Theories of money and finance

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Structure

1. Endogenous money and post-Keynesian economics
2. Endogenous money and shadow banking
3. Modern Money Theory (MMT)
4. Minsky's Financial Instability Hypothesis (FIH)
5. Modelling Minsky's FIH

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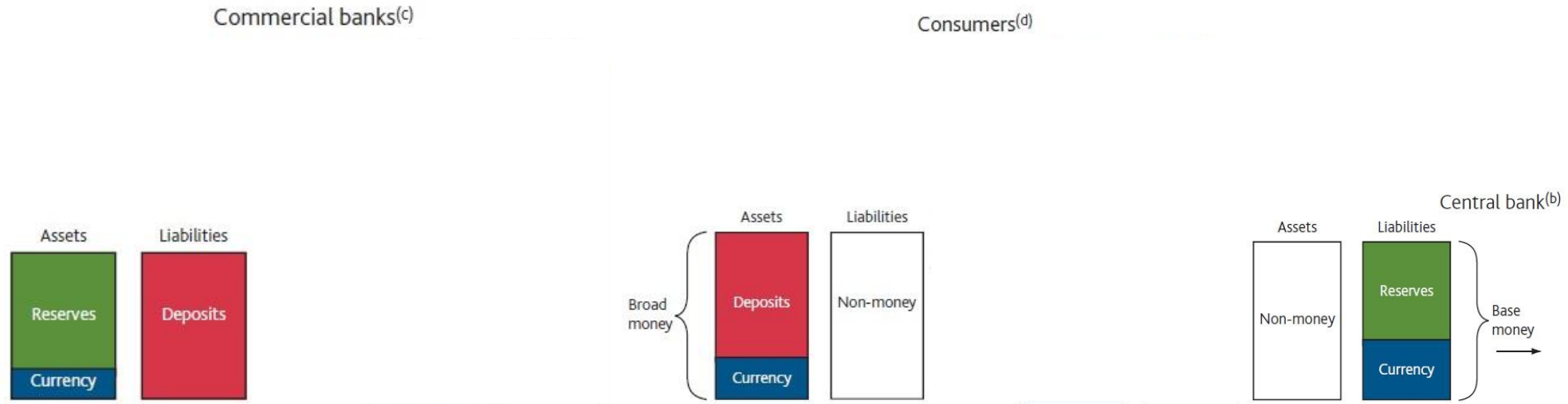
1. Endogenous money and post-Keynesian economics

- According to the traditional **mainstream** approach, banks are **financial intermediaries**: they receive deposits from households and provide loans using these deposits.
- For many decades, **post-Keynesians** have called the money multiplier approach into question, arguing that money is created endogenously and, therefore, banks do not need to wait for receiving deposits to provide loans (see e.g. Moore, 1988; Fontana, 2003).
- According to the **endogenous money approach**, loans are created ex nihilo as long as the borrower is creditworthy. Banks are not passive and their lending decisions can affect economic activity.
- Since the **Global Financial Crisis**, the view of post-Keynesians about the money creation process has been increasingly accepted in the academia and the central banking community (see e.g. Mc Leay et al., 2014; Unger, 2016; Bundensbank, 2017; Jakab and Kumhof, 2019).

1. Endogenous money and post-Keynesian economics

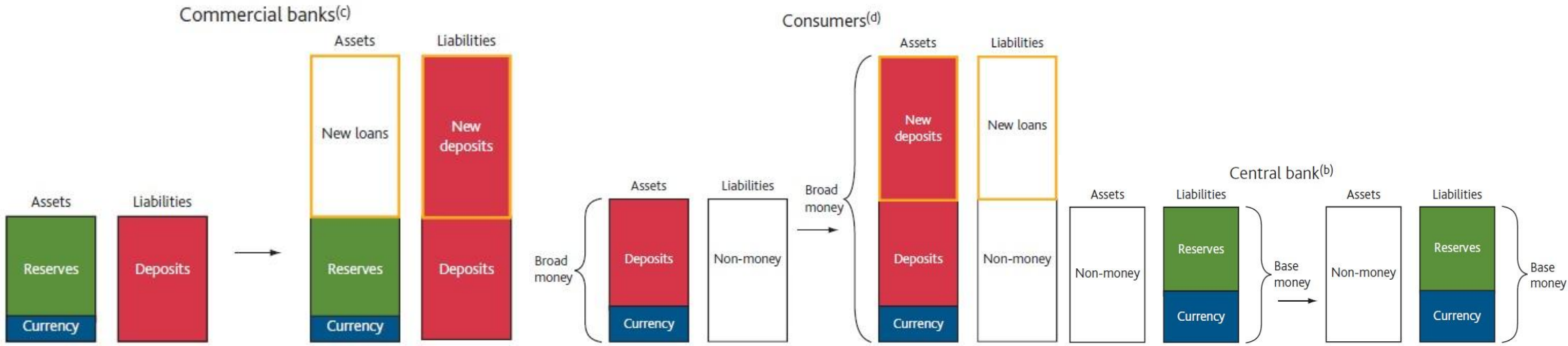
Suppose the following **balance sheets** of commercial banks, consumers and the central bank.



Source: McLeay et al (2014), available at: https://www.bankofengland.co.uk/-/media/boe/files/quarterly-bulletin/2014/money-creation-in-the-modern-economy.pdf

1. Endogenous money and post-Keynesian economics

New lending affects the balance sheets as follows:



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1. Endogenous money and post-Keynesian economics

- At the **individual level**, however, the issue is a bit more complicated.
- Consider this hypothetical balance sheet of a bank:

Assets	Liabilities
Loans: 90 Reserves: 10	Deposits: 100

If the bank decides to **create new loans**, the change on its balance sheet is as follows: →

Assets	Liabilities
Loans: 90 (+50) Reserves: 10	Deposits: 100 (+50)

- What will happen if the borrower of the bank buys goods and services from a depositor of another bank? Even if there are no reserve requirements, the **bank needs to get £40**.

1. Endogenous money and post-Keynesian economics

- These are 3 ways via which the **bank can address** this issue:

1) Loans from other banks

Assets	Liabilities
Loans: 90 (+50)	Deposits: 100 (+50)
Reserves: 10 (+40)	Loans from other banks (+40)

2) Loans from the central bank

Assets	Liabilities
Loans: 90 (+50)	Deposits: 100 (+50)
Reserves: 10 (+40)	Loans from the central bank (+40)

3) Deposits of other banks

Assets	Liabilities
Loans: 90 (+50)	Deposits: 100 (+50+40)
Reserves: 10 (+40)	

- Therefore, even at the individual level, the lending behaviour of banks is **not restricted by reserves**.

