BANK FOR INTERNATIONAL SETTLEMENTS

Policy Response to the Crisis: Issues and Continuing Challenges

Presentation for
SEACEN-CeMCoA/BOJ Directors of Research Seminar on
Macro-Financial Links and Monetary Policy Management
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The views expressed in this presentation are those of the author and do not necessarily reflect the position of the Bank for International Settlements.

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Introduction

- Crisis: macroprudential interpretation
- Key channels of transmission of the global crisis, a financial shock followed by a macroeconomic shock. Impact and recovery.
- How did policymakers respond to the different ways the crisis was transmitted?
  - (1) interest rate responses; (2) responses to ensure liquidity and the flow of financing; (3) Effectiveness and implications for monetary policy transmission
- Some policy issues:
  - Policy assignment during crisis in which financial and macroeconomic stability at risk.: What role for interest rate policy? What role for other policies?
  - Medium-term: (1) Should interest rate policy address financial stability concerns; (2) What role for prudential or other policies?

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Crisis: macroprudential interpretation

- Two dimensions of risk (Claudio Borio (2009), Vox)
- "Time dimension": how aggregate risk evolves over time
- "Cross-sectional": how risk is distributed in the financial system at a given point in time

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Time dimension of aggregate risk

- System-wide risk can be amplified by interactions within the financial system and between the financial system and the real economy. Actions that are rational for individual economic agents can be undesirable on the aggregate, destabilising the whole system.
- Procyclicality (e.g., Crockett 2000, Borio et al 2001, BIS 2001, Brunnermeier et al 2009) in the financial system reflects feedback effects and the endogenous nature of aggregate risk.
- Expansions: Declining risk perceptions, rising risk tolerance, weakening financing constraints, rising leverage, higher market liquidity, booming asset prices, and growing expenditures mutually reinforce each other, potentially leading to the overextension of balance sheets. Contractions: Reverse process, amplifying financial distress.

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Cross-sectional dimension

- Common (correlated) exposures across financial institutions that imply that institutions can fail together
- Two reasons for common exposures by financial institutions
  - Directly exposed to the same or similar asset classes or
  - Indirect exposures associated with linkages among them (e.g. counterparty relationships in interbank markets).

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Macroprudential interpretation of crisis

- Time dimension: Boom in property prices and in credit, notably for subprime mortgages, and outside the regulated financial sector. Once creditors refused to invest in subprime debt, quality of assets of banks holding this debt or other collateralised obligations came into question.
- Cross-section dimension: once bank assets came into question, other banks refused to lend to them. Banks in response also began to hoard liquid assets. Net outcome, liquidity drains from interbank markets.
- As discussed below, the “cross-section” or interbank network extends into emerging markets as well; bank financing to emerging markets also declined sharply.

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Tighter financing conditions: capital inflow reversal

Cross-border lending[1]

In billions of US dollars

	2008			2009	
	2Q	3Q	4Q	1Q	2Q
Emerging market economies					
External loans	101.5	45.5	–203.7	–100.0	–10.6
To banks	38.1	18.9	–178.3	–94.8	–0.7
To non-bank private sector	63.4	26.6	–25.4	–5.2	–9.9
Emerging Asia[2]					
External loans	69.0	9.6	–193.5	–114.5	21.6
To banks	51.7	9.0	–168.4	–102.2	16.4
To non-bank private sector	17.3	0.6	–25.1	–12.3	5.2

[1] External loans of BIS reporting banks, estimated exchange rate adjusted changes. [2] Brunei, Cambodia, China, Fiji, Hong Kong SAR, India, Indonesia, Korea, Malaysia, Mongolia, Myanmar, Nepal, Papua New Guinea, the Philippines, Singapore, Sri Lanka, Taiwan, Thailand and Vietnam.

Source: BIS locational banking statistics by residence.

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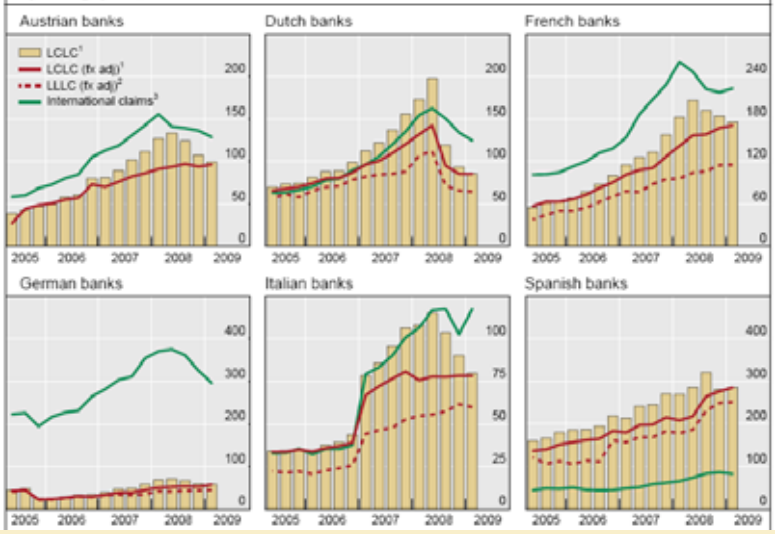
Claims on emerging markets

By banking system, in billions of US dollars



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Claims on emerging markets

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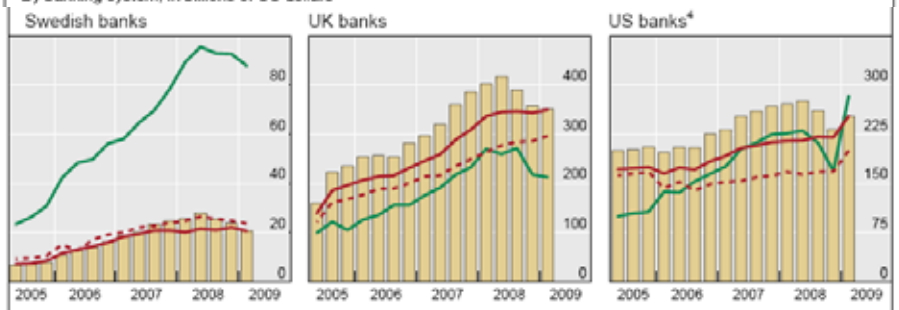

[1] Local claims in local currency, or local currency claims extended by banks' foreign offices to residents of the host country. The bars show reported claims whereas the solid red line tracks claims expressed at constant Q1 2009 exchange rates. [2] Local liabilities in local currency, adjusted for exchange rate movements. [3] International claims comprise cross-border claims in all currencies and local claims in foreign currencies extended by banks' foreign offices to residents of the host country; these claims are not adjusted for exchange rate movements, since no currency breakdown is available. [4] See footnotes 4 and 10 in the main text.

Source: BIS consolidated statistics (immediate borrower basis). Graph 4

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Increased short-term dollar financing costs

- Because of higher perceived counterparty risks, banks refuse to lend dollars to each other in interbank markets
- Scarcity of dollars in cash markets spills over to foreign exchange swap markets as banks turn to these markets to obtain dollars
- Often, these would be banks outside the US which need dollar financing
- Implied interest rate cost of obtaining dollars in foreign exchange swap markets rises sharply

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The FX swap-implied dollar rate from the euro in gross terms can be written as

$$\frac{F_{t,t+s}}{S_t}\left(1+r_{t,t+s}^{EUR}\right)$$

S_t FX spot rate between the euro and dollar at time *t*,

$F_{t,t+s}$ FX forward rate contracted at time *t* for exchange at time *t+s*,

$r_{t,t+s}^{EUR}$ is the uncollateralised euro cash fixed interest rate from time *t* to time *t+s*. corresponds to the euro/dollar forward discount rate that is used for the FX swap price quotation.

