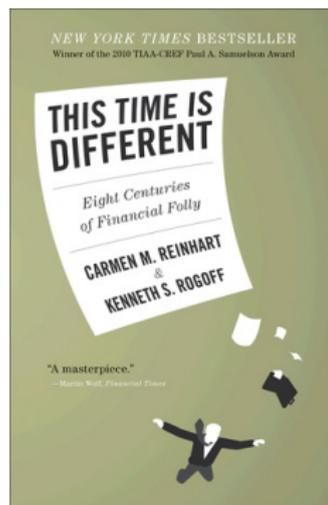
Reinhart, Rogoff (2009)

The rest of the lecture draws from the 2009 book by Reinhart and Rogoff (and related NBER WP)

- systematic documentation of financial crises in 66 countries over several centuries

## Roadmap

1. default on external sovereign debt
2. ... on domestic debt (inc. inflation)
3. banking crises



# External Sovereign Debt

Reinhart, Rogoff (2009, Ch 4)

RR document a stunning number of sovereign debt defaults

- the record suggests, however, that rich countries may have “graduated” from external defaults (and very high inflation)

# External Sovereign Debt

Reinhart, Rogoff (2009, Ch 4)

RR document a stunning number of sovereign debt defaults

- the record suggests, however, that rich countries may have “graduated” from external defaults (and very high inflation)

Why do countries default on their debts?

- because they do not *want* to pay (not because they cannot)
- about half of middle-income countries’ defaults take place at debt level below 60% of the GDP
- governments rarely sell their assets to pay debt

# External Sovereign Debt

Reinhart, Rogoff (2009, Ch 4)

RR document a stunning number of sovereign debt defaults

- the record suggests, however, that rich countries may have “graduated” from external defaults (and very high inflation)

Why do countries default on their debts?

- because they do not *want* to pay (not because they cannot)
- about half of middle-income countries’ defaults take place at debt level below 60% of the GDP
- governments rarely sell their assets to pay debt

Governments pay when costs of default exceed the benefits

- future access to borrowing, broader reputational concerns
- legal rights of the lenders in borrowers own courts
- no international enforcement mechanism, but penalties can work through disruption in trade etc. (in the 19th century, superpowers sometimes also invaded countries because of unpaid debt)

# External Sovereign Debt

Reinhart, Rogoff (2009, Ch 4)

## Illiquidity vs insolvency

- much of government debt is short-term
- liquidity crisis occur when country is willing and able to serve its long-term debt, but cannot roll over short-term debt
- could happen due to a coordination failure, i.e. even a small shock can push the country into a bad equilibrium
- this is why institutions like the IMF can be extremely helpful

# External Sovereign Debt

Reinhart, Rogoff (2009, Ch 4)

## Illiquidity vs insolvency

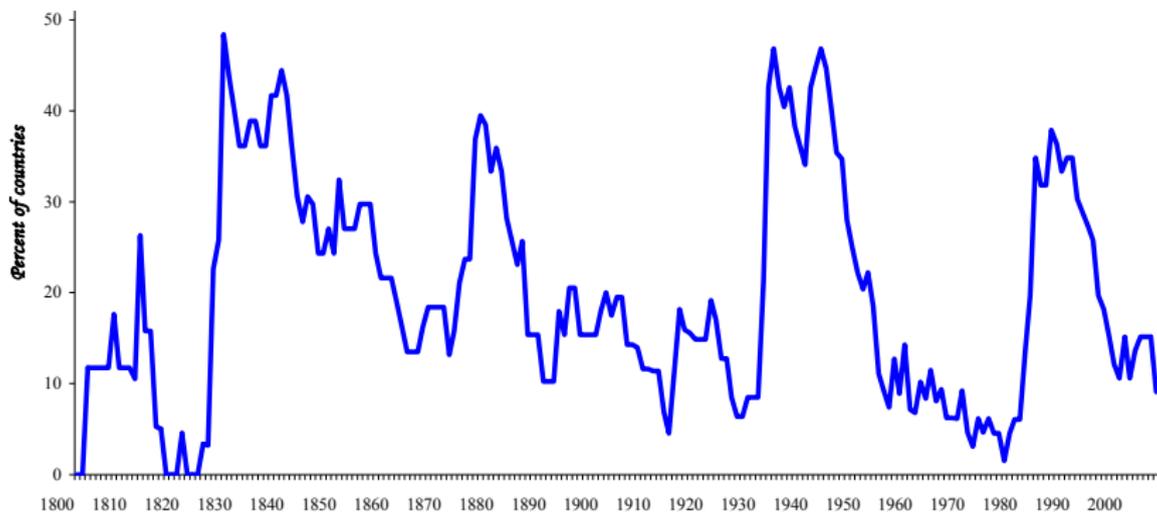
- much of government debt is short-term
- liquidity crisis occur when country is willing and able to serve its long-term debt, but cannot roll over short-term debt
- could happen due to a coordination failure, i.e. even a small shock can push the country into a bad equilibrium
- this is why institutions like the IMF can be extremely helpful