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1. Endogenous money and post-Keynesian economics

What drives money creation and the terms of credit?

1. **Demand** for credit (how much firms and households want to borrow)
2. **Supply** of credit which depends on (a) the financial position of borrowers and (b) the financial position of lenders.

- Traditionally, **horizontalists** (e.g. Moore, 1988; Lavoie, 1992) have focused on (1) and 2 (a), while **structuralists** (e.g. Dow, 1996; Palley, 1996) have also concentrated on 2 (b).

- **Interest rates** are affected by 2 (a) and 2 (b), but also by the oligopoly power of banks and the central bank policy.

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2. Endogenous money and shadow banking

- **Shadow banking** captures financial intermediaries that conduct maturity, credit and liquidity transformation without access to central bank liquidity or public sector credit guarantees.
- Shadow banking has given rise to the so-called **'originate-to-distribute' model of banking** in which the default risk on granted loans is disconnected from loan originators.
- The originate-to-distribute model comes in contrast to the traditional **'originate-to-hold' model**.
- An important process conducted by shadow banking is **securitisation**.
- Broadly speaking, securitisation is a technique that **transforms illiquid assets into liquid tradable instruments**.

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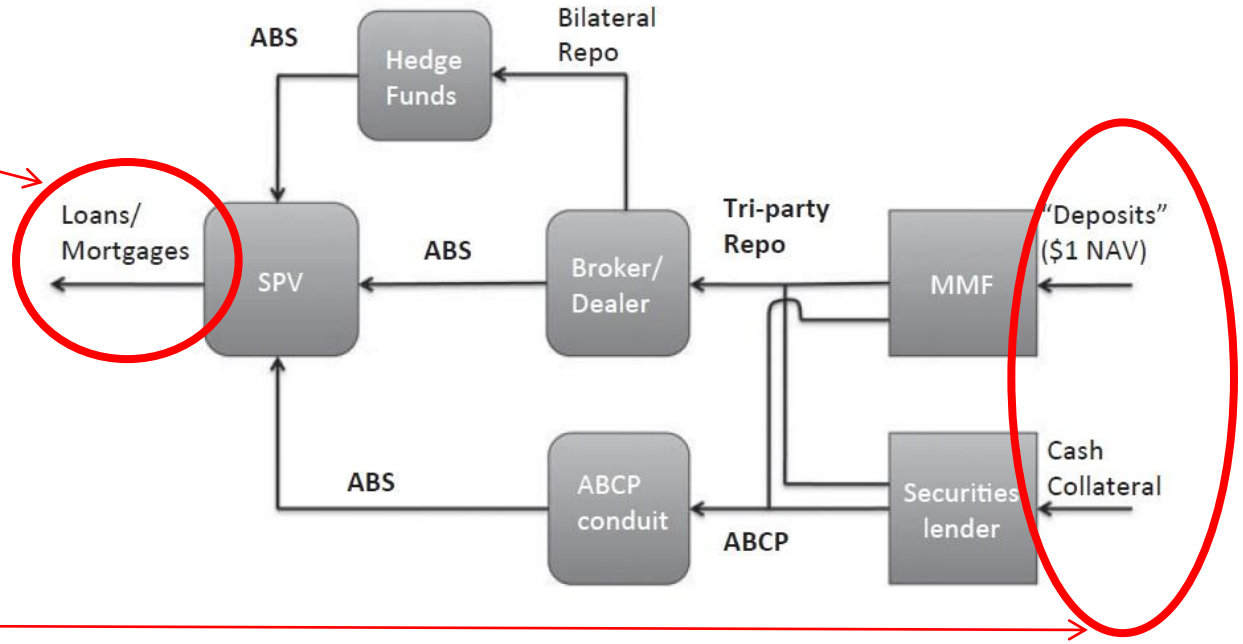
2. Endogenous money and shadow banking

The securitisation process begins when **commercial banks** (the originators) decide to securitise a part of their loans.



The securities are bought by **investors**.

Source: Krishnamurthy et al (2014), available at: https://onlinelibrary.wiley.com/doi/abs/10.1111/jofi.12168
Note: Special Purpose Vehicle (SPV), Asset-Backed Security (ABS), Asset-Backed Commercial Paper (ABCP), Money Market Fund (MMF)

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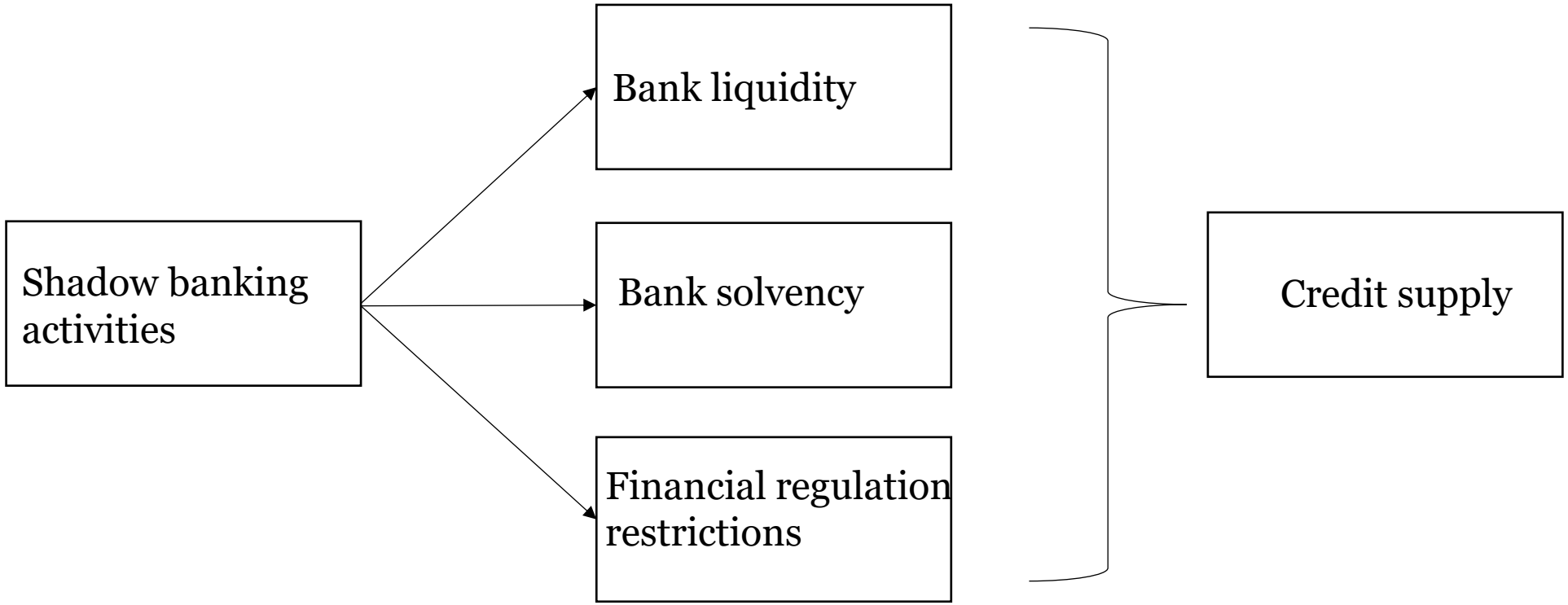
2. Endogenous money and shadow banking