$F_{t,t+s}/S_t$ euro/dollar forward discount rate used for the FX swap price quotation

$$1+r_{t,t+s}^{USD}=\frac{F_{t,t+s}}{S_t}\left(1+r_{t,t+s}^{EUR}\right)$$

Indifference (CIP)

$r_{t,t+s}^{USD}$ uncollateralised dollar cash fixed interest rate

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Higher costs of short-term financing in foreign currency[1]

In basis points

[1] Spreads of implied US dollar rate over OIS rate (except as noted); implied rates calculated using forward, spot exchange rates (against US dollar) and local interbank market rates. [2] 3-month US Libor minus OIS spreads.

Sources: Bloomberg, Datastream, JPMorgan, BIS calculations.

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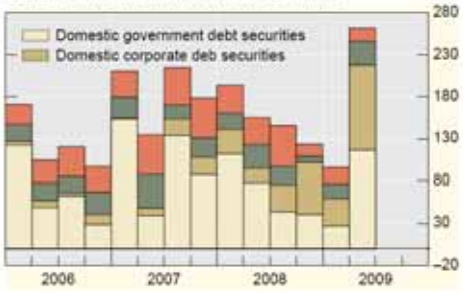
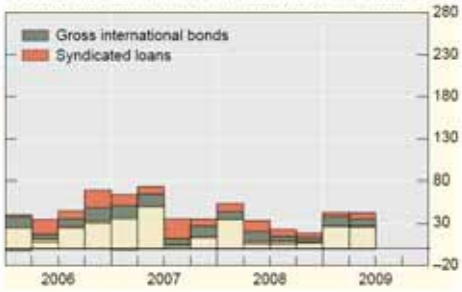
Developments in the bond markets

Issuance in Asia[1], in billions of US dollars



Issuance in Latin America[2], in billions of US dollars



The shaded area indicates the month of September 2008.

[1] China, Chinese Taipei, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. [2] Argentina, Brazil, Chile, Colombia, Mexico and Peru.

Sources: CEIC; Datastream; JPMorgan Chase; BIS.

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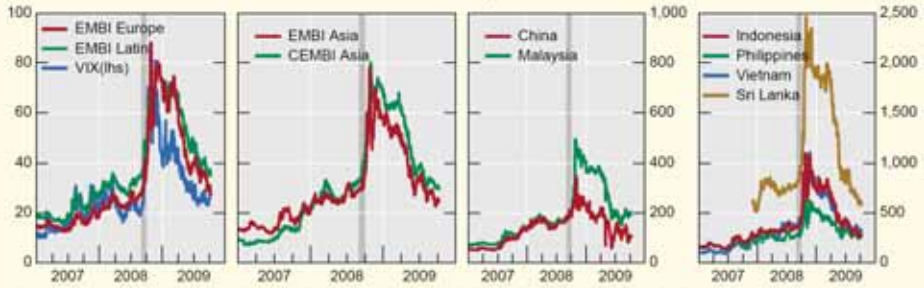
Sovereign and corporate spreads for international bonds

In basis points



The shaded area marks the month of September. Lehman Brothers bankrupted on 15 September 2008.

Sources: Datastream; JPMorgan Chase.

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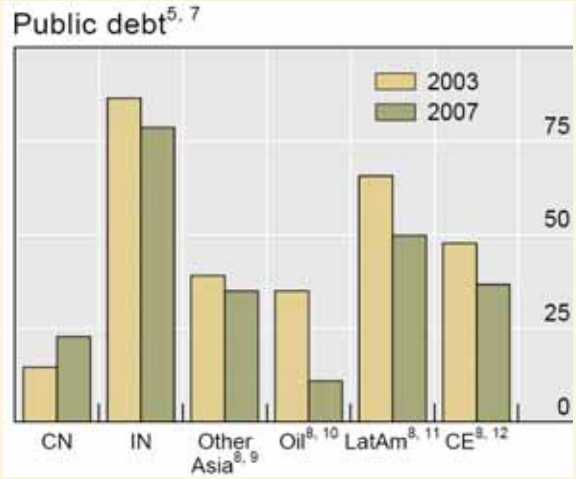

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Amounts outstanding of international debt securities – developing countries

In billions of US dollars

	End-2000		End-2006		End-2007		Sep-2008	
	Govt	Corp	Govt	Corp	Govt	Corp	Govt	Corp
Developing Countries	365	223	455	542	482	702	481	753
Russia	37	1	32	61	29	102	28	117
Korea	5	44	8	89	7	103	4	111
Brazil	58	30	54	57	55	65	52	69
United Arab Emirates	0	0	1	31	2	50	4	61
Mexico	61	33	43	49	42	54	40	53
India	0	4	0	21	0	38	0	40
China	5	12	6	24	6	33	6	39
Kazakhstan	1	0	0	19	0	30	0	34
Malaysia	3	13	4	28	4	29	4	30

Countries are ranked by outstanding corporate bonds in September 2008.

Source: BIS International Financial Statistics.

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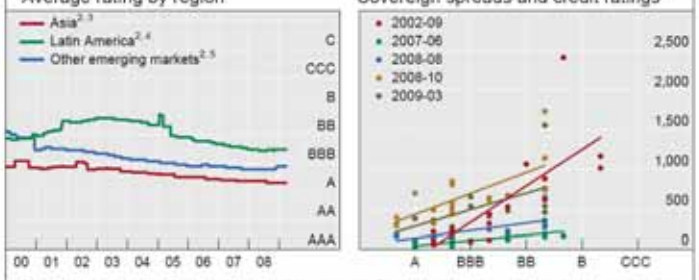
Sovereign spreads, credit ratings, 2000-08



[1] S&P foreign currency long-term debt ratings. [2] Simple average of the economies in the group. [3] China, Chinese Taipei, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. [4] Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela [5] The Czech Republic, Hungary, Poland, Russia, South Africa and Turkey. [6] Horizontal axis: S&P foreign currency long-term debt ratings at the end of the period. Vertical axis: JPMorgan EMBI Global (EMBIG) sovereign spreads over US Treasury yields. For Korea and Thailand CMA 5-year CDS spreads. The countries shown are Brazil, Chile, China, Colombia, Hungary, Indonesia, Korea, Malaysia, Mexico, Peru, Philippines, Poland, Russia, South Africa, Thailand and Turkey.

Sources: JPMorgan; Standard and Poor's; Thomson Reuters; national data. Graph V.8

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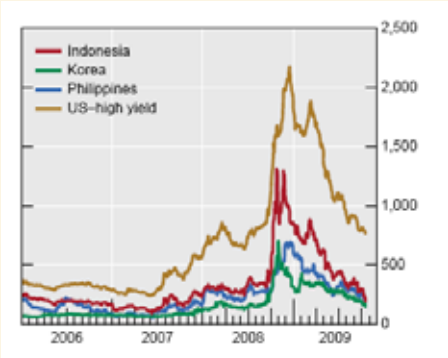
Sovereign spreads versus high yield spreads



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Exchange rates[1]

15 September 2008 = 100.

[1] Against the US dollar; a rise indicates depreciation.

Sources: Bloomberg; Datastream; national data.