## Defaults are almost always partial (or “rescheduling”)

- even a tiny part of the debt defaulted after the Russian Revolution was paid 69 years later
- typically the partial repayment is significant

# Default is common

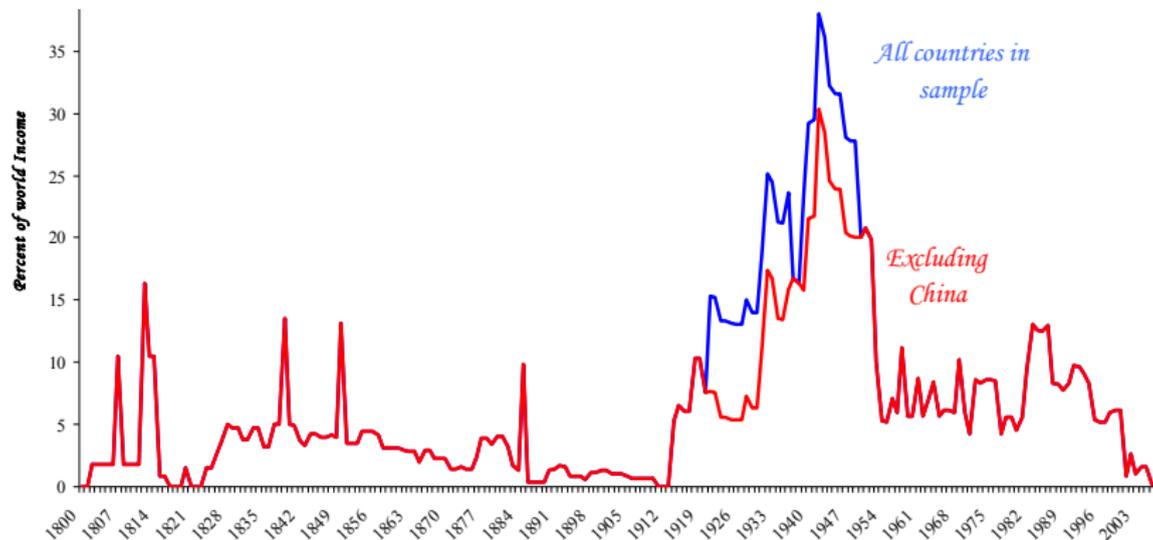
Reinhart, Rogoff (2008, 2009, Ch 5)



Share of countries in external default or restructuring. Data: 66 countries that cover at least 90% of world's GDP in 1800–2006. RR08: “the current period can be seen as a typical lull that follows large global financial crises”

