

Bank of England

Lender of Last Resort in times of digital finance and AI – Bagehot revisited

Yale Program on Financial Stability Conference

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Key questions

- What if anything has changed already since Bagehot?
 - Phase I, Pre-GFC
 - Phase II, GFC
 - Phase III, post GFC
 - What could change in a digitalised world?
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Why Bagehot's prescription mattered in his time

Bagehot's famous prescription was to lend freely against good collateral at a penal rate, so as to prevent the dysfunction of the commercial bill market, which was central to trade

Principle	Purpose	Why it mattered
Lend freely	Elastic provision of liquidity	Ensure sufficient liquidity was provided such that one bank's inability to pay did not create a cascade in the commercial bill market
Against good collateral	Protect the central bank	Limit solvency and credit risk to the public balance sheet
At a penalty rate	Preserve market discipline	Discourage routine reliance on official liquidity and reduce moral hazard so that only institutions with a genuine liquidity need would borrow from the Bank

Phase I (pre-GFC): Bagehot's principles broadly continued to be applied in practice, but also a belief on the power of market discipline emerged

- The key concern remained that stress at particular institutions could propagate through similar types of intermediaries or to core markets, eg:
 - Lifeboat in 1973-75 addressed common strains among a group of intermediaries
 - Intervention in Johnson Matthey Bankers in 1984 reflected concern about the disruption that the failure of an important participant could cause in the London gold market
- These all involved intervening via an individual financial institution
- Prior to the GFC, an influential view was that providing central banks supplied sufficient aggregate reserves, the interbank market could do the rest and central banks did not necessarily need to intervene to preserve credit intermediation – a clear market failure needed to be established (eg Goodfriend and King, 1988).

Phase II: GFC showcased clear market failures, central banks had to innovate

Banks hoarded liquidity, interbank and wholesale funding markets froze and the BoE expanded both the scale and scope of support Bank of England facilities introduced between 2007 and 2009

Facility	Introduced	Purpose
Extended collateral long-term repo operations	Autumn 2007	Provided longer-term liquidity against a wider range of collateral as money markets became stressed.
Special Liquidity Scheme (SLS)	April 2008	Allowed banks to swap illiquid mortgage-backed and other securities for Treasury Bills.
Discount Window Facility (DWF)	October 2008	A standing bilateral liquidity insurance facility allowing firms to borrow highly liquid assets against a wide range of collateral.
Asset Purchase Facility (APF)	January 2009	Vehicle through which the Bank could purchase private-sector assets and, later, government bonds. Created to improve credit conditions and market functioning and subsequently became the operational vehicle for QE.
Corporate Bond Purchase Scheme (within APF)	2009	Purchases of investment-grade corporate bonds to improve conditions in corporate credit markets and reduce borrowing costs for companies.
Commercial Paper Facility (CPF)	2009	Purchases of high-quality commercial paper to support short-term funding markets for non-financial companies when private issuance markets became impaired.
Credit Guarantee Scheme Purchases	2009	Secondary-market purchases of bank debt issued under the Government's Credit Guarantee Scheme, aimed at supporting bank funding markets.

