- Policymakers and mainstream economics caught up in surprise.

- No early warning on the forthcoming crisis, rather continuous denial of worsening conditions. (See Bezemer 2009 for a good summary)

- Mainstream *ex-post* explanations of the reasons (See Mizen 2008, IMF 2006, Brunnermeier 2009, Goodhart 2008, Hall 2009 among others for detailed discussions)

- Low interest rates between 2001-2006, and expansionary monetary policy easing credit conditions.

- Prudent lending by banks through reduction of standards and prudent borrowing by sub-prime mortgagors.

- The housing boom associated with falling credit standards

- Incentive problems in the originate and distribute model.
  - Brokers and originators fee income
  - Originator's incentive problem regarding the assessment of the borrower quality
  - Credit Rating Agencies and incentive problems (up front payment to assess structured products,

- The bonus schemes in banks and investment banks encouraging excessive risk-taking (though expressed much more rarely)

- Moving of loans to off-balance sheet vehicles in order to reduce the amount of capital banks needed to hold to conform with the regulations of Basel I.
- Off-balance-sheet vehicles making risks less transparent for investors.

- Increased use of wholesale and short-term funding to support the O&D model: creates a new vulnerability. Loans are immediately packaged into securitized products and sold to other investors, (securitized) credit growth depends more on investors' willingness to hold asset-backed paper- less on stable short- and long-term depositors in banks to finance traditional loans.

- Implication: less liquidity is held in the form of stable long-term deposits and an increase in maturity mismatch.
- Complexity of financial products, making proper risk assessment difficult.
- Increased risk in security tranches due to pooling from same geographical area.
- Optimistic forecasts by Credit Rating Agencies relying on historically low rates of defaults.

- While all these reasons have contributed to the crisis and are rightly identified, all were ex-post explanations – almost no mention of the danger in mainstream economic journals or among policymakers until problems emerge. Even after, very few foresaw the magnitude.

"She was asking me if these things are so large, how come everyone missed it?"

Luis Garicano on the Queen's visit to LSE, November 2008

- A few arguments for the reasons of this failure (Definitely see Bezemer 2009 on this)
- On the economic theory side, one of the main reasons: Alienation of macroeconomics from finance and accounting.
- Especially in the last decade with innovations in financial industry to escape regulations and increase profits, credit creation relies much more on securities market. (%40 of total credit in U.S)

- Mainstream (neoclassical) macro models lack explicit modelling of these markets or flow of funds relations in the economy
- Rather, financial variables are determined by developments in real economy. (inflation-output gap)

- Equilibrium modelling, optimizing agents.

- Rational expectations – Neutral money - No explicit modelling of credit flows, asset prices, balance sheet affects, financial, real estate and insurance sectors.

- Shocks as triggers of crisis rather than endogenous processes

- By design, these models cannot detect bubbles due to flow of funds into certain sectors.
- However, there were other models predicting the collapse and even the timing of it consistently for a few years
- Stock-flow consistent models (mostly used by Post-Keynesians following Minsky)
- Balance-sheet approach to the economy with explicit modelling of financial (sometimes real estate and insurance) sector.
- Flow-of-funds analysis rather than equilibrium models
- Non-optimizing agents in an uncertain environment.
- Stock-flow consistency to close the models