# Defaults weighted by share of world income

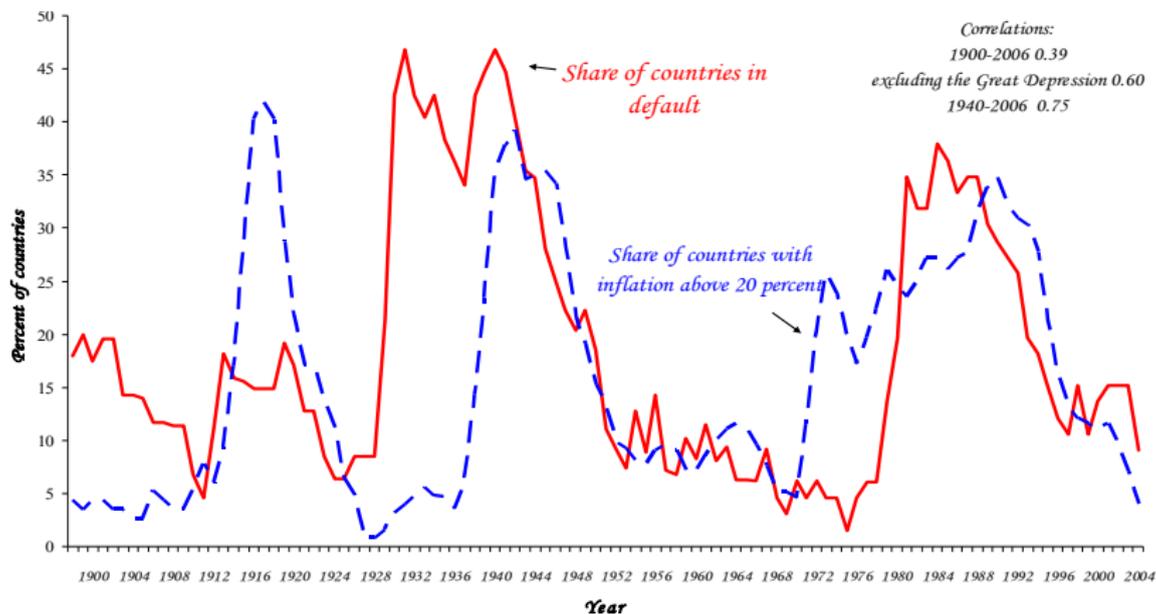
Reinhart, Rogoff (2008, 2009, Ch 5)



“Only the two decades before World War I—the halcyon days of the gold standard—exhibited tranquility anywhere close to that of the 2003-to-2007 period. Looking forward, one cannot fail to note that whereas one and two decade lulls in defaults are not at all uncommon, each lull has invariably been followed by a new wave of default.”

# Inflation and External Default: 1900-2006

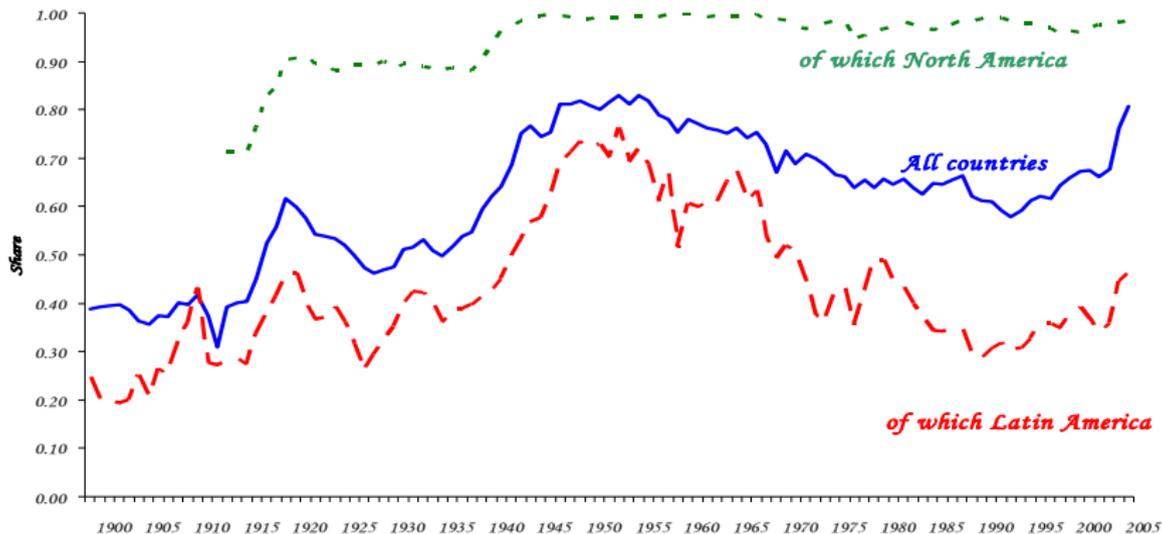
Reinhart, Rogoff (2008, 2009, Ch 7)



This figure illustrates a striking correlation between the share of countries in default on debt at one point and the number of countries experiencing high inflation (defined as inflation over 20 percent per annum). Since World War II, inflation and default have gone hand-in-hand. Why? Perhaps because inflation is one way to default on domestic debt.