Links between securitisation and repos

Citybank		Goldman Sachs (GS)		IBM		PIMCO hedge fund	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
	IBM deposit −100 GS deposit +100	Deposit +100	Repos +100	Deposit −100 Repos +100			
Securitized loans −100	IBM deposit −100	MBS +100	Repos +100	Deposit −100 Repos +100			
Securitized loans −100 New loan to PIMCO +100	IBM deposit −100 PIMCO deposit +100	MBS +100	Repos +100	Deposit −100 Repos +100		Deposit at City bank +100	Loan from City bank +100

Source: Lavoie (2014), available at:
https://www.elgaronline.com/monobook/book/9781839109621/9781839109621.xml
Note: MBS stands for Mortgage-Backed Security

2. Endogenous money and shadow banking



The role of **shadow banking** in the money creation process has been a subject of debate among heterodox economists (see e.g. Gabor and Vestergaard, 2016; Michell, 2017; Caverzasi et al, 2019; Lavoie, 2019; Bouguelli, 2020; Michell, 2024).

2. Endogenous money and shadow banking

Securitisation and capital requirements

- **Securitisation process** can help banks to avoid capital requirements (Lavoie, 2014).
- This is the case since securitisation allows banks to **remove loans** out of their balance sheet (and receive fee income).
- The removal of these loans reduces the capital adequacy requirements of banks (since a risky asset is removed from their balance sheets). This reduction incentivises **banks to provide new loans**.
- Banks might also provide **more credit** because they need to worry less about the ability of borrowers to repay their debt.

Capital adequacy ratio (CAR)

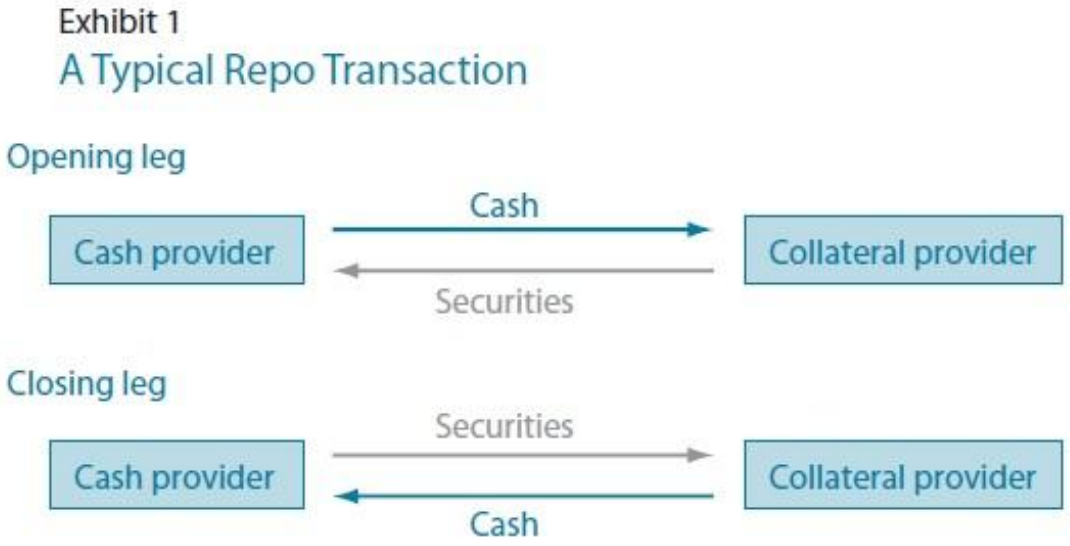
$$CAR = \frac{Capital}{RWA}$$

Note: RWA stands for risk-weighted assets

2. Endogenous money and shadow banking

Repos and liquidity in private markets

- **Repos** are used for getting access to liquidity in the private markets through collateralised lending.
- The **haircut** is the excess of the market value of the securities over the borrowed money (cash), divided by the market value of securities (see figure).
- When the price of collateral increases and the haircut of collateral declines, banks and non-banks can get access to liquidity more easily and this can reinforce financial asset price inflation. This can **increase credit supply**.
- However, the opposite holds when the price of collateral declines and the haircut of collateral increases. Thus, repos are conducive to the **pro-cyclicality of credit**.



Source: Copeland et al (2012), available at: https://www.newyorkfed.org/medialibrary/media/research/epr/2012/1210cope.pdf

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2. Endogenous money and shadow banking

Repos and central bank liquidity

- In the case of central bank lending, central banks typically ask for **collateral** when they lend through their facilities.
- The assets that can serve as **collateral** are determined by central banks based on a number of criteria that reflect credit quality.
- Central banks determine the **haircut** on assets: the higher the haircut of an asset the lower the liquidity that can be obtained using this asset as collateral.
- The Eurosystem collateral framework is conducive to the **pro-cyclicality of credit** since it largely adopts the practices in the private repo markets.
- Vestergaard and Gabor (2022) argue that the Eurosystem collateral policies **should address this procyclicality** by: (i) using countercyclical haircuts, (ii) suspending collateral valuation practices and (iii) conducting outright purchases of collateral assets.