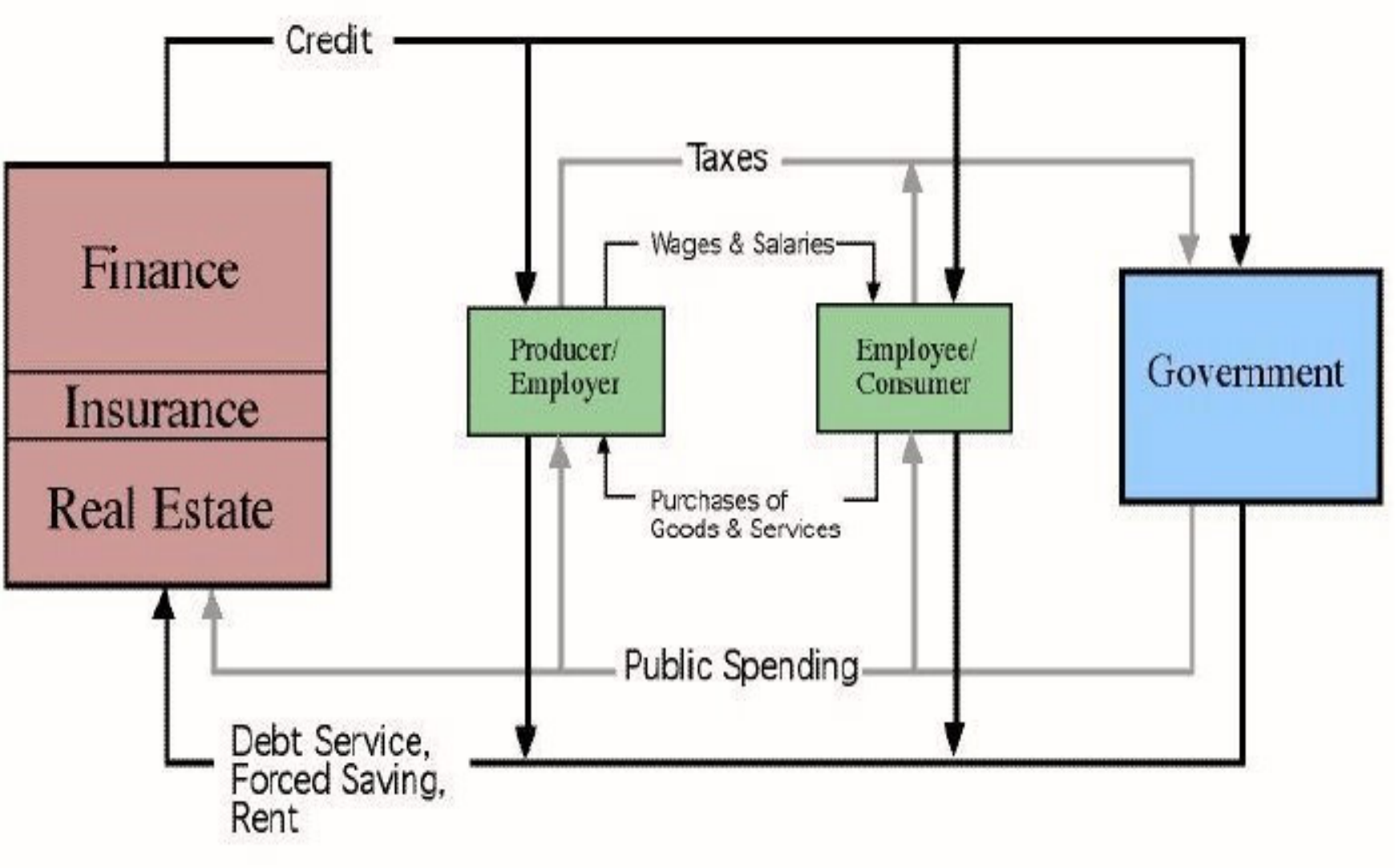
Bezemer (2009)

Table 1: Anticipations of the Housing Crisis and Recession

Analyst	Capacity	Forecast
Dean Baker, US	co-director, Center for Economic and Policy Research	" …plunging housing investment will likely push the economy into recession." (2006)
Wynne Godley, US	Distinguished Scholar, Levy Economics Institute of Bard College	"The small slowdown in the rate at which US household debt levels are rising resulting form the house price decline, will immediately lead to a …sustained growth recession … before 2010". (2006). "Unemployment [will] start to rise significantly and does not come down again." (2007)
Fred Harrison, UK	Economic commentator	"The next property market tipping point is due at end of 2007 or early 2008 …The only way prices can be brought back to affordable levels is a slump or recession" (2005).
Michael Hudson, US	professor, University of Missouri	"Debt deflation will shrink the "real" economy, drive down real wages, and push our debt-ridden economy into Japan-style stagnation or worse." (2006)

Stephen Keen, Australia	associate professor, University of Western Sydney	"Long before we manage to reverse the current rise in debt, the economy will be in a recession. On current data, we may already be in one." (2006)
Jakob Brøchner Madsen & Jens Kjaer Sørensen, Denmark	professor & graduate student, Copenhagen University	"We are seeing large bubbles and if they bust, there is no backup. The outlook is very bad" (2005)" The bursting of this housing bubble will have a severe impact on the world economy and may even result in a recession" (2006).
Kurt Richebächer, US	private consultant and investment newsletter writer	"The new housing bubble – together with the bond and stock bubbles – will invariably implode in the foreseeable future, plunging the U.S. economy into a protracted, deep recession" (2001). "A recession and bear market in asset prices are inevitable for the U.S. economy… All remaining questions pertain solely to speed, depth and duration of the economy's downturn." (2006)
Nouriel Roubini, US	professor, New York University	"Real home prices are likely to fall at least 30% over the next 3 years"(2005). "By itself this house price slump is enough to trigger a US recession." (2006)
Peter Schiff , US	stock broker, investment adviser and commentator	"[t]he United States economy is like the Titanic ...I see a real financial crisis coming for the United States." (2006). "There will be an economic collapse" (2007).
Robert Shiller , US	professor, Yale University	"There is significant risk of a very bad period, with rising default and foreclosures, serious trouble in financial markets, and a possible recession sooner than most of us expected." (2006)