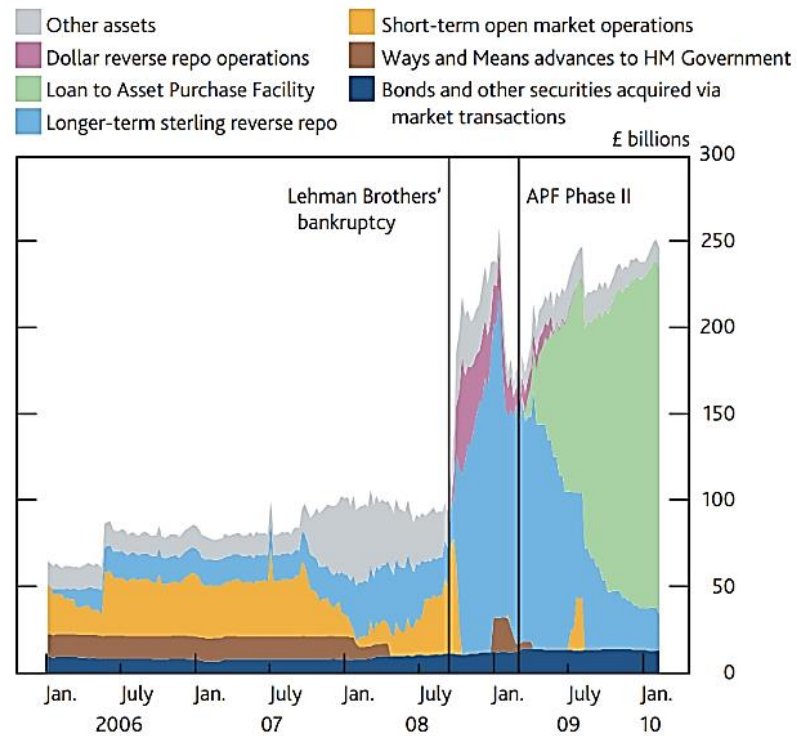
Market-wide to banks

Traditional bilateral

Market-wide

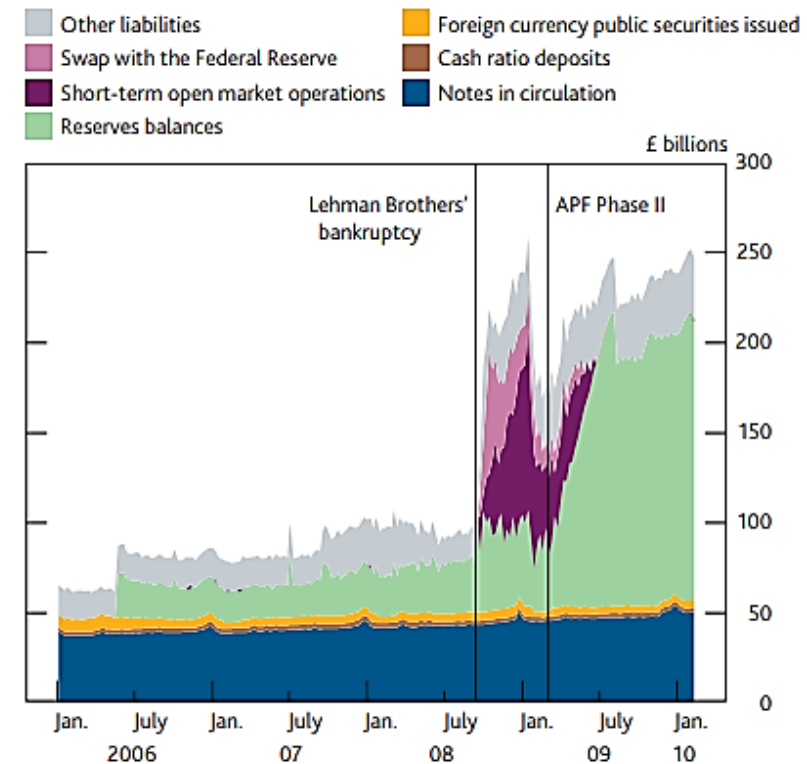
Phase II: The composition and size of the balance sheet changed

Bank of England balance sheet assets 2006-2010



(a) Excludes loans and associated deposits in course of settlement.

Bank of England balance sheet liabilities 2006-2010



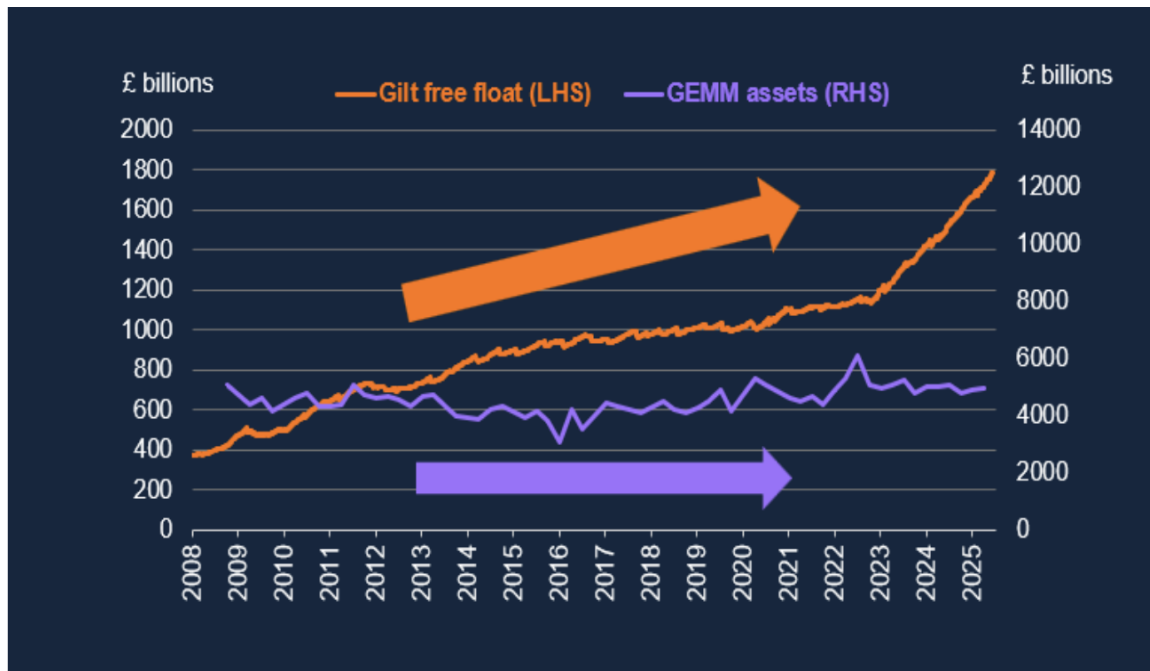
(a) Excludes loans and associated deposits in course of settlement.