2. Endogenous money and shadow banking

New forms of shadow banking

- **Private (non-bank corporate) credit** is provided through bilateral agreements or small 'club deals' outside the realm of public securities or commercial banks.
- Private credit predominantly involves alternative asset managers **(e.g. private credit funds or business development companies (BDCs)),** who raise capital from institutional investors (e.g. **pension funds and insurance corporations**) using funds and lend directly to predominantly middle-market firms.
- It developed as a **lending solution** for middle-market companies deemed too risky or large for commercial banks and too small for public markets.

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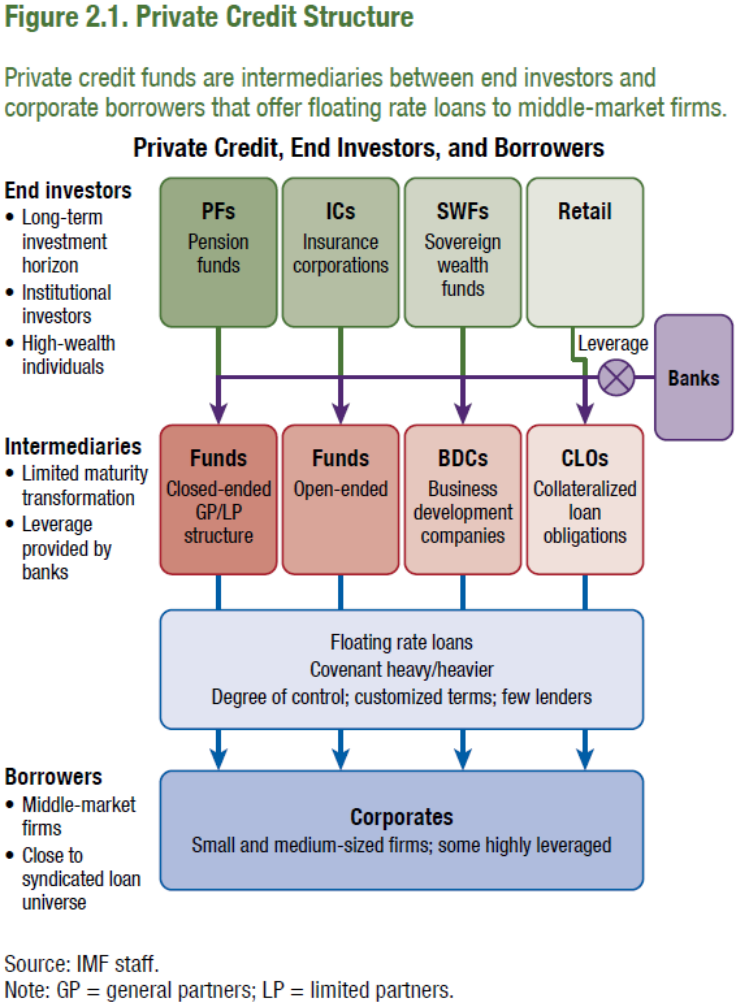
Private credit + Add to myFT

Private credit could 'amplify' next financial crisis, study finds

Industry may become a 'locus of contagion' during market upheaval, report from US officials and bankers says

Private lending to riskier borrowers boomed after post-financial crisis regulations prompted Wall Street to tighten credit standards © Victor Blue/Bloomberg

Source: Financial Times (2025)



Source: IMF (2024)

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3. Modern Money Theory (MMT)

- **Modern Money Theory (MMT)** extends the concept of endogenous money to the government sector.
- According to MMT, a sovereign government is never in danger of running out of money and thus is always **solvent**.
- From an MMT perspective, countries that issue sovereign currency do **not need to rely on taxes** to increase government spending. Fiscal policy should be used to achieve **full employment,** for example, through employer-of-last-resort programmes.
- Although MMT highlights that there are no financial resource constraints, it accepts that there are **real resource constraints** (e.g. labour constraints and environmental constraints).

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3. Modern Money Theory (MMT)

Critiques of MMT:

- Some scholars call into question the claim that **taxes and bonds do not and cannot finance government spending** (e.g. Lavoie, 2013).
- Although the central bank is the issuer of the state money and has the ability to monetise public debt (i.e. a country cannot default in its own currency), effective monetisation is bounded by market constraints and reactions that can for instance affect **long-term interest rates** (e.g. Palley, 2019).
- Budget deficits can have significant adverse **exchange rate** and balance of payments effects (e.g. Palley, 2020).
- It is not easy to have full employment without **inflation** (e.g. Palley, 2020).

3. Modern Money Theory (MMT)

Critiques related to the Global South

- **The degree of policy space does not depend only on** monetary sovereignty (MS). It also relies very much on the position of the country's currency in the **currency hierarchy** (CH). Many countries in the Global South are at the bottom of the currency hierarchy.
- MMT overfocuses on demand deficiency and does not sufficiently consider **supply constraints** and the role of structural change in the Global South (Aboobaker and Ugurlu, 2023).

The currency hierarchy, monetary sovereignty, and policy space: a Post-Keynesian approach

				(Degree of) monetary sovereignty (MS)		
				– → +		
				Non-sovereign currency[a]	*Sovereign currency*	
				Degree of policy space		
				– → +		
Currency hierarchy (CH)	*Key currency*	Degree of policy space	+	n.a.	1 United States	
	Center currencies			3 Eurozone countries	2 e.g. UK, Japan, Canada, Switzerland	
	Peripheral currencies[b]		–	6 Ecuador	5 e.g. Turkey, Peru, etc.	4 e.g. China, Brazil, Mexico, India

Source: Prates (2020)

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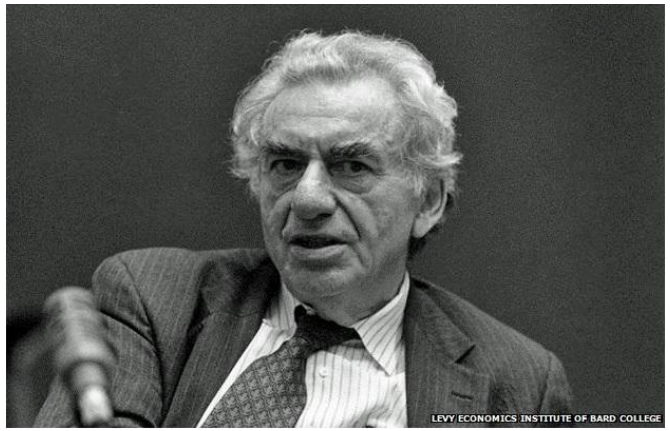
4. Minsky's Financial Instability Hypothesis (FIH)

- The **Financial instability hypothesis (FIH)** was developed in the 1970s and 1980s by Hyman **Minsky**.
- It has been used by various economists to explain the **global financial crisis**.
- Minsky's FIH can be summarised by the phrase '**stability is destabilising**'.
- There are two **reasons** why stability can be destabilising.
- The first one is linked to the way that financial agents form **expectations**. During periods of euphoria both firms and banks might be induced to participate in more debt contracts and increase their **financial fragility**.