Figure 1: Schematic Overview of Flow-of-fund Models



Source: Hudson (2006b)

- The FIRE (Finance, Insurance, Real Estate) sector includes banks and non-bank wealth-managing organizations (pension funds, insurers, investment banks, real estate agents) and it generates credit flows
- As households, firms and government borrow from the FIRE sectors, liquidity flows from t
- The credit flow facilitates investment, consumption and production. The total value of this credit flow is necessarily equal to real sector income (profits and wages) plus financial assets and obligations (interest payments) of the real sector
- Funds originate from banking in FIRE and either circulate in the real sector or return to FIRE in the form of debt service or fees

- Therefore, there is a trade-off between the credit used to finance production (retained earnings or new lending) and the credit that returns to the FIRE sector.
- The important question then is the ratio of total returns in the economy absorbed by the financial sector.
- A sustainable growth pattern displays a constant ratio of credit flows to financial and real sectors. In such a case, the debt burden does not grow as a proportion of the real economy and thus remains serviceable.
- So debt growth is the key to track the sustainability of economic growth.

Figure 2: The Flow of Funds in Matrix Representation

	Households	Firms current	Firms capital	Banks current	Banks capital	Govt.	Row sum
Consumption	$-C$	$+C$					0
Govt. expenditure		$+G$				$-G$	0
[Sales]		$[S]$					
Change in the value of inventories		$+\Delta I$	$-\Delta I$				0
Tax		$-T$				$+T$	0
Wages	$+WB$	$-WB$					0
Profits	$+F$	$-Ff$		$-Fb$			0
Interest on loans		$-rl.L_{-1}$		$+rl.L_{-1}$			0
Interest on money	$+rm.M_{-1}$			$-rm.M_{-1}$			0
Interest on bills	$+rb.Bsp_{-1}$			$+rb.Bsb_{-1}$		$-rb.Bs_{-1}$	0
Interest on bonds	$+B_{-1}$					$-B_{-1}$	0
Stock of cash	$-\Delta Hp$				$-\Delta Hb$	$+\Delta H$	0
Stock of current deposits	$-\Delta Mn$				$+\Delta Mn$		0
Stock of demand deposits	$-\Delta M$				$+\Delta M$		0
Stock of bills	$-\Delta Bsp$				$-\Delta Bsb$	$+\Delta Bs$	0
Stock of bonds	$-\Delta B.pb$					$+\Delta B.pb$	0
Stock of loans			$+\Delta L$		$-\Delta L$		0
Column sum	0	0	0	0	0	0	0

Source: Godley (1999:395)

- Financial innovation may create sudden changes in the fraction of total resources appropriated by the real and financial sector
- While such innovations may be beneficial for consumption smoothing, better financing of investment and easier debt-servicing, they may also result in a sustained drain of liquidity from real to financial sector: Financialization of the economy.
- This may create asset bubbles as *by definition,* any credit flow to the firms and households that is not invested in the real economy will be held as wealth and invested in FIRE.

- The extra liquidity invested in the FIRE sector pushes up asset prices – which leads to further borrowing as the net worth of the household increases due to increase in the value of the collateral- More credit created in FIRE – Further increase in asset prices. (Herding behaviour adds on to this euphoria)
- The result is higher returns on financial investments and a larger fraction of credit flow used for debt-servicing and financial fees. Consumption and production can be financed by new credit and increases in net worth due to asset bubbles, rather than profits and wages
- The bubble is ALWAYS unsustainable, as it is constrained by the ability of the real sector to pay back

Hyman Minsky and Post-Keynesian Economics

- Blaming the "bubble" for the current crisis is rather like blaming the car for an accident—when we ought to take a good long look at the driver, and at the bartender who kept the whiskey flowing all evening before helping the drunk to his car after last call… Unfortunately, those in charge of the financial system have for a very long time encouraged a blurring of the functions, mixing drinking and driving while arguing that the invisible hand guided by self interest can keep the car on course. The current wreck is a predictable result. (Wray 2007)

- Minsky and Financial Instability Hypothesis

  See Hyman Minsky (1986), Minsky (1992) Kregel (2007), Wray (2008, 2009)

- Developed by Hyman Minsky, received much attention from the academic world and policymakers recently.