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Explaining differences in exchange rate responses

- Liquidation of domestic currency liquidity to meet increased demand for US dollars (i) demand for dollar liquidity to service external debts, or by parents of foreign banks; (ii) unwinding of carry trades; (iii) contracts that increase demand for US dollars (eg derivatives)
- Authorities willingness to tolerate exchange rate volatility during a crisis
- Availability of foreign currency within the financial system (foreign reserves, public and private holdings of foreign assets) to meet the demand for US dollars

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Local currency markets

- Reductions in liquidity
- Volatility in domestic bond markets

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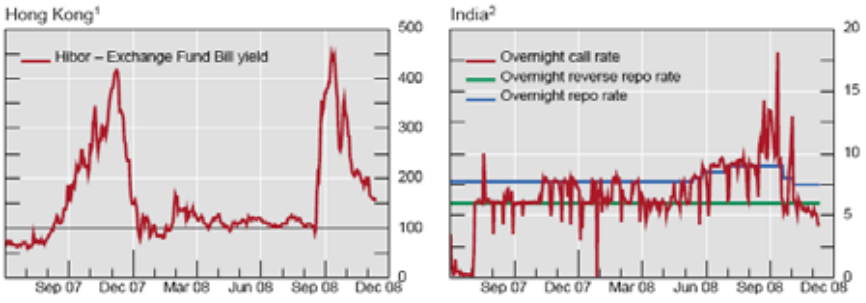
Strains in Hong Kong and Indian money markets



[1] 3-month maturity; in basis points. [2] In per cent. Repo and reverse repo rates form the Liquidity Adjustment Facility corridor.

Source: Datastream.

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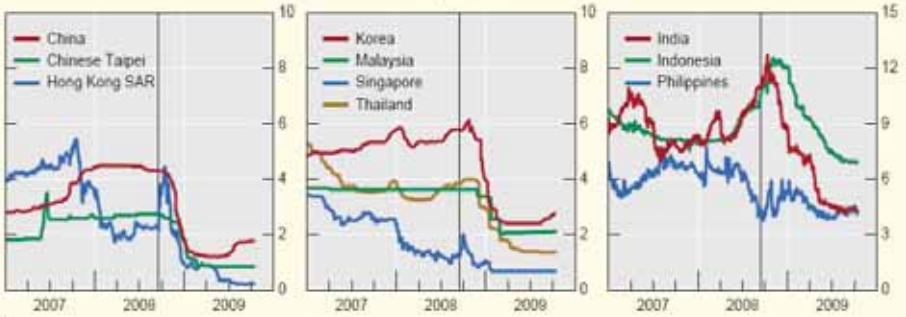
3-month interbank rates[1]

In per cent



[1] China, Shanghai interbank rate; for Chinese Taipei, Taiwan NTD money market rate; for Hong Kong SAR, the Hong Kong interbank rates; for India, Mumbai interbank rate; for Indonesia, Jakarta interbank offered rate; for Korea, Korea interbank offered rate; for Malaysia, the Kuala Lumpur interbank offered rate; for the Philippines, interbank offered rate; for Singapore, Singapore interbank rate; for Thailand, Bangkok interbank offered rates

Sources: Bloomberg; Datastream.

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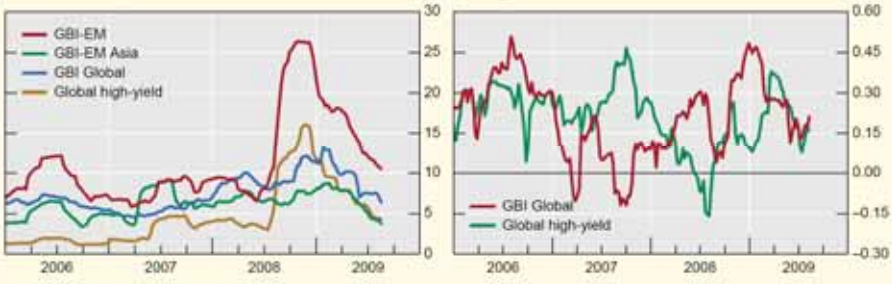
Correlations and volatility of returns

Based on unhedged daily returns in US dollar terms; weekly average

Rolling volatility[1]

Rolling correlations[2]



Note: GBI = Government bond index.

[1] Standard deviation of daily percentage changes over a centred 90-day moving window, annualized. [2] Correlations with GBI-EM Asia (Emerging market local currency government bond index, in US dollar terms) over a centred 90-day moving window.

Sources: Datastream; JPMorgan Chase.

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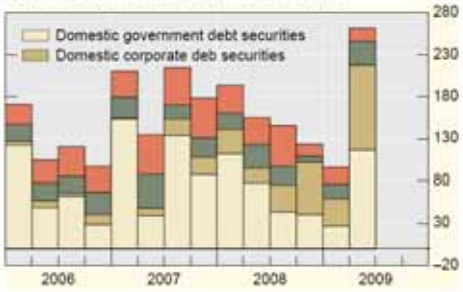
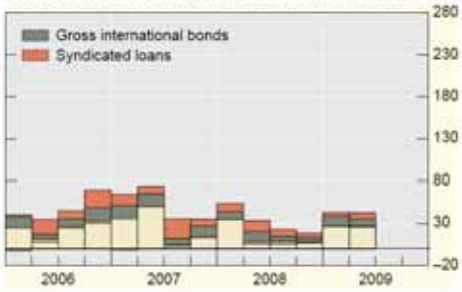
Developments in the bond markets

Issuance in Asia[1], in billions of US dollars



Issuance in Latin America[2], in billions of US dollars



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Sources: CEIC; Datastream; JPMorgan Chase; BIS.

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Equity prices[1]

January 2006-October 2009

1. In local currency.

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Crisis experiences

- Perceptions of counterparty risk disrupted liquidity in emerging foreign exchange markets (new).
- Rising sovereign spreads and interruptions in international debt financing affected most EMEs. However effect moderated by improved fiscal positions, reduced sovereign external borrowing and higher sovereign ratings.
- Exchange rate depreciation and volatility raised concerns but these generally appeared to be less severe than in past crises
- In Asia, domestic debt markets appeared to be more stable than US high yield or international debt markets. Perhaps a “spare tyre” (more mixed in Latin America).

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During crisis and recovery foreign factors played the main role in driving asset price behaviour in EMEs

- Counterparty risk perceptions: prompted withdrawal of cross bank financing from EMEs and raised the cost of short-term foreign currency financing. Perceived counterparty risk will influence recovery in such financing
- Pattern of Vix recovery (a measure of risk aversion) associated with fluctuations in cost of financing in EMEs:
  - International bonds. Vix and rise in sovereign spreads (Graph); cycles in domestic bonds and equity prices also appear to be related to global investor risk aversion.
  - Cost of funding (and risk aversion itself) it was argued was influenced by developed country policy responses, notably Fed swap facilities supplying dollars

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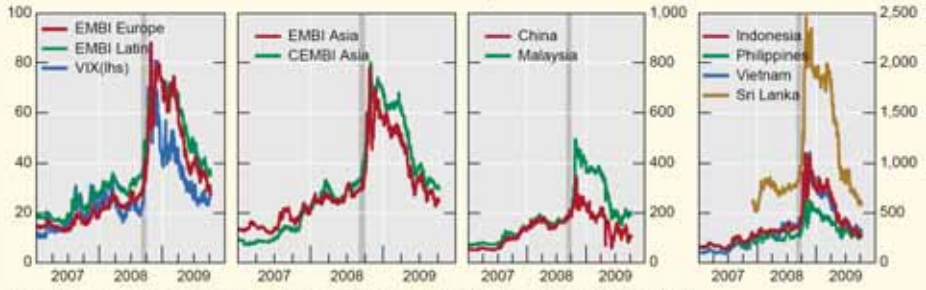
Sovereign and corporate spreads for international bonds

In basis points



The shaded area marks the month of September. Lehman Brothers bankrupted on 15 September 2008.