Hyman Minsky (1919-1996)

Available at:
http://www.economist.com/blogs/freeexchange/2010/01/the_fed_discovers_hyman_minsky

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4. Minsky's Financial Instability Hypothesis (FIH)

- Minsky captured the increase in indebtedness by making a **distinction** between three finance regimes: (a) hedge (b) speculative and (c) Ponzi.
  i. A **hedge** unit is deemed viable and debt financing is not expected.
  ii. A **speculative** economic unit is expected to take on new debt in order to cover (partially or totally) the amortisation of debt commitments.
  iii. The **Ponzi** finance regime corresponds to the more financially fragile situation.
- The economy is more **financially fragile** the higher is the proportion of speculative and Ponzi firms.
- Financial fragility can lead to **financial instability** which is captured by an increase in defaults, a decline in asset prices and a fall in economic activity.
- The passage from hedge towards Ponzi finance regimes is driven primarily by **euphoric expectations**.

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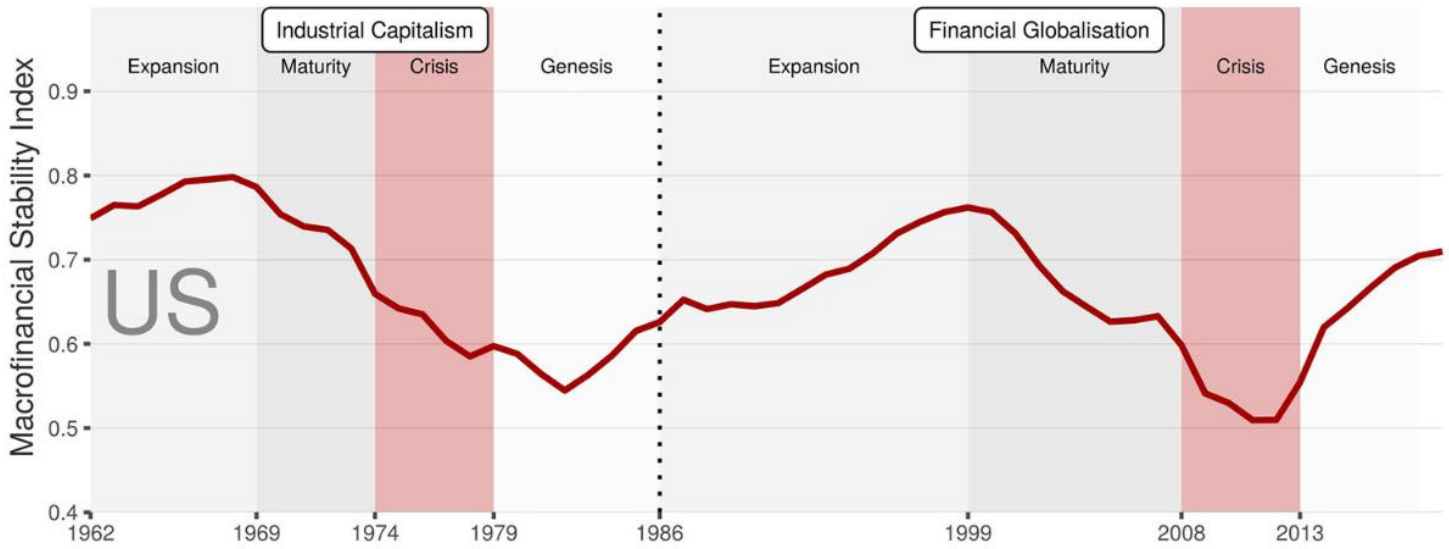
4. Minsky's Financial Instability Hypothesis (FIH)

- The second reason why stability is destabilising is the fact that stability brings about **institutional** and **policy changes** that might make the system more fragile.
- One evolution that Minsky paid particular attention to was the change in institutions that led to the emergence of the so-called **money managers,** who replaced **corporate managers** as the masters of private sector economic activity since the early 1980s.
- Wray (2011) has used the concept of **money manager capitalism (MMC)** to explain the processes that led to the Global Financial Crisis.

4. Minsky's Financial Instability Hypothesis (FIH)

- Minsky used the term **'thwarting mechanisms'** to describe those institutional structures and policies that can stabilise the inherently unstable macrofinancial system.
- Dafermos et al (2023) argue that the endogenous change in the effectiveness of thwarting mechanisms can give rise to **institutional supercycles**.

Macrofinancial Stability Index (MSI) and supercycles, US (1962-2019)



Source: Dafermos, Gabor and Michell (2023), available at: https://www.tandfonline.com/doi/full/10.1080/13563467.2022.2161497

4. Minsky's Financial Instability Hypothesis (FIH)

What are the key features in Minsky's FIH that make it unique compared to conventional approaches to financial crises?

