

# The Global Financial Crisis: Causes and Cures

International Consulting Economists' Association  
The Institute of Commonwealth Studies, London  
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## **A couple of notes:**

Presentation updated and clarified after the ICEA meeting so that non-attendees can follow the reasoning without the help of a presenter.

To lighten the load, some cartoons were inserted for the sake of the original meeting. I was encouraged to keep them in even as this went online. If you own one of these and would like them to be removed, please do say and I will happily oblige.

# Pre-crisis analysis that raised concerns about the risks

- Part One: 'UK House Prices: A Critical Assessment', 2004
- Part Two: 'Bubbles and Buyers', 2004
- Part Three: 'UK House Prices, Consumption and GDP in a Global Context', 2005
- Part Four: Risk Premia in Housing Markets
- Part Five: Global Banking Liquidity, Mortgage Markets and Housing
  
- The first three available at:  
[www.economics.ox.ac.uk/members/andrew.farlow](http://www.economics.ox.ac.uk/members/andrew.farlow)
- Book about the financial and economic crisis forthcoming with OUP late 2010

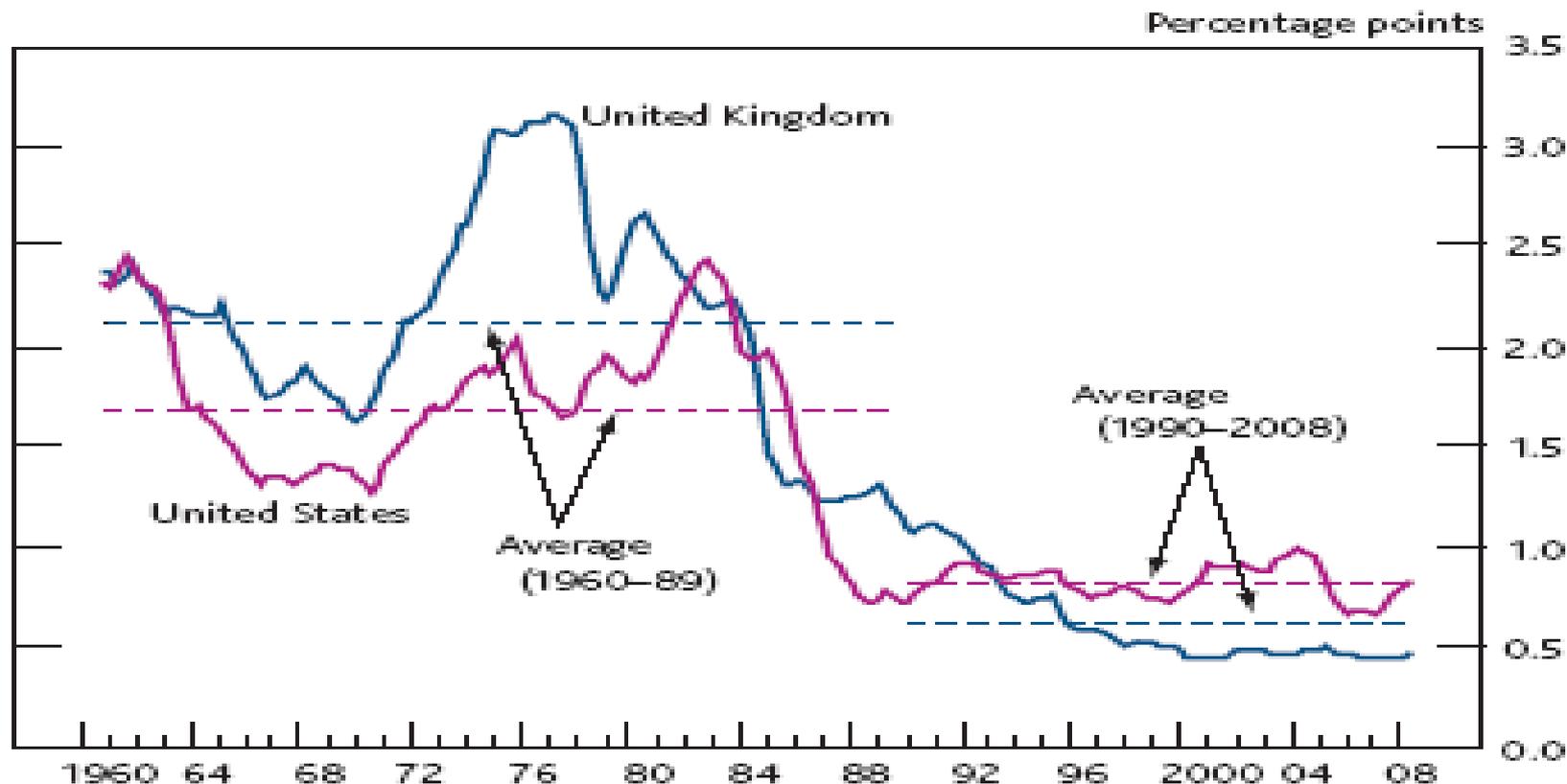
## Before the crisis: Build-up of imbalances

- “The turmoil is best seen as the natural result of a prolonged period of generalized and aggressive risk-taking, which happened to have the subprime market at its epicenter. In other words, it represents the archetypical example of financial instability with potential serious macroeconomic consequences that follows the build-up of financial imbalances in good times...overstretched balance sheets...masked by the veneer of buoyant asset prices and strong economic growth.”
- Claudio Borio, BIS Working Paper 251, March 2008

# The quiet before the storm

- The 'Great Moderation'
- World economy posted record growth rates in 2004, 2005 and 2006
- Inflation remarkably quiescent
- “Based on consensus forecasts, as recently as in June 2007 the future looked as bright as the past.” BIS Working Papers No 251

# Volatility of global GDP growth<sup>(a)</sup>

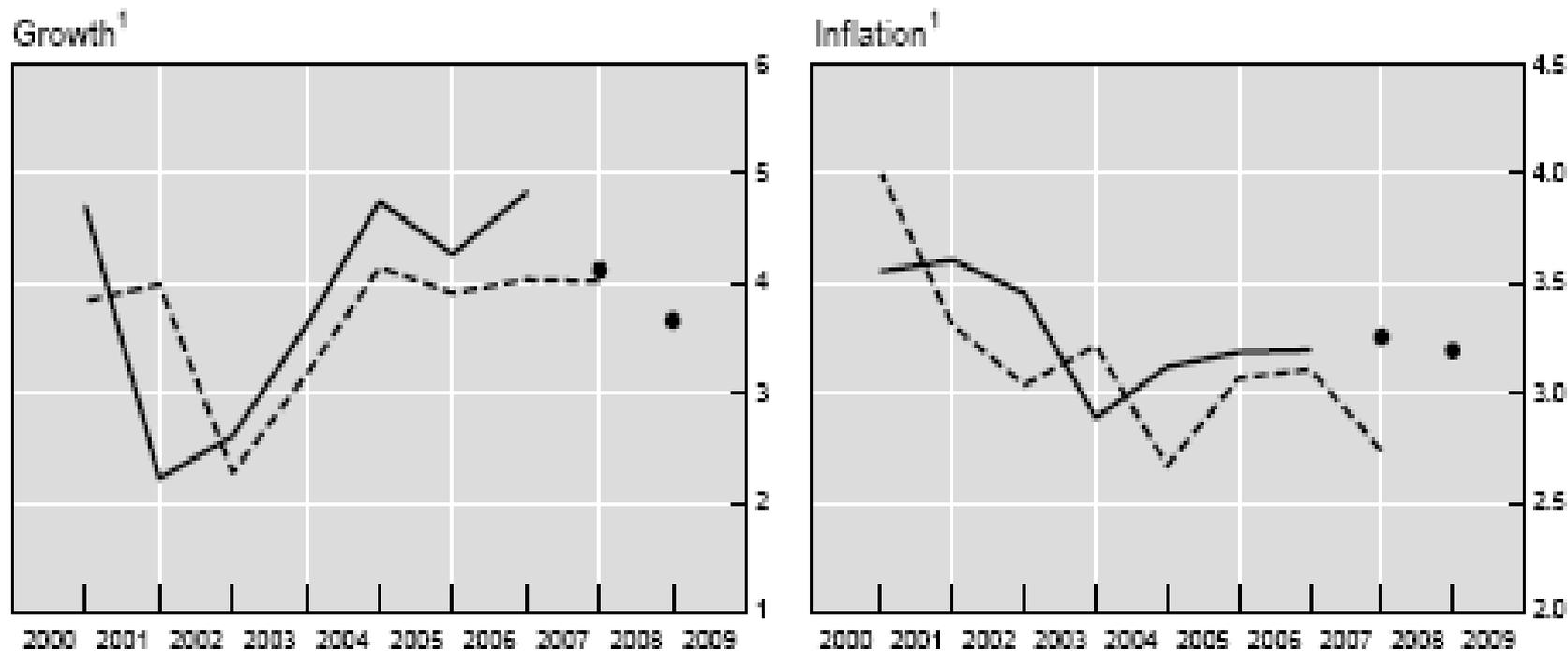


Sources: ONS, Thomson Datastream and Bank calculations.

(a) Five-year rolling average of annualised volatility of quarter-on-quarter growth rate. 2008 data are to Q2.

# Supposedly rosy outlook before the storm

## Remarkable macroeconomic performance



<sup>1</sup> In per cent. The dashed lines show the consensus forecasts made at the end of the preceding year; the dots show forecasts for 2007 and 2008 as of December 2007. Annual changes in real GDP and consumer prices. Average of countries available in Consensus Economics.

Sources: © Consensus Economics; national data; BIS calculations.

# Supposedly rosy outlook before the storm

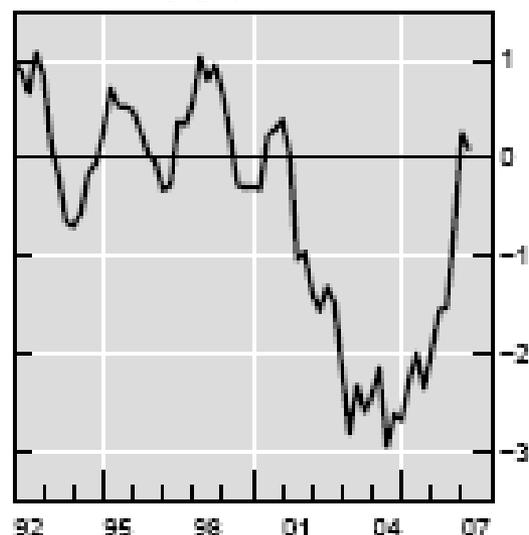
- Interest rates low
- Financial market liquidity rose steadily
  - Apparent reductions in macroeconomic uncertainty + strong competitive pressures to maintain returns → investors and financial firms took on ever greater risk
  - Asset prices bid up
- Credit and monetary aggregates expanding rapidly
- High commodity prices
- Some measures of ‘risk’ not flagging that markets were worrying
  - Spreads
  - Implied volatilities, etc.
- Capital position of financial institutions high by historical standards and profitability at record levels

## But risk was building up

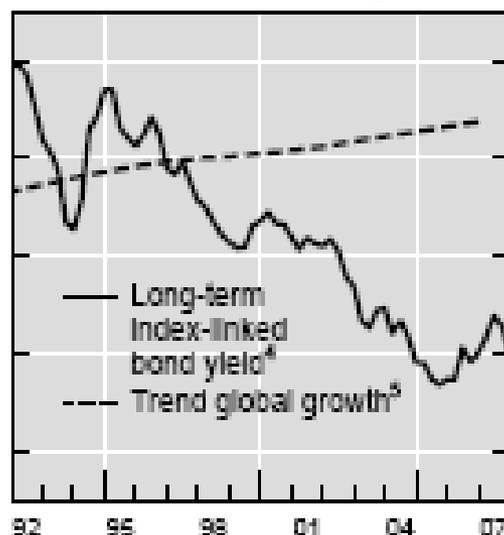
- Opacity of new instruments
- Exposure distributed across the system and maybe hard to see
- Risk perceptions
  - Hard to measure time dimension of risk
  - Especially how risk for whole system evolves
- Market indicators of risk (such as implied risk premia in housing markets) comparatively low just before peak, but in fact risk very high:
  - “History has not dealt kindly with the aftermath of protracted periods of low risk premiums.” (Greenspan 2005)
- Economy goes strength to strength seemingly validating high asset prices and low risk premia

# Low interest rates, credit and monetary aggregates expanding rapidly

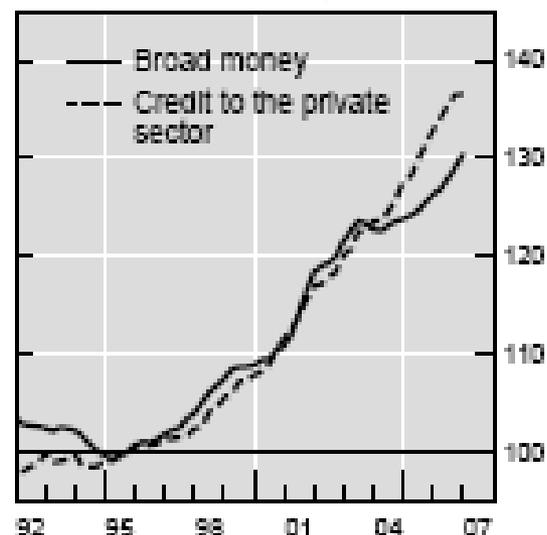
Real policy gap<sup>1,2</sup>



Interest rate and trend growth<sup>3</sup>



Measures of liquidity<sup>1,6</sup>

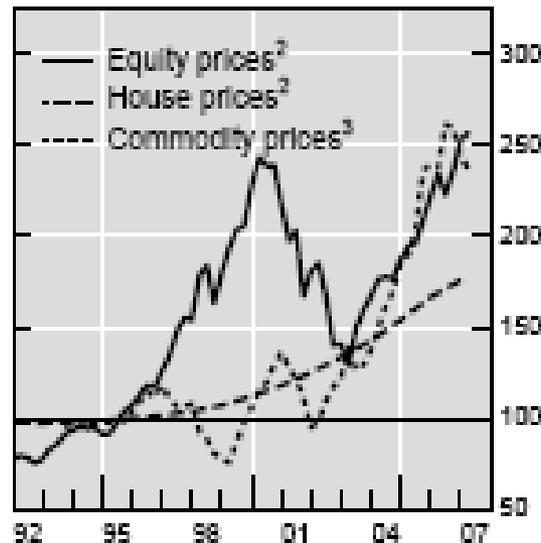


<sup>1</sup> Sixteen OECD countries; weighted averages based on 2000 GDP and PPP exchange rates. <sup>2</sup> Real policy rate minus natural rate. The real rate is the nominal rate adjusted for four-quarter consumer price inflation. The natural rate is defined as the average real rate 1985–2000 (for Japan, 1985–95; for Switzerland 2000–05) plus the four-quarter growth in potential output less its long-term average. <sup>3</sup> In per cent. <sup>4</sup> From 1998; simple average of Australia, France, the United Kingdom and the United States; otherwise only Australia and the United Kingdom. <sup>5</sup> Trend world real GDP growth as estimated by the IMF. <sup>6</sup> Relative to nominal GDP; 1995 = 100.

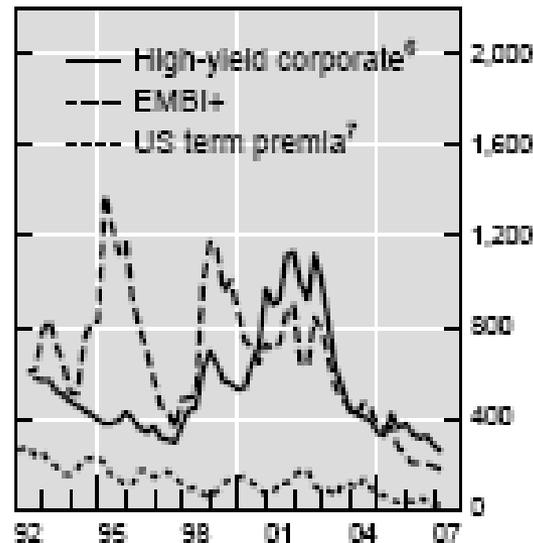
Sources: IMF; OECD; Bloomberg; national data; BIS calculations and estimates.