# Domestic public debt as a share of total

Reinhart, Rogoff (2008, 2009, Ch 7)



“Because historical data on domestic debt is so difficult to come by, it has been ignored [...] contrary to much contemporary opinion, domestic debt constituted an important part of government debt in most countries, including emerging markets, over most of their existence. Furthermore, contrary to the received wisdom, this data reveal that a very important share of domestic debt—even in emerging markets—was long-term maturity”

# Default through debasement: examples

Reinhart, Rogoff (2009, Ch 11)

Dionysius of Syracuse, 4th century BC

- had borrowed heavily from his subjects

# Default through debasement: examples

Reinhart, Rogoff (2009, Ch 11)

## Dionysius of Syracuse, 4th century BC

- had borrowed heavily from his subjects
- issued a decree that all money in circulation was to be turned over to the government (refusing was a capital crime)
- stamped each one-drachma coin with a two-drachma mark
- ... and used them to pay off his debts

# Default through debasement: examples

Reinhart, Rogoff (2009, Ch 11)

## Dionysius of Syracuse, 4th century BC

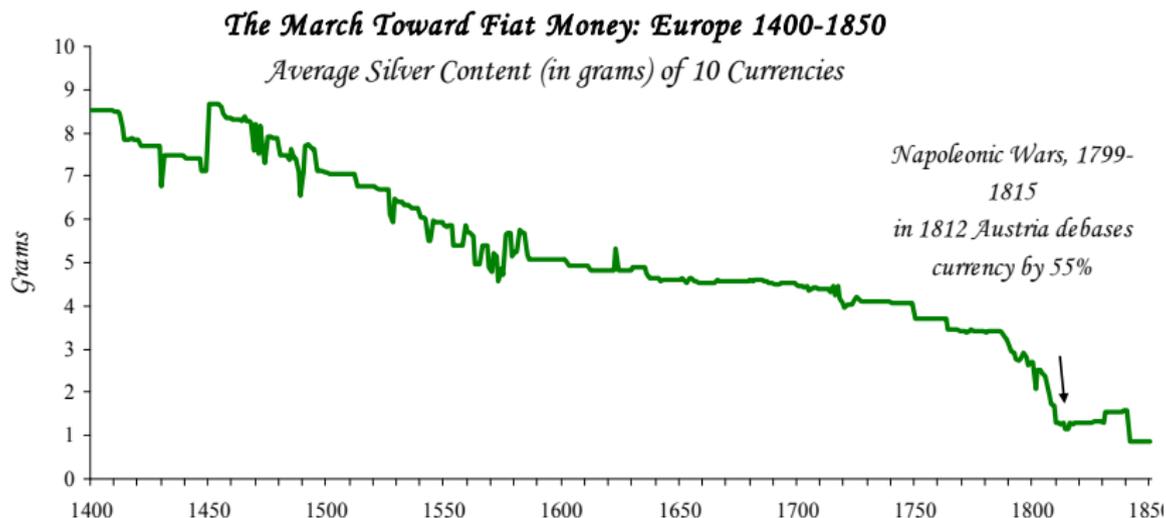
- had borrowed heavily from his subjects
- issued a decree that all money in circulation was to be turned over to the government (refusing was a capital crime)
- stamped each one-drachma coin with a two-drachma mark
- ... and used them to pay off his debts

## Henry VIII

- inherited a huge fortune, confiscated the church's assets
- ... and resorted to an epic debasement where the silver pound lost 83% of its silver content between 1542–47

# Default through debasement

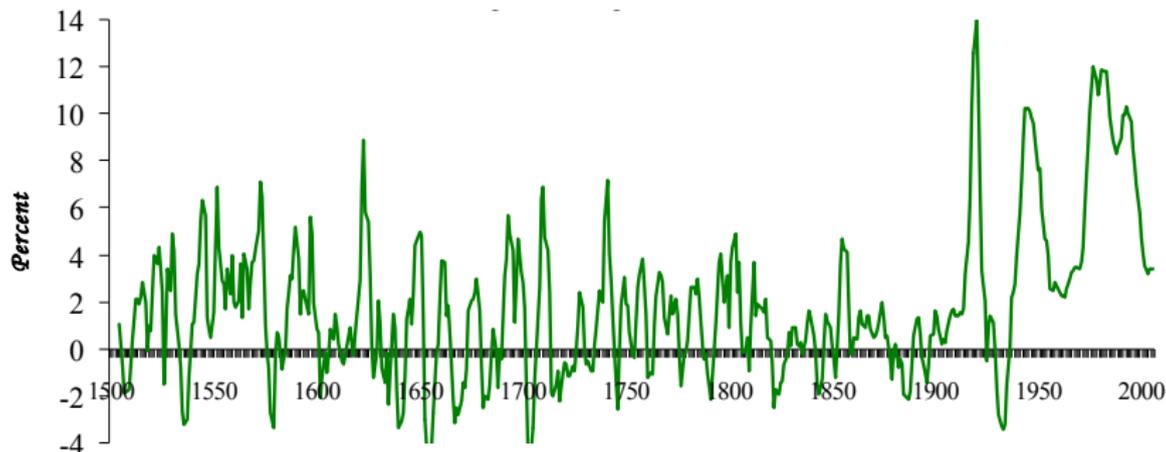
Reinhart, Rogoff (2008, 2009, Ch 11)