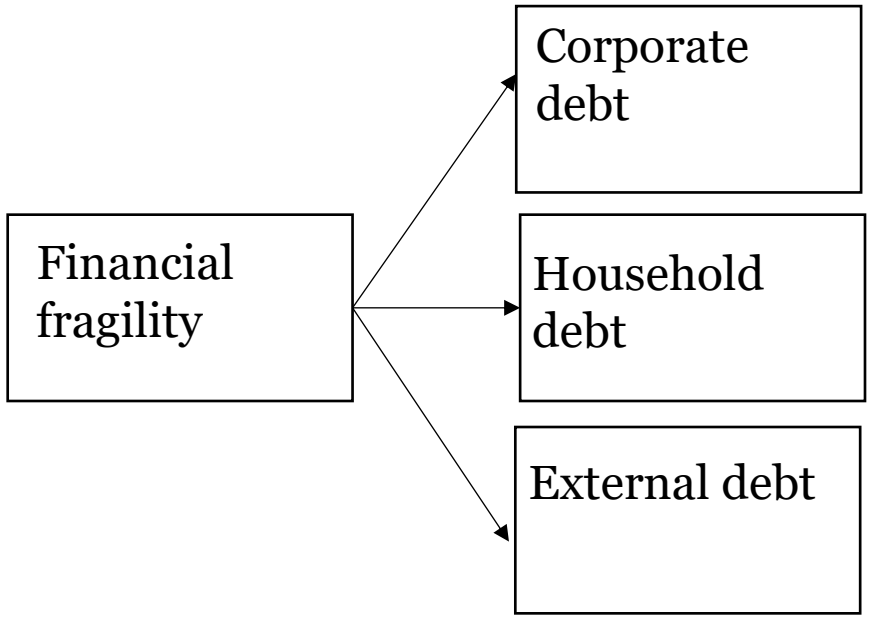
- First, Minsky views the financial system as a network of **interconnected balance sheets** that interact dynamically (Gabor, 2020). Financial instability is the result of the endogenous interaction of balance sheets.
- Second, in Minsky's FIH **money is endogenous**.
- Third, Minsky's understanding of financial instability takes explicitly into account **evolutionary** changes that affect the stabilising role of institutions (see Wray, 2011; Argitis, 2019; Dafermos et al., 2023).

5. Modelling Minsky's FIH

How can economies become financially fragile?

- **Financial fragility** is connected with the accumulation of debt.
- The Minskyan literature has focused in **three types of debt**: i) corporate debt, ii) household debt and iii) external debt
- The aim is to explain what can drive the rise in each of these types of debt and how debt accumulation can lead to **instability**.

Different shades of financial fragility

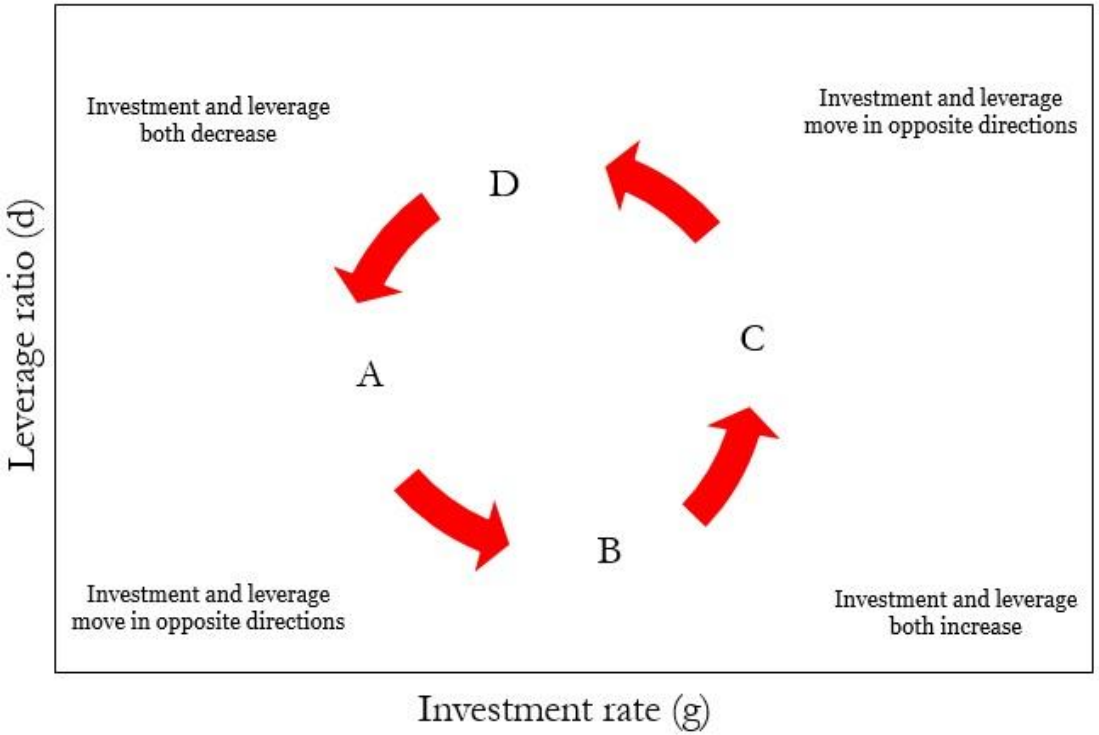


Source: Nikolaidi (2017, 2021); see also Nikolaidi and Stockhammer (2017)

5. Modelling Minsky's FIH

Corporate debt

- Most Minskyan macroeconomic models have analysed the **fragility** that stems from corporate debt using this setting as a starting point (see e.g. Lima and Meirelles, 2007, Charles, 2008):
  i. Firms undertake investment, driven primarily by expected sales and profitability.
  ii. The part of investment spending that is not covered by retained profits is **financed through loans**.
- There might be a dynamic interaction between leverage ratio and investment that can give rise to instability and real-financial **cycles** (see the figure).



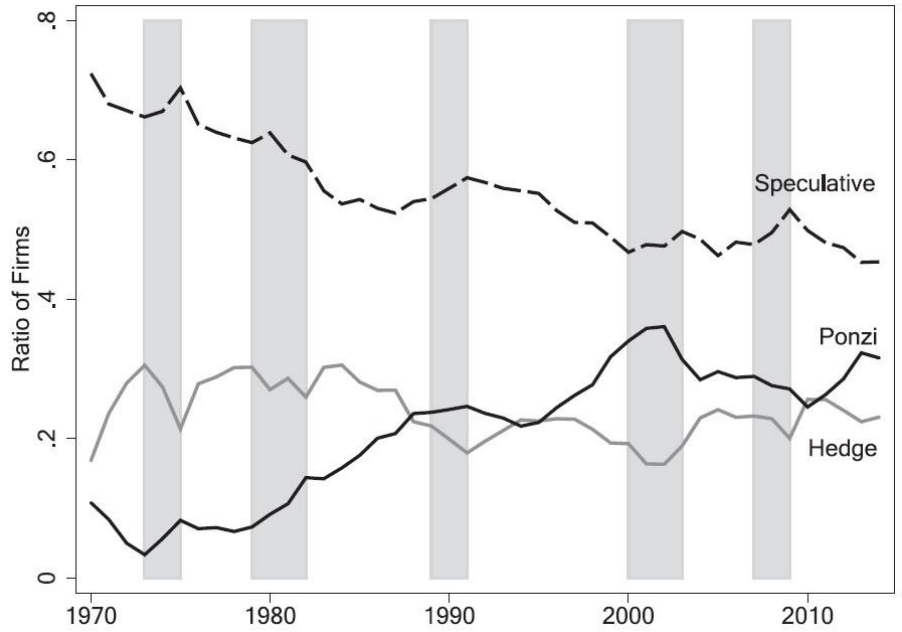
5. Modelling Minsky's FIH

Corporate debt

Empirical question: is the leverage ratio of firms pro-cyclical?