Sources: Datastream; JPMorgan Chase.

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Foreign influences on domestic rates in normal times

- Question: to what extent do interest rate movements in small open economies reflect the influence of foreign rates?
- Do the exchange rate regime and financial depth or integration matter?

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"Impossible trinity" or policy trilemma

- Capital mobility and exchange rate regime should matter
- A country can choose only two out of the following three policy options:
  - An open capital account,
  - The ability to peg or stabilise the exchange rate, or
  - The ability to set a policy interest rate to achieve domestic monetary policy objectives ("monetary policy independence" from external factors).

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Moreno and Saxena (2009)

- Studies the transmission of interest rate shocks in a set of small open economies before the crisis
- Examines indicators of (i) exchange rate flexibility and intervention; (ii) bond market depth and financial integration relevant for "impossible trinity".
- Estimate vector error correction models for each economy to characterise relationship (1) domestic and foreign policy rates (typically overnight) and (2) rates at medium-term (1 year) and longer-term (5 year) maturities.
- Innovation: Can assess how much insulation a floating exchange rate buys a small open economy at somewhat longer maturities.
  - Existing literature focuses only on short-term interest rates
  - Do foreign longer-term rates affect domestic policy rates even if foreign policy rates do not
  - Do foreign rates sometimes anchor domestic medium-term or long-term rates even if domestic policy rates are set independently of foreign policy rates?

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Findings

- In a set of small open economies impossible trinity works in the following sense: foreign interest rates have a much larger impact on domestic interest rate in pegged exchange rate regimes than in floating regimes.
- However, the amount of insulation among countries that float varies considerably and is not obviously related to degree of financial integration or bond market development. *S*ome countries (ie Australia and New Zealand) have a higher degree of insulation from foreign interest rates than others (Israel, Norway, Sweden Switzerland, Mexico, Thailand).

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- Impulse responses for the error-correction models for each country
- Responses of domestic interest rates (row headers) to shocks to foreign and domestic interest rates (column headers). 95% confidence intervals.

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Variance decompositions: Domestic policy rate

- Pegged regimes. Denmark and Hong Kong, the foreign policy rate accounts respectively for 83% and 74% of the variance of the domestic short-term rate (in Hong Kong most of the remainder is explained by the foreign 1 year rate).
- Floating regimes. The contribution of foreign policy rate is not significant in Mexico and Australia. However, other foreign rates have as much of an impact on Australia (over 20%) as in Hong Kong. It is even larger in New Zealand (49%), and Norway (23%), For other floaters (Israel, Korea, South Africa, Sweden and Thailand), foreign rates account for 20% or less of the variance of (the forecast error of) the domestic policy rate.

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Variance of the forecast error

Forecast horizon (weeks)	ForPol	ForMT	DomPol	DomMT
Dom5yr (HK)				
1	0	56	0	44
12	0	81	0	19
24	1	82	0	18
Dom5yr (MX)				
1	1	4	12	83
12	5	17	4	74
24	4	20	6	70
Dom5yr (AUS)				
1	0	54	0	46
12	7	64	0	29
24	8	66	1	25

Notes: Columns may not sum to 100 due to rounding error.
For = Foreign; Dom = Domestic; MT is 1 yr rate for shocks to DomPol or to Dom1yr and 5yr rate for shocks to Dom5yr.

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Variance decompositions

- *At 5 year maturities*, foreign rates once again account for most of the variance of the domestic rate at similar maturities for countries that peg (89% and 82% respectively for Denmark and Hong Kong).
- The contribution is foreign rates to domestic rates in countries that float is smaller, for example in the Table it is only 20% for Mexico. However, in some cases it is quite large, 66% in Australia, 50% or higher in New Zealand, Sweden and Switzerland.

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Monetary independence at longer horizons?

- Short-term policy rates are influenced by foreign policy rates in countries that peg, but not in countries that float.
- However, even in countries that float, innovations in 5-year foreign interest rates sometimes affect the domestic policy rate.
- Innovations in longer-term foreign interest rates have a significant impact on domestic rates at longer maturities in some countries that float;
- A similar impression is conveyed by variance decompositions
- Question: What does openness imply for monetary policy transmission in aftermath of crisis?

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Issues for discussion:

- What are the implications of external influences (risk aversion, foreign interest rates or asset price movements, shocks to liquidity) for balance of payments policies? Is there a case for capital controls? Does the crisis have implications for the design of prudential policies to reduce vulnerability to external financing shocks (eg how much reliance of banks on wholesale or interbank financing, particularly foreign)?
- Sovereign borrowing abroad fell significantly in this decade but in some countries private foreign borrowing was high. Did the crisis reveal risks from private borrowing that need to be addressed?
- To what extent did good pre-crisis policies (eg fiscal consolidation) help contain increases in sovereign spreads? Did good policies enhance access to financing or shorten the period in which markets were closed?
- How much did international bond financing contract? Did domestic bond financing act as an effective substitute?
- Compared to the Asian crisis, how much was exchange rate depreciation a concern? What issues does the rebound in exchange rates pose?

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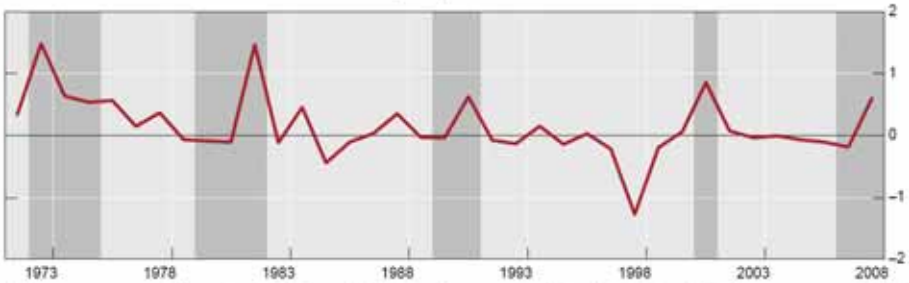
Recoupling

Business cycle phase co-movement[1]



[1] Average co-movement of annual real GDP growth in Asia-Pacific economies with the United States. Shaded areas represent NBER-dated recessions. See Yetman (2009) for details on construction.

Sources: IMF; NBER; BIS calculations.

BIS (Representative Office for Asia and the Pacific), "The international financial crisis: timeline, impact and policy responses in Asia and the Pacific," August 2009

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Impact of decline in global demand

Industrial production, merchandise exports and retail sales

Seasonally adjusted data, 2005 = 100

[1] Simple average of Indonesia, Malaysia, the Philippines and Thailand. In retail sales, Malaysia and the Philippines are excluded.

Sources: Datastream; national data.

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Industrial production, merchandise exports and retail sales

Seasonally adjusted data, 2005 = 100

[1] Cruel petroleum production. [2] Cement production.

Sources: CEIC, Datastream.

