Growth and the business cycle

Lecture 1

The determinants of growth and business cycles theories

Economics: An inquiry into the nature and causes of the Wealth of Nations (Adam Smith):

- **The determinants of growth in the long run:**
  - **"Nothing matters more to the long term economic welfare of a nation than its rate of economic growth**: **compounded over many years, seemingly small differences in annual growth rates can lead to vast differences in standards of living**" (Robert Barro)

- **The theory of fluctuations in aggregate economic activity** (an inquiry into the causes and dynamics of Business Cycles):
  - Classical theory
  - Keynesian theory
  - Monetarist theory
  - Real Business Cycle Theory
  - Fisher-Minsky theory

The determinants of growth in the long run: the **Solow-Swan (neoclassical) growth model**

- **Factor endowments**:
  - Land and natural resources available (R), assumed fixed
  - Labour employed (N)
  - Capital (K)
    - Physical (factories, infrastructure)
    - Human (education)
    - Institutional (rule of law, institutions, etc.)

$$Y = f(R, N, K)$$

In the traditional neoclassical framework **Growth** depends on:

- **Increase in labour employed or increase in labour productivity**
- **Increase in capital employed or increase in capital productivity**

Key assumption: labour and capital are subject to diminishing returns in a closed economy

- In the long run the economy will converge towards a steady state rate of growth, **which depends only on the rate of labour force growth and on the (exogenously given) rate of technological progress**

- **The rate of capital accumulation determines the rate of economic growth**
- **As it moves towards a steady rate of growth, a country with a higher saving rate will experience faster growth, since it will have faster capital accumulation**
- Conditional convergence: a "poor" country, with less capital per worker (relative to its long run or steady state capital per worker) will grow faster and therefore "catch up" with "richer" countries

$$dY = f'_n dn + f'_k dk + TFP$$

- "Total Factor Productivity" (TFP), the residual growth – unexplained by increases in labour and capital employed or by increases in labour and capital productivity – is often used as a measure of "technological progress". TFP could also arise because of "organizational progress" (better use of technological innovations)
- **Per-capita growth will cease in the absence of continuous improvements in technology**

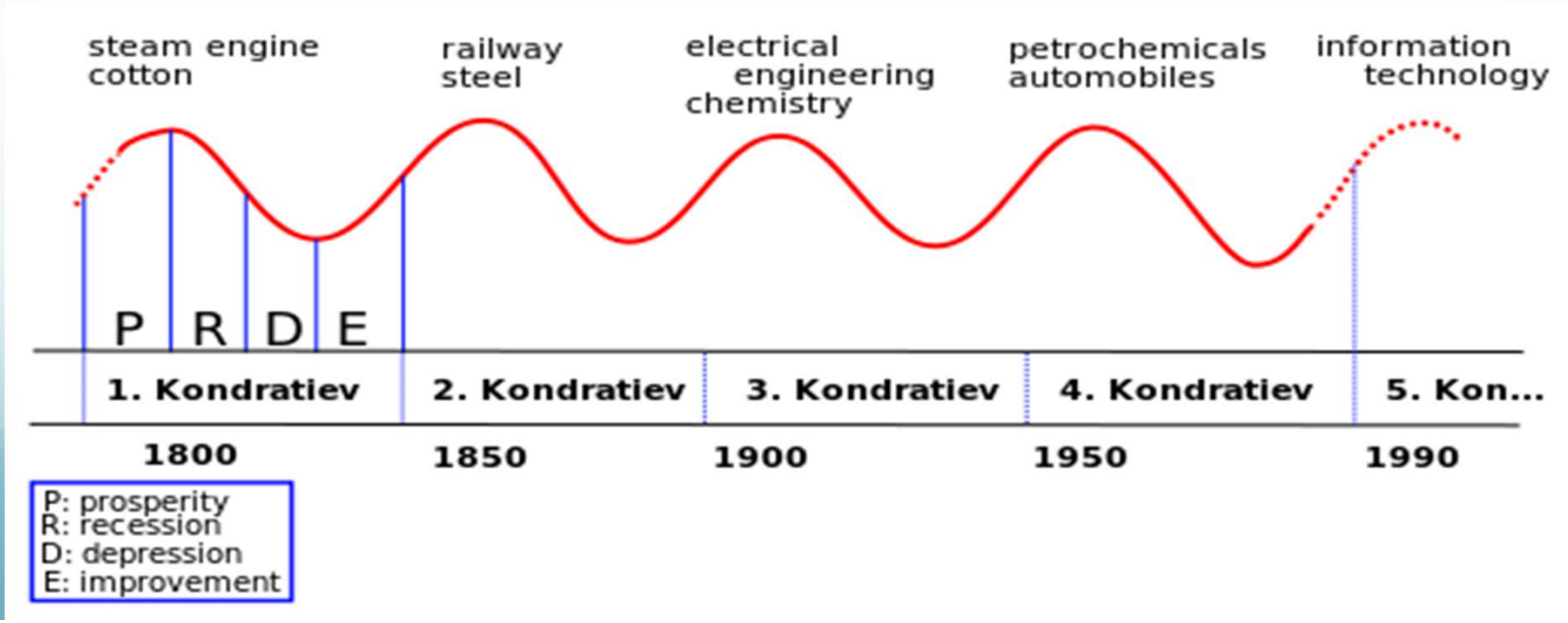
The business cycle

- **An economy organized on free-enterprise principles is subject to economy-wide fluctuations in production, trade and economic activity.** These fluctuations occur around a long term growth trend and give rise to what is commonly called a "**business cycle**"
- Nineteen's century economist were very aware of business cycles
- According to Schumpeter a business cycle has 4 stages:
  - Expansion (increase in production, income, prices, generally low real interest rates)
  - Crisis (financial markets crashes and multiple bankruptcies)
  - Recession (drop in production, income, prices and generally high real interest rates)
  - Recovery (increase in productivity, consumer confidence, aggregate demand)