# Booming asset prices

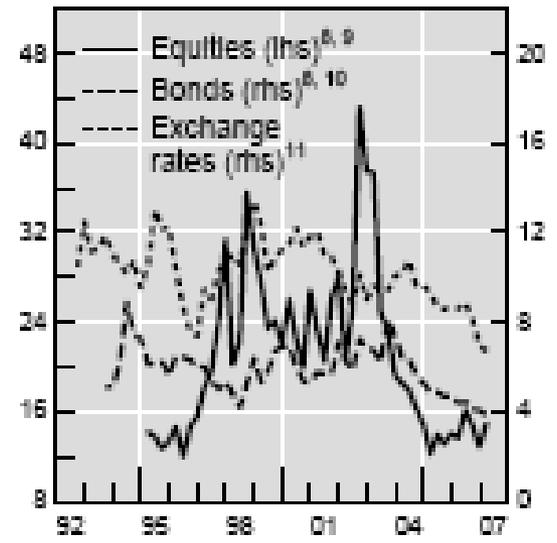
Asset and commodity prices<sup>1</sup>



Bond spreads<sup>4,5</sup>



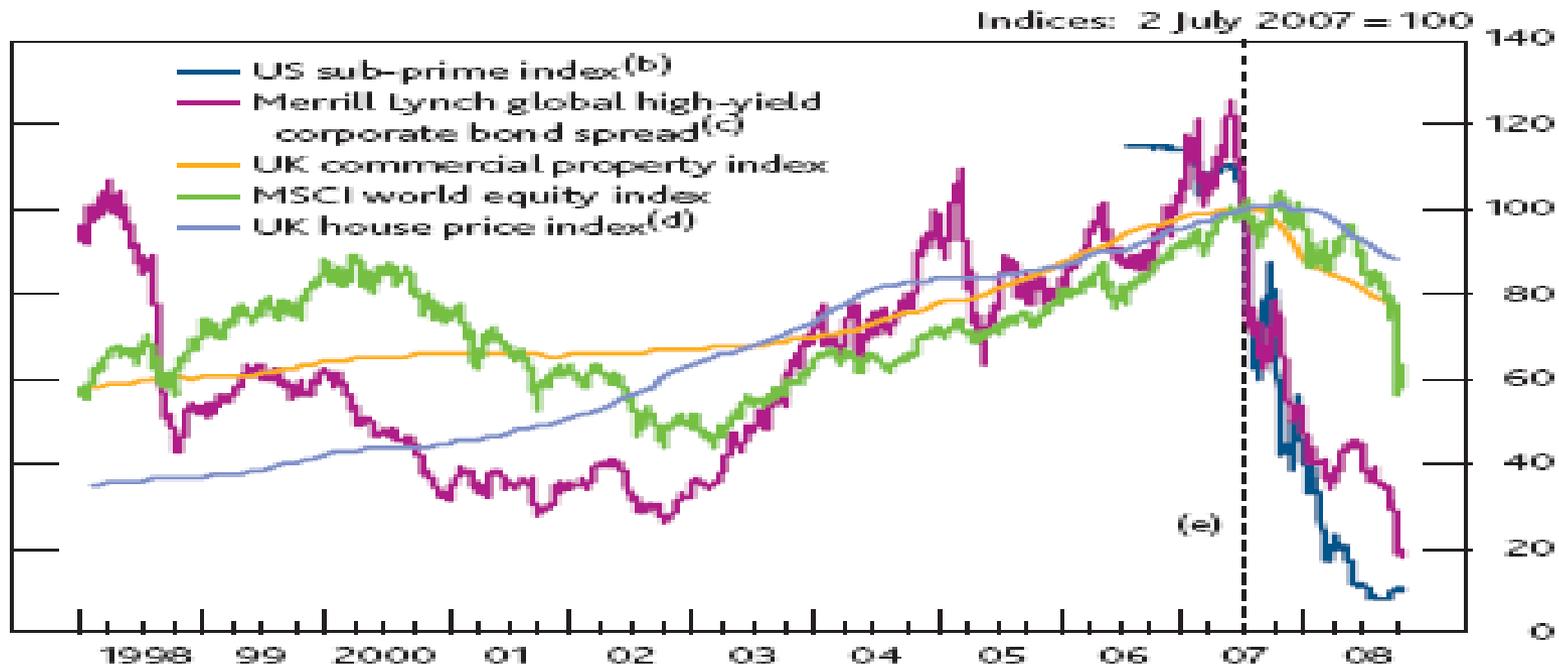
Implied volatilities<sup>4</sup>



<sup>1</sup> 1995 = 100. <sup>2</sup> Sixteen OECD countries; weighted averages based on 2000 GDP and PPP exchange rates. <sup>3</sup> Goldman Sachs Commodity Index, in US dollar terms, deflated by US CPI; quarterly averages. <sup>4</sup> Quarterly averages. <sup>5</sup> In basis points. <sup>6</sup> As from December 1997, simple average of United States and euro area high-yield indices, otherwise only US. <sup>7</sup> Estimated for 10-year zero coupon Treasuries. <sup>8</sup> Simple average of the United States and Germany. <sup>9</sup> Derived from the price of call option contracts on stock market indices. <sup>10</sup> Price volatility implied by the price of call options on 10-year government bond future contracts. <sup>11</sup> JPMorgan benchmark Index for the level of G7 currencies' implied volatility.

Sources: OECD; Bloomberg; Datastream; Merrill Lynch; JPMorgan Chase; national data

# A selection of asset prices<sup>(a)</sup>

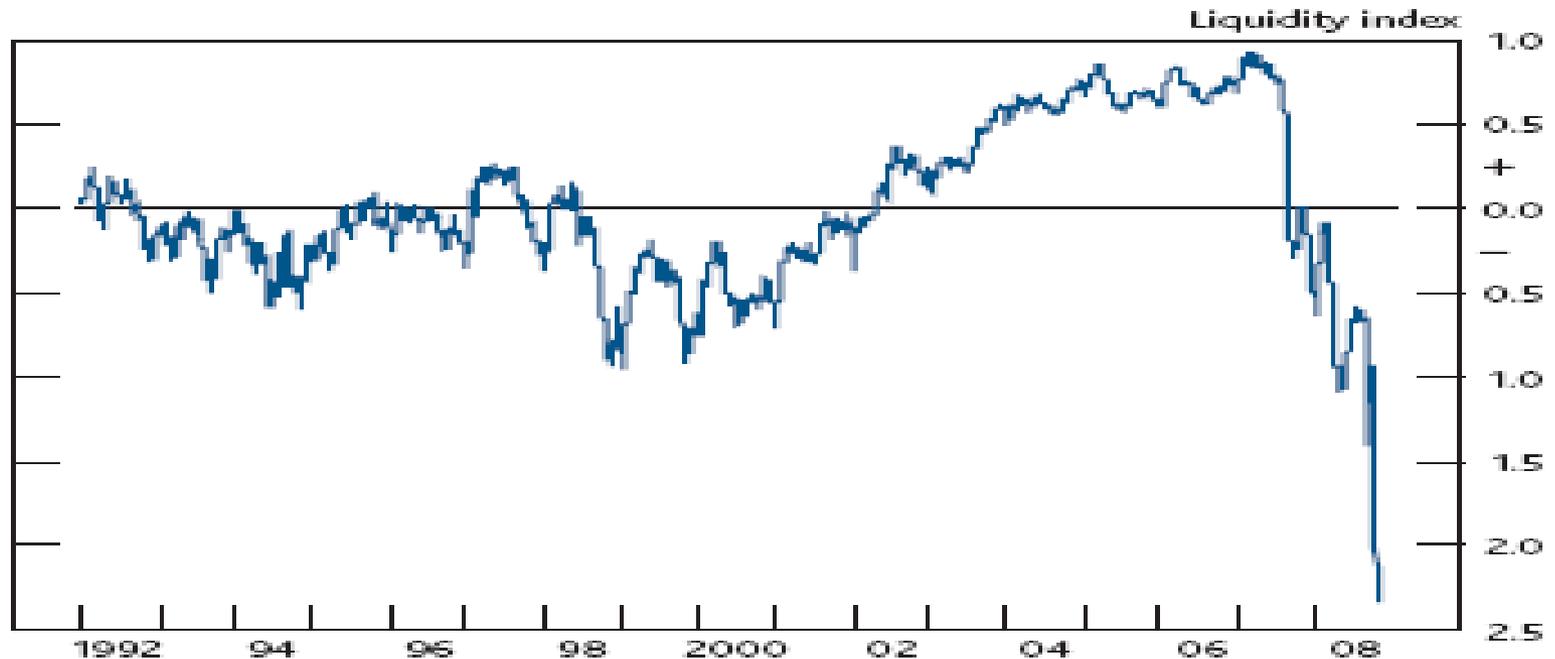


Sources: Halifax, IPD, JPMorgan Chase & Co., Merrill Lynch, Nationwide, Thomson Datastream and Bank calculations.

- (a) Data to close of business on 20 October 2008.
- (b) Sub-prime series is the A-rated 2006, H2 vintage ABX.HE index.
- (c) Series inverted.
- (d) Average of Halifax and Nationwide house price indices.
- (e) Dashed line shows start of July 2007.

Source: FSR October 2008

# Financial market liquidity<sup>(a)</sup>



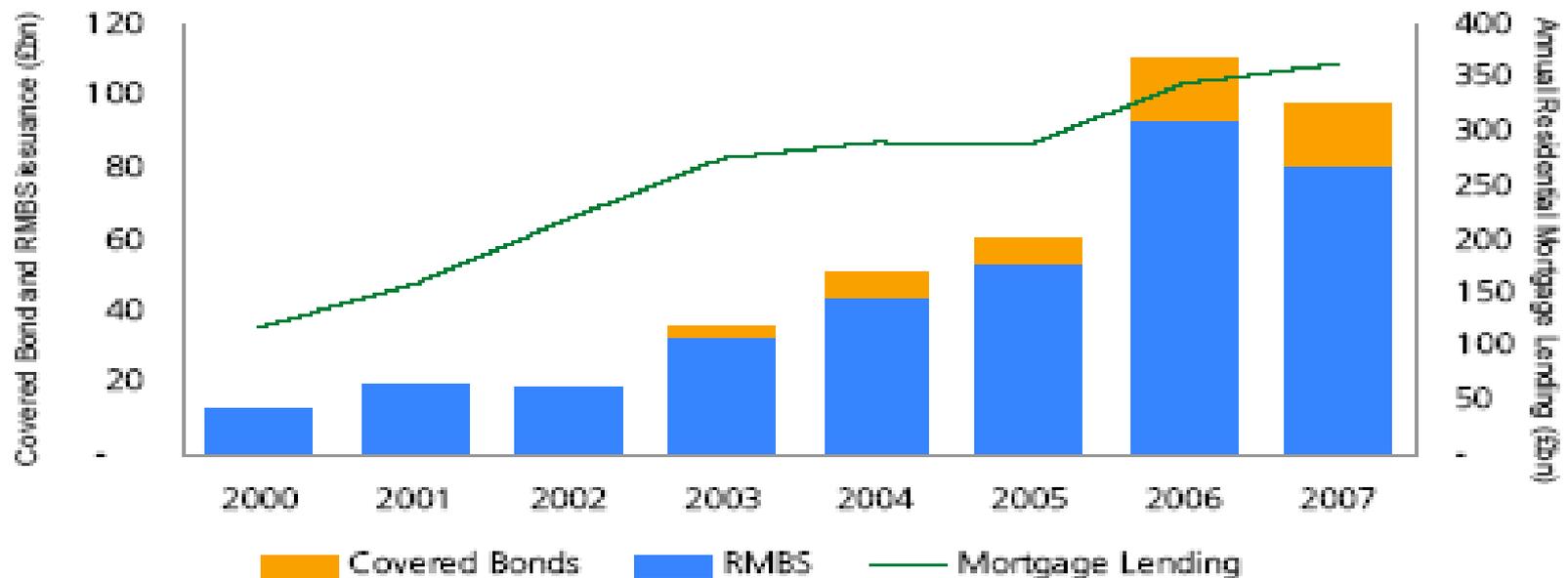
Sources: Bank of England, Bloomberg, Chicago Board Options Exchange, Debt Management Office, London Stock Exchange, Merrill Lynch, Thomson Datastream and Bank calculations.

(a) The liquidity index shows the number of standard deviations from the mean. It is a simple unweighted average of nine liquidity measures, normalised on the period 1999–2004. The series shown is an exponentially weighted moving average. The indicator is more reliable after 1997 as it is based on a greater number of underlying measures. The recent fall in the indicator is largely due to a sharp decline in the interbank market liquidity measure.

Source: FSR October 2008

# 4-fold increase in RMBS

## RMBS and Covered Bond issuance vs. Mortgage Lending



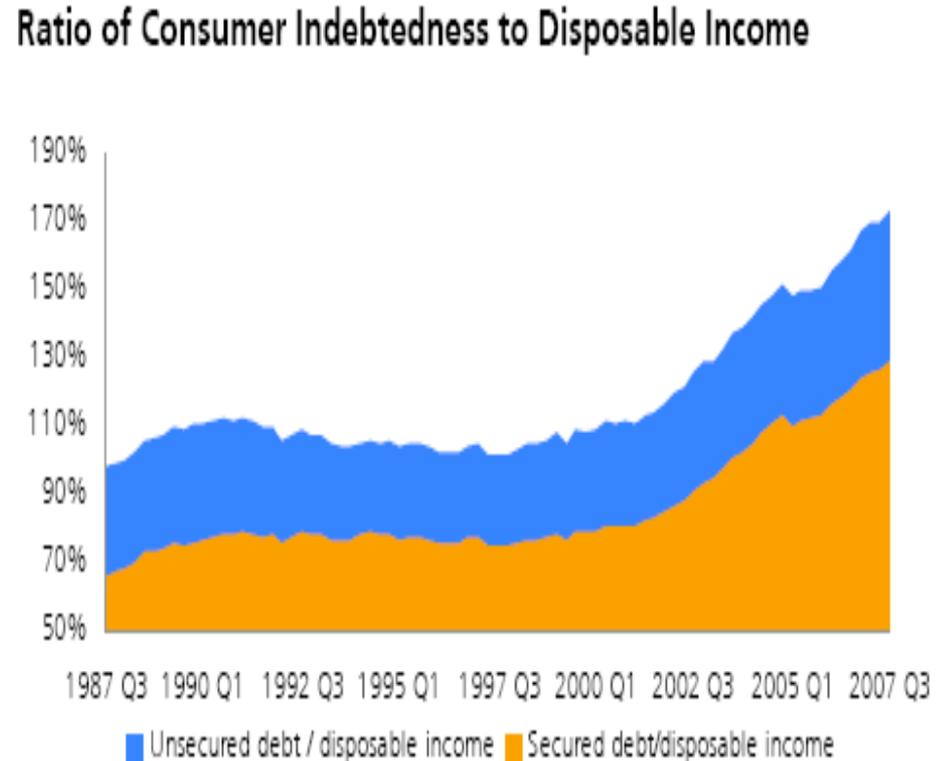
Source: UBS

RMBS = Residential Mortgage-Backed Securities

Banks' high structural dependence on wholesale funding markets, the impaired functioning of which led to rising rollover risk later (markets not deep enough)

# Build-up of leverage and increasingly stretched balance sheets

- 60% effective growth in real residential balance sheet, that is, in consumer indebtedness
- Consumer debt to disposable income at an all time high
- Various rationales presented at the time for the rapid rise in house prices and debt holdings
  - E.g. permanently lower and more stable inflation
  - Unlocked credit constraints
  - Hence, one-off shift to permanently higher but sustainable debt levels



Source: UBS

# Global imbalances

- Increased borrowing in a range of developed countries was part-financed with inflows of foreign capital
  - Greater integration of international capital markets
- Growing current account surpluses in oil-exporting countries and in some Asian economies
  - Reached around US\$1 trillion in 2007
- China foreign currency reserves at end of 2008 hit \$2trillion
- Asia, national saving increase often thought a response to 1997–98 currency crises
  - A cushion against future crisis

# Global imbalances

- High savings in Asia contributed to low global long-term real interest rates
- Cheap exports (China and Asia) + growth in world trade, helped falls in inflation in developed countries
- Nominal short-term interest rates at very low levels
- Still...economic conditions appeared stable by historic standards

# High asset prices kept leverage in check..

- “Despite the rapid increase in credit, however, the balance sheets and repayment capacity of corporations and, to a lesser extent, households did not appear to be under any strain. The high level of asset prices kept leverage ratios in check while the combination of strong income flows and low interest rates did the same with debt service ratios.”
- Borio

## Meanwhile, signs of the search for yield

- Development of a wave of ever-more complex financial instruments employing leverage to generate higher returns
- Banks enabled to increasingly package and distribute internationally
- Strong feedback mechanisms, real economy and financial systems: Supply of liquidity fed its own demand!
- Less discrimination between instruments of differing credit quality