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Forecast growth and inflation for 2009

	Real GDP (YoY, in per cent)			CPI (YoY, in per cent)		
	Forecast[1]	Change		Forecast[1]	Change	
		Jun2009 vs Dec2008	Oct2009 vs Jun2009		Jun2009 vs Dec2008	Oct2009 vs Jun2009
China	8.4	–0.3	0.9	–0.6	–2.0	–0.3
Chinese Taipei	–4.0	–5.6	1.5	–0.8	–1.5	0.2
Hong Kong SAR	–3.1	–4.3	1.5	0.4	–1.5	–0.4
India	6.1	–0.5	0.3	8.4	–0.7	2.9
Indonesia	4.4	–0.7	0.7	4.8	–2.2	–0.6
Korea	–0.8	–4.4	2.0	2.8	–0.6	0.3
Malaysia	–2.8	–5.6	0.5	0.6	–2.1	–0.3
Philippines	1.6	–2.5	1.0	3.1	–2.1	–0.5
Singapore	–2.6	–6.4	4.3	0.1	–2.1	0.3
Thailand	–3.5	–6.1	0.3	–0.9	–2.5	–0.2

[1] Consensus forecast (October 2009).

Source: © Consensus Economics.

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Forecast growth and inflation for 2009

	Real GDP (YoY, in per cent)			CPI (YoY, in per cent)		
	Forecast[1]	Change		Forecast[1]	Change	
		2009[2] vs 2008 update[3]	2009 update[1] vs 2009[2]		2009[2] vs 2008 update[3]	2009 update[1] vs 2009[2]
Brunei	–1.2	...	–0.8	1.5	...	0.0
Cambodia	–1.5	–3.5	–4.0	0.8	–8.0	–6.2
Fiji	–1.0	–1.9	–0.5	7.0	–0.1	2.5
Mongolia	2.8	–5.0	–0.2	10.0	–2.5	0.5
Nepal	3.8	–2.0	0.8	12.8	1.5	2.8
Papua New Guinea	4.5	–1.1	0.5	7.0	–0.7	0.0
Sri Lanka	4.0	–1.5	–0.5	5.0	–10.0	–3.0
Vietnam	4.7	–1.5	0.2	6.8	–13.5	2.8

[1] Asian Development Outlook 2009 update published in September 2009. [2] Published in March 2009. [3] Published in September 2008.

Source: Asian Development Outlook.

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Questions on the recovery

- Growth scenarios. Growth led by (i) domestic demand, supported by fiscal stimulus. How sustainable? (ii) US recovery; (iii) Growth in China.
- Risks to inflation outlook? What concerns does the recovery in commodity prices pose?

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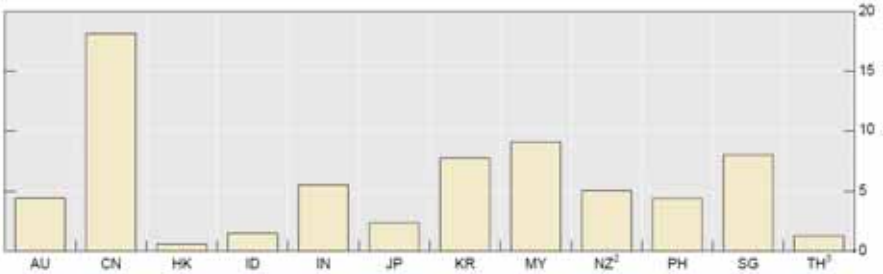
Announced size of fiscal stimulus relative to 2008 GDP[1]

In per cent



For an explanation of the economy abbreviations, see Graph I.3.

[1] Data up to April 2009; some announced stimulus plans may be spread over multiple years. [2] 2007 GDP number used as a denominator. [3] Not including infrastructure spending plans of THB 1.43 trillion over the 2010-12 period.

Source: IMF; Reuters News; UNESCAP.

BIS (Representative Office for Asia and the Pacific), "The international financial crisis: timeline, impact and policy responses in Asia and the Pacific," August 2009

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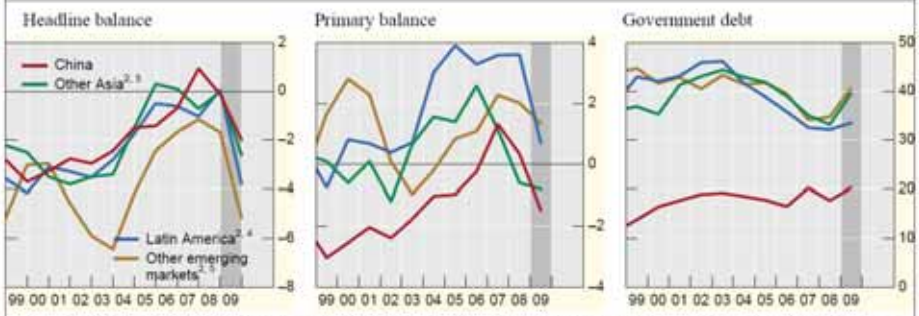
BANK FOR INTERNATIONAL SETTLEMENTS

Public finance develpments[1]



[1] As a percentage of GDP; grey areas represent forecasts. [2] Median of the economies in each group. [3] Chinese Taipei, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. [4] Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. [5] The Czech Republic, Hungary, Poland, Russia, South Africa and Turkey.

Sources: European Commission; IMF; Moody's Investor Service.

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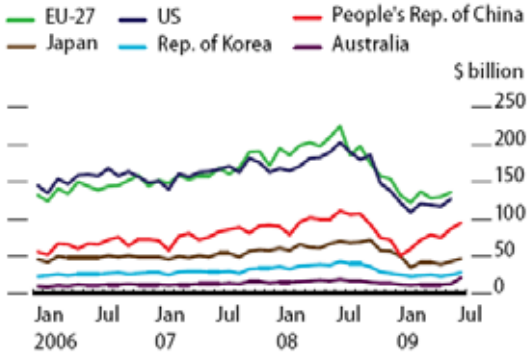
BANK FOR INTERNATIONAL SETTLEMENTS

2.2.20 Global imports



Source: CEIC Data Company Ltd., downloaded 2 September 2009.

Source: Asian Development Bank, Asian Development Outlook Update, 2009

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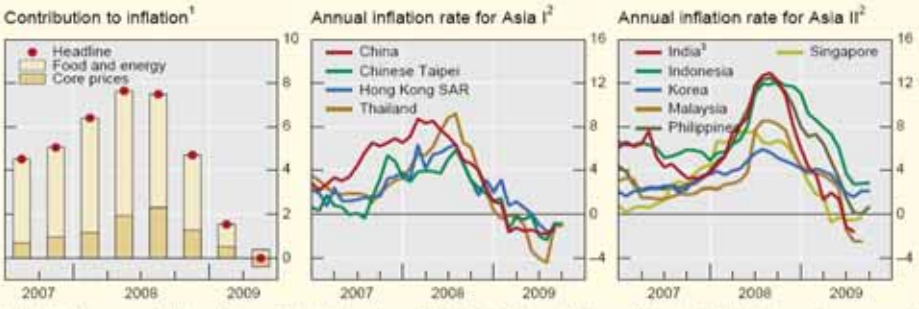
BANK FOR INTERNATIONAL SETTLEMENTS

Asia's inflation



[1] Weighted average of China, Chinese Taipei, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand based on 2005 GDP and PPP exchange rates; in per cent. [2] in per cent. [3] Wholesale prices.

Sources: Bloomberg; CEIC; Datastream; national data.