The business cycles classification

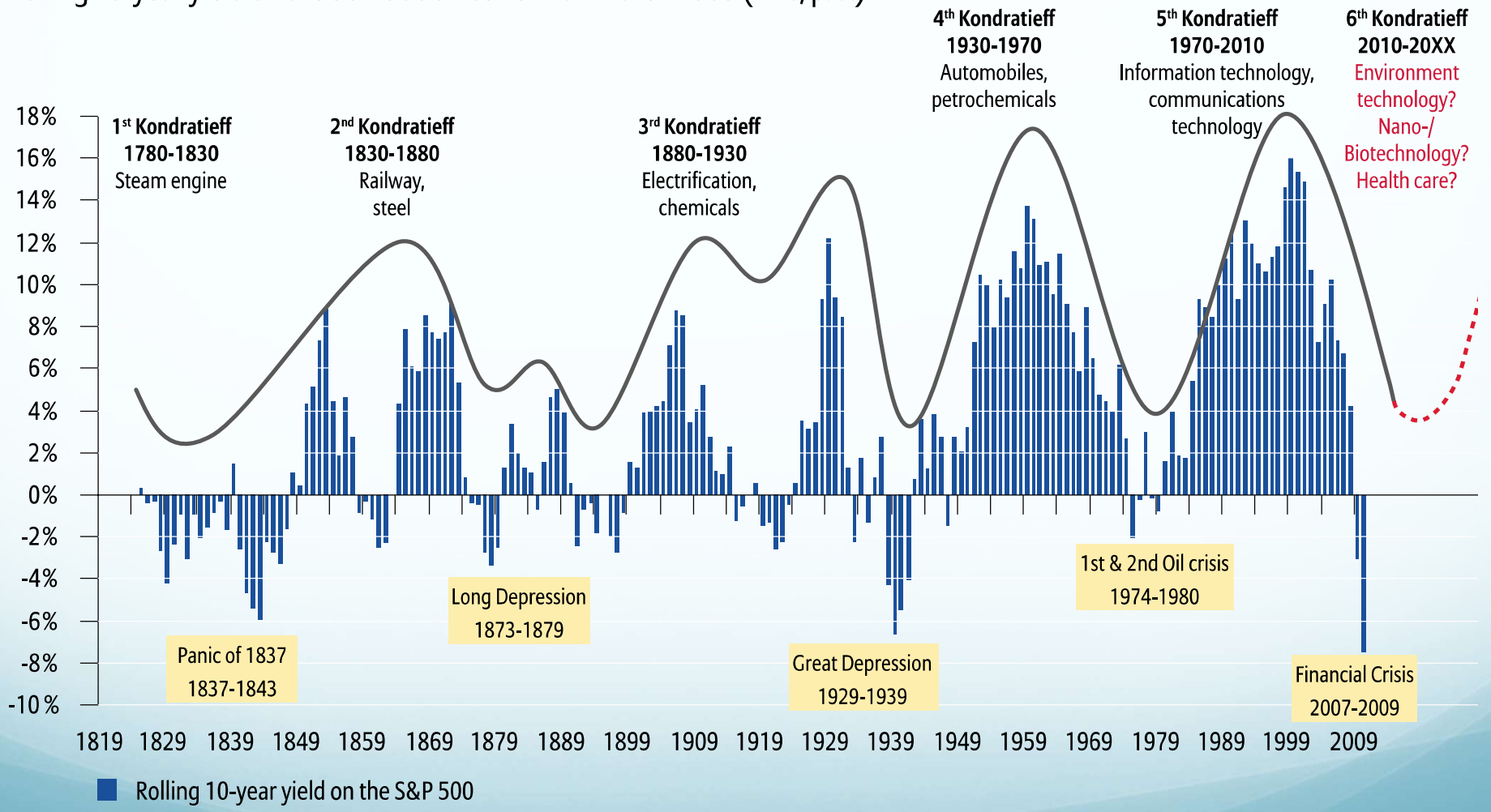
- Schumpeter classified business cycles according to their periodicity:
  - (Kitchin) inventory cycle of 3-4 years
  - (Juglar) fixed investment cycle of 7-8 years
  - (Kuznets) infrastructural investment cycle of 15-25 years
  - (Kondratiev) wave or long technological cycle of 45-60 years

These different business cycles can build on each other, increasing or dampening the fluctuations of economic activity



The Kondratieff Cycles

Figure 1: Kondratieff cycles – long waves of prosperity.
Rolling 10-year yield on the S&P 500 since 1814 till March 2009 (in %, p. a.)

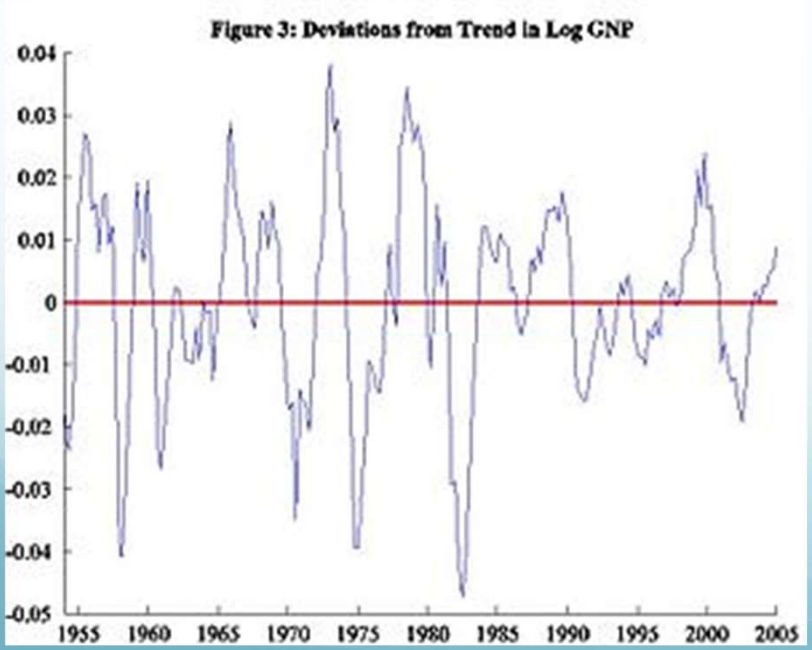


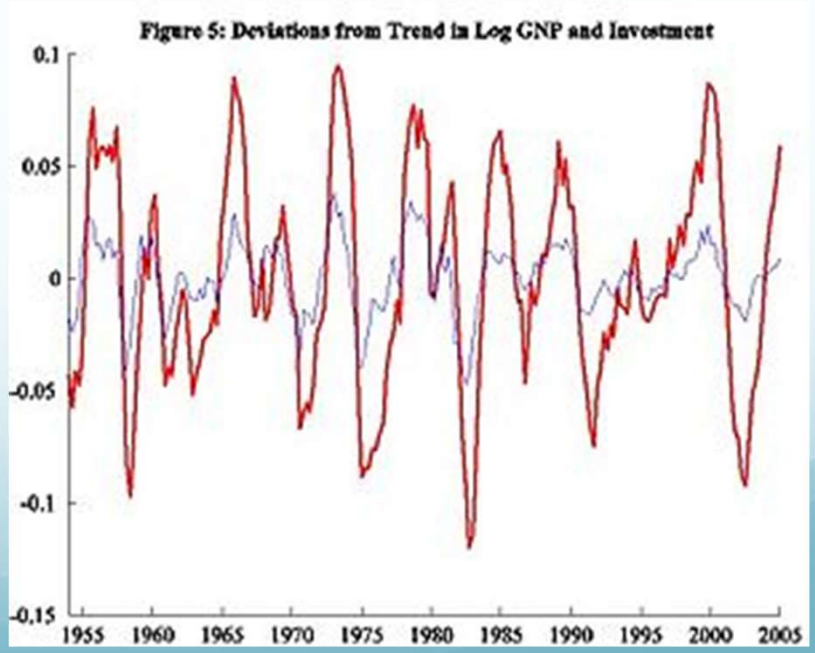
Source: Datastream; Illustration: Allianz Global Investors Capital Market Analysis

The business cycle

MACROECONOMICS FOCUSES ON THE SEARCH FOR EXPLANATIONS OF THE CYCLICAL VARIATIONS IN THE RATE OF GROWTH OF NATIONAL INCOME RELATIVE TO ITS LONG TERM RATE OF GROWTH

- Why do business cycles take place?
- What are the causes of business cycles?