- Using a Keynesian approach, Minsky argues crisis are endogenous to the capitalist system because of an inherent financial instability, and occur due to this rather than euphoria, bubbles or mania.
- The difference in this interpretation arises from the basic perspective on markets and their efficiency

Standard Smithian Perspective

"As every individual, therefore, endeavors as much as he can both to employ his capital in the support of domestic industry, and so to direct that industry that its produce may be of the greatest value; every individual necessarily labours to render the annual revenues of the society as great as he can. He generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it ... and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention."[4]

(True) Keynesian Perspective

"If I may be allowed to appropriate the term speculation for the activity of forecasting the psychology of the market and enterprise for the activity of forecasting the prospective yield of assets over their whole life, it is by no means always the case that speculation predominates over enterprise. As the organization of investment markets improves, the risk of the predominance of speculation does, however, increase. ...

- The major difference is that while Smitihian theory argues that markets will always lead to the efficient and socially desirable outcome, Keynesian view holds that markets may lead to the capital formation to be ill-done.

- Therefore, in this tradition, neo-classical economics claims that crisis occur due to the flaws in the institutional structure rather than any inherent characteristic of a market economy.

- Another important distinction is that Keynes argues the economic problem is ‘the capital formation of the country’ rather than allocation of scarce resources as argued by Knight.

- Minsky defines a capitalist economy as a set of interrelated balance sheets and income statements.
- Every financial unit has assets and liabilities with varying characteristics with respect to liquidity, maturity etc.
- Liabilities are commitments to make payments either at specific dates or when a contingency arises
- Assets are either financial or real, so they generate yields when a contract is fulfilled, when a production process takes place or when they are sold or pledged

- The role of money:
- Post-Keynesian economics places money at the centre of the analysis
- The exchange of present money for future money determines the capital formation of a capitalist economy (borrowing-lending relations)
- The present money finances the inputs that are used in the production process, while profits are the future money generated by assets of the firm
- As a result of such debt-financing, firms have a ‘time series’ of liabilities that necessitate them to make future payments using future cash flows

- Therefore, in a Keynesian world, ‘money is connected with financing through time.’ Or in other words, money connects past, present and future.
- Expectations of future profits channels the funds to the firms while realization of profits *determine* the transfer of the funds back to where they originated from. (whether or not the payments arising from liabilities are going to be made by the firm)
- Minsky recognizes that the existence of complex financial relations between banks, households and the government in the modern world may lead to different systemic dynamics.

- However, profit is still the main determinant of system behaviour, and realized profits are ultimately what determine the evolution of the financial relations in the economy.

- So at its core, financial instability hypothesis is a theory of affect of debt- relations on the capitalist system

- Minsky argues that banks (financial intermediaries in general) are at the centre of the system instability.

- Banks will continuously try to innovate new assets and liabilities in order to increase profits and overcome regulatory restraints

- Thus, the constant velocity of money as claimed by quantity theory of money is invalidated, and there is no linear proportional relationship between money and price level. (MV = PY).

- Minsky defines three basic income- debt relations with respect to economic units: Hedge finance, speculative finance and Ponzi finance

- Hedge finance: A strong financial position that does not require buying/selling of assets or borrowing/lending due to shortages in cash flows. Large cash flows from operations or large cash reserves.

- Speculative finance: A position where cash flows meet interest payments on outstanding debt, requires rolling over of debt or liquidation of assets to meet cash flows. These units roll-over their liabilities