- Wolfson (1990) showed that ahead of the US stock market crash in 1987 there was an **increase** in the corporate net interest payments to gross capital income.
- However, Lavoie and Secarrecia (2001) **did not find** supportive evidence for an increasing leverage ratio for the G-7 countries over the period 1971-97.
- Davis et al (2019) show that there was a secular growth in the share of Ponzi firms in the US non-financial corporate sector, from 10.8% in 1970 to 31.6% in 2014. However, the share of **Ponzi firms did not increase** during all periods of economic expansion.

Incidence of hedge, speculative and Ponzi financing regimes.
Full sample of firms; 1970-2014.

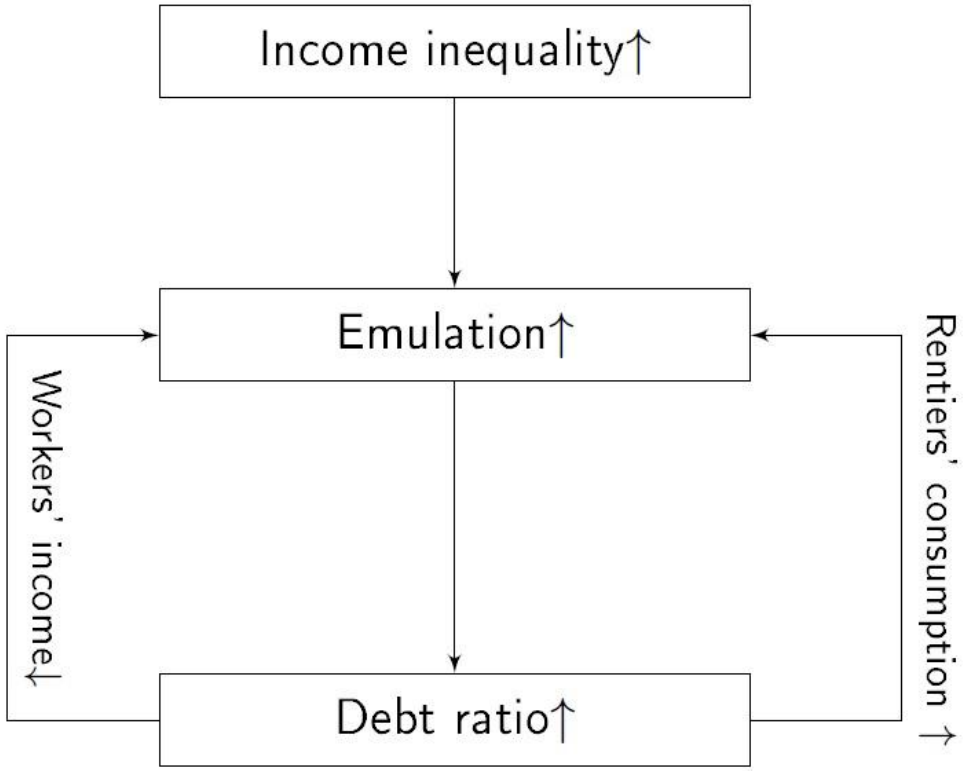


Source: Davis et al (2019)

5. Modelling Minsky's FIH

Household debt

- **Minsky** did not analyse household debt in his FIH. However, household debt has been the focus of many Minskyan models.
- There are Minskyan models that analyse the way through which household debt interacts with **income distribution** (see Palley, 1994; Kapeller and Schütz, 2014; Ryoo and Kim, 2014; Giraud and Grasselli, 2021).
- These models are in line with some **empirical evidence**. For example, Cynamon and Fazzari (2008, 2016) and Barba and Pivetti (2009) argue that increasing income inequality contributed to the rise in the indebtedness of the US household sector (see Palley, 1994 and Kim, 2013, 2016).



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5. Modelling Minsky's FIH

External debt

- External debt, and especially **foreign currency denominated debt**, can be a significant source of financial fragility in an open economy framework.
- Kohler (2019) has developed a Minskyan model that shows how endogenous cycles can arise in emerging market economies (EMEs) through the interaction between **flexible exchange rate** dynamics and balance sheet effects.
- However, endogenous cycles à la Minsky can arise in an open economy framework even in the case in which the **exchange rate is not flexible** (see Foley, 2003).
- Dafermos (2018) has shown how endogenous cycles can emerge as a result of endogenous changes in the **target debt ratio** of the domestic private sector. These changes in the target debt ratio are driven by the expectations of both the foreign lenders and the domestic borrowers.