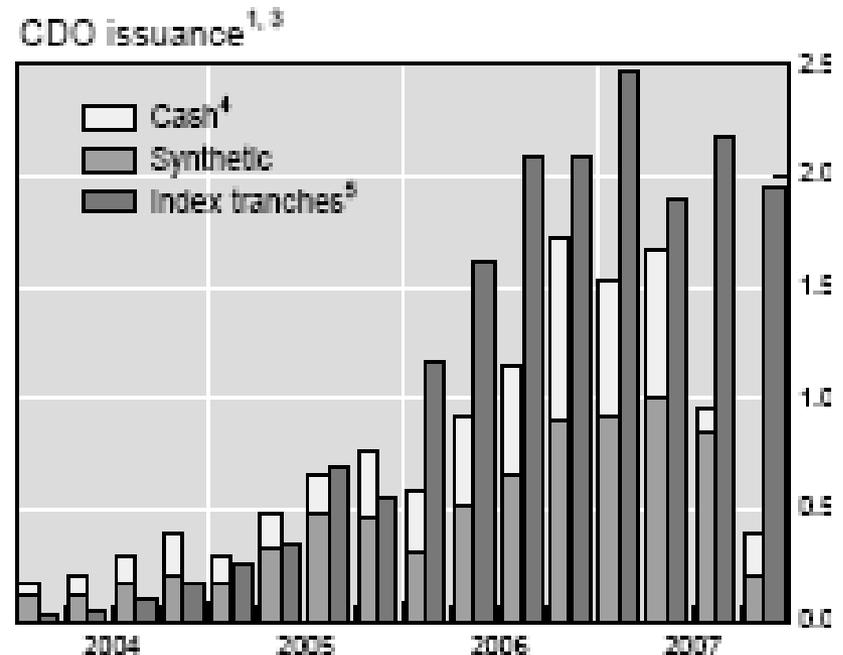
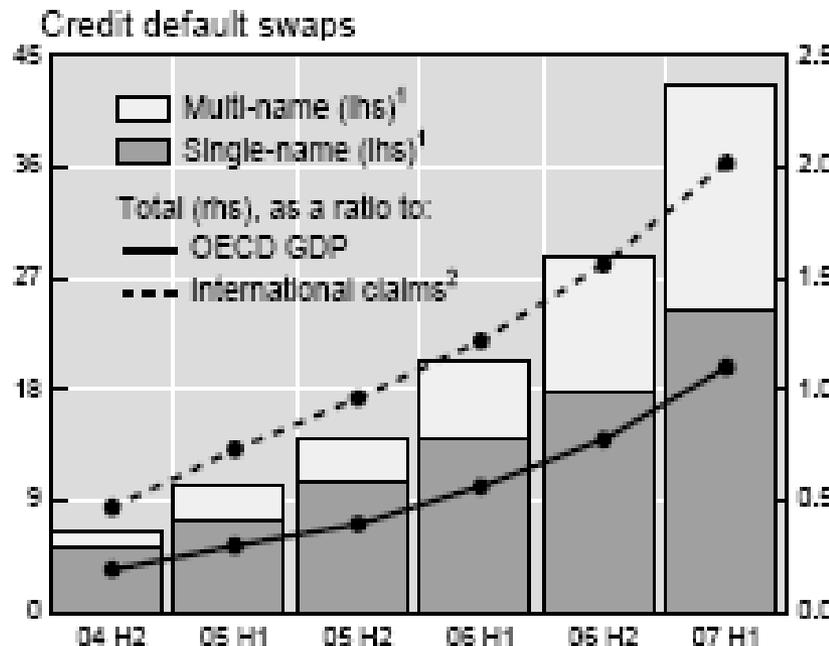
# New products...

- Credit default swaps (CDSs)
- Credit derivative contract between two counterparties
  - Buyer makes periodic payments to the seller
  - Buyer receives a payoff if the underlying instrument defaults
- CDS contracts have insurance-like property
  - Buyer pays a premium in return for which gets sum of money if one of the specified events occur
- But non-insurance properties too
  - Seller does not have to be regulated
    - Hence may exacerbate counterparty risk
  - CDS contracts are generally subject to mark-to-market accounting
    - Income statement and balance sheet volatility introduced that would not be case with insurance contract
- Buyer does not need to own the underlying security

# Structured credit products

- Structured credit products
  - Portfolios of credit exposures are “sliced and diced and repackaged to better suit the needs of individual investors” (BOE Stability Review)
  - This category included Collateralised Debt Obligations (CDOs), backed both by cash instruments, such as primitive securities, loans or asset-backed securities, and by derivative claims, such as CDSs and CDOs themselves
  - Expansion of these products contributed to, and supported by, a strengthening of the originate-and-distribute (O&D) business model of financial intermediation
  - Increasingly, rather than holding the credits they originated, credit institutions would sell them off – possibly after having repackaged them – into the capital markets

# Spectacular growth in credit risk transfer instruments



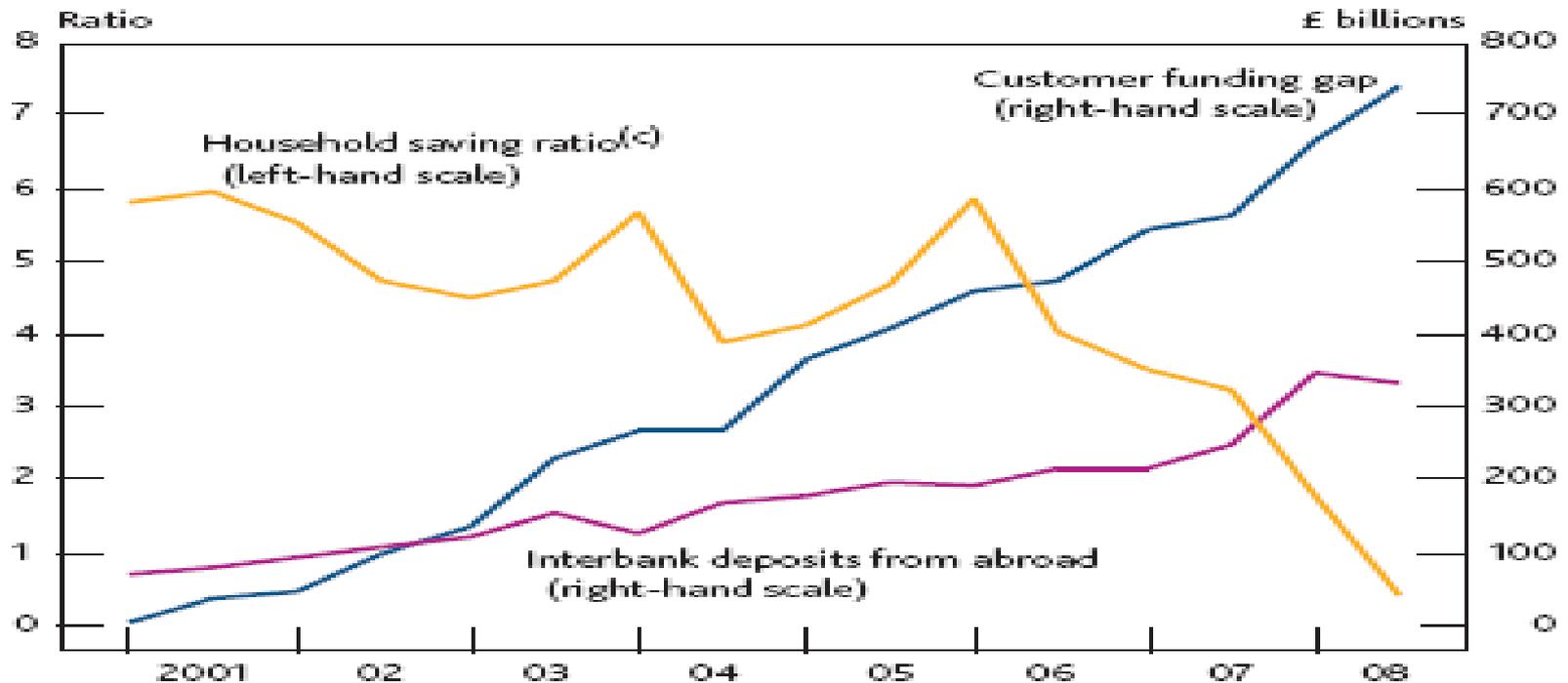
<sup>1</sup> In trillions of US dollar. <sup>2</sup> Of BIS reporting banks; cross-border and local foreign currency claims. <sup>3</sup> Annualised. <sup>4</sup> Sum of cash tranche sizes by pricing date; Includes only cash and hybrid structures. Hybrid portfolios consisting mainly of structured finance products different from cash CDOs are excluded. <sup>5</sup> Covers about 80% of Index trade volume, according to CreditFlux Data+.

Sources: IMF; CreditFlux Data+; ISDA; national data; BIS calculations.

# UK customer funding gap

- 2001, UK customer lending roughly matched customer deposits
- 2008, the surplus of lending over deposits — the customer funding gap — was £700 billion
- Much of the gap ultimately sourced from overseas
- US acted as intermediary for this
  - Attracting capital inflows from the rest of the world
  - Exporting funds to other countries
- Foreign interbank deposits rose from 2001, supporting a rise in the customer funding gap

# Major UK bank customer funding gap, etc.

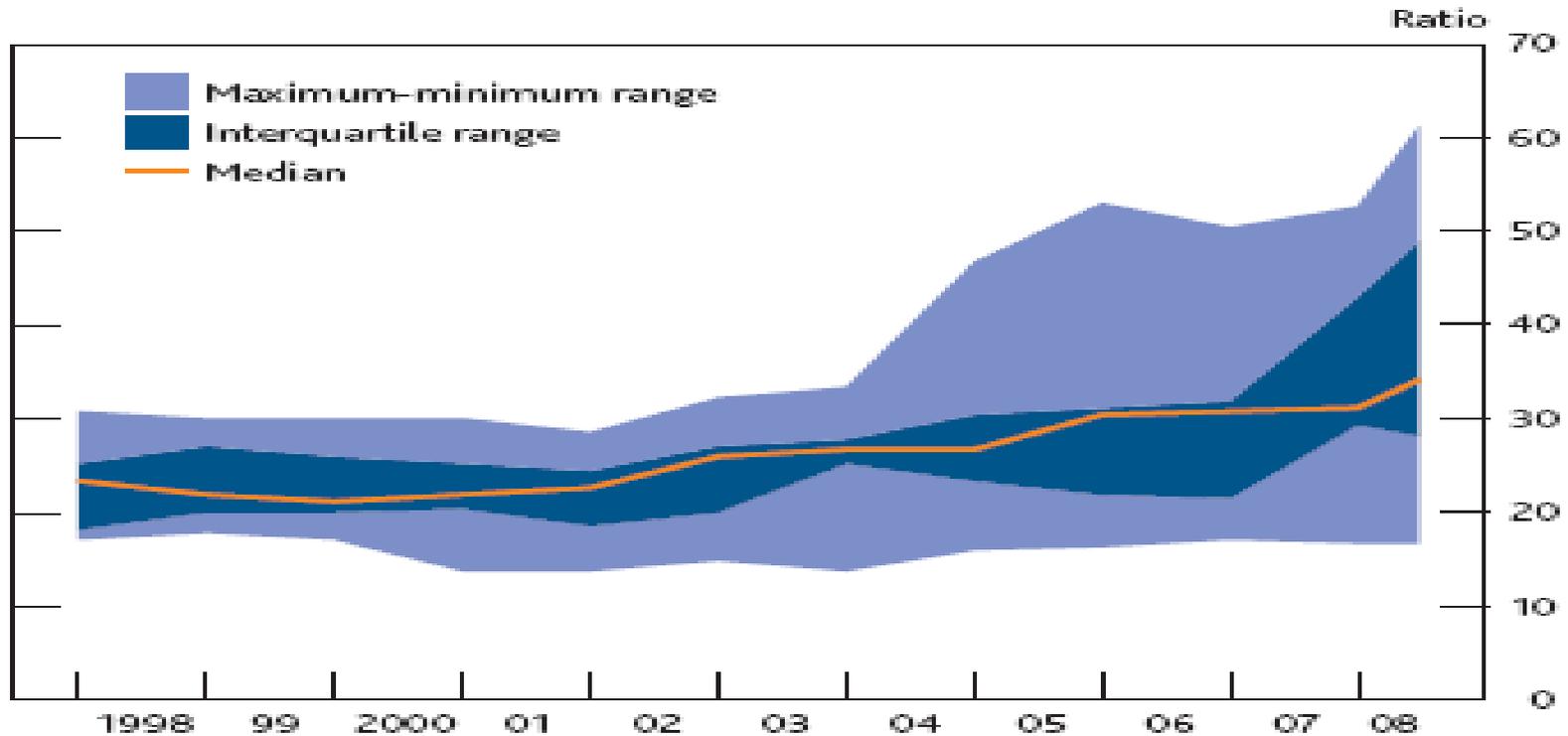


Sources: Bank of England, Dealogic, ONS, published accounts and Bank calculations.

- (a) Customer funding gap is customer lending less customer funding, where customer refers to all non-bank borrowers and depositors.
- (b) Data exclude Nationwide.
- (c) UK household savings as a percentage of post-tax income.

Source: FSR October 2008

# Major UK bank leverage ratios



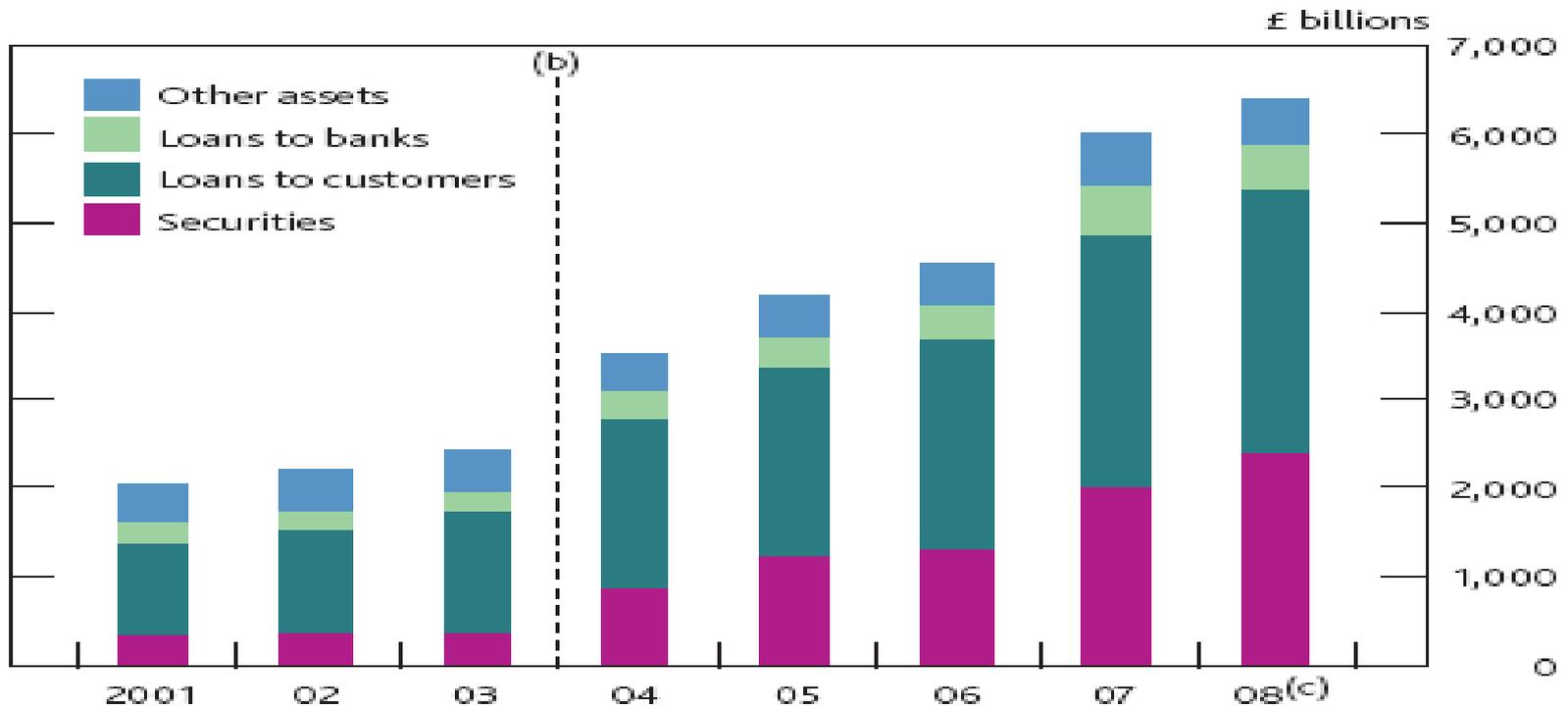
Sources: Published accounts and Bank calculations.

(a) Leverage ratio defined as total assets divided by total equity excluding minority interest.

(b) Excludes Nationwide due to lack of interim data.

Source: FSR October 2008

# Major UK banks' balance sheets<sup>(a)</sup>



Sources: BankScope published by Bureau van Dijk Electronic Publishing, published accounts and Bank calculations.