The theory of business cycles:
Classical theory

Say's Law: "Products are paid for with products"

"Supply creates its own demand"

"The production of commodities creates, and is the one and universal cause which creates, a market for the commodities produced"

According to classical economic theory – mainstream until 1930 – **economic cycles are caused by exogenous influences** ("**shocks**") due to **natural causes**, wars, **technology changes**, "**market failures**" - like monopolies (business or labour union) - **or distortive government intervention**

Left by itself **the economy is self-regulating** and **full employment is the natural state of things**: when wages are too high (in real terms) the economy will contract. The contraction in the economy will induce a rise in unemployment that will cause a drop in (real) wages. As wages fall, the entrepreneur will start to hire again and the cycle begins anew

Markets can be temporarily disrupted by "external" events but **are:**

- self-regulating,
- fundamentally resilient
- their collective wisdom is always right

The prices of assets bought and sold in the markets accurately reflect all known information (Efficient Market Hypothesis), therefore they are always accurate and justified (any future price change depends on "unknowns")

The theory of business cycles: **Keynesian theory**

- **The determinants of employment levels (and output) is aggregate demand**. If wages are cut or workers fired, aggregate demand will falter and this will lead to cut in investment. Likewise, consumers – faced with uncertainty about their future incomes - will save more and spend less, further dampening demand ("**the paradox of thrift**"). Lower demand will lead to further cuts in investments

- In this self-fulfilling cycle, **the economy can enter in multiple "underemployment equilibria"**, in which, as demand falls below supply of goods, prices fall and we experience **deflation**

- **Solution**: **Government should step in and create demand, thus reviving the "animal spirits" of capitalism**

The theory of business cycles: **Monetarist theory**

- **Instability within any economy can be explained by fluctuations in the money supply**

MV = PY

M= Money Supply, determined by Central Bank

Y = real GDP, not influenced by monetary policy

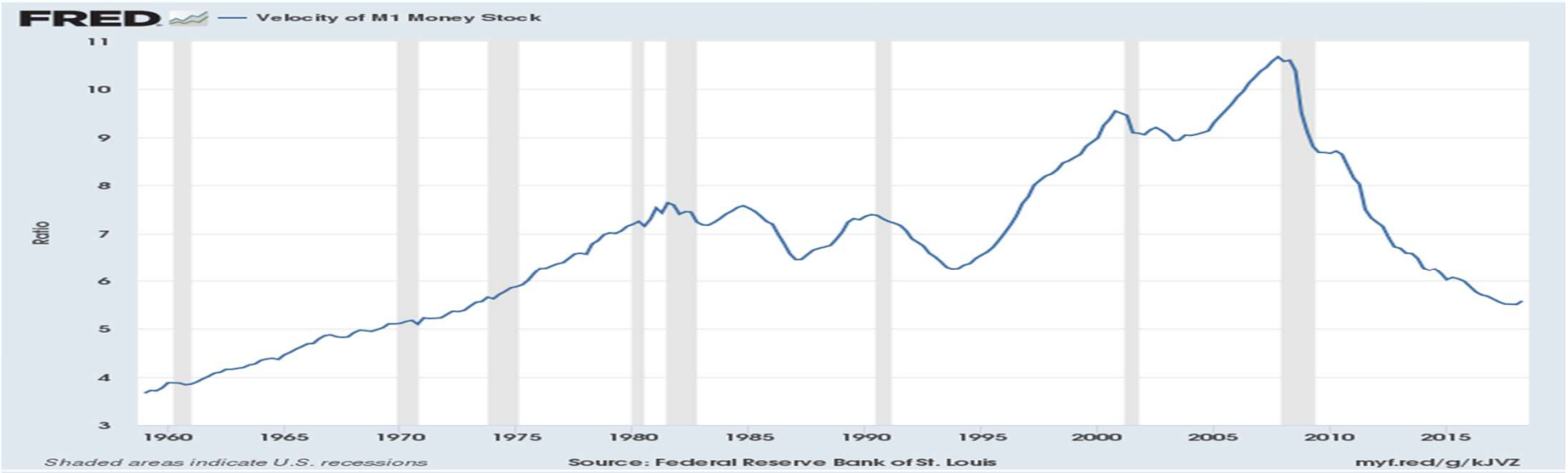
P = price level

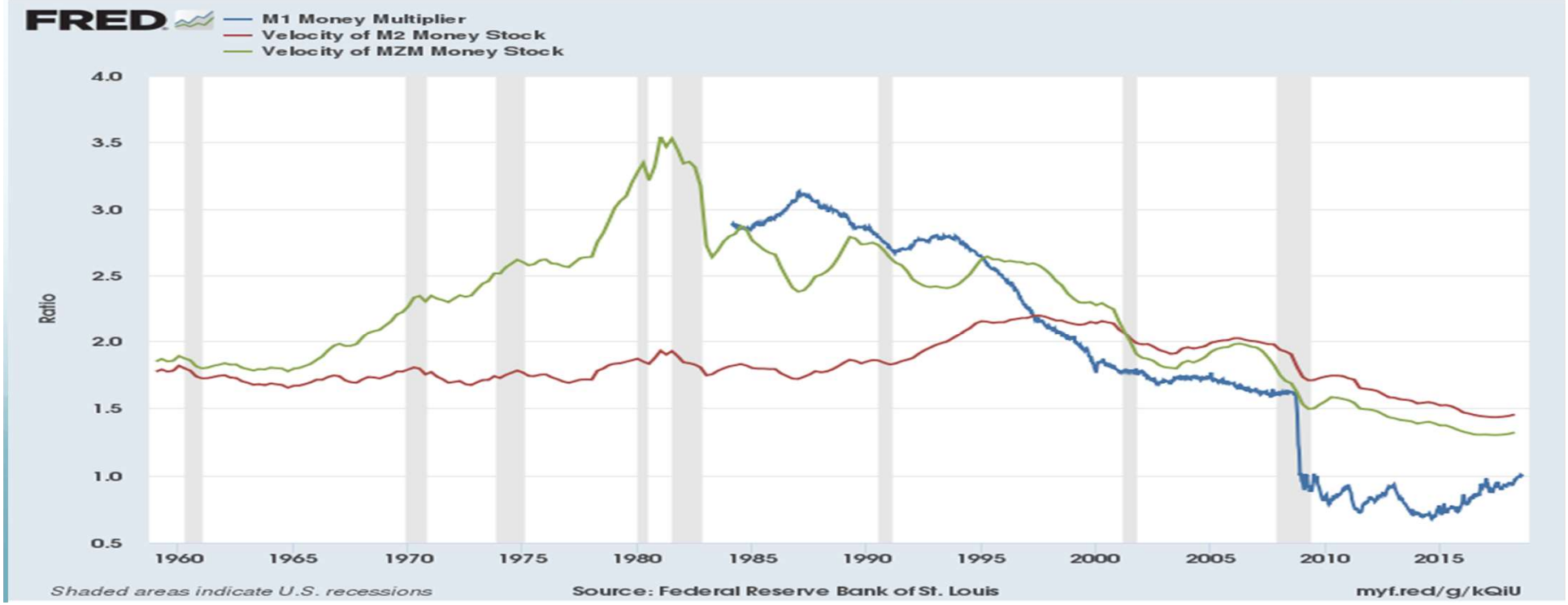
V = velocity of circulation of money, [V = f (.....), V is a function of several factors, but is considered constant in "normal" circumstances in the short term]