Lessons from the GFC for LOLR

- Source of the problem: excessive leverage => market could not distinguish between good and bad assets, wholesale funding markets froze even against good collateral, liquid banks hoarded liquidity, interbank market malfunctioned
 - Bank of England stepped in to fix malfunction in funding markets, by lending to banks in market-wide operations against much broader collateral, initially in a sterilised or off-balance sheet way (until APF in January 2009, which subsequently became vehicle for QE)
 - But BoE also intervened directly to buy assets, such as corporate bonds and commercial paper, to improve credit conditions essentially trying to improve financing conditions for businesses directly
 - Bank stepped in to fix market dysfunction by becoming Dealer of Last Resort
 - Purpose was to improve funding intermediation and market liquidity in order to prevent sharp changes in credit provision to businesses and households
 - Ultimately, same purpose as Bagehot, ensuring market that financed the economy worked but delivered through market-wide facilities
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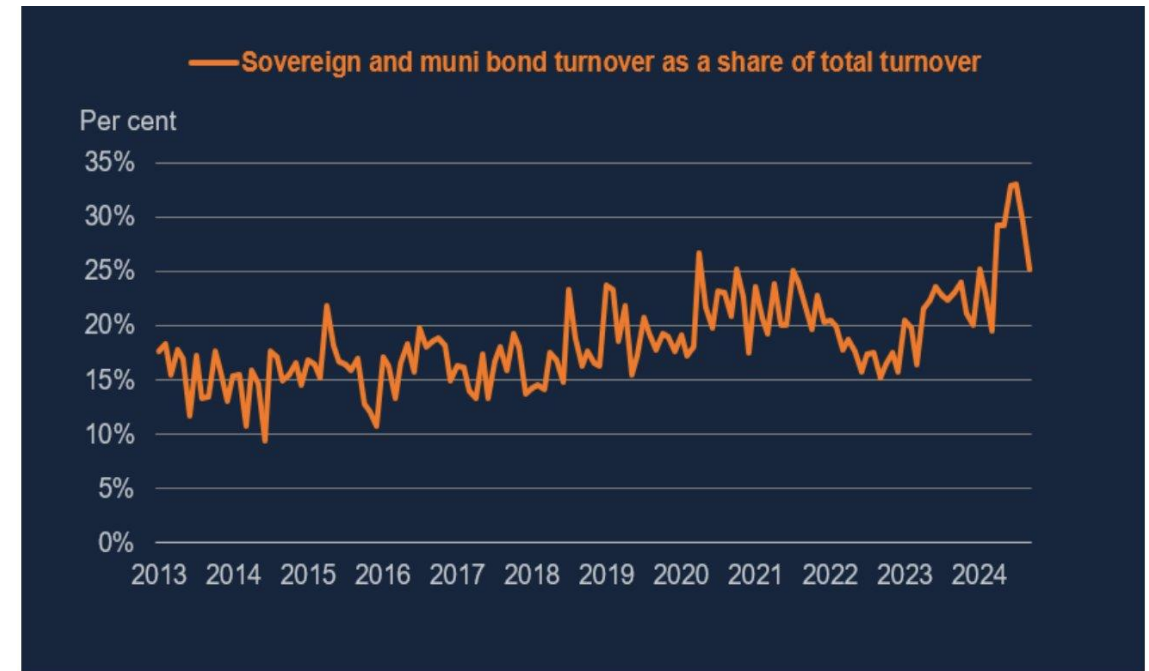
Phase III: Post-GFC sovereign debt has increased more than bank intermediation capacity, with non-banks playing a bigger role in core markets

Total amount of government debt held privately and estimated dealer banks' balance sheets



Source: Bloomberg Finance L.P., PRA regulatory returns and Bank calculations(a) Gilt-edged market makers' total assets are based on quarterly averages available from 2008 at market value. It excludes assets of banking entities that are authorised to operate in the UK through branches. Government debt outstanding is calculated at face value.