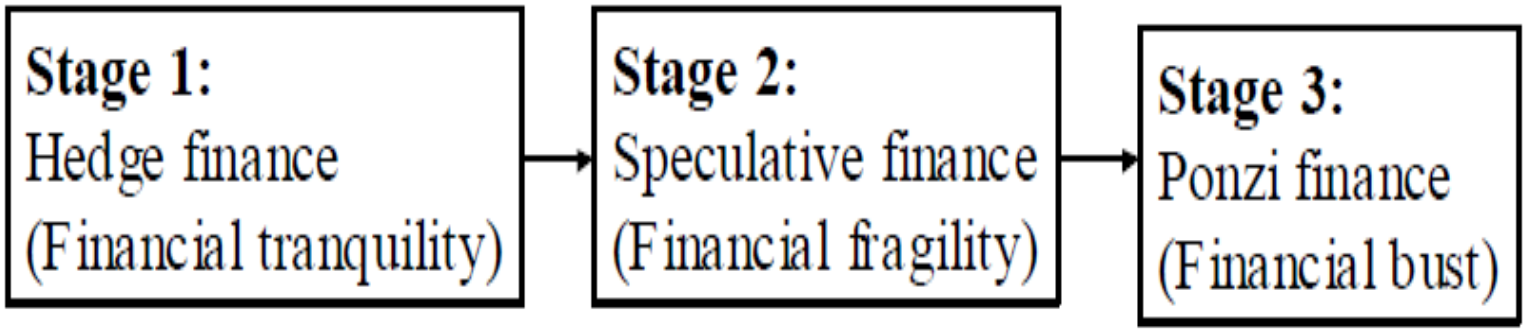
- Ponzi Finance: A position where cash flows do not meet interest payments on outstanding debt, therefore relies on continuous increase in asset prices to be sustainable. Without increase in asset prices, failure to roll-over debt results in rapid liquidation of assets.

- Whether or not the economy is going to be a sustainable equilibrium seeking system depends on which financing type is dominant in the economy
- If hedge units are dominant, the economy is stable, as the fraction of speculative and Ponzi financing units increase, the likelihood of a crisis increases
- So the first theorem of FIH states that the economy has stable and unstable financing regimes, dominated by hedge units

- The second theorem of the FIH: Over long periods of stability, economic units move from hedge-financing to speculative and Ponzi financing.
- The idea draws from Keynes view that when speculation leads to over-investment and debt financing, it will result in increased demand and inflation
- In such cases, the typical central bank action is to raise the interest rates to reduce inflationary pressures

- The implication is that rising interest rates push more economic units from hedge to speculative, and from speculative to Ponzi financing.
- As a result, units with shortfalls of cash will try to make position by liquidating assets (if there exists a market)
- This will bring about a collapse of asset values and start a debt-deflation process.
- Another important concept: Margin of safety
- Margin of safety can be defined as the excess of future cash flows from income-generating assets or production over cash outflows arising from liabilities

Figure 2. Stages of the basic Minsky cycle.



- Refers to the buffers any economic unit can take against unexpected shocks to prevent the emergence of need for borrowing or liquidation of assets. (liquid securities, cash flow over debt commitments, cash reserves)

- The margin of safety for a bank on a loan can be roughly considered as the difference between the value of the investment project and the amount of the loan. (compensating deposits, collateral or any other form of agreement to help the bank recover the loan if expectations fail)

- During stable economic times, margins of safety are reduced. (Stability is destabilizing)

- This is not necessarily due to banks becoming euphoric or over-optimistic about economic conditions. The recent stability of the economy validates riskier projects.

- This is because criteria used to evaluate the riskiness of loans is backward-looking.

- From the banker's perspective, the probability of default is lower, and the ability to pay back is improving as recent data suggests.

- Leading to lending to previously declined projects. Neither the banker nor the borrower is aware of declining margins of safety,.

- Excess borrowing, overinvestment and asset price bubbles

  More and more economic units are drawn to Ponzi-financing, requiring the continuation of the increase in asset prices.

- 'Minsky moment': End of the Minsky cycle when lending stops. Ponzi Units face problems of financing cash flows on debt commitments, fire sale of assets.

- '' when over-indebted investors are forced to sell even their solid investments" (Lahart 2007); "when lenders become increasingly cautious" (Magnus 2007c); "credit crunch or Minsky moment" (Whalen 2008); and "when the Ponzi pyramid financial scheme collapses" (Davidson 2008)

- The result is a debt-deflation, as the fall of prices increase real value of debt and necessitate further asset sales, with increasing excess supply in the market. Financial institutions face severe liquidity and **solvency** problems.

- 2008 Credit Crunch: A Minsky moment? (See Kregel 2008)
- Not in the exact sense. No observation of gradual decline in margin of safety to fragile levels through stable times.

- Rather, the margin of safety was not sufficient in the first place.
- Main difference from a typical Minsky cycle: The relation between banks and borrowers.

- Securitization removed the responsibility of bankers to evaluate the creditworthiness of borrowers.

- The loans are financed by investors in securities, and investors rely on Credit Rating Agencies' assessments.