(a) Excludes Nationwide due to lack of interim data.

(b) IFRS break.

(c) 2008 H1.

Source: FSR October 2008

# Taking stock of key features of developments in financial innovation and practice

- Growth of credit risk as a separate asset class and the growth of credit risk transfer instruments
- Rise of the Originate-to-Distribute business model that allowed centralized lenders to enter mortgage markets
- Potential distortions in the incentives in O&D chain
  - Reduced incentives to screen
  - Chains of Principle-Agent problems
  - Dispersed responsibilities (coordination problems)
  - Potential conflicts of interest when dealing with long and complex chains from originator to ultimate investments. (e.g. credit rating agencies accused of compromising integrity so as to win business ... they both rate and consult on how to package at the same time)
  - O&D allowed credit to go much further than would have without?
  - Securitization distributing risk/distributing fear?

# Taking stock: Growing symbiosis of financial institutions and markets...

- Growing symbiosis between a range of financial institutions and financial markets
  - Often seen as alternatives, but increasingly highly complementary
- Financial institutions increasingly reliant on markets
  - Source of income
  - To help value products
  - To manage risk
- In turn financial markets more reliant on these financial institutions for market-making services and liquidity
- Way risk was repackaged made the valuing of products increasingly difficult for regulators and observers, and hid the true risks

# Taking stock: Competitive banking pressures

- Competitive pressures to chase volume in the face of strong demand for structured credit products
- This boosted the profitability of banks that were also able to demonstrate strong capital positions by historical standards
- Mark-to-market – boosted banks profitability in the upswing
  - Even as reduced profit in downswing and exacerbated crisis
- Incentives (structure of their payments) of bankers?
- Overextension of credit masked by apparently vibrant economy, including property market
- The nature of ‘bubbles’
  - The special dangers of debt-backed (compared to equity) ‘bubbles’ (debt has a ‘disciplining’ default state in a world of asymmetric information and imperfect monitoring, etc.)

# Taking stock: Where did all the risk go?

- Result = under-pricing and shifting of risk?
- Where did all the risk go?
- Evidence of the mispricing of risk both by households and financial institutions (e.g. excessively low risk premia)
- Warning signs issued at the time about risk and leverage (BIS, some economists, Bank of England, popular press, and others)
- Warnings largely ignored

# Taking stock: Shadow banking system

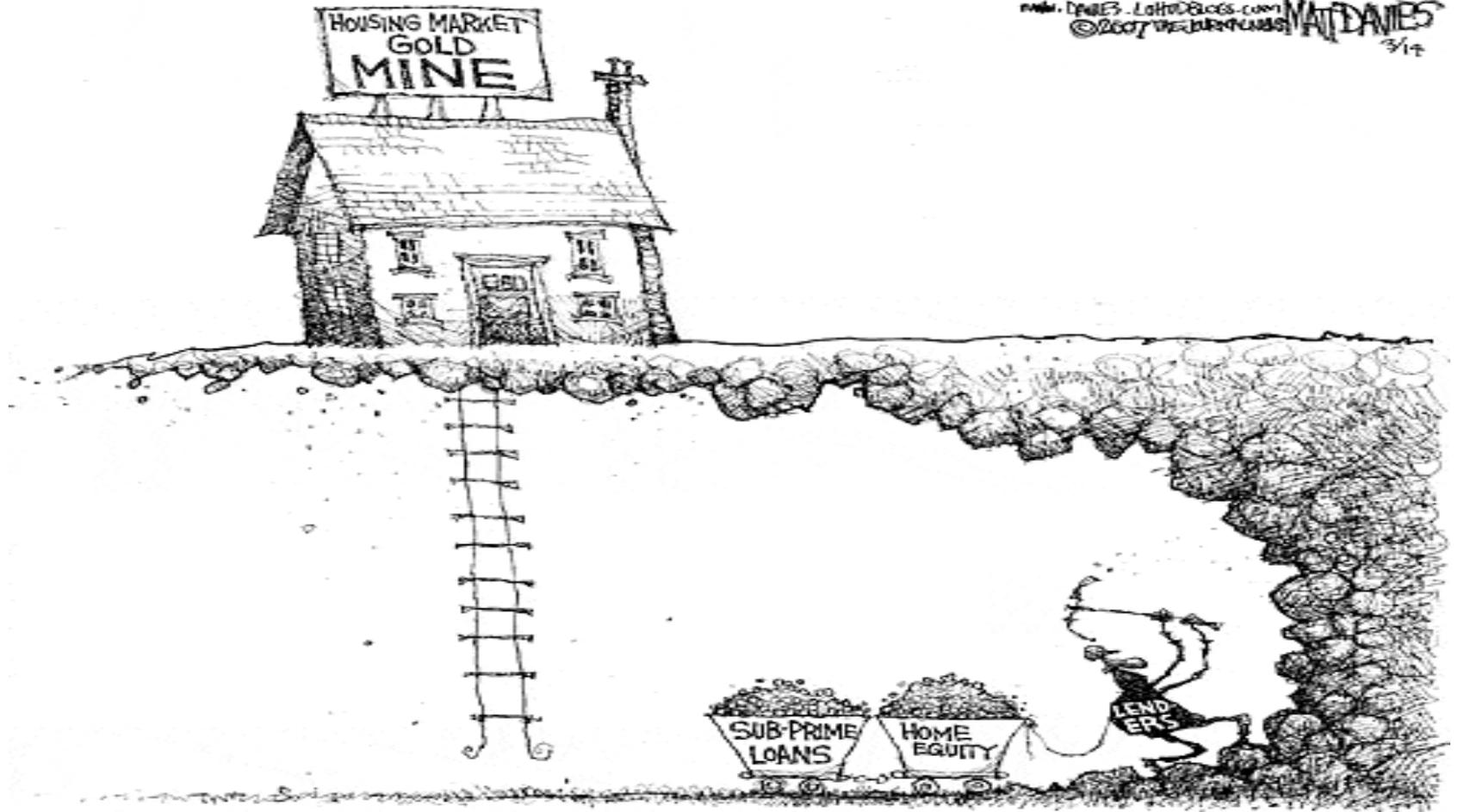
- Growth of a thinly-capitalized shadow banking system
  - Profited from large-scale liquidity and maturity transformation at low capital cost
  - Escaped the regulators
  - Hundreds of billions of dollars worth of loans made without the need to raise much new capital
  - Relied on asset prices continuing to rise, or at least not collapsing
  - Relied on wholesale markets continuing to buy the short-term paper needed to sustain this
  - Combined with deterioration of underwriting standards in this period that led to the subsequent underestimation of the level and correlation of defaults (more on this below)

There was a slight problem with all of this...



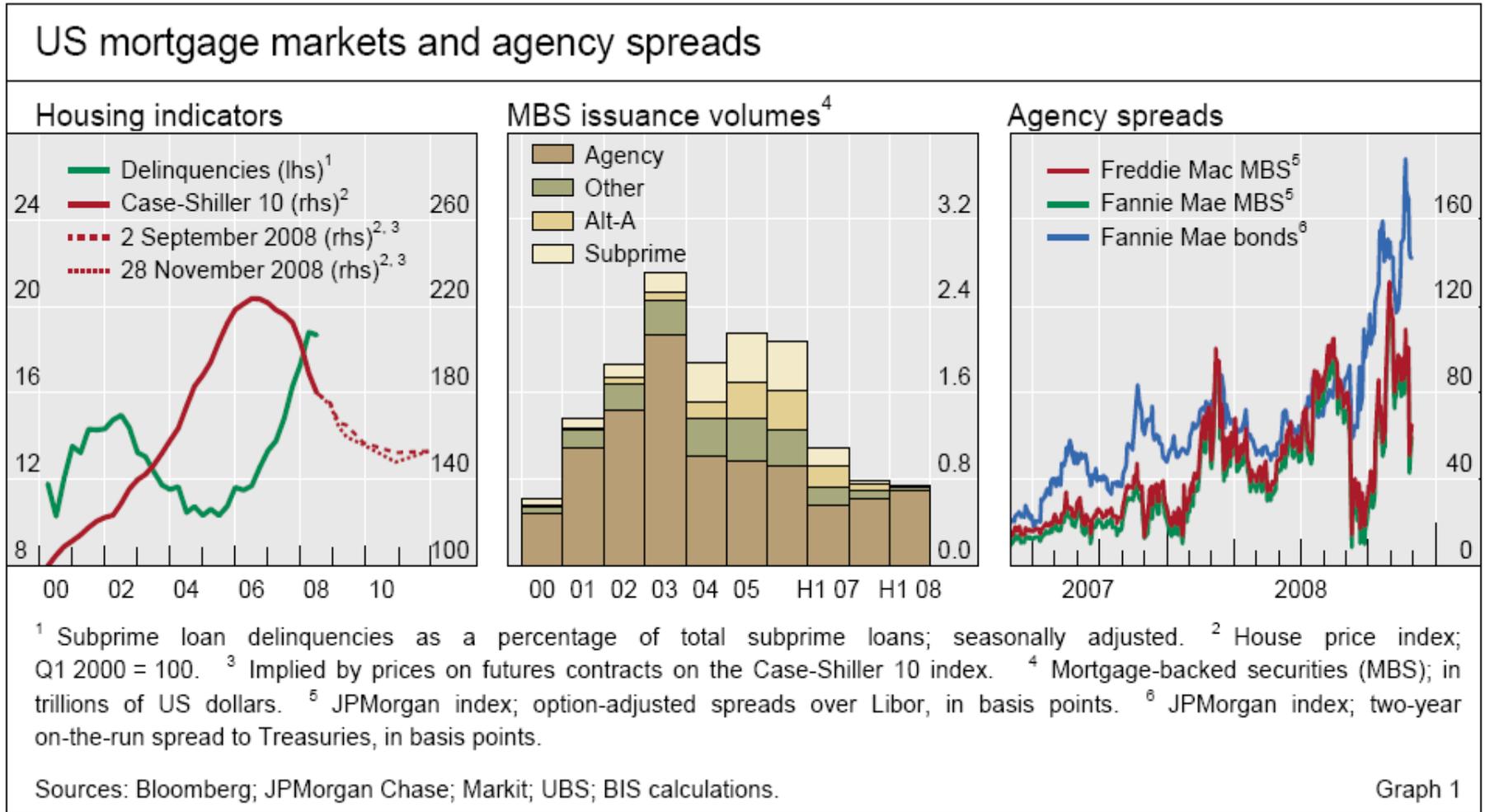
# US Sub prime

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MATT DANES  
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At heart of the US problem: Policy measures to foster home-ownership of low-income households and widespread use of no-recourse loans

# US Sub prime

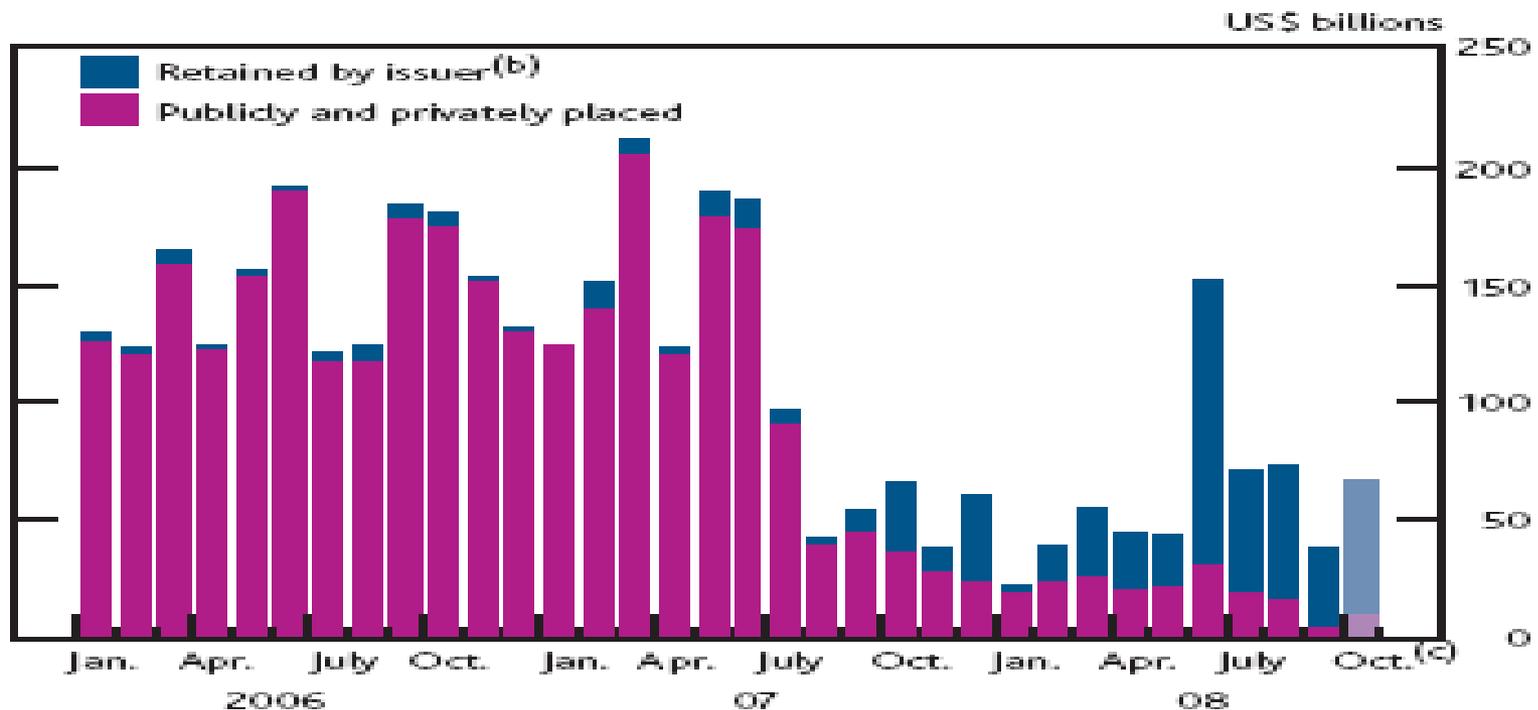


Lending standards deteriorated 2006 onwards

Banks chasing volume to satisfy strong demand for structured credit products

7 September 2008, Fannie Mae and Freddie Mac) are taken into conservatorship

# Global residential mortgage-backed securities issuance<sup>(a)</sup>



Sources: Dealogic and Bank calculations.

- (a) Non-retained issuance proxied by issuance eligible for inclusion in underwriting league tables. Retained issuance proxied by issuance not eligible for inclusion.
- (b) This includes RMBS used as collateral in central bank operations.
- (c) Shaded area is total up to 20 October 2008.

Source: FSR October 2008

# Crisis starts and spreads rapidly

- (R)MBS market collapsed as asset quality deteriorated
- Surge in need for capital as billions of dollars of activities suddenly required 4%-8% capital support
- Problems of opacity identified above made it impossible for financial institutions during the crisis to ascertain the size of their own exposures and that of their counterparties
- Banks short of capital stopped lending to other banks who might go bust risking the first bank's capital
  - Counterparty risk
- This triggered a generalised collapse in lending

# Crisis starts and spreads rapidly

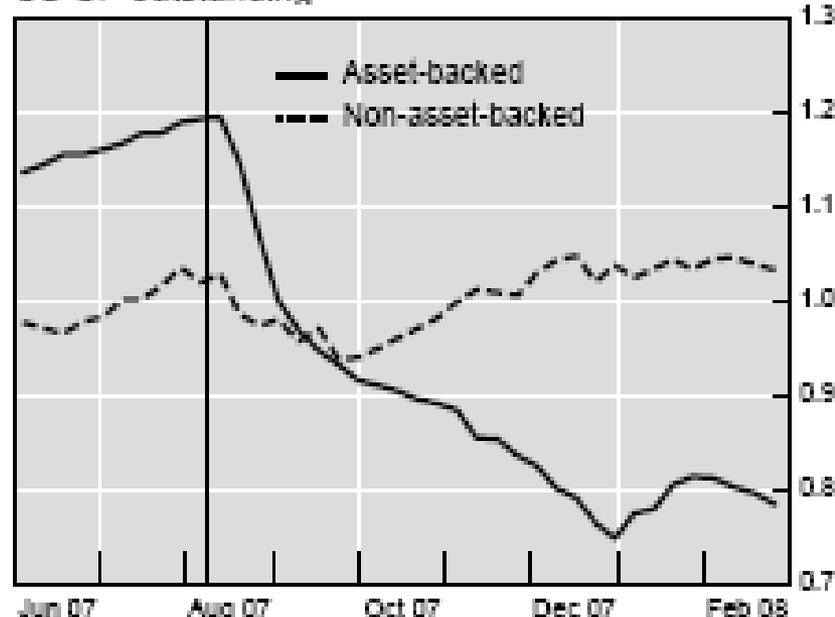
- Interaction between asset prices and financial balance sheets, and the self-defeating spiral of trying to strengthen balance sheets by reducing lending that only leads to further declines in asset prices, balance sheets further weakened, lower GDP, and the cycle further fed
- Individually rational to tighten, but collectively irrational
  - Prisoners dilemma outcome
- Hoarding of liquidity
- Risk premium became a mix of liquidity and counterparty credit risks
- Liquidity crisis exposed the underlying asset quality problem
- Risks that had supposedly been disbursed away from financial institutions flowed back to them
- Ultimately flowed back to taxpayers?