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BANK FOR INTERNATIONAL SETTLEMENTS

Challenges for monetary authorities (crisis)

- Dilemmas prior to Lehman bankruptcy resolved by crisis; still constraints in some regions (eg still high inflation, concerns about possibly unstable exchange rate expectations)
- How did authorities use interest rate policy and other policies?

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BANK FOR INTERNATIONAL SETTLEMENTS

Policy and short-term rates[1]

	Inflation		Monetary policy rates			Latest effective changes[4]		
	Current[2]	Target 2009	Current	Policy decision in last meeting	Date of last meeting			
Emerging Asia								
China	-1.2		5.31	–	Q2 2009	Dec08 –27	Nov08 –108	Oct08 –27
			(1.59)	…	…	…	…	…
Hong Kong SAR	–1.6		0.50	–	Sep 24	Dec08 –100	Oct08 –50	Oct08 –50
India	–0.1		4.75	–	Jul 28	Apr09 –25	Mar09 –50	Jan09 –100
Indonesia	2.8	3.5 – 5.5	6.50	–	Oct 5	Aug09 –25	Jul09 –25	Jun09 –25
Korea	2.2	2.5 – 3.5	2.00	–	Oct 9	Feb09 –50	Jan09 –50	Dec08 –100
Malaysia	–2.4		2.00	–	Aug 25	Feb09 –50	Jan09 –75	Nov08 –25
Philippines	0.7	2.5 – 4.5	5.00	–	Oct 01	Jul09 –25	May09 –25	Apr09 –25
Singapore	–0.3		0.19	…	…	…	…	…
Chinese Taipei	–0.9		1.25	–	Q3 2009	Feb09 –25	Jan09 –50	Dec08 –75
Thailand	–0.5[3]	0 – 3.5[3]	1.25	–	Oct 21	Apr09 –25	Feb09 –50	Jan09 –75
Memo:								
United States	–0.6		0.00 – 0.25	–	Sep 23	Dec08 –75 to –100	Oct08 –50	Oct08 –50
Euro	–0.3	Below, but close to, 2	1.00	–	Oct 08	May09 –25	Apr09 –25	Mar09 –50
Japan	–2.2		0.10	–	Sep 17	Dec08 –20	Oct08 –20	Feb07 +25

[1] In per cent respectively percentage points. China, benchmark one-year lending rate. On 23 December 2008, the People's Bank of China (PBoC) decreased the benchmark one-year lending rate and the rate that banks pay for one-year deposits by 27 basis points, to 5.31 percent from 5.58 percent, and to 2.25 percent from 2.52 percent respectively. The figures in parenthesis indicate the one-week SHIBOR (repo rate prior to October 2006); for Chinese Taipei, discount rate; for Hong Kong SAR, official base rate; for India, repo rate, reverse repo stood at 3.25 per cent; for Indonesia, one-month official discount rate; for Korea, overnight target rate; for Malaysia, overnight policy rate; for the Philippines, midpoint of repo and reverse repo rates range; for Singapore, overnight interbank rate; for Thailand, overnight repo rate. [2] Annual inflation for the latest month for which data are available, in per cent. [3] Core inflation, 3-month average. [4] In basis points.

Sources: Bloomberg; Datastream; national data.

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BANK FOR INTERNATIONAL SETTLEMENTS

Real policy rate[1]

[1] Policy target rates of their proxies corrected by forward- and backward-looking inflation component (equally weighted 12-month backward looking CPI inflation and 12-month forward looking consensus expectations.

Sources: Bloomberg; ©Consensus Economics; Datastream; IMF; national data.

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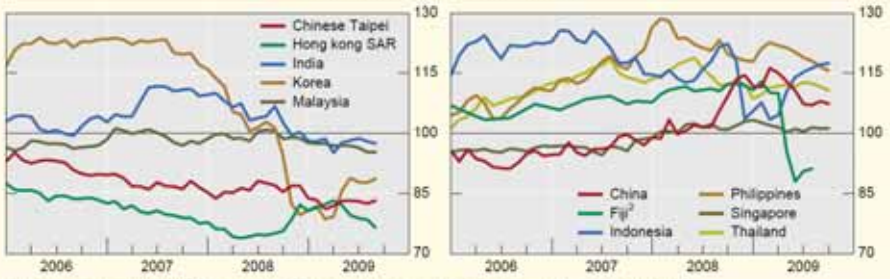
BANK FOR INTERNATIONAL SETTLEMENTS

Real effective exchange rate[1]



[1] BIS broad index, 2004=100, an increase indicates an appreciation of the local currency. [2] From IMF-IFS.

Sources: IMF; BIS.

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BANK FOR INTERNATIONAL SETTLEMENTS

Some other crisis responses

- Foreign currency liquidity
- Domestic currency liquidity and support to financial system

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BANK FOR INTERNATIONAL SETTLEMENTS

Foreign reserve adequacy[1]

Outstanding year-end reserves position

	In billions of US dollars				As a percentage of quantity indicated								
					GDP	Short-term external debt[2]				M2			
	96	07	08	09	08	96	07	08	09	96	07	08	09
China	105	1528	1946	2273	45	376	1249	1867	1746	11	28	28	27
India	20	267	247	261	20	260	339	338	350	11	28	27	25
Korea	33	262	200	249	22	45	176	173	171	6	19	19	20
Chinese Taipei	88	270	292	332	75	458	732	1150	1042	17	34	35	37
Indonesia	18	55	49	57	10	51	186	174	203	15	31	30	28
Malaysia	26	101	91	91	41	226	446	411	452	20	40	35	33
Philippines	10	30	33	35	20	121	227	406	345	26	39	43	47
Thailand	37	85	108	127	40	80	863	996	1079	18	31	38	41
Memo:													
Asia[3,8]	*246*	*2327*	*2685*	*3115*	*40*	*285*	*624*	*682*	*827*	*12*	*27*	*27*	*27*
Southeast Asia[4,8]	*91*	*270*	*281*	*309*	*27*	*119*	*431*	*497*	*520*	*20*	*35*	*36*	*37*
Latin America[5,8]	*142*	*397*	*440*	*436*	*13*	*145*	*238*	*372*	*344*	*71*	*47*	*49*	*44*
Central Europe[6,8]	*40*	*124*	*133*	*161*	*17*	*383*	*177*	*171*	*229*	*39*	*26*	*33*	*36*
Other[7,8]	*29*	*569*	*513*	*495*	*15*	*59*	*260*	*271*	*259*	*19*	*41*	*42*	*42*

[1] For the outstanding year-end position, regional aggregates are the sum of the economies listed; for percentages, medians. For 2009, latest available data. [2] Consolidated cross-border claims to all BIS reporting banks on countries outside the reporting area with a maturity up to one year plus international debt securities outstanding with a maturity of up to one year. [3] China, India, Korea and Taiwan. [4] Indonesia, Malaysia, the Philippines and Thailand. [5] Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. [6] The Czech Republic, Hungary and Poland. [7] Russia, South Africa and Turkey. [8] Sum of the regions listed.

Sources: IMF; Thomson Reuters; national data.