- CRAs has no information about individual borrowers. (apart from some data obtained from banks). They evaluate securities using statistical techniques on historical default rates in similar groups of borrowers

- Backward-looking evaluation
- Default rate evaluation depends on previous borrowers performance

- Data generated by stable times: Statistical backward-looking models necessarily lowering margins of safety.

- Different from a typical Minsky cycle: Bankers lowering margins of safety through observing the performance of the customer in stable times.

- The probability of undervaluation of risk in good times increases dramatically as sample increases

- Incentive problems associated with the Credit Rating Agency and Issuers (Ashcraft et al 2008)
  - CRA's paid by issuers

- CRAs paid higher to evaluate structured products
- **CRAs income does not depend directly on the successful evaluation of the securities as it is flat payment** (unlike banks and customers before securitization).
- Credit ratings are designed to assess the risks of expected payoff- provide no information about the default probability in a downturn. (domino affects neglected). Makes credit ratings almost useless in evaluating systemic threat regardless of precision.

- A big portion of risk ends up in bank balance sheets through buying of securities, backup credits to SIVs, buy-back guarantees for securities. (hedged by CDS in theory)

- Creates a systemic risk not confined to sub-prime loans.

- Particularly sub-prime mortgages have in-built decline in margins of safety. (Remember the terms of ARMs)
- To maintain the same cushion of safety as the beginning when interest reset date comes (depending on the terms of the ARM),
  - the borrower's income should increase at the same rate as interest payments, or
  - the interest rates should stay at the same level or lower than initial mortgage contract (refinancing), or
  - House prices should increase for higher collateral (refinancing)

- This is true for all adjustable-rate loans and mortgages but the problem is much more pronounced in sub-prime mortgages and other types of low-quality loans.

- Sub-prime mortgagors by nature Ponzi-financing units. Most likely way to meet cash payments in future is by re-borrowing or refinancing. (unless personal incomes increase at the speed of interest payments on ARM loans)

- Refinancing: low interest rates and increase in housing prices essential for better terms of refinance. (Typical Ponzi financing unit)

- Increase in sub-prime lending fuelled housing demand and increased the prices, enabling Ponzi-units to survive and adding new ones through new lending.

- Rather than hedge units turning into Ponzi-units gradually through falling margins of safety, combination of jump-starting Ponzi-units with in-built declining margins of safety
- Unregulated derivatives market, hedging opportunities through CDS and payment schemes in big financial institutions accelerate the cycle.
- Palley (2009): Claims this is the end of a Minsky super-cycle. Super-cycles work over regular Minsky cycles.
- A super-cycle occurs over long periods of time, passing through three stages: Regulatory capture (reducing profits for financial sector), regulatory relapse (easing restrictions) and regulatory escape (financial innovations).

- Palley (2009): Claims The Credit Crunch is the end of a Minsky super-cycle.

- Basic Minsky cycle creates optimism through stable times due to backward looking evaluation

- The optimism about the ‘new economy’ spreads to regulators. (Great Moderation years)

- Provides the ground for reduced (or absent) regulation

- Why do economies not display more instability than observed then?

- Minsky and Ferri (1992) argue that the economy has thwarting systems which prevents it from passing over and below certain thresholds

- Floor- and – ceiling models, where the economy moves between upper and lower boundaries

- Even the belief that ‘they will not let it happen’ is stabilizing on its own (self-fulfilling prophecies)

- Consider the hyperinflation case and the role of confidence in the monetary and fiscal authority in hyperinflationary episodes.

- The thwarting systems prevent the economy from displaying explosive behaviour. Therefore, a transitory period that resembles stability can be achieved.

- However, every economic unit learns policy and develops an awareness of these thwarting systems to adjust its behaviour and to overcome the problems these systems create against its own benefit

- Three basic such systems are customs, institutions or policy interventions which change the outcomes that would prevail if every unit pursued only its own interest
- A good example is always a central bank and its lender of last resort role (consider the importance of this in the provision of liquidity during the credit crunch)

- A super Minsky cycle works over regular Minsky cycles and occurs when the economy's thwarting systems have been eroded

- The range of the fluctuations during regular Minsky cycles increase as economic agents thrive to overcome the thwarting systems (remember that at the core of this process are the banks, which continuously innovate to increase profits and overcome regulatory restraints)
- This does not necessarily imply a determinist linear increase in the severity of recessions through time. (Figure below shows the linear case)
- It is only the floors and ceilings that are changing, while individual recessions may be milder or stronger depending on context

Figure 3. Stages of the super-Minsky cycle.