## Crisis starts and spreads rapidly

- Diversification – though across borrowers in a mortgage pool – had not been achieved across originators, issuers or servicers
- High internal cost of capital also made arbitrage difficult in this period
- Credit market prices overshoot during correction phase, and no arbitrageurs to purchase these cheap assets (currently financially constrained or fearing mark-to-market losses)
- Inter-bank lending rates (LIBOR) partially decoupled from central bank rates
- Securitisation markets all but shut down

# The asset-backed commercial paper (ABCP) markets seize up

US CP outstanding<sup>1</sup>

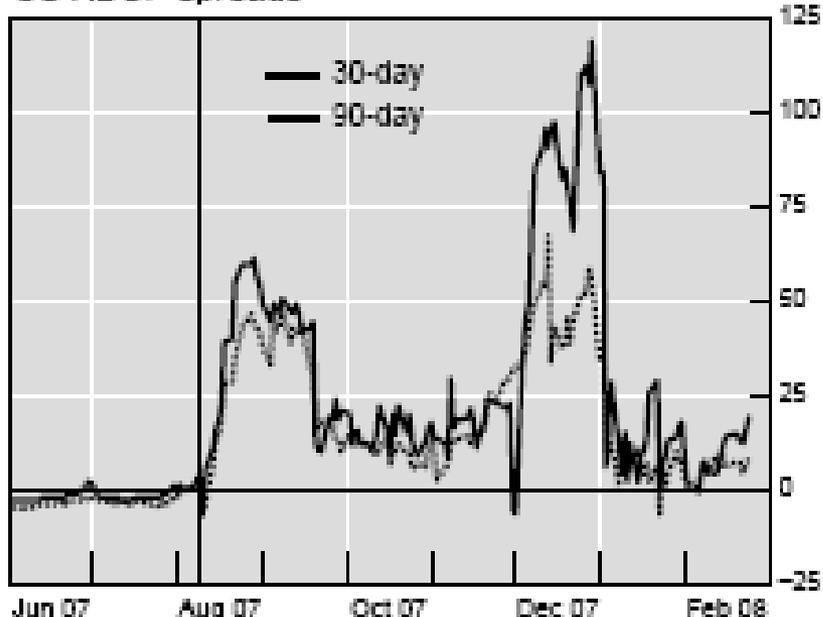


The vertical lines indicate 9 August.

<sup>1</sup> In trillions of US dollars. <sup>2</sup> ABCP yield minus the corresponding Libor rate, in basis points; ABCP yields for A1+ rated issues.

Sources: Federal Reserve Board; Bloomberg; BIS calculations.

US ABCP spreads<sup>2</sup>



(9 August, highlighting the underlying problems, Paribas suspended redemptions on three of its funds)

## Unique feature of this crisis..

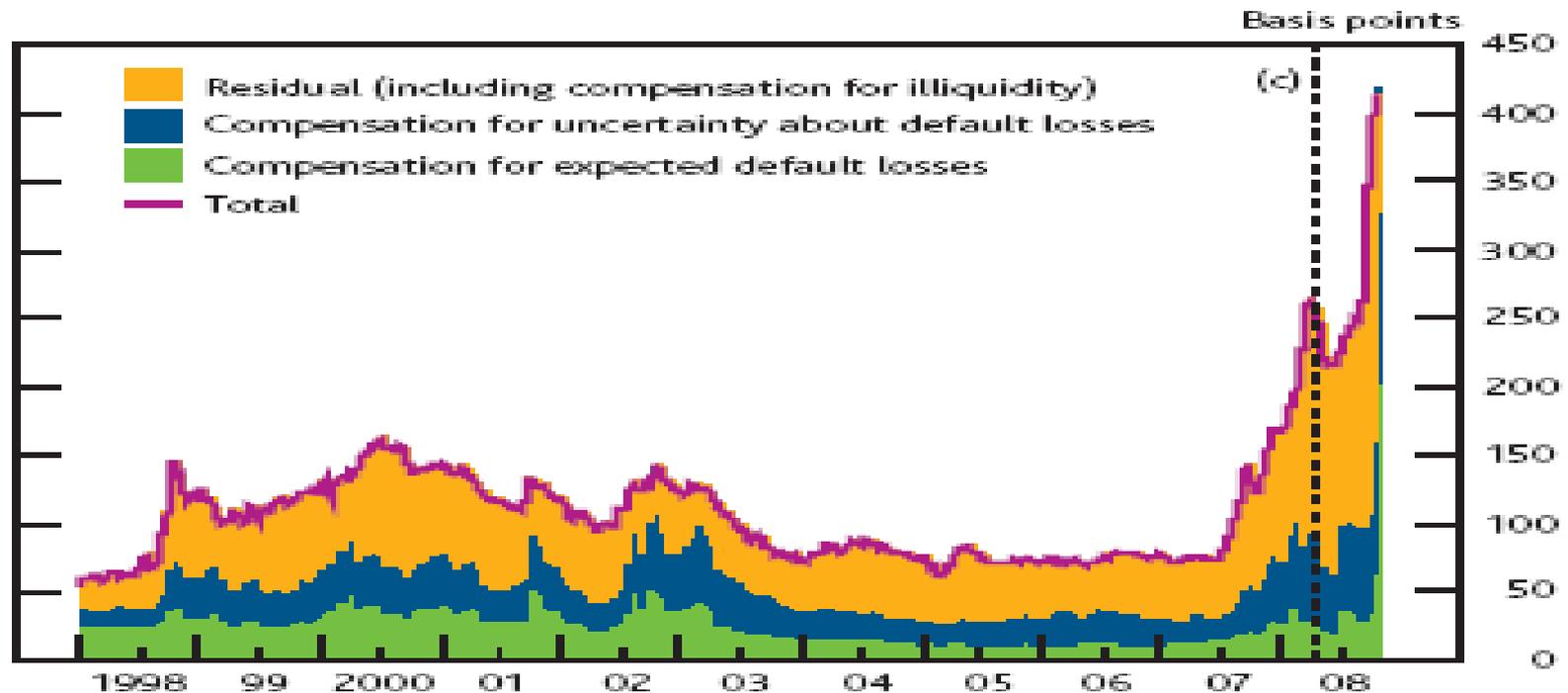
- Drying up of liquidity made it difficult to fairly value underlying assets, with the use of mark-to-market for this purpose had deleterious consequences
- Paribus: *“the complete evaporation of market liquidity”* had made it *“no longer possible to value fairly the underlying US ABS assets”*
- Hard/impossible to value assets at the heart of the crisis

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"Is there any point in the  
little piggy going to market?"

# Decomposition of sterling-denominated investment-grade corporate bond spreads<sup>(a)(b)</sup>



Sources: Bloomberg, Merrill Lynch, Thomson Datastream and Bank calculations.

- (a) Webber, L and Churm, R (2007), 'Decomposing corporate bond spreads', *Bank of England Quarterly Bulletin*, Vol. 47, No. 4, pages 533–41.
- (b) Option-adjusted spreads over government bond yields.
- (c) April 2008 Report.

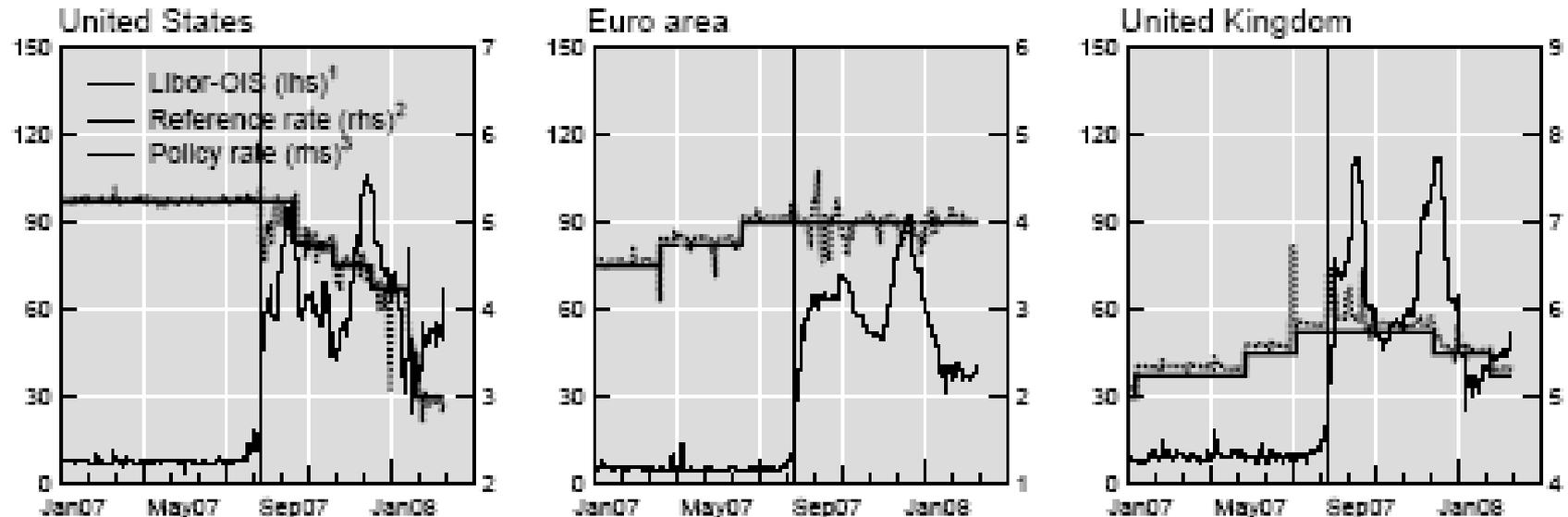
# Interbank markets seize up

- Soaring demand for liquid funds in the wake of the contraction in the money market mutual fund sector
- Global interbank markets seized up
- Banks' access to short-term funding lost



# Interbank market seizes up

Three-month Libor–OIS spread (lhs) and money market rates (rhs)



The vertical lines indicate 9 August.

<sup>1</sup> Libor rate minus OIS rates (for the euro area, EONIA swap; for the United Kingdom, SONIA swap); in basis points. <sup>2</sup> For the United States, effective federal funds rate; for the euro area, EONIA; for the United Kingdom, overnight Libor. <sup>3</sup> For the United States, federal funds target rate; for the euro area, minimum bid rate in the main refinancing operation; for the United Kingdom, official Bank rate.

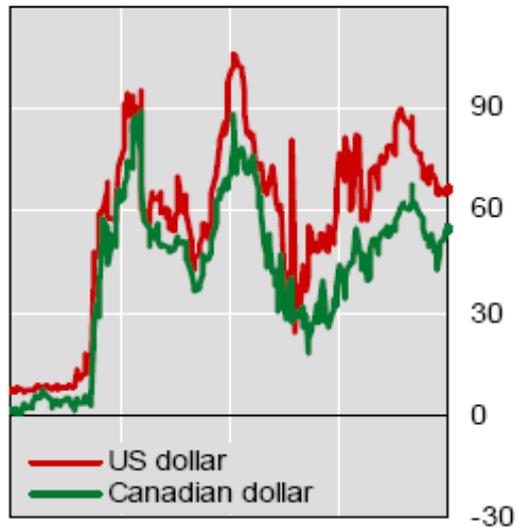
Sources: Bloomberg; BIS calculations.

Immediate response by central banks with large-scale exceptional injections of liquidity, followed by other actions

From BIS Working paper 251

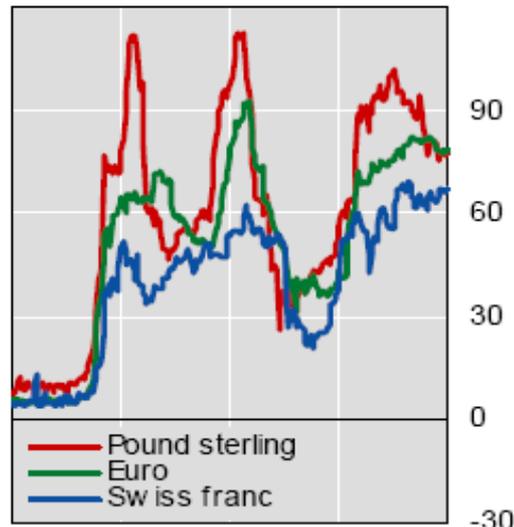
# LIBOR: Bank access to short term funding hit

North America



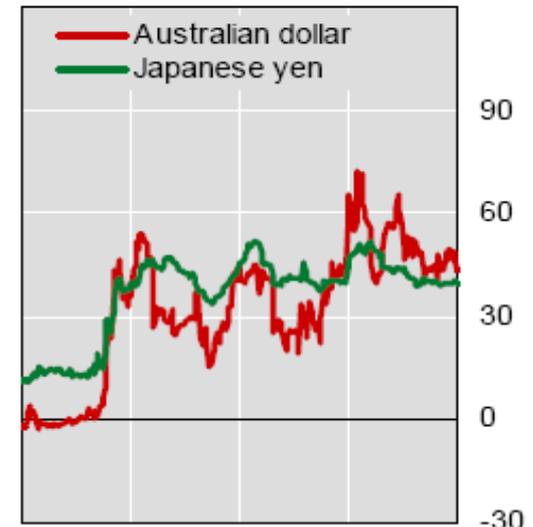
Jun 07 Sep 07 Dec 07 Mar 08

Europe



Jun 07 Sep 07 Dec 07 Mar 08

Asia-Pacific



Jun 07 Sep 07 Dec 07 Mar 08

<sup>1</sup> Three-month Libor minus three-month overnight index swap (OIS) rates.

Source: Bloomberg.

## The London Interbank Offered Rate:

Daily reference rate based on the interest rate at which banks borrow unsecured funds from banks in the London wholesale money market (or interbank market). Roughly comparable to the U.S. Federal Funds rate

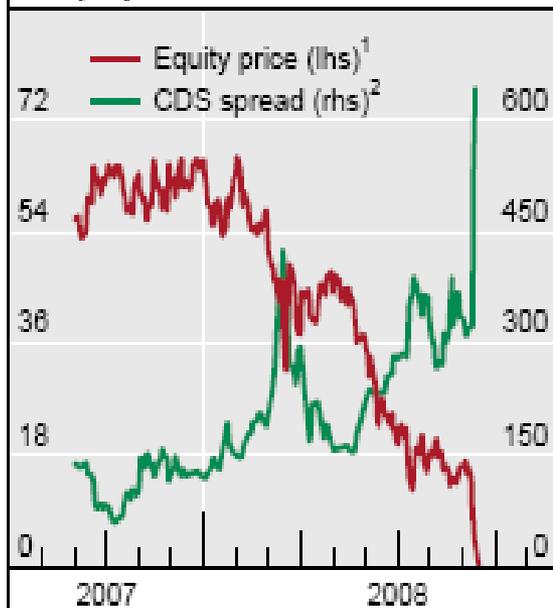
# Lehman: A case study

- Often thought of as a critical moment, so we'll explore it in a bit more detail
- Shows how vicious and speedy the reaction can be
- 15 September 2008, Lehman Brothers Holdings Inc filed for Chapter 11 bankruptcy protection
- Consolidated bank and bond debt of more than \$600 billion
- BIS, Dec 2008, three key areas because of pre-crisis role of Lehman
  - CDS
  - Money Market Funds
  - Brokerage Activities

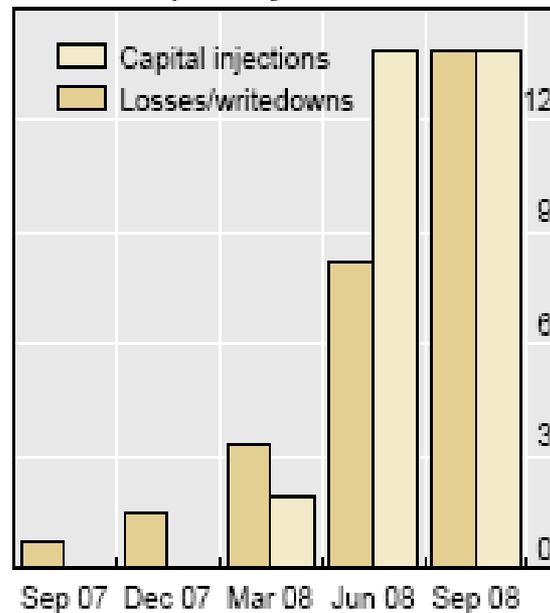
# Lehman

## Lehman Brothers: selected indicators

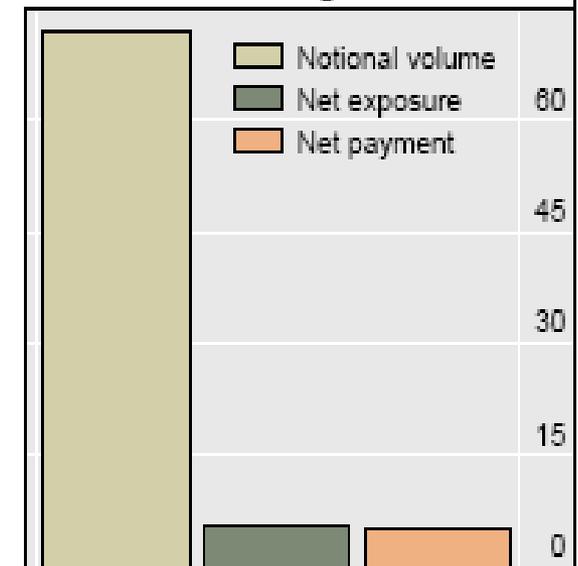
### Equity and CDS level



### Losses/capital injections<sup>3</sup>



### Lehman-referencing CDS<sup>3</sup>



<sup>1</sup> In US dollars. <sup>2</sup> In basis points. <sup>3</sup> In billions of US dollars.