SEC regulated hedge fund sovereign and muni debt turnover as a share of total



Source: Securities and Exchange Commission (SEC) Private Funds Statistics, and Bank calculations

The LDI crisis in 2022 illustrated this

- In Autumn 2022, falling long-dated gilt prices generated collateral calls for LDI funds by banks that had limited intermediation capacity in stress. Funds sought to raise cash through asset sales, placing further pressure on prices and creating the risk of a self-reinforcing spiral
 - Traditional LOLR lending was unlikely to be effective not only because LDIs are not banks but because they needed to deleverage, not simply bridge a temporary funding gap
 - The Bank undertook temporary and targeted purchases in the segment of the gilt market where dysfunction was most acute. Purchases stemmed the price spiral and gave LDI funds time to sell assets, raise capital and reduce leverage in a more orderly way
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The dash for cash was a broader shock

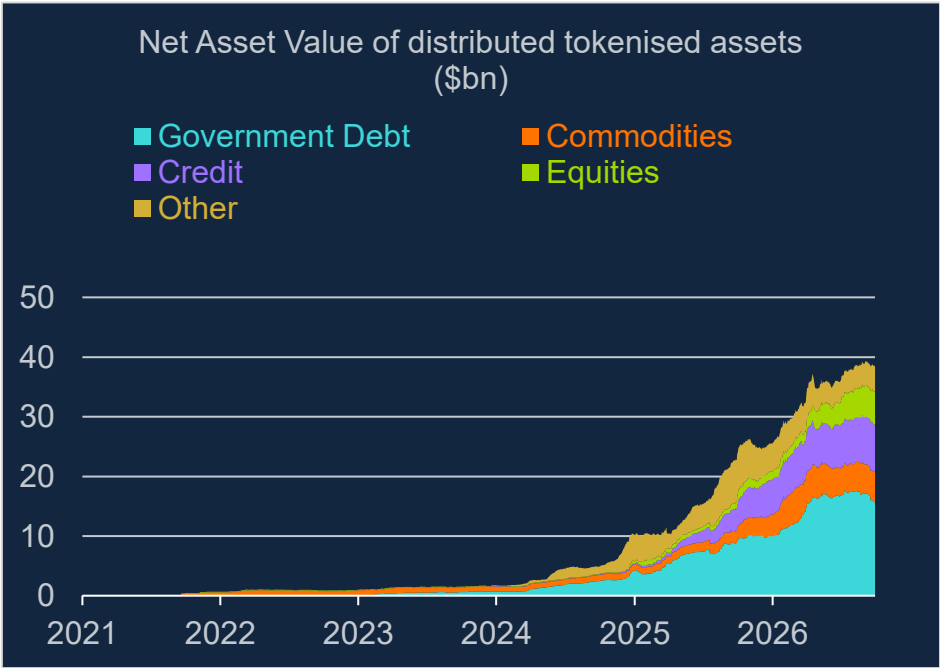
- In March 2020, the Covid-19 pandemic triggered a global dash for liquidity with similar but much broader market functioning concerns to the LDI crisis
 - But there was also a severe macroeconomic shock
 - Given interest rates were at the EZB, asset purchases were required not just for restoring market functioning but also to provide additional monetary stimulus, a bit like in January 2009 at the GFC although the source of the problem did not lie in the financial system
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Lessons from all the phases

- In all phases, the central bank balance sheet had to expand elastically – Bagehot's first principle applies
 - Sometimes, to offer lending to individual institutions, sometimes to the system, but always to relax intermediation constraints to ensure core markets function (GFC, covid) and/or institutional distress does not cascade (pre-GFC, and GFC)
 - The penalty rate concept has evolved. In Bagehot's time, there was no regulation so it was the only way to preserve discipline. Some GFC interventions were aimed at restoring credit market functioning so pricing was targeted to the problem
 - Intermediation constraints have also led the central bank to act not only as a lender, but also as a dealer (asset purchaser/seller) – backstop pricing remains important alongside other tools such as ensuring interventions are “temporary and targeted” to protect against moral hazard
 - However, where possible, collateralised lending operations are preferable as a first port of call – fewer moral hazard risks and lower risks to public funds
 - In all relevant cases the ability to take, value and haircut collateral is central, both for preserving incentives, but also for reducing risk to the central bank
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How does digitalisation and innovation change all of this?

	Traditional Markets	Digitalised Markets	Implications for LOLR
Market Hours	Liquidity stress emerges during defined operating windows.	24/7 markets. Tokenised markets and settlement assets operate continuously.	Timing: Liquidity needs may emerge at any time.
Settlement	Settlement takes hours or days. Friction from intermediaries and messaging systems.	Near-instant settlement. Collateral and liquidity move in real time.	Speed: Liquidity support may need to be delivered faster.
Infrastructure	Concentrated liquidity, collateral pools and settlement assets.	Multiple platforms and settlement assets. Stablecoins, tokenised deposits and tokenised assets.	Complexity: Intervention and oversight become more challenging.



Source: RWA.xyz and Bank calculations

Innovation changes the timing, speed and complexity of liquidity intervention – meaning LOLR must be ready to operate in a faster, “always on” and more fragmented financial system – operational readiness becomes key