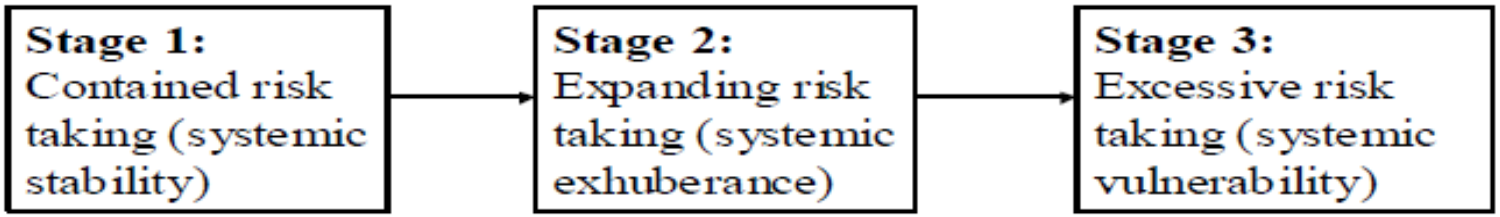
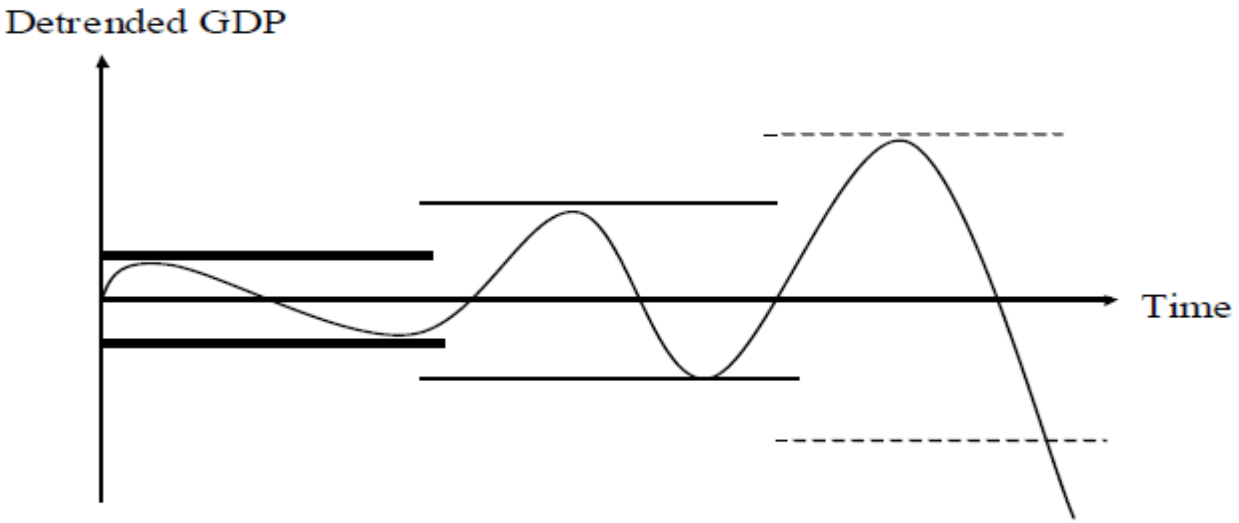
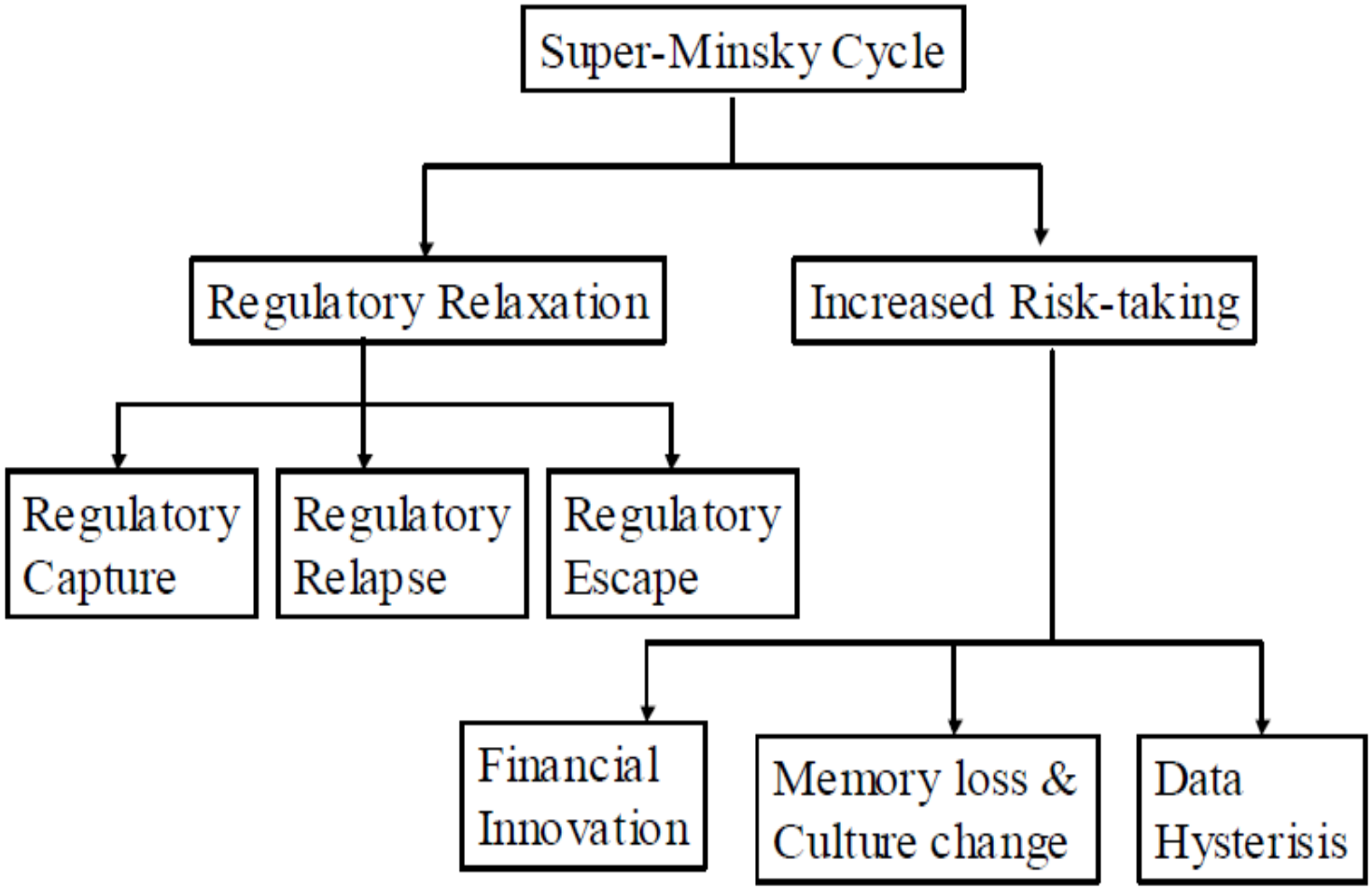