PY = nominal GDP

- **Rational expectations - since economic agents are rational they will discount attempt to "fool" them by their monetary authorities / governments:**
  - **Lucas' critique to the Phillips curve** – inefficacy of monetary policy
  - **Ricardian equivalence for debt financed government spending** – inefficacy of debt financed fiscal policy

The Money Velocity and the Money Multiplier (1/V)





The Money Multiplier (1/V) and Money Velocity

The top figure on the previous page shows the time evolution of the velocity of M1 from 1960 onwards, whereas the bottom figure shows the time evolution of the M1 multiplier from 1985 onwards, compaered with the velocity of M2 and with the velocity of MZM

The **M1 multiplier** (blue line in bottom chart) **is defined as the ratio of M1 to the Adjusted Monetary Base** estimated by the Fed of St. Louis. Normally, the M1 multiplier is larger than 1 since money put on a checking account is used at least in part by banks to provide loans. The M1 money multiplier slipped dramatically after the 2007-08 financial crisis, falling below 1. So each $1 increase in reserves (monetary base) results in the money supply increasing by $0.75-0.90. This expresses the fact that **since the financial crisis banks have substantially increased their holding of excess reserves**, **reflecting the freezing of lending by and amongst financial institutions**

The **velocity of money is the frequency at which one unit of currency is used to purchase domestically-produced goods and services within a given time period.** In other words, it is the number of times one dollar is spent to buy goods and services per unit of time. If the velocity of money is increasing, then more transactions are occurring between individuals in an economy. The frequency of currency exchange (velocity of M) provides insights into whether consumers and businesses are saving or spending their money

There are several components of money supply,: M1, M2, and MZM (M3 is no longer tracked by the Fed). These components are arranged on a spectrum of narrowest to broadest:

M1, the narrowest component, is the money supply of currency in circulation (notes and coins, traveler's checks, demand deposits, and checkable deposits). A decreasing velocity of M1 might indicate fewer short- term consumption transactions are taking place. We can think of shorter- term transactions as consumption we might make on an everyday basis

The broader M2 component includes M1 in addition to saving deposits, Certificates of Deposits (less than $100,000), and money market deposits for individuals. Comparing the velocities of M1 and M2 provides some insight into how quickly the economy is spending and how quickly it is (short-term) saving

MZM (money with zero maturity) is the broadest component and consists of the supply of financial assets redeemable at par on demand: notes and coins in circulation, traveler's checks (non-bank issuers), demand deposits, other checkable deposits, savings deposits, and all money market funds. The velocity of MZM helps determine how often financial assets are switching hands within the economy

The theory of business cycles: **Real Business Cycle (RBC) Theory**

- **The RBC theory (Kydland & Prescott, 1982) explains business cycle fluctuations by real (in contrast to nominal) shocks**
- As in classical business cycle theory, business cycles do not represent a failure of markets to clear but rather they reflect the most efficient possible operation of the economy (decisions by rational economic agents), given the structure of the economy
- **RBC theory sees recessions and periods of economic growth as the efficient response to exogenous changes in the real economic environment** (such as technology shocks directly changing the effectiveness of capital and/or labour)
- The basic RBC model predicts that given a temporary positive shock, output, consumption, investment and labour all rise above their long-term trends and hence formulate into a positive deviation. Furthermore, since more investment means more capital is available for the future, a short-lived shock may have an impact in the future. That is, above-trend behaviour may persist for some time even after the shock disappears. This capital accumulation is often referred to as an internal "propagation mechanism", since it may increase the persistence of shocks to output. It is easy to see that a string of such productivity shocks will likely result in a boom. Similarly, recessions follow a string of bad shocks to the economy. If there were no shocks, the economy would just continue following the growth trend with no business cycles
- **The level of national output necessarily maximizes expected utility** (individuals and firms respond optimally all the time) **and government should therefore concentrate on long-run structural policy changes and not intervene through discretionary fiscal or monetary policy designed to actively smooth out economic short-term fluctuations**

The theory of business cycles: **Fisher – Minsky theory**

1. **Inflation** depends on **growth of money**
2. **Asset bubbles** (and crashes) depend on **growth of** (decline in) **credit**

- **Instability** **is an inherent and inescapable flaw of capitalism** because it originates in the very financial institutions that make capitalism possible
- **The financial system** necessary for capitalist vitality and vigour – which translates entrepreneurial spirits into effective demand for investment – **contains the potential for runaway expansion, powered by an investment boom**. This runaway expansion can readily grind to a halt because accumulated financial excesses (high leverage, excessive debt) render the **financial system fragile**
- **Paradox**: **Financial stability can be destabilizing** (because it is extrapolated too far and therefore induces investors to "overprice"/"overtrade" risky assets and underprice "risk")

Minsky three-part taxonomy of borrowers

Based on the **relation between operating income and debt service payments** of individual borrowers:

1. Hedge Finance (HF): **Anticipated operating income is more than sufficient to pay both interest and scheduled reduction in debt** –
   Low Risk: only big economic crisis can hit operating income

2. Speculative Finance (SF): : **Anticipated operating income is sufficient to pay interest but not to repay debt, that must be rolled over at maturity** –
   Medium Risk: "sudden stop", i.e. when lender refuse to roll-over loans

3. Ponzi Finance (PF) : **Anticipated operating income is insufficient even to pay just the interest on debt** –
   High Risk: Borrowers can meet their commitment to pay the (generally high) interest rates on their outstanding loans only if they obtain cash from new loans or if they manage to sell some assets (which means they must rely on ever increasing asset prices)

- During a boom the "quality" of debt decreases and the "fragility" of the credit structure (and of the financial system) increases – more is lent to SF & PF borrowers
- During a crash more SF becomes PF and even some HF might become SF
- Pro-cyclicity of credit is destabilizing

The pro-cyclicality of credit

- **Supply of credit increases when economy is booming and decreases during economic slowdowns: a pro-cyclical behaviour**
  - During booms:
    - Investors become optimistic and more eager to borrow
    - Lenders assessment of both the risk of individual investments and of systemic risk declines and they are more eager to loan

- **Expansion of credit** takes places through:
  - **Banking sector** (normally "heavily" regulated and "protected")
  - **"Shadow" banking system** (non-bank lenders, normally lightly regulated)

- Expansion of credit results from development of "substitutes" to previous "traditional monies". Examples:
  - Silver was substituted by "bills of exchange" (early 1800): facilitating international trade
  - Clearing House Certificates (around 1850): facilitating interbank transactions
  - Partly paid Stocks (UK, 1847), "Reportage" (France, 1882) and call money loans (US, 1920): facilitating leverage, leveraged investments and speculation
  - CDs, Eurodollar, Money Markets funds (after 1950) : bypassing "ceilings on interest" rules
  - Derivatives and Securitization (after 1980): facilitating leverage and risk trading/spreading

- **Expansion of credit is a systematic development due to efforts to reduce transaction costs and holding of liquidity and money balances**

- **History of money is a story of continuing innovations so that the existing supply of money can be used more efficiently and of developments of close substitutes for traditional money in order to circumvent formal requirements applied to money**

The debt-deflation cycle

- **A decline in prices of assets and commodities leads to a reduction in the value of collateral and induces banks to call loans or refuse new ones**; therefore firms sell inventories and households sell securities/assets. This behaviour, whilst rational from the point of view of each individual agent, can lead to a "**debt-deflation spiral**" as prices fall still further (Irving Fisher)