“Although some writers seem to believe that inflation only really became a problem with the advent of paper currency in the 1800s, students of the history of metal currency will know that governments found ways to engineer inflation long before that. The main device was through debasing the content of the coinage, either by mixing in cheaper metals, or by shaving down coins and reissuing smaller coins in the same denomination.”

# Median inflation rate: 1500–2007

Reinhart, Rogoff (2008, 2009, Ch 12)



However spectacular some of the coinage debasements, paper money brought inflation up to a whole new level. There is clear inflationary bias throughout history (with some periods of deflation due to business cycles, poor crops, etc.), but starting in the 20th century, inflation spikes radically.

# Defaulting on domestic debt

Reinhart, Rogoff (2009, Ch 7, 11)

These examples illustrate that

- inflation is a popular way to default on domestic debt (and international debt when possible)
- governments are creative & coercive in engineering defaults

RR also document 70 outright domestic defaults since 1800

- almost certainly an underestimate
- comparison: 250 defaults on external debt since 1800

# Banking crises

Reinhart, Rogoff (2009, Ch 10)

## Bank run

- customers lose confidence and demand their deposits *en masse*
- bank forced to liquidate assets, typically on fire sale prices
- run can become self-fulfilling

# Banking crises

Reinhart, Rogoff (2009, Ch 10)

## Bank run

- customers lose confidence and demand their deposits *en masse*
- bank forced to liquidate assets, typically on fire sale prices
- run can become self-fulfilling

## Systematic banking crises

- systematic crises tend to be sparked with a shock affecting everyone (e.g. subprime mortgages, exchange rate collapse)
- banks tend to hold similar portfolios → markets dry up if everyone attempt to sell at the same time

Banking crises are typically amplification mechanisms

# Banking crises

Reinhart, Rogoff (2009, Ch 10)

## Bank run

- customers lose confidence and demand their deposits *en masse*
- bank forced to liquidate assets, typically on fire sale prices
- run can become self-fulfilling

## Systematic banking crises

- systematic crises tend to be sparked with a shock affecting everyone (e.g. subprime mortgages, exchange rate collapse)
- banks tend to hold similar portfolios → markets dry up if everyone attempt to sell at the same time

Banking crises are typically amplification mechanisms

*“Although many now-advanced economies have graduated from a history of serial default on sovereign debt or very high inflation, so far graduation from banking crises has proven elusive”*

# Amplification during the Great Depression

Reinhart, Rogoff (2009, Ch 10)

Friedman and Schwartz (1963): *A Monetary History of the United States, 1867-1960*. Princeton University Press.

- failure of almost 1/2 of US banks in the early 1930s worsened the Depression mainly through reduction of money supply

Bernanke (1983): Nonmonetary Effects of the Financial Crisis in Propagation of the Great Depression. *AER* 73(3): 257-76

- banks unable to intermediate between borrowers and lenders
- credit for households, small firms became costly/unavailable
- downturn of 1929–30 pushed into a protracted depression

# Sources of banking crises

Reinhart, Rogoff (2009, Ch 10)

## Capital flow bonanzas

- countries are more likely to experience a banking crises within three years of surge in capital inflows
- other forms of financial liberalization also seem to be associated with banking crises

## Housing prices

- banking crises tend to occur either at the peak of a boom in real housing prices or right after the bust
- real housing prices tend to collapse at similar magnitudes in emerging and advanced economies

## Real equity prices

- “pure stock market crashes” tend to be associated with much milder banking crises than housing price crashes

# Fiscal legacy of banking crises

Reinhart, Rogoff (2009, Ch 10)

Bailout is the most common policy response for banking crises

- motivation: to prevent a credit crunch
- purchases of bad assets, directed mergers, direct takeovers
- create major fiscal consequences (huge literature attempting to measure them)