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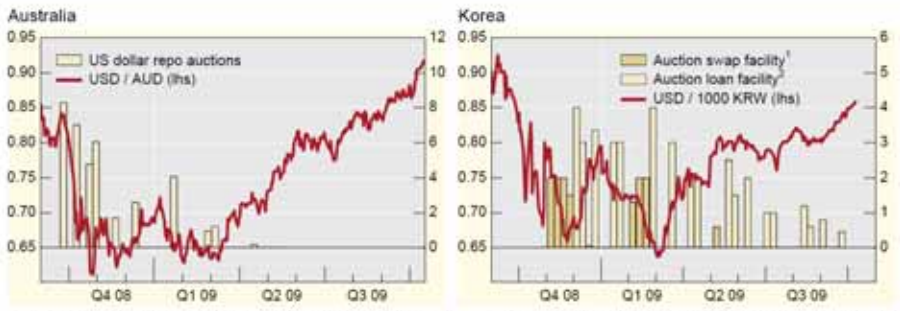
BANK FOR INTERNATIONAL SETTLEMENTS

Central bank US dollar auctions

In billions of US dollars



[1] Competitive swap auction facility using the official foreign reserves. [2] Competitive US dollar loan facility auction using US dollar proceeds of swap transactions with the Fed.

Sources: Reserve Bank of Australia; The Bank of Korea.

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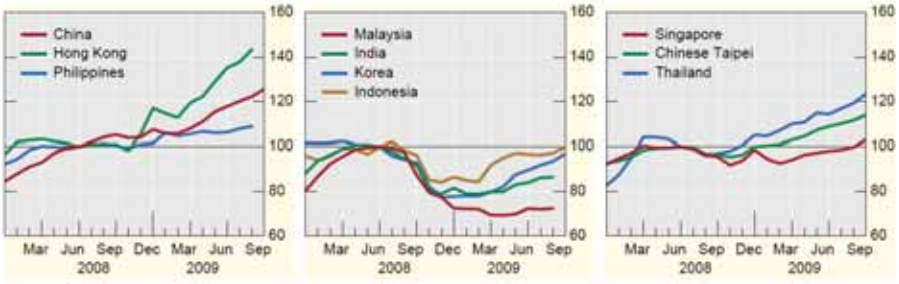
BANK FOR INTERNATIONAL SETTLEMENTS

Foreign reserves

June 2008 = 100



Sources: IMF.

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BANK FOR INTERNATIONAL SETTLEMENTS

Issues for discussion

- Choice of intervention markets and instruments: spot, forward? Discretionary versus non-discretionary? Auctions, direct purchases? Sterilisation instruments?
- What is the appropriate level of foreign reserves? Should reserves be used to reduce external borrowing or to stabilise the flow of financing during periods of financial stress? Was rapid decline in reserves a concern?
- Implications of renewed reserve accumulation? (Graphs)
- Foreign reserves vs alternatives (eg: Fed swap lines, other bilateral swaps or regional pooling arrangements, IMF FCL)

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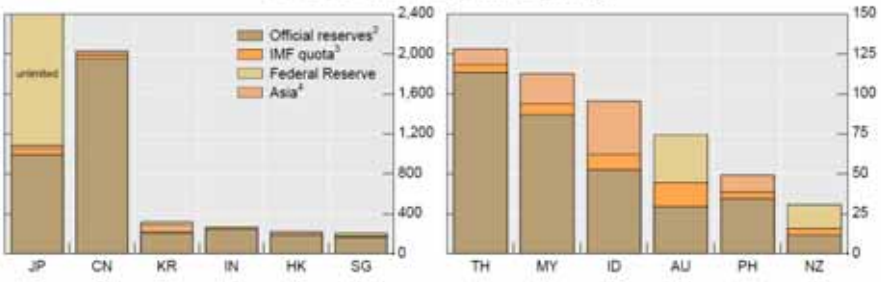
BANK FOR INTERNATIONAL SETTLEMENTS

Reserves and foreign currency swaps[1]



For an explanation of the economy abbreviations, see Graph I.3.

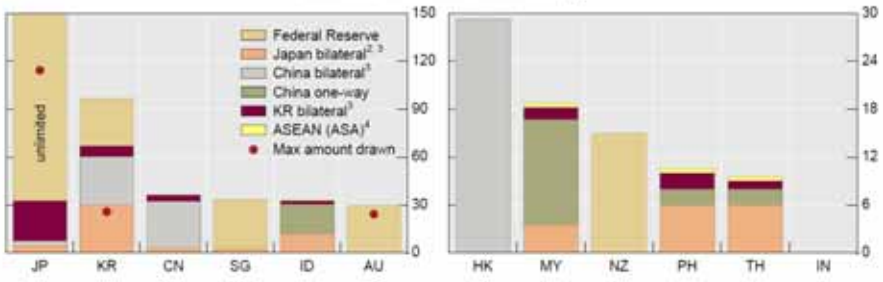
[1] In billions of US dollars. ASEAN swaps net to zero. [2] As of March 2008; excludes SDRs, the reserve position in the IMF and gold. [3] Based on traditional 300% cumulative limit. More recent operations in eastern Europe have been as large as 12 times the quota (Latvia), so available liquidity may be underestimated here, especially for smaller economies. [4] Bilateral foreign currency swaps in place among Asian economies and the ASEAN Swap Arrangement (ASA). Does not include Japan's recently announced emergency fund of $60 billion equivalent in yen funding.

Sources: IMF; national data.

BIS (Representative Office for Asia and the Pacific), "The international financial crisis: timeline, impact and policy responses in Asia and the Pacific," August 2009 68

BANK FOR INTERNATIONAL SETTLEMENTS

Bilateral and multilateral swaps[1]



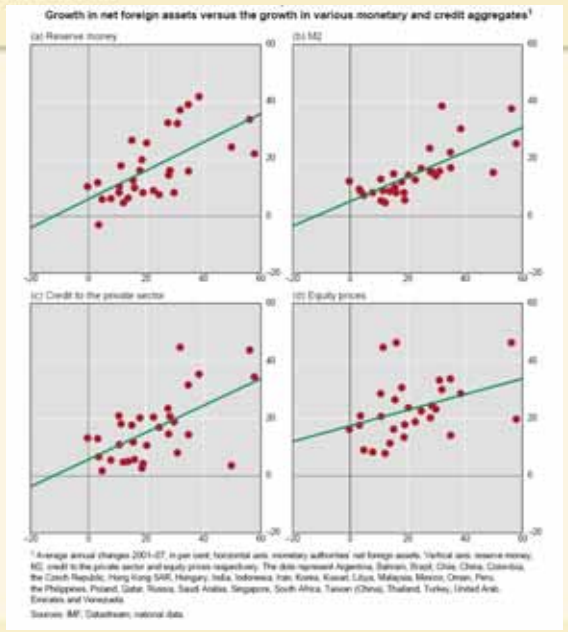
For an explanation of the economy abbreviations, see Graph I.3.

[1] In billions of US dollars; maximum withdrawal. CMIM will encompass many but not all of these swaps. [2] Does not include the recently announced yen-denominated $60 billion equivalent fund. [3] Bilateral swaps in place, some in US dollars, some in local currencies. Excludes other bilateral swaps shown. [4] Refers to swaps among ASEAN members.

Sources: BoJ; IMF; Bloomberg; national data; BIS calculations.

BIS (Representative Office for Asia and the Pacific), "The international financial crisis: timeline, impact and policy responses in Asia and the Pacific," August 2009 69

BANK FOR INTERNATIONAL SETTLEMENTS



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Source: CGFS Papers No. 33

BANK FOR INTERNATIONAL SETTLEMENTS

Domestic currency liquidity and support for financial system

- As in other EME regions variety of “macroprudential” tools already in place prior to crisis that could potentially enhance resilience of financial sector (Table)
- Combined with measures to supply liquidity and support the financial system (eg by deposit guarantees)
- Results (i) stability in deposits and (ii) continued robustness of financial system.