- If **agents are leveraged** (normally they are highly leveraged at the top of a cycle) the decline in prices leads to bankruptcies, forcing liquidation of assets "at any price", thus further lowering the value of loan collateral of even solvent debtor and bringing everyone closer to default

- **Defaults of firms and households** mean that **banks incur losses** and fear spreads that some of them may become insolvent

- **The credit system suddenly freezes**: banks stop lending to each other and keep large "precautionary" balances at the Central Bank. Liquidity freezes and even very "basic" lending, like trade finance, suddenly stops, with negative impact on "real" activity

- Any amount of Money provided by the Central Bank to the credit system is hoarded, therefore **money supply and credit to the economy falls** (the "velocity" of money, V, declines): to avoid falling in a "liquidity trap" Central Banks flood the system with liquidity "(dropping money from a helicopter") and embark in various forms of "Quantitative Easing" (QE)

Monetarist vs Keynesian Theories: a critique

The debate between Monetarists and Keynesians **ignores:**

(i) **the instability of credit and the fragility of the banking system** (and of the financial system)

(ii) **the pro-cyclicality of asset based lending & finance**

(iii) **the negative impacts on production and prices when the credit system becomes paralyzed by defaults caused by asset price declines (deflation)**

- Both school of thought **take the well functioning of the "financial plumbing" of the economy for granted**, which we will see it's never the case during a financial crisis
- **Finally: if we assume "rational" economic agents why do business cycles still occur?**

Risk vs Uncertainty

- **Risk is when the probability distribution of future states of the world (or of future market risk-returns) is known by agents**. Risk can be calculated, securitized (that is "sliced" and "repackaged"), priced and hedged

- **Uncertainty is when agents are not able to form priors on the distribution of future outcomes (Knight, 1921)**

- **Rational Expectation Hypothesis** (REH; Muth, 1961) assumes that information collection is close to costless and that agents have cognitive faculties sufficient to weight probabilistically all future outturns. Therefore markets are "efficient", in the sense that all public information is immediately and accurately incorporated into the asset, leaving no room for systematic forecasting errors

- In its strongest version, REH and efficient markers hypothesis assumed a stable structural model whose structure is known by all agents. More realistic hypothesis allow agents to rationally learn about evolving economic structures. This learning process over time could explain apparently biased expectations (i.e. predictable forecasts errors) in empirical data

- In an **uncertain** environment, where statistical probabilities are unknown, this very detailed approach to model the economy may no longer be suitable

- Herbert Simon, the father of **decision making under uncertainty**, believed human behaviour in complex environments followed **simple behavioural rules**, that he called "**heuristics**"- that is simple rules of thumb or mental shortcuts that over time have evolved to help us select subsets of information that are believed to be the most relevant

Behavioural Economics and Finance

- Kahneman & Tversky (1974), the fathers of behavioural economics, used heuristics as means of explaining violations of the REH axioms
- "Econs" are fully rational beings capable of performing very complex calculations with all available information; "Humans" often exhibit "**bounded rationality**" – rationality that is limited by their cognitive resources and observational powers
- Experimental studies have revealed systematic biases in people's judgements as well as systematic deviations from the preferences implied by the REH

  Main biases:

  - Heuristic Simplifications:
    - Availability – ease of access or recall information/narratives
    - Representativeness/Extrapolation – relying on stereotypes rather than on cold statistical analysis, thus ignoring information like sample size or "base rate", randomness or reversal to the mean
    - Conservatism, i.e underweighting of new evidence/anchoring, regret aversion
    - Framing: narrow framing (ignoring correlations effects), disposition effect (selling winners too early, holding on to losers, house money effect (taking more risk after a big win)
  - Self Deception (overconfidence and limits to learning):
    - Overconfidence / overoptimism : feeling above average
    - Biased self attribution / confirmation bias / hindsight bias
- 4 major reasons - all linked to common human traits – of **why we make poor choices**:

1. the "narrow framing" of problems that makes us miss options
2. the "confirmation bias" that leads us to give undue credence to information confirming a decision while ignoring other information
3. the injection of "short-term emotion" into the decision process
4. overconfidence that we naturally display about the future (something that may be peculiar to only certain of the world's cultures, by the way)

Arbitrage

"Markets can stay irrational longer than you can stay solvent"

JMKeynes

Why do rational traders not take advantage of mispricing due to the behavioural biases described above, as postulated by Milton Friedman (1954)?

- **Arbitrage is both risky and costly**, so not always it can counter the impact of "irrational" (noise) traders
- **Arbitrage is riskless only in the extreme case of perfect substitutability and frictionless markets**. In real life **"imperfect hedges" can move against the arbitrageur ("noise risk") and force him to sell at a loss**, especially if he is leveraged (and even more so if many leveraged arbitrageurs have similar positions)
- This situation is exacerbated when there is a **principal-agent problem**, as is the case for institutions managing other people money, **where principal and agent can have very different time-horizons**
- This is particularly true for "macro"-inefficiencies (like market bubbles) without good asset substitutes, for which therefore it is not possible to hedge risk in arbitrage: arbitraging market-level mispricing becomes risky and unattractive
- **Abundant risk capital, flush liquidity and easy access to leverage** – as witnessed between 2002 and 2007 worldwide - may **reduce micro-inefficiencies** (Samuelson) but **boost macro inefficiencies** in a Minskyian sense (rendering the whole system more fragile and instable)

Manias, Panics and Crashes

"Happy families are all alike; every unhappy family is unhappy in its own way" Tolstoy, Anna Karenina

- **No matter how different the latest financial frenzy or crisis appears, there are usually remarkable similarities with past experience from other countries and from history**

- **Manias are associated with economic euphoria**; corporates and households (and sometimes even governments) become increasingly upbeat, investment spending and/or consumption spending surges because credit is plentiful

- **During these euphoric periods** an increasing number of investors seek short term capital gains from increases in asset prices rather than from the investment income based on the productive use of these assets. **Banks lend freely, generally against those same assets that are increasingly becoming overpriced**

- Bubbles in prices of any asset – be it real assets, like housing or real estate, natural resources or precious metals, and even tulip bulbs or financial assets, like stocks, bonds or currencies – always implode: by definition a **bubble involves a non-sustainable pattern of price changes or of cash flows growth**

Definition of a "bubble"

- A "**bubble**" refers to a situation in which **excessive public expectations of future price increases cause prices to be temporarily elevated**. For instance, during a housing price bubble, homebuyers think that a home that they would normally consider too expensive for them is now an acceptable purchase because they will be compensated by significant further price increases. They will not need to save as much as they otherwise might, because **they expect the increased value of their home to do the saving for them** (Ponzi finance). First-time homebuyers may also worry during a housing bubble that if they do not buy now, they will not be able to afford a home later

- The expectation of large price increases may have a strong impact on demand: if people think that the prices on an asset are very unlikely to fall, and certainly not likely to fall for long, there will be little perceived risk associated with an investment in that asset

- **What is the origin of bubbles**? Speculative bubbles are caused by:
  - "**precipitating factors**" that change public opinion about markets or that have an immediate impact on demand
  - "**amplification mechanisms**" that take the form of price-to-price feedback