# Fiscal legacy of banking crises

Reinhart, Rogoff (2009, Ch 10)

Bailout is the most common policy response for banking crises

- motivation: to prevent a credit crunch
- purchases of bad assets, directed mergers, direct takeovers
- create major fiscal consequences (huge literature attempting to measure them)

RR argue that focusing on bailout costs is

- misguided: not clear how to estimate these costs
- incomplete: fiscal consequences reach far beyond the immediate bailout costs

# Fiscal legacy of banking crises

Reinhart, Rogoff (2009, Ch 10)

Bailout is the most common policy response for banking crises

- motivation: to prevent a credit crunch
- purchases of bad assets, directed mergers, direct takeovers
- create major fiscal consequences (huge literature attempting to measure them)

RR argue that focusing on bailout costs is

- misguided: not clear how to estimate these costs
- incomplete: fiscal consequences reach far beyond the immediate bailout costs

Instead, they advocate examining total government debt

- average 3-year increase in government debt: 86%
- Finland's 1990s crisis: more than 250%

*“arguably, the true legacy of banking crisis is greater public indebtedness—far over and beyond the direct headline cost of big bailout packages”*

# Mental legacy of financial crises

Malmendier, Nagel (2011); Knüpfer, Rantapuska, Sarvimäki (2017)

MN examine variation across birth cohorts in the US and show that individuals who have experienced low stock market returns

- report lower willingness to take financial risk
- are less likely to participate in the stock market
- invest a lower fraction of their liquid assets in stocks
- are more pessimistic about future stock returns

# Mental legacy of financial crises

Malmendier, Nagel (2011); Knüpfer, Rantapuska, Sarvimäki (2017)

MN examine variation across birth cohorts in the US and show that individuals who have experienced low stock market returns

- report lower willingness to take financial risk
- are less likely to participate in the stock market
- invest a lower fraction of their liquid assets in stocks
- are more pessimistic about future stock returns

KRS examine within birth cohort variation in labor market experiences during the Finnish Great Depression and find that

- individuals who worked in the most affected labor markets in 1991–93 invest significantly less in risky assets in 2005
- robust to *very* rich set of control variables; cannot be fully explained by the impact on income and wealth
- individuals whose family members and neighbors experienced adverse circumstances also avoid risky investments

# Finance: concluding thoughts

Economic growth is created primarily by "real" factors

- labor, capital, natural resources, technology

However, financial factors have a crucial supporting role

- efficient allocation of capital, sharing and diversifying risk

# Finance: concluding thoughts

Economic growth is created primarily by "real" factors

- labor, capital, natural resources, technology

However, financial factors have a crucial supporting role

- efficient allocation of capital, sharing and diversifying risk

At the same time, financial innovation creates new risks

- designing efficient regulation vital, but requires an understanding of the origins and dynamics of financial crises
- producing this information is hard because financial crises occur at macro level → limited scope for (quasi-)experiments
- thus research on financial crises necessarily relies heavily on theory and more "traditional" historical narratives

# Papers for essays

Guinnane, Banerjee, Besley (1994): Thy Neighbor's Keeper: the Design of a Credit Cooperative with Theory and a Test. *QJE* 109(2): 491-515

- Builds a model explaining why cooperatives might function better than conventional banking and uses 19th century German credit cooperatives to test between alternative hypothesis (social sanctions, repeated interaction, monitoring)

Guinnane (2001): Cooperatives as Information Machines: German Rural Credit Cooperatives, 1883-1914. *JEH* 61(2): 366-389

- Use the business records of 19th century German credit cooperatives to show that efficiency advantages (in comparison to conventional banks) are at least part of the explanation for their success.

# Papers for essays

Rajan, Ramcharan (forthcoming): The Anatomy of a Credit Crisis: The Boom and Bust in Farm Land Prices in the United States in the 1920s. *AER*

- Credit availability directly inflated land prices and amplified the relationship between positive fundamentals and land prices. When fundamentals soured, areas with higher credit availability suffered a greater fall in land prices and had more bank failures. The negative effects persist for decades.

Mian, Sufi (2009): The Consequences of Mortgage Credit Expansion: Evidence from the U.S. Mortgage Default Crisis. *QJE* 124(4): 1449-1496

- In 2000s, the expansion in mortgage credit to subprime ZIP codes (and the subsequent default crisis) is closely correlated with the increase in securitization of subprime mortgages