Source: Bloomberg.

# Lehman CDS

- Lehman central role as a major counterparty and reference entity in CDS market
- Bankruptcy filing would trigger default clauses in CDS contracts referencing Lehman
- Bankruptcy would terminate the contracts that Lehman had entered into as a counterparty
- Netting, settlement and replacement of positions would raise operational risks
- No hard public information on the volume of CDS contracts referencing Lehman or the net amounts required to settle them
- Lack of this information created huge uncertainty about the capacity of already strained money markets to accommodate the anticipated corresponding liquidity needs
  - Had that information (or ability to extract that information) been present, how different would matters have been?

# Lehman Money Market Funds

- A major source of funding for Lehman was its issuance of commercial paper and other forms of short-dated debt
- Money market funds attracted to these securities by their high credit ratings and yield premiums relative to US government paper
- Investors felt protected against principal loss because:
  - Regulatory restrictions imposed on fund managers
  - Fund managers had avoided losses in the past
- At instigation of bankruptcy, 25 money market fund advisers took actions to protect their investors against losses

# Lehman Money Market Funds

- The net asset value of a public money market fund, Reserve Primary, fell below \$1.00 per share
  - First money market mutual fund in 14 years to ‘break the buck’ (i.e. report less than one dollar’s worth of net assets for each dollar invested)
- This triggered liquidation and distribution
- This triggered massive redemptions by investors in other US money market funds, especially ‘prime’ funds invested in commercial paper
  - 10th – 24th September, investors pulled \$184 billion
- Liquidating assets into essentially illiquid markets
- A RUN

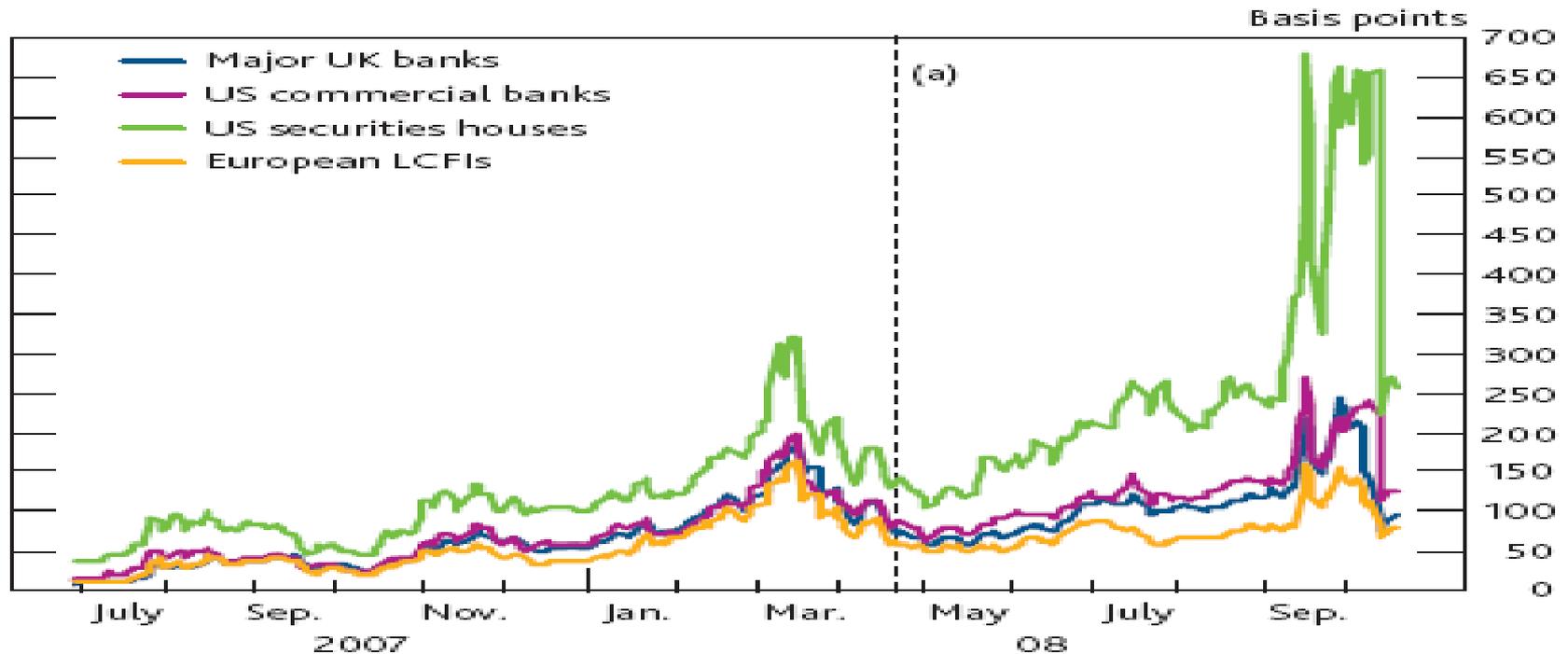
# Lehman Prime Brokerage Activities

- A large and complex financial institution, managed as a global firm
- Funding activities centralized in the United States
- Separate administration and bankruptcy applications filed outside the United States
- Problems of different legal procedures across countries
- Lehman provided prime brokerage services to a large number of hedge funds
- Hedge funds placed investment assets with Lehman's broker-dealer units in different jurisdictions
- These assets, posted as collateral for funding activities, were reused by Lehman to meet its own obligations (re-hypothecation)

# Lehman Prime Brokerage Activities

- Following insolvency, these clients suddenly lost access to (and, potentially, part of their claims on) their collateral assets for the duration of the administration process
- Future accessibility would depend on different legal proceedings and contractual arrangements in various jurisdictions
- Worried about potentially sizeable asset sales and withdrawals from individual prime brokerage accounts
- This in turn would add to pressures in funding and securities lending markets

# Various credit default swap premia (FSR October 2008)



Sources: Markit Group Limited, Thomson Datastream, published accounts and Bank calculations.

(a) April 2008 Report.

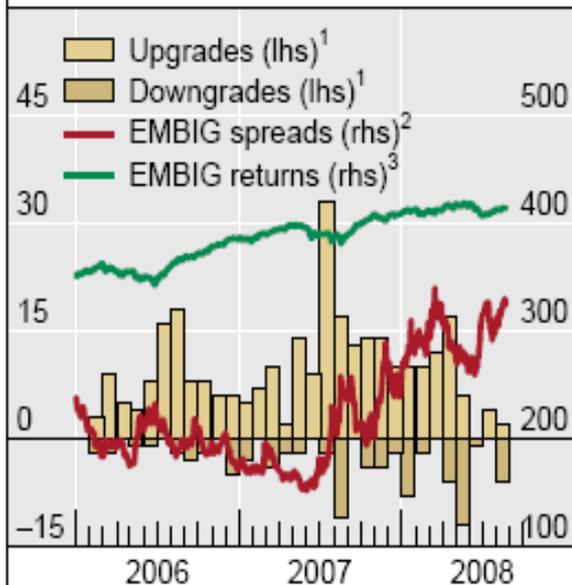
See FSR Chart 3.1 for details.

Financial-ECG scan when global financial system is having a heart attack?

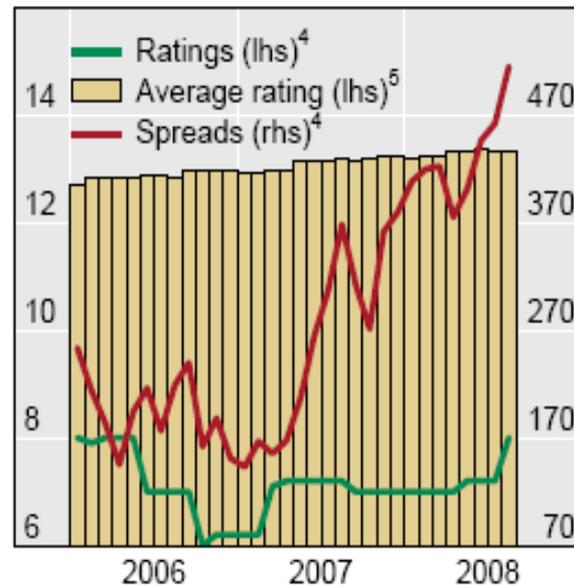
# Emerging markets

## Emerging market assets

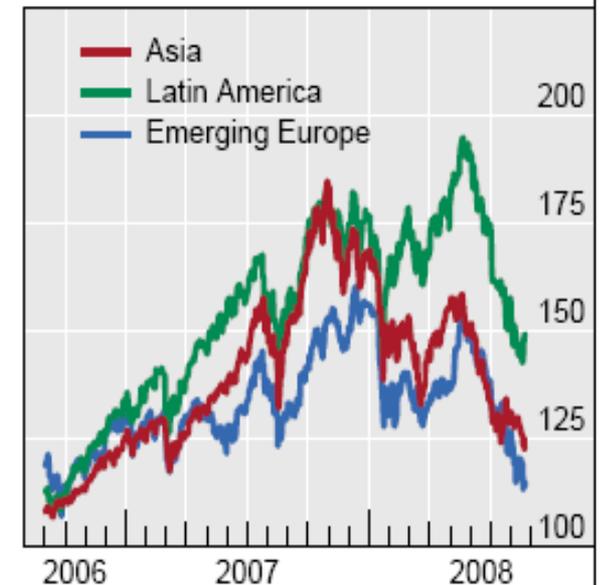
### Ratings and EMBIG indices



### Dispersion and rating changes



### MSCI regional equity prices<sup>6</sup>



<sup>1</sup> Monthly long-term foreign and local currency sovereign rating changes from Fitch, Moody's and Standard & Poor's.  
<sup>2</sup> EMBI Global index; sovereign spread over government bond yields, in basis points. <sup>3</sup> EMBI Global index; cumulative total returns. <sup>4</sup> Difference between 90th and 10th percentiles; for spreads, in basis points; for ratings, in number of notches. Calculated using identical weights. <sup>5</sup> Average credit rating for all constituents of the JPMorgan Chase EMBI Global index; based on long-term foreign currency ratings from Standard & Poor's. Higher values imply higher ratings. <sup>6</sup> In local currency; 31 December 2005 = 100.

# Banking system rescue



# Banking system rescue...some preliminary thoughts

- Careful not to judge with the benefit of hindsight:
  - Was the best done given the information available at the time (*Can't* criticize if the case)
  - Next time, how will being better prepared help? (*Can* criticize... lack of preparedness)
- Rescue thinking went from piecemeal case-by-case to system-wide and sometimes abruptly changed (e.g. in the US)
- “The rule book for interventions designed to address liquidity gridlock in markets has yet to be written” BIS
- In the case of solvency crisis, should be allowed to take losses (see moral hazard issues below)
- If problems originate in markets and not specific institutions, it is less clear
- Need to operate in one without causing problem to the other

# Government-backed initiatives

- Government initiatives two pronged:
- 1) Reduce bank leverage by purchasing distressed assets or making capital injections. Hence support balance sheets
- 2) Ensure bank funding through explicit government guarantees on retail deposits and other bank liabilities
- Importance of the signaling effect (a sort of a free lunch) from these moves (indeed CDS spreads fell on the news)
- Importance of liquidity to get pricing/information discovery working again

# Rescue and stability

Elements of banking system rescue plans in developed economies <sup>1</sup>					
Country	Expansion of retail deposit insurance	Guarantee of wholesale liabilities <sup>2</sup>		Capital injections <sup>3</sup>	Asset purchases
		New debt	Existing debt		
Australia	✓	✓	✓		✓
Austria	✓	✓		✓	
Belgium	✓	✓			
Canada		✓			✓
Denmark	✓	✓	✓		
Finland	✓				
France		✓		✓	
Germany	✓	✓		✓	✓
Greece	✓	✓		✓	
Ireland	✓	✓	✓		
Italy		✓		✓	
Netherlands	✓	✓		✓	
New Zealand	✓				
Norway					✓
Portugal	✓	✓			
Spain	✓	✓		✓	✓
Sweden	✓	✓		✓	
Switzerland				✓	✓
United Kingdom	✓	✓		✓	
United States	✓	✓		✓	✓

<sup>1</sup> As of mid-November 2008. <sup>2</sup> Includes bond issuance, interbank lending and other wholesale liabilities. Coverage of the guarantee on these items varies across countries. <sup>3</sup> Refers to announced programmes only (excluding standalone actions).

Source: BIS.

# Taking out the toxic garbage

- Early US system-wide approach emphasised cleansing the system of 'toxic' securities
  - But how to design mechanisms so as to buy troubled securities at 'fair value' (e.g. via suitably designed reverse auctions) and not in a way that rescues poor financial decision making with an expensive fix that leaves behind a long-term fiscal drag?
  - Challenges faced when dealing with complex products where there may be poor competition and concentrated ownership and when part of the problem is that a lack of transparency in the first place made the valuing of products difficult
  - How to use these mechanisms not just to price the securities purchased but to provide information on securities not purchased, to create liquidity, and get the price mechanism going again so that prices are at least near to current 'fundamentals'?
  - How to remove the most toxic first?
  - If covers all distressed instruments, it would be large programme

# Banks capital positions hit



# Principles of recapitalisation

- UK and European, and then US, attention turned to recapitalisation and the insurance of bank transactions
- Principles of recapitalisation
  - Should target undercapitalised but otherwise solvent financial institutions (on the assumption, where necessary, that there is sufficient injected liquidity and troubled securities bought at fair value so a measure of ‘solvency’)
  - Capital injection should also not automatically be related to prior levels of troubled securities (which rewards the reckless, generates moral hazard, and is not an efficient way to allocate capital)
  - Some previously large financial institutions (e.g. that took big risks on the property market) should naturally end up smaller and some of the smaller ones end up larger
  - Private capital should be pulled in (e.g. mandated rights offering to current shareholders, etc.)
  - As an implicit state guarantee on existing liabilities, suffers same problems as above. Hence, also needs exit strategy

# Guarantees and distortions of guarantees

- The UK started with a Special Liquidity Scheme
  - Allow UK banks to swap illiquid assets such as RMBS against UK Treasury bills
  - Targeted raising the confidence of markets while leaving the risk of loss with banks
  - Second quarter 2008 recovery of mortgage-backed bonds
    - Largest increase seen in UK (\$8bn to \$90bn)
- Get stability at some costs, and has needs:
  - Increase relative cost of borrowing for debt instruments that are close substitutes for bank debt
  - Complex and unpredictable combinations of initiatives complicates pricing of relative credit risks of different forms of bank liabilities
  - Loan guarantee schemes should allow banks to fail where it is efficient for them do so, while crafting special treatment of insolvent institutions where the systemic risks are high. But how?
  - How is efficiency monitored and measured?
  - Needs a clear exit strategy

# Cross-border issues

- Differences across countries in design and implementation
- Differences in the scope and price of government guarantee schemes for new debt issuance
- Banks in one jurisdiction at a disadvantage to those in another jurisdiction because funding costs become a function of the specific insurance fee structure and of the solvency of the country that provides the guarantee of bank liabilities
- Retail deposits in foreign-owned banks: Little clarity about how foreign depositors would be treated in the event of bank failure
- The instrument choice and terms for capital injection may also affect competitive positions in global markets:
  - Differences in the effective cost of capital provided by governments
  - Terms of capital injections, and the associated conditions, may affect access to private equity capital