Manias, Panics and Crashes: international propagation

Historically both euphoria and panic have spread from one country to others, through several different channels:

- GDP increases/decreases in one country induces increases/decreases in demand for imports and hence increases/decreases exports (and GDP) in other countries
- Capital flows (followed by "sudden stops"), that lead to increases/decreases in the value of the currency and in prices of the assets in the receiving country
- Increases/decreases in credit in one country spill over in other countries, given the global interconnections in the banking and financial sectors (incl. financial innovation)

Development of Manias, Panics and Crashes

- **Most crisis begin with a bubble**, in which **the price of a particular asset rises far above its underlying fundamental value**. Major **technological innovation** (railroads, internet, etc.) **and changes in trade patterns** (globalization) lead to expectations of high growth and even higher returns, sufficient to foster a self-fulfilling rise in the asset's price [**precipitating factors**]

- Asset bubbles are often associated with an **excessive growth in the supply of credit**, a consequence of:
  - **Financial Innovation**
  - **Loose monetary policy of the Central Banks**
  - **Lax supervision and regulation of the financial system**

- The bubble goes hand in hand with **excessive accumulation of debt**, as investors borrow money to buy into the boom

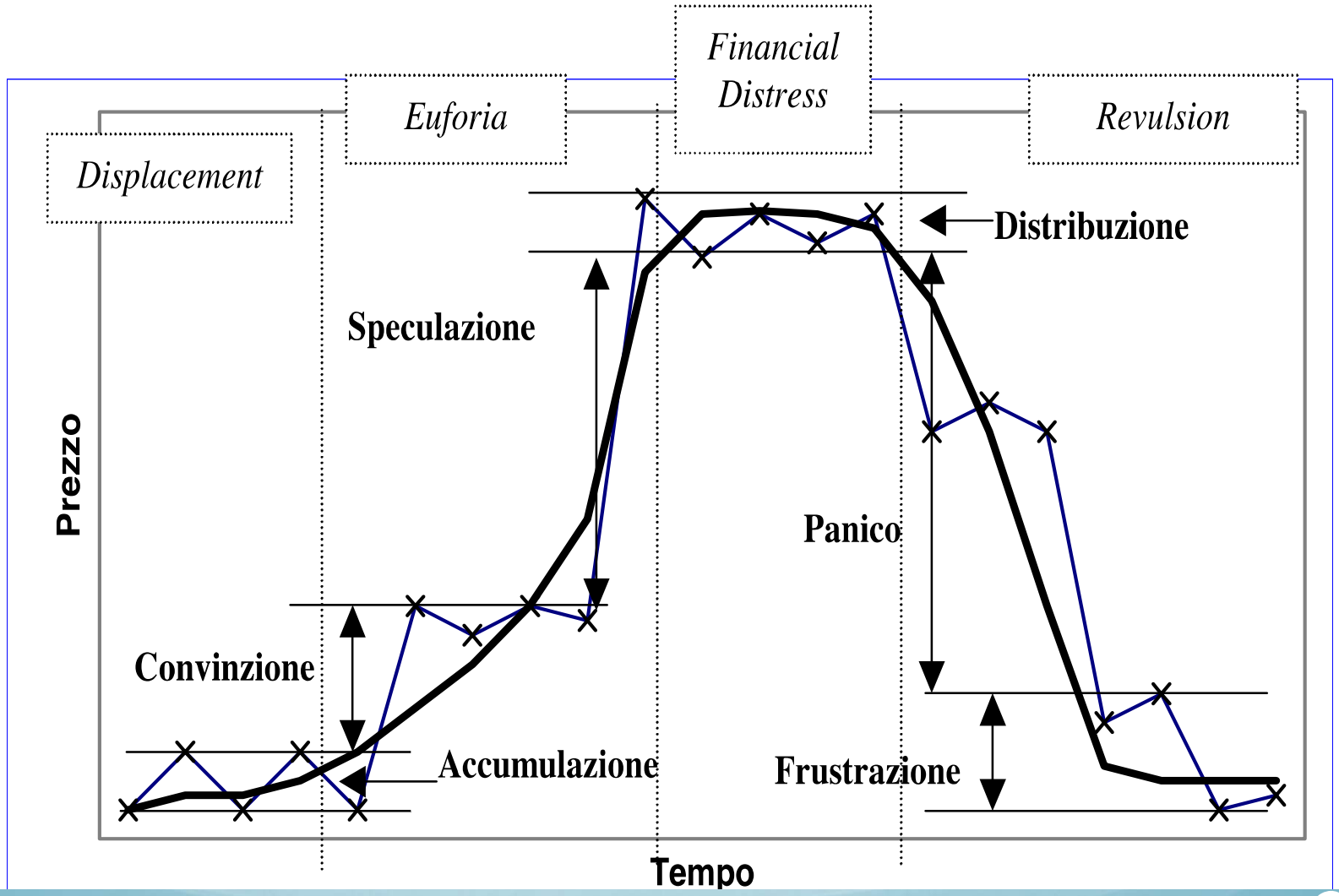
- Assets at the heart of the bubble typically serve as collateral and, since the **value of collateral is rising**, more can be borrowed and thus **leverage keeps growing** [**amplification mechanism**]

- However unsustainable, this debt-financed consumption or investment has real economic effects: household and firms purchasing goods and services fuel economic growth (and a **"this time is different"** feeling)

- When the prices of bubbly assets stop rising, the **boom turns into bust**, triggering panicked "**margin calls**" (borrowers have to put up more cash/collateral to compensate for falling prices) and starting **a vicious circle of fire sales and price collapses**

- **Crises are not "Black Swans" but "White Swans"**, **with remarkably predictable elements of boom and bust** (as illustrated in Reinhart-Rogoff "This time is Different")

The Phases of a Financial Crisis



The Phases of a Financial Crisis

- By studying many empirical historical examples, C. Kindleberger has identified the universal scenario associated with the development of bubbles as follows:

Displacement → (credit creation) euphoria → critical financial distress → revulsion

1. The upswing usually starts with an **opportunity** ("displacement") – new markets, new technologies or some dramatic political change – and investors looking for good returns

2. The scenario proceeds through the **euphoria** of rising prices, particularly of assets, while an **expansion of credit inflates the bubble**. In the manic euphoric phase, investors scramble to get out of money and move into illiquid things such as stocks, commodities, real estate or tulip bulbs: a larger and larger group of people seeks to become rich without a real understanding of the processes involved (the prospect of easy capital gains attracts first-time investors and swindlers who seek to benefit from their gullibility)

3. Ultimately, insiders discern that expected profits cannot possibly justify the exorbitant prices of assets and begin to take profits. The markets stop rising and people who have borrowed heavily find themselves over-stretched. This is **distress**, which generates unexpected failures

4. The final phase is a self-feeding panic (**revulsion or discredit**), where the bubble bursts. People of wealth and credit scramble to unload whatever they have bought at greater and greater losses, and **cash becomes king**. The sudden fall, first in the price of the primary object of speculation, then in most or all other assets, is associated with a reverse **rush for liquidity**. Bankruptcies increase. Liquidation speeds up, sometimes degenerating into panic. The value of collateral (credit and money) sharply contracts

Finally debt deflation ends as productive assets move from financially weak owners (often speculators or the original entrepreneurs) to financially strong owners (well capitalized financiers). This provides the foundation for another cycle, assuming that all the required factors (displacement, monetary expansion, appetite for speculation) are present