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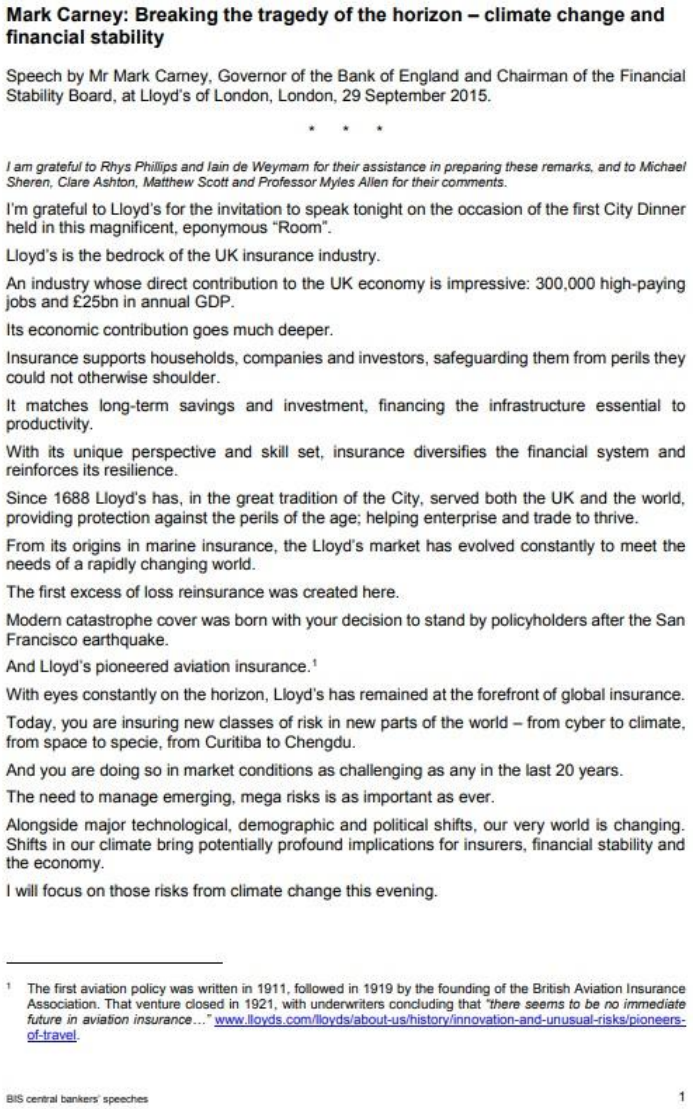
5. Modelling Minsky's FIH

- Over the past few years, central banks and financial supervisors have paid attention to the **risks** that **climate change** poses to the financial system.
- Mark Carney (the former Governor of the Bank of England) was the first one who talked about the possibility of experiencing a **climate Minsky moment**, which broadly refers to the financial instability that could result from climate change or from actions taken to tackle climate change (Carney, 2015).
- There are some **ecological stock-flow consistent (E-SFC) models** that have analysed some aspects of a climate Minsky moment (e.g. Dafermos and Nikolaidi, 2019, 2021, 2022).



Mark Carney: Breaking the tragedy of the horizon – climate change and financial stability

Speech by Mr Mark Carney, Governor of the Bank of England and Chairman of the Financial Stability Board, at Lloyd's of London, London, 29 September 2015.

* * *

I am grateful to Rhys Phillips and Iain de Weymarn for their assistance in preparing these remarks, and to Michael Sheren, Clare Ashton, Matthew Scott and Professor Myles Allen for their comments.

I'm grateful to Lloyd's for the invitation to speak tonight on the occasion of the first City Dinner held in this magnificent, eponymous "Room".

Lloyd's is the bedrock of the UK insurance industry.

An industry whose direct contribution to the UK economy is impressive: 300,000 high-paying jobs and £25bn in annual GDP.

Its economic contribution goes much deeper.

Insurance supports households, companies and investors, safeguarding them from perils they could not otherwise shoulder.

It matches long-term savings and investment, financing the infrastructure essential to productivity.

With its unique perspective and skill set, insurance diversifies the financial system and reinforces its resilience.

Since 1688 Lloyd's has, in the great tradition of the City, served both the UK and the world, providing protection against the perils of the age; helping enterprise and trade to thrive.

From its origins in marine insurance, the Lloyd's market has evolved constantly to meet the needs of a rapidly changing world.

The first excess of loss reinsurance was created here.

Modern catastrophe cover was born with your decision to stand by policyholders after the San Francisco earthquake.

And Lloyd's pioneered aviation insurance.[1]

With eyes constantly on the horizon, Lloyd's has remained at the forefront of global insurance.

Today, you are insuring new classes of risk in new parts of the world – from cyber to climate, from space to specie, from Curitiba to Chengdu.

And you are doing so in market conditions as challenging as any in the last 20 years.

The need to manage emerging, mega risks is as important as ever.

Alongside major technological, demographic and political shifts, our very world is changing. Shifts in our climate bring potentially profound implications for insurers, financial stability and the economy.

I will focus on those risks from climate change this evening.

[1] The first aviation policy was written in 1911, followed in 1919 by the founding of the British Aviation Insurance Association. That venture closed in 1921, with underwriters concluding that *"there seems to be no immediate future in aviation insurance…"* www.lloyds.com/lloyds/about-us/history/innovation-and-unusual-risks/pioneers-of-travel.

BIS central bankers' speeches 1

Source: Carney (2015), available at: https://www.bis.org/review/r151009a.pdf

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Core readings

- McLeay, M., Radia, A. and Thomas, R. (2014). Money creation in the modern economy, Bank of England Quarterly Bulletin, 54 (1), 14-27.
- Nikolaidi, M. (2021). Minsky's financial instability hypothesis, pp. 22-44, in d'Apice, V., Ferri, G. (eds.) A Modern Guide to Financial Shocks, Edward Elgar [Manuscript available here].
- Prates, D. (2020). Beyond modern money theory: a Post-Keynesian approach to the currency hierarchy, monetary sovereignty, and policy space, Review of Keynesian Economics, 8 (4), pp. 494-511.

Additional readings

- Dafermos, Y., Gabor, D. and Michell, J. (2023). Institutional supercycles: An evolutionary macro-finance approach, New Political Economy, 28 (5), pp. 693-712.
- Nikolaidi, M. and Stockhammer, E. (2017). Minsky models: A structured survey, PKSG Working Paper No. 1706.
- Lavoie, M. (2022). MMT, sovereign currencies and the Eurozone, Review of Political Economy, 34 (4), pp. 633-646.
- Michell, J. (2024). Theorising non-bank financial intermediation, Review of Keynesian Economics, 12 (2), pp. 181-196.
- Palley, T. (2020). What's wrong with Modern Money Theory: Macro and political economic restraints on deficit-financed fiscal policy, Review of Keynesian Economics, 8 (4), pp. 472-493.
- Vestergaard, J. and Gabor, D. (2022). Should central bank liquidity be a vehicle for fiscal disciplining?, *Cambridge Journal of Economics*, 46, 491-509.
- Wray, R. and Tymoigne, E. (2008). Macroeconomics meets Hyman P. Minsky: The financial theory of investment, The Levy Economics Institute Working Paper No. 543.

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