# A package big enough to drive out more 'correct prices'?

- Stabilising liquidity and removing uncertainty will help drive out more 'correct' prices (i.e. those prices justified by credit fundamentals)
- Be 'big enough' (including having option to be bigger if needs be)
- If too small, it will not help drive out 'correct prices'...
- (Note, early attempts in a sense hit this constraint...they were too small...)
- Driving out correct prices is like an externality
- CDSs the giant elephant in the room. It will take years to siphon CDSs out of the system, and nobody really knows how to

# Past banking system cases and lessons...

- Japan: Badly-executed rescue of fundamentally insolvent banks that ultimately backfired
- Finland and Sweden: A rescue that mostly worked
- Moral hazard problems
  - Dilemma of how to treat insolvent institutions where the systemic risks are high (e.g. Lehman Brothers)
  - In the ongoing moment of a crisis it is often not possible to be a purist about moral hazard
  - How to minimise the risks to governments...but the costs of doing so (e.g. government ownership of safer interest-bearing preference shares or riskier ordinary shares)
  - How to time actions, such as when to relinquish government-held stakes

# Likely costs and losses

- On the one hand losses are being exaggerated
  - Future losses became overstated because of illiquidity and uncertainty, and mark-to-market issues
- However, as the economy deteriorates
  - Real losses start to materialize
  - Hard to work out counterfactual scenarios of crisis/non-crisis
  - Winners and losers on each side of a contract
  - Collateral value of assets that are losing their value cause credit squeeze
- May be overshooting
  - Switch to excessive risk aversion
  - House price falls overshoot for momentum/sentiment/credit market reasons

# Likely costs and losses

- Taxpayer costs are a function of success or failure of 'rescue' packages
  - The degree to which loan losses will destroy the capital provided by the government
  - Whether overpayment for toxic instruments
  - How much interest on preference shares and fees on guarantees the government will pick up
  - Impact of more expensive borrowing costs on consumers and companies
  - Impact of the severity of economic recession, etc.
  - Impact of rescue packages on sovereign risk and hence knock-on impact to, e.g., government terms for raising finance
  - Timing and nature of exit strategies

# Mark-to-market losses on selected financial assets (FSR October 2008, BoE calculation, this and following tables)<sup>(a)(b)</sup>

	Outstanding amounts	Losses: Apr. 2008 Report	Losses: Oct. 2008 Report
<hr/>			
United Kingdom (£ billions)			
Prime residential mortgage-backed securities	193	8.2	17.4
Non-conforming residential mortgage-backed securities	39	2.2	7.7
Commercial mortgage-backed securities	33	3.1	4.4
Investment-grade corporate bonds	450	46.2	86.5
High-yield corporate bonds	15	3.0	6.6
<b>Total</b>		<b>62.7</b>	<b>122.6</b>

(a) Estimated loss of market value since January 2007, except for US collateralised loan obligations which are losses since May 2007

(b) Data to close of business on 20 October 2008

# Mark-to-market losses on selected financial assets

## United States (US\$ billions)

Home equity loan asset-backed securities (ABS) <sup>(c)</sup>	757	255.0	309.9
Home equity loan ABS collateralised debt obligations (CDOs) <sup>(c)(d)</sup>	421	236.0	277.0
Commercial mortgage-backed securities	700	79.8	97.2
Collateralised loan obligations	340	12.2	46.2
Investment-grade corporate bonds	3,308	79.7	600.1
High-yield corporate bonds	692	76.0	246.8
<b>Total</b>		<b>738.8</b>	<b>1,577.3</b>

(c) 2005 H1 to 2007 H2 vintages. The home equity loan asset class is comprised mainly of US sub-prime mortgages, but it also includes, for example, other mortgages with high loan to value ratios. Home equity loans are of lower credit quality than US Alt-A and prime residential mortgages

(d) High-grade and mezzanine ABS CDOs, excluding CDO-squareds

# Mark-to-market losses on selected financial assets

Euro area (€ billions)

Residential mortgage-backed securities <sup>(e)</sup>	387	21.5	38.9
Commercial mortgage-backed securities <sup>(e)</sup>	34	2.8	4.1
Collateralised loan obligations	103	6.8	22.8
Investment-grade corporate bonds	5,324	283.8	642.9
High-yield corporate bonds	175	29.1	75.9
<b>Total</b>		<b>344.1</b>	<b>784.6</b>

(e) Germany, Ireland, Italy, Netherlands, Portugal and Spain

# Total losses

- Estimated mark-to-market losses more than doubled between FSR April 2008 and October 2008
- Total: US\$2.8 trillion



# Features of property market in a crisis

- Particular features of the property market impact on the crisis
- Difficulty in arbitraging the market
- Nature of debt as a funding instrument
- Housing as consumption as well as an asset
- The degree of overvaluation to start with (Moody's, BIS, IMF) and how this aggravate financial collapse
  - UK could have correction at least as strong as US even without their subprime component mainly because of extent of UK mispricing
- Risk of price falls in both cases (financial institutions and housing markets) deters investors

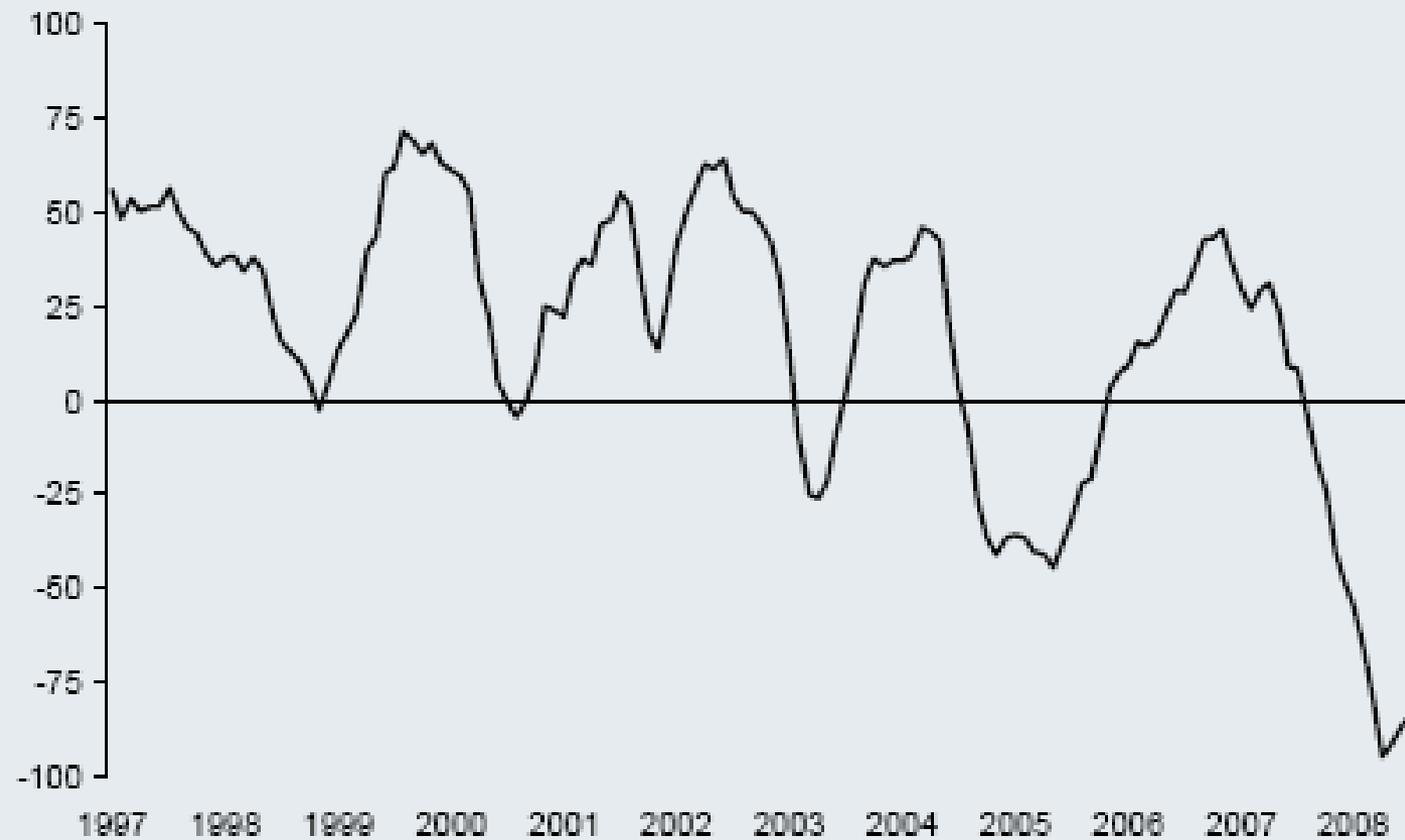
# Features of property market in a crisis

- The impact on different sectors of society (households and BTL) of the jump to higher effective mortgage rates after teaser mortgage rates revert to long-term rates with this compounded too by credit tightening
- Dynamics of real estate = considerable inertia in prices... not clear as quickly as other asset markets
- Worst credits granted just before the peak
- Distributional issue across society = nonlinear responses
- Record low levels of housing market transactions and mortgage approvals, inventory overhang, etc.

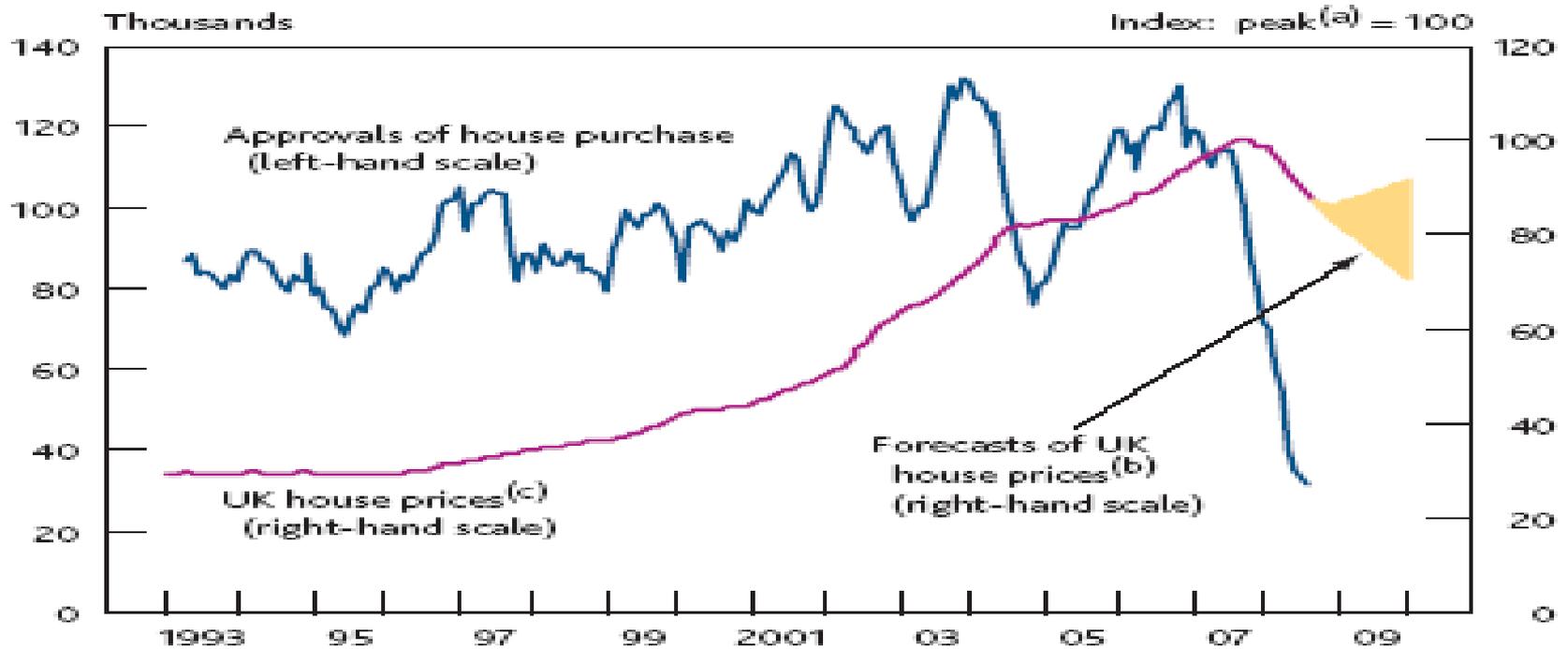
# UK house prices

## Price changes in England and Wales

% balance of surveyors



# UK house prices



Sources: Bank of England, Halifax, HM Treasury, Nationwide and Bank calculations.

- (a) October 2007.
- (b) House price projections are based on a range of forecasts from 'Forecasts for the UK economy: a comparison of independent forecasts', October 2008 (compiled by HM Treasury), as represented by the orange shaded area.
- (c) Average of Halifax and Nationwide house price indices.

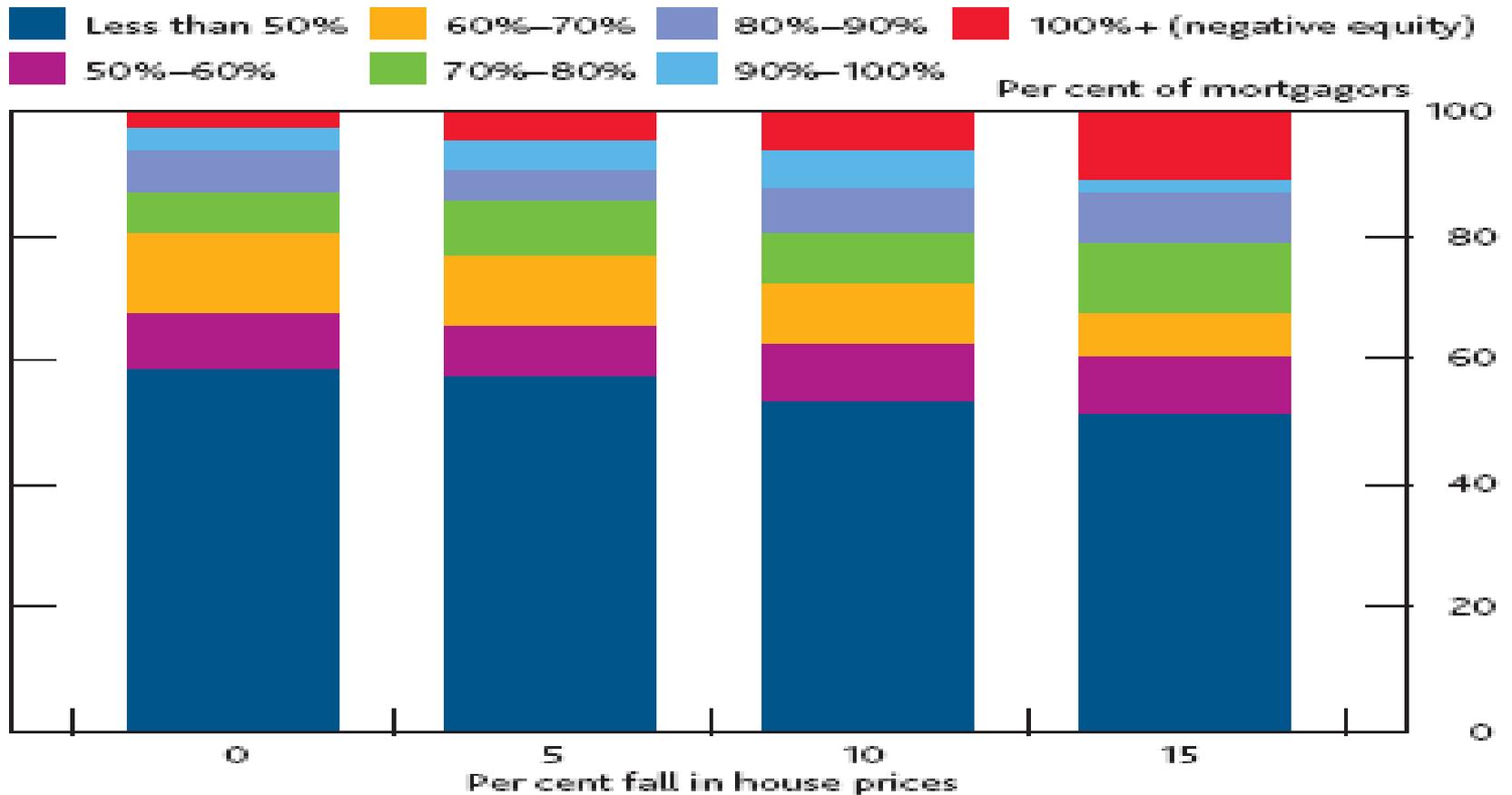
## Property market: A few thoughts on BTL