Business Cycles & Financial Crisis: **the three key elements**

Business cycles leading to financial crisis are characterized by three elements:

1. **Changes in trade patterns**, due to:
   - New entrant(s) in the world markets (typically exploiting a "comparative advantage") [in the past: end of wars]
   - Lowering of trade tariffs
   - Change in terms of trade
2. **Technological innovation(s)**
3. Credit growth/unsustainable **increase in leverage**, often accompanied by financial liberalization/innovation

Business Cycles & Financial Crisis: **a stylized description**

- **Changes in trade patterns and technological innovations** represent a **shock to the macroeconomic system** and economic agents will anticipate improvement of profit opportunities in some sector/countries or even in the overall share of profits on GDP
- The rate of economic starts to accelerate, feeding further optimism
- Corporation, households and investors **borrow to take advantage of the improved profit opportunities**; government usually will borrow to help those "left behind" by these transformations (or facilitate borrowing by these "weak"/"un-creditworthy" constituencies, like most recently sub-prime borrowers in US)
- The boom is fuelled by **expansion of credit** by the traditional banking sector or, through **financial innovation**, by new unregulated intermediaries ("shadow banks") via new financial instruments
- Soros claims that financial markets can validate a given trend by influencing not only market prices but also the fundamentals that market prices are supposed to reflect (Reflexivity theory: the feedback loop between market participants' understanding of economy and economy itself)

History does not repeat itself
but
it often rhymes

- “The charm of history and its enigmatic lesson consist in the fact that, from age to age, nothing changes yet everything is completely different” (Aldous Huxley)
- “Luck is what happens when preparation meets opportunity” (Seneca)
- “Knowing is the beginning of action; action is the completion of knowledge” (Wang Yangming)

Even the brightest can get caught in a bubble

- Almost 300 years ago, one of the smartest ever humans did something very stupid.
- In the spring of 1720 **Sir Isaac Newton** ditched his shares in the South Sea Company, which had been a granted a monopoly on British trade with South America, for a cool 100 per cent profit of £7,000. However, the stock kept climbing and Sir Isaac bought them back at almost three times the price he initially paid. Within months the bubble had burst, obliterating the scientist's life savings and leading him to lament that he "could calculate the motions of the heavenly bodies but not the madness of people".
- Sir Isaac's misfortune shows how even history's most brilliant minds can fail to spot financial excess — aside from his scientific renown, he was also head of the Royal Mint at the time of the South Sea Bubble.

History of financial crisis

Year	Countries	New Trade/other events	New Tech	Fin Innovation
1636-37	Holland	Trade with India; end of war with Spain	Tulip bulbs	Vendor financing, gold inflows from Spain
1720	England, France	Trade with Americas	Lower transport costs	South Sea & Mississippi Co Stocks
1772	Britain, Holland	Trade with India, exp. commodities; end of 7 years war	Housing, turnpikes, canals	Country banks, Bills of Exchange
1810/1815/ 1819/ 1825-26	Britain	Trade with Americas, end of Napoleonic war	Canals, cotton, mines	Banks, bonds sold in instalment, Exchequer Bills, Default of all Newly Independent

History of financial crisis

Year	Countries	New Trade/other events	New Tech	Fin Innovation
1836 /1837 /1838	Britain, US, France	Trade with US	Railways, cotton land, cotton, building sites	Joint-stock / wildcat / regional banks
1847 / 1848	Britain, Continental Europe	Trade with US, wheat and potato harvest failure	Railways	Partly paid railways securities
1857	US, Britain, Continental Europe	Trade with US	Railways, wheat, new agricultural land, steamships	Gold discoveries, clearinghouse, banks M&A, new banks
1866	Britain, Italy	Trade with Europe	Cotton, Shipping companies	Joint-stock discount houses

History of financial crisis

Year	Countries	New Trade/other events	New Tech	Fin Innovation
1873	Germany/Austria, United States	Trade with US; Franco-Prussian indemnity	Buildings, Railways, shipping, Suez Canal	New industrial & construction banks, capital inflows from Europe
1882	France	Trade with SE Europe	Lower transport costs	Securities bought on margin
1890	Britain (baring	Trade with S. America & S. Africa	Electricity, commodities	Argentine sec, Private co going public
1907	US, France/Italy	Boom in world trade	New industries	Banks making investments in industries, Trust Co.

History of financial crisis

Year	Countries	New Trade/other events	New Tech	Fin Innovation
1920-21	Britain, US	Post war trade boom	New industries	Reparation & War Debts
1929-39	World	End of gold standard, speculation on land, commodities & stocks	New industrial organization	Assets bought on margin, international capital flows
1960-70	World	Europe and Japan post WW2 recovery	Chemical and other new industries Military tech	Eurodollar market
1974-5	World	OPEC, other Emerging countries, spec on commodities	Electronics, IT, drugs	Floating exchange rates, “fiat” money

History of financial crisis

Year	Countries	New Trade/other events	New Tech	Fin Innovation
1979-82	World (exp. LatAM)	Spec on Commodities, Trade with South America and OPEC, US farmland, real estate	Electronics, chemicals, IT,	Syndicated bank loans, mortgage loans (MBS)
1982-87-92/ 1990	US / Japan	Trade with Europe, Japan, NIA (HK, Singapore, Taiwan, Korea)	Outsourcing, IT	Derivatives, new financial instruments (cum warrant bonds, zero coupon bond, “junk” bond)
1994	Mexico	NAFTA	Outsourcing	New Banks

History of financial crisis

Year	Countries	New Trade/other events	New Tech	Fin Innovation
1997-98	South East Asia, Russia, Emerging Markets	WTO, speculation on land & stocks in EM	Outsourcing	Easier international capital flows
2000-1	US	Speculation on Stocks	Internet	
2007-	World	China, other EM, speculation on commodity & on housing	Internet, outsourcing, just-in-time inventories	ABS, CDO, CDS, SPV, etc.
2010-	Europe	China, other EM, speculation on commodities	Outsourcing, just-in-time inventories	euro

"This time is different"

Highly leveraged economies are always fragile and vulnerable to crisis of confidence, but "This time is different"

"**Financial crisis are things that happen to other people, in other countries at other times**: we have learned from past mistakes and the current boom, unlike many booms that precede catastrophic collapses in the past, is built on sound fundamentals, structural reforms, technological innovation and good policy"

Some examples:

- Latin American Debt Crisis of 1980s:
  - Why this time is different? Commodity prices are strong, interest rates are low, oil money is being "recycled", there are skilled technocrats in governments, money is being used for high-return infrastructure investments and bank loans are being made instead of bond loans, as in the interwar period of 1920s/1930s. With individual banks taking up large blocks of loans, there will be incentive for information gathering and monitoring to ensure that money are well spent and loans repaid
  - Outcome: Steeply higher real interest rates (forced by Fed Chairman Volker to curb US inflation) combined with a collapse of global commodity prices led to the default of Mexico in August 1983, followed by over a dozen of other EM countries. It took almost a decade for LatAm to recover
- Asian Debt Crisis of end of 1990s:
  - Why this time is different? The region has a conservative fiscal policy, stable exchange rates, high rates of growth and savings, and no remembered history of financial crisis
  - Outcome: Overinvestment and break-up of dollar peg
- The Great Contraction of 2007-:
  - Everything is fine because of globalization, the technology boom, a better understanding of monetary policy and a superior financial system capable of allocating risks to those agents better equipped to carry them, thanks to securitization