Figure 4. The full Minsky cycle through time.



- A super-cycle occurs over long periods of time, with two simultaneous processes: Regulatory Relaxation and Increased Risk-Taking
- The regulatory relaxation increases the supply of risky instruments, while increased risk taking increases both supply and demand.
- Passes through three stages: Regulatory capture (reducing profits for financial sector), regulatory relapse (easing restrictions) and regulatory escape

Figure 6. Details of the super-Minsky cycle.



- Following a crisis, stricter regulations are put into place (Great Depression). If these regulations are binding and can effectively be implemented, they reduce profits for the financial sector.
- This creates incentives for the financial sector to try to capture regulatory authorities (mainly via lobbying) This is the regulatory capture phase.

- The regulatory relapse phase corresponds to the period during which regulations are eased, as regulators re-interpret past crisis and are affected by the recent stability brought about by the past regulations in the recent years.

- In most cases, this period is accompanied by an intellectual justification, and a generally changing social attitude against regulation (greater freedom?)
- The final phase is regulatory escape, which occurs through financial innovation that lies outside the domain of past regulation. (e.g ?you should be able to think of some?)

- Similarly, the increased risk-taking process involves three dimensions: Financial innovation, memory loss and data hysteresis

- Financial innovation provides the new instruments that enable in increased risk-taking (e.g home equity loans, ARMs, securities, derivatives)
- Memory loss relates to individuals forgetting about recent financial crisis and increases the willingness to take risk.
- Data Hysteresis: Stable times after the completion of a cycle generates misleading data for those using backward-looking analysis. (Danger of using time-series data)