- Except in regional concentrations and a major downturn, current evidence seems to suggest impact of the BTL sector is not as important as sometimes suggested
- However, financial structure of term liabilities funded by revolving short-term rental contracts
- Concentration of portfolios and potential correlations of losses
- Given the distribution of loans to value (LTV), if prices fall much further, ratings migration on a variety of mortgage segments, not just BTL, will eventually pass a tipping point
- BTL bunched around 80% LTV, so vulnerable if 20%-30% price falls

# Property market, BTL

- Tipping point when much higher percent BTL in negative equity
- Investors facing a liquidity squeeze similar to banks before them
- Downward power of forced sales on prices?
- Risk of overshooting based on excessive risk aversion, momentum and credit market problems?
- Implications for bank rescue packages too
- As argued by author in 2005, nominal prices can fall quickly – as much already as over 4 years in the previous downturn

# Price fall scenarios: LTV

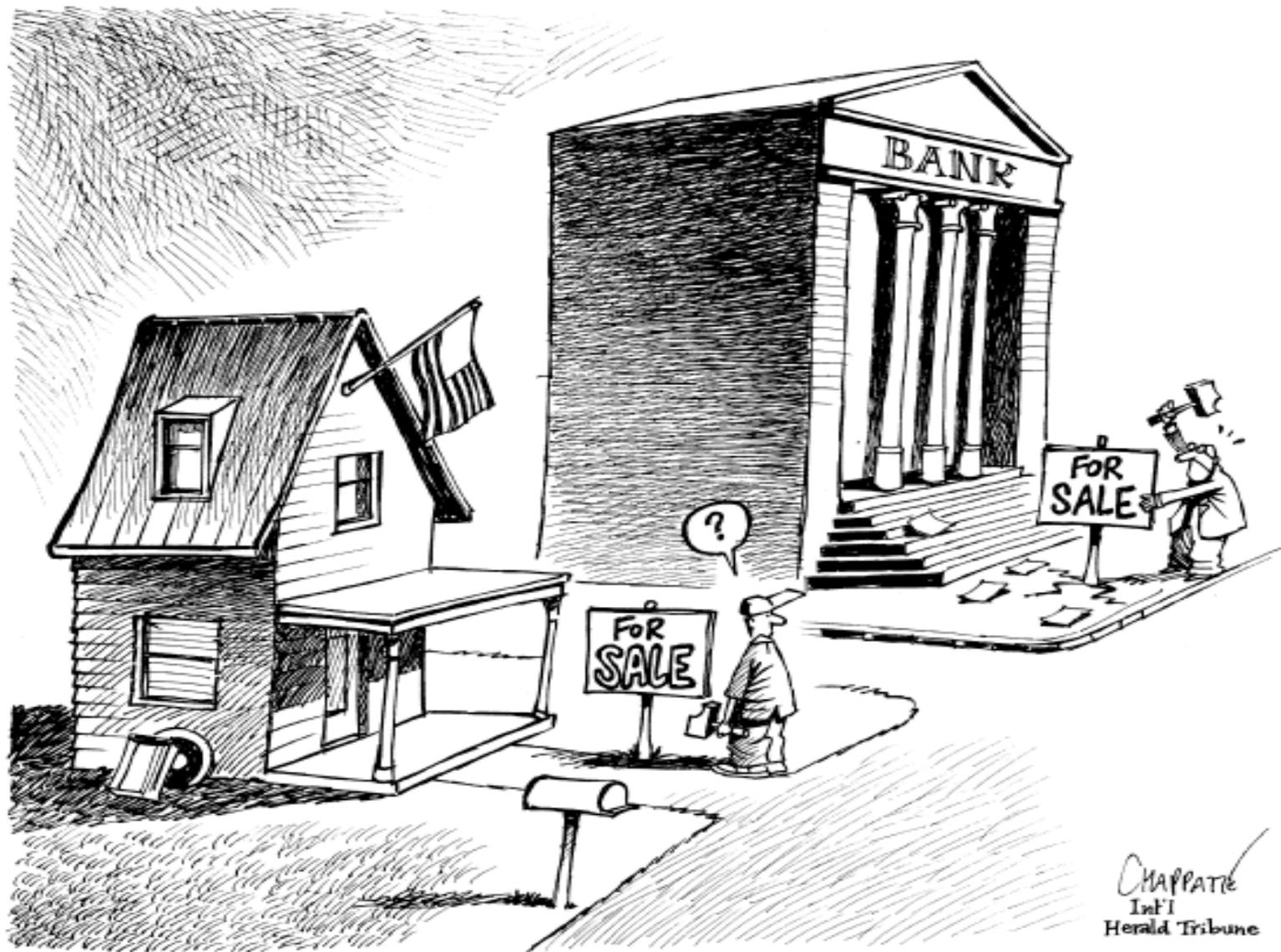


Sources: 2008 NMG Research survey and Bank calculations.

(a) NMG Research survey conducted between 19 September and 2 October 2008.

# Housing and consumption

- Consumption explains the lion's share of growth in the US and UK
- If house prices got seriously overvalued and risk premia excessively low, the effects of deleveraging and the collapse in house prices will feed through to household consumption and saving decisions, growth, unemployment and so forth
- Winners and losers in both financial sector and housing markets: Part of the real economy impact depends on distributional issues at play in the build-up and collapse



CHAPPATTE  
Ink!  
Herald Tribune

## Incentives to enact reform

- “[T]here is a developing consensus on what is to be done to make the financial system less vulnerable to crisis. The bad news is that it is largely the same consensus we reach after every crisis, ultimately to little effect: more disclosure, more regulation and reform of bankers’ compensation. These are generally desirable, and where there is a will there is a way. There lies the problem. Financial supervisors had the wherewithal to do something about the party in the financial sector that was played out in full view of everyone between 2003 and 2006 but they did not have the will to do it.”

Charles Goodhart and Avinash Persaud ‘A party pooper’s guide to financial stability’, Financial Times  
June 4 2008

WORLD  
ECONOMIC  
FORUM

WORLD  
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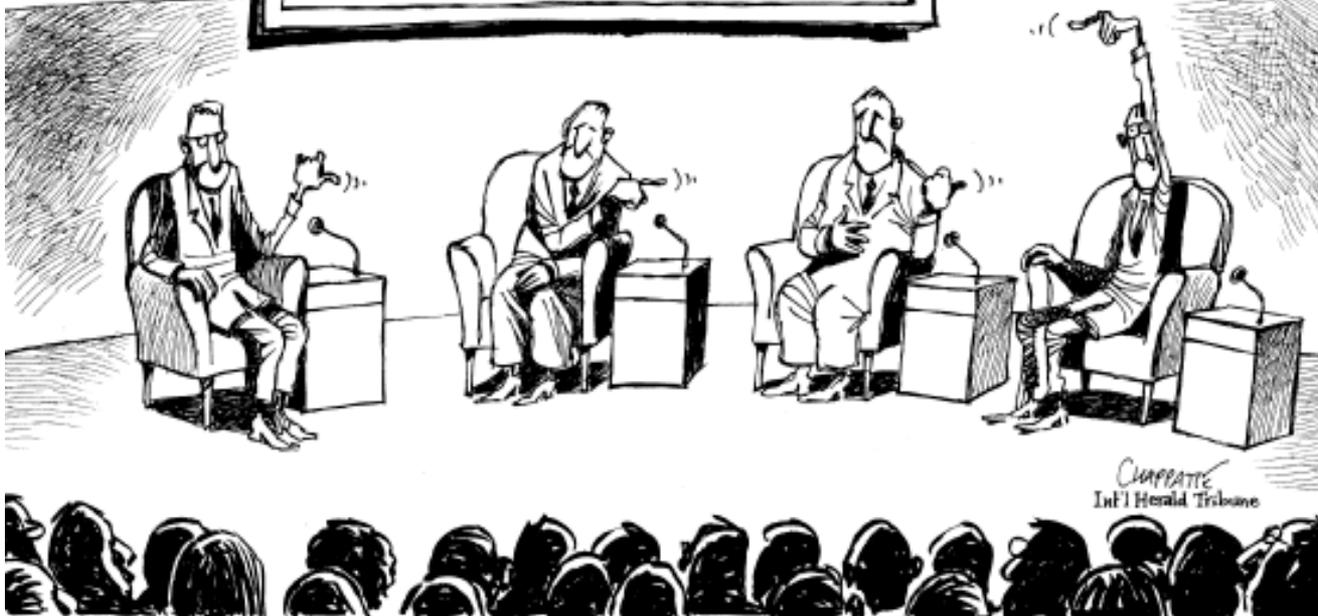
# Who's To Blame For The Economic Mess?

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ECONOMIC  
FORUM



# Three areas for reform and policy change

- Accounting, disclosures, and risk management systems (including remuneration based on performance of these)
- The architecture of prudential regulation
- Monetary policy

# Credit Rating systems

## CGFS Papers

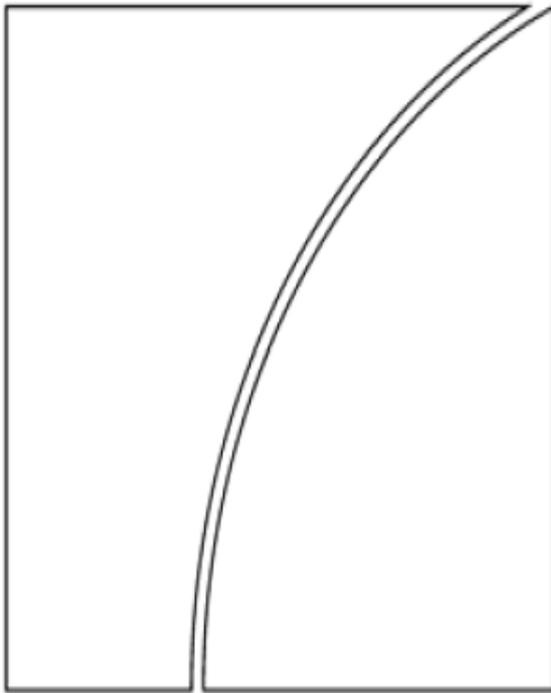
No 32

Ratings in structured finance:  
what went wrong and what can be  
done to address shortcomings?

Report submitted by a Study Group established by the Committee  
on the Global Financial System

This Study Group was chaired by Nigel Jenkinson of the Bank of  
England

July 2008



# Problems with credit ratings of credit structured products

- Market-value oriented accounting standards and capital adequacy rules interacted in a self-defeating way
  - Spirals of forced sales at the heart of this crisis
- Higher credit ratings reduce capital needs (and converse)
- CRAs failed to spot deterioration in underwriting standards that led to underestimate of level and correlation of defaults in subprime mortgages in pools of RMBS and SF products backed by them
- Impact of subsequent losses amplified by way RMBS got securitized and obscured risks
- In CRA's economic forecasts, pooling reduced idiosyncratic risk but increased exposure to systematic risk

# Problems with credit ratings of credit structured products

- 1) Risk profile very different from traditional corporate securities
  - Risk management and stress testing systems need updating to account for the differences in risk characteristics between structured finance and traditional corporate securities
  - Typically, higher tail risk, so can be very misleading for investors to extrapolate credit risk profile of these securities from such ratings
  - Corporate debt ratings depend heavily on analyst judgment but have a long historical record
  - Corporate debt ratings separate out firm's long-run condition and competitiveness from the business cycle
  - RMBS credit ratings depend on ability of CRA to predict level of losses under different economic scenarios. But, historical data on US subprime confined to benign economic environment
    - No past price collapses, structural breaks in the data, underestimation of the originator risk factor
    - Underestimated severity of housing market downturn
  - Assumption of geographical diversification was not correct
  - Going to Mars but confusing metric with Imperial?

# Problems with credit ratings of credit structured products

- 2) Payoffs are non-linear
  - Steady good returns in good times. Big losses in bad times
  - Hence, very sensitive to asset prices and incomes, but this is not picked up by investors in the variation in good times
  - Asymmetric and subject to threshold effects
- 3) Modeling future default and risk profile of such instruments faces considerable uncertainty
  - Limitations of current models and difficulty in estimating key model parameters with any degree of confidence
  - Poor economic forecasting especially relating to macroeconomic and sectoral developments
  - Where there are no liquid markets, mark-to-market point estimates are subject to a high degree of uncertainty
- 1,2,3 together lulled in to false sense of security. Too much reliance on these ratings as indicators of risk

# CRA and the bigger picture

- CRAs faced conflict of interest
  - CRAs were rating bundles and valuing bundles for a fee and making profits... and competing with each other for business
- Combined with incentive structure and competitive pressures of banking system that emphasized size of business share over concerns about risks
  - Role of banking compensation schemes that did not link compensation to ex ante risk measures, limited the downside risk but rewarded heavily on the upside, and had too heavy a reliance on front-loaded payments making it impossible to claw payments back later when things went wrong
- In the crisis, loss of trust in ratings system exacerbated matters
- In crisis, resort to mark-to-model... led to more uncertainty around value of instruments



# Prudential system changes on the way

- Pro-cyclicality of Basel II: Rating downgrades in downswings may lead to increases in minimal capital requirements
- How to adjust ratings for the cycle (so as to bring about a greater capital cushion in booms when the risk is actually rising)? Maybe by requiring stress testing of capital position? FSA working on a system?
- Basel II will introduce capital charges for off balance sheet exposures with maturity of less than one year
- Basel II improves cross-sectional dimension of risk, still needs much more attention to the time dimension
- There will be capital charges for operational risk (interest rate risk in the banking book, liquidity risk, concentration risk, etc.)

# Prudential system changes on the way

- How to incorporate (market and funding) liquidity risk into 'liquidity rules' to complement the capital adequacy rules?
- How to get proper systemic risk thinking in to models?
- How to properly stress-test the system in 'good times'?
- Need improved disclosure
  - Current system: Reluctance of some banks to seek more capital if it signals a problem to the market
- Limit financial imbalances in first place
- Role for new institutions such as clearing houses for CDSs?

# Monetary policy

## Interest rates: price and financial stability?

- Periods of stability lead to asset price bubbles
  - 2007-08 subprime mortgages
  - 1997-98 Asia
  - 1990s Japan
  - 1929 US
- Credible anti-inflation regimes may contribute to a build-up of financial imbalances – a new dimension to the time inconsistency problem?
  - “Time inconsistency”, sequence of apparently optimal responses given conditions at the time, may not be optimal if taken as a whole
- Buoyant growth and strong asset prices might actually mask risks being taken
- Low interest rates kept the debt servicing ratios down even as levels of debt rose
- Asset prices (e.g. house prices) a form of inflation?

# Monetary policy

## Interest rates: price and financial stability?

- Should central banks take asset prices into consideration in monetary policy frameworks? If so, how? “Response option” tightening even if near-term inflation is under control?
- Challenges in using interest rates to control bubbles
- What is the link between liquidity and monetary policy in a system no longer dominated by traditional deposit-taking banks?
- Evidence for the ‘Greenspan put’ in build-up to the recent crisis?
- Don’t overplay this hand, given the many other failings in regulation and oversight and the forces that played out in the build-up to the current crisis that were not per se monetary policy phenomenon
- The build-up of government financial imbalances and the general lack of financial preparedness
- Recent controversies about inflation forecasting errors and their policy implications
- Recent events have much to tell us about fiscal policy too, and the importance for fiscal policy and monetary policy working together

# Some long term issues...bank panics and reform

- How to make rescue situations less panicky
  - Rules versus discretion: “The rule book for interventions designed to address liquidity gridlock in markets has yet to be written” (BIS, 2008, WP 251, p20)
  - What might ‘crisis’ rules look like? Astonishingly, this seemed to be somewhat ad hoc in the early days of the recent crisis
  - Reform will involve clinging on to those parts of the rescue that worked and jettisoning those that did not
- How far should regulatory reform go?
  - Regulations can be got around and create perverse incentives too
  - Don’t mix up the idiosyncratic (the subprime epicenter of the crisis) with the more generic heart of the problem (aggressive risk taking under poor incentive structures)
  - Tradeoff between killing all risk-taking (which is good for growth and long-term welfare) and letting it run to excess

# Some long term issues...the bigger economic picture

- Will prevention of a global depression ultimately lead to high inflation and fiscal debt burdens and negative effects on long-term growth in some countries?
- Do current bail outs increase the probability of future boom-bust cycles?
- Has the nature of boom-bust simply morphed? The phase of morphing seemed so benign at the time?
- Countries that did not have housing and credit bubbles got dragged in anyway. Policy implications?
- UK one of the countries to be hit hardest
- UK at the epicenter of the morphing process? A bit ironic given all the talk about “an end to boom and bust”?

# THANK YOU

Feedback always most welcome  
[andrew.farlow@economics.ox.ac.uk](mailto:andrew.farlow@economics.ox.ac.uk)