The aftermath of severe financial crises

Severe financial crisis are protracted affairs, whose aftermath is characterized by:

1. **Deep and prolonged collapses in assets markets**:
   - **Declines in real housing prices average 35% over 6 years**
   - **Declines in equity prices average 56% over about 3 ½ years**

2. **Profound declines in output and employment:**
   - **Unemployment rate rises on average 7 percentage points during the down phase of the cycle, which lasts on average more than 4 years**
   - **Output falls (from peak to trough) more than 9% on average, although the downturn, average ca. 2y, is considerably shorter than for unemployment***

3. **Value of government debt tends to explode: on average it rises by 86% (in real terms, relative to pre-crisis levels****

* Presumably this is partly because potential GDP growth is positive and we are measuring only absolute changes in income and not gaps relative to potential output. Even so, recessions surrounding financial crises are usually long compared to normal recessions, which typically last less than a year

** The main cause of debt explosions is not the widely cited costs of bailing out and recapitalizing the banking system: bailout cost are difficult to measure (the divergence among estimates from competing studies is considerable), but even upper-bound estimates pale next to actual measured increases in public debt. The biggest driver of debt increases is the inevitable collapse in tax revenues that governments suffer in the wake of deep and prolonged output contraction. Automatic stabilizers and countercyclical fiscal policy efforts contribute to the debt buildup. Finally, if interest rates soar following a financial crisis, a spike in interest burden on debt further raises the outstanding debt amount

How to deal with the aftermath of a crash

In the long run:

- Everyone – households, corporations, governments, banks, other financial market players – must **reduce their level of debt**
- **If private leverage is not reduced, banks, firms and households will be unable to lend, invest, consume and growth will be impaired** ("Zombie" banks, firms and consumers have kept the Japanese economy from recovering since the 1990 crisis)
- **Insolvent banks, firms and households must be allowed to go bankrupt** in a necessary, though painful process of "creative destruction" (Schumpeter)
- **If public leverage is not reduced, the impulse will be to get rid of these debts by inflating the currency (internal inflation and external devaluation)**
- **Imbalances in trade and public finance should be addressed in a "structural" way**

How to deal with the aftermath of a crash

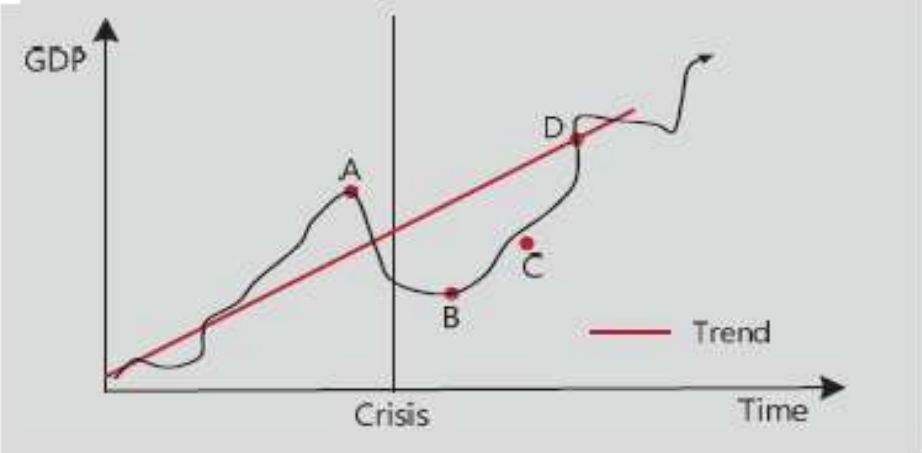
In the short run (both during and immediately after a crash):

- **Governments with available resources should step in** to **break the vicious circle of falling asset prices, falling private demand and falling private investments**
- **Central Banks should step in** to **provide liquidity to the banking sector and to financial markets**
- **Governments and Central Banks should intervene** to **deal with insolvent banks and other financial market institutions**
- Care should be applied in withdrawing public support (too soon can risk igniting another crisis)

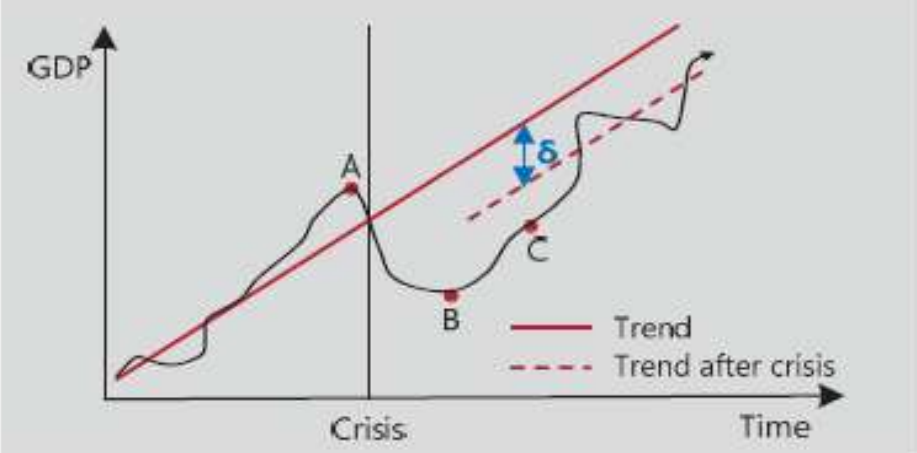
- The issue is how to deal with "**moral hazard**" (= the willingness to take excessive risks knowing that the government – hence the taxpayer – will bail out and shoulder whatever negative consequences follow)

Measuring the costs of crises: a schematic overview

Keynesian/Fed Interpretation



Wicksellian/BIS Interpretation



Point A: pre-crisis peak; point B: post-crisis trough; point C: GDP growth equals trend GDP growth for the first time after the crisis; point D: the level of GDP returns to the pre-crisis level.

Source: BIS Annual Report, 2014

- The BIS argues that there has been a permanent loss of capacity in the developed economies following the GFC, due to forbearance on bad loans by the banking sector, which allows moribund companies and technologies to survive, while failing to finance the next wave of productive innovation. The Keynesian view, by contrast, is that there has been a temporary loss of capacity, but that this can eventually be restored, if demand recovers sufficiently.

- This divergence of views on economic capacity leads in turn to a major difference on appropriate fiscal policy. The BIS implies that cyclically-adjusted fiscal policy is looser than it seems, because GDP can never return to its earlier trends. The Keynesian view is that fiscal policy should not be tightened too soon, and perhaps not at all until output has fully recovered.

Suggested Readings

- Charles P. Kindleberger, Robert Z. Aliber: **Manias, Panics and Crashes: A History of Financial Crises**, Fifth Edition, Palgrave 2005, Chapters 1, 2, 4, 7, 8
- Nouriel Roubini, Steven Mihm: **Crisis Economics**, Penguin Books, 2011, Chapter 1, 2
- Carmen M. Reinhart, Kenneth S. Rogoff: **This Time is Different: Eight Centuries of Financial Folly**, Princeton University Press, 2009, Chapter 14