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BANK FOR INTERNATIONAL SETTLEMENTS

Pre-emptive prudential and monetary measures taken against credit booms in Asia

	Prudential instruments					Monetary instruments	
	LTV	Capital	Provision	Exposure limit	Lending criteria	Credit limit	Average reserve requirement
China	2001, 2005, 2006				2004		2003, 2004, 2006, 2007–08
Hong Kong SAR	1991, 1997			1994–98		1994	
India		2005, 2008,2009	2005, 2006, 2007	2006	2007	2003	2004, 2006, 2007–08
Korea	2003, 2006–08				2006		2006
Malaysia	1995–98	2005		1997–98	1995		1994–98
Thailand	2003				2004-05		

LTV = loan-to-value ratio; Capital = capital requirements; Provision = loan provisioning rules; Credit limit = limit on credit growth; Lending criteria = limits on debt repayment-to-income, debt repayment-to-debt or credit line-to-income ratio; Exposure limit = credit exposure to a sector. The years indicated refer to the timing of the introduction of the measure. A year after a dash refers to the timing of the lifting or relaxing of the measure.

BIS (Representative Office for Asia and the Pacific), "The international financial crisis: timeline, impact and policy responses in Asia and the Pacific," August 2009

BANK FOR INTERNATIONAL SETTLEMENTS

Domestic currency liquidity and support for financial system

- Changes in monetary operations: (i) extending the maturity of borrowing from the central bank (eg Chinese Taipei, Hong Kong, India, Indonesia and also Australia and New Zealand); (ii) broadening the eligibility of collateral for lending by central banks (Hong Kong, and Korea and as well as Japan, Australia and New Zealand) and broadening participation (India, Korea).
- Lower reserve requirements (Graph)
- Deposit/debt guarantees.
- Recapitalisation: Size much smaller than those by the US and western European governments (Graph). Also, capital injections by governments in the region were largely made to state-owned banks, with the objective of expanding lending to SMEs and the trade sector. Capital from governments in the United States and western Europe was most often provided to large private financial institutions.

BANK FOR INTERNATIONAL SETTLEMENTS

Reserve requirements

In percent

China, required reserve ratio[1] | India, cash reserve ratio | Chinese Taipei, required reserve ratio[2]

[1] For major banks. [2] Average required reserve ratio of deposits.

Source: Bloomberg.

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BANK FOR INTERNATIONAL SETTLEMENTS

Deposit/debt guarantees

- Sep 2008: Asia-Pacific economies followed Western European countries by introducing a blanket guarantees on deposits, increasing the deposit insurance coverage amount or expanding the set of eligible deposits protected by deposit insurance. (Australia, Korea and New Zealand, in order to facilitate access by banks to international financial markets, also provided state guarantees on non-deposit wholesale liabilities.)
- Facilitate the supply of credit, particularly to lower rated SMEs as they tend to suffer disproportionately during a credit crunch. Hong Kong and Malaysia: credit guarantee schemes for SME loans, Korea expanded the provision of credit guarantees to SMEs through the two existing government agencies.

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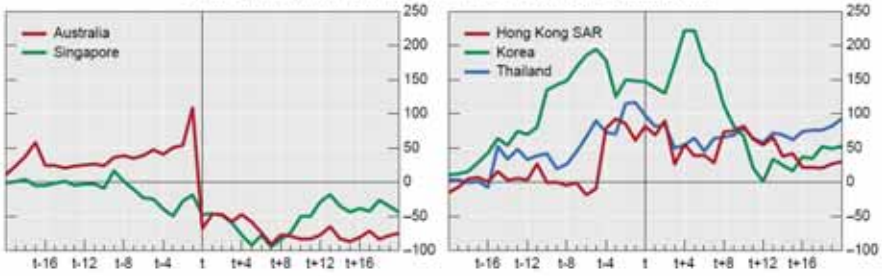
BANK FOR INTERNATIONAL SETTLEMENTS

Did deposit/credit guarantees help?

Impact of deposit and debt guarantee announcements on CDS spreads

Cumulative abnormal changes in bank CDS spreads, in basis points



't' is the date of announcement of policy measures. For Australia, blanket deposit guarantee and debt issuance guarantee. For Hong Kong SAR, Singapore and Thailand, blanket deposit guarantee. For Korea, debt issuance guarantee. Six banks for Australia, three for Hong Kong SAR, eight for Korea, three for Singapore and three for Thailand. The linear relationship between a bank's CDS spread and a market benchmark is calculated over the period between 21 September 2007 and 12 September 2008. For banks in Australia, the iTraxx Australia index is used for the market benchmark. For banks in Hong Kong SAR, Korea, Singapore and Thailand, the iTraxx Asia ex-Japan IG index is used.

Sources: Markit; BIS calculations.

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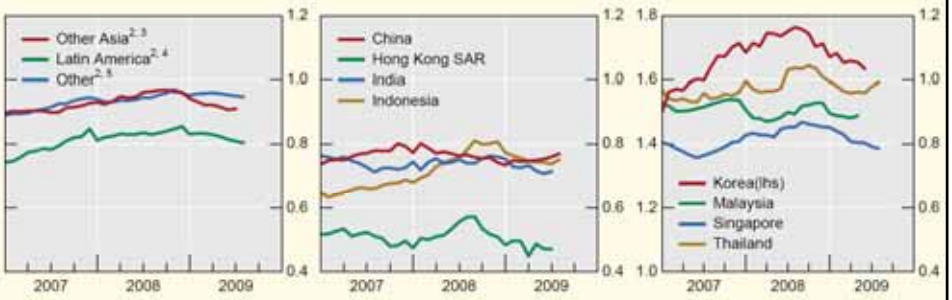
BANK FOR INTERNATIONAL SETTLEMENTS

Ratio of total loans to total deposits[1]



[1] Banking institutuions claims on the private sector (IMF IFS code 22d) divided by the sum of demand and time and savings deposits (IMF IFS codes 24 and 25 respectively); end of period. [2] Weighted average of the economies listed, based on 2005 GDP and PPP exchange rates. [3] Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. [4] Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. [5] The Czech Republic, Hungary, Poland, Russia, South Africa and Turkey.

Source: IMF, *International Financial Statistics*.

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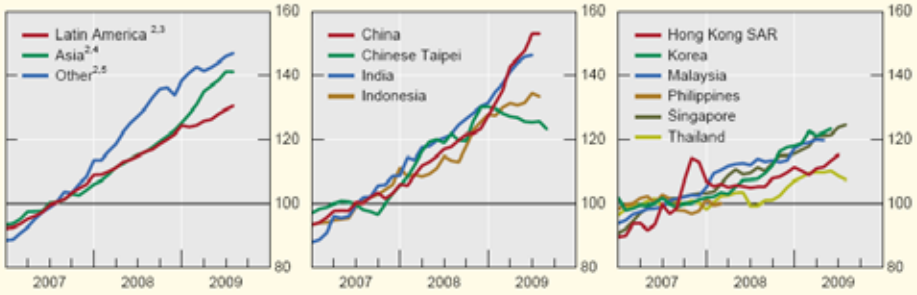
BANK FOR INTERNATIONAL SETTLEMENTS

Bank deposits[1]

2007 = 100



[1] In nominal and local currency terms. [2] Weighted average of the economies listed, based on 2005 GDP and PPP exchange rates. [3] Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. [4] China, Chinese Taipei, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. [5] The Czech Republic, Hungary, Poland, Russia, South Africa and Turkey.

Source: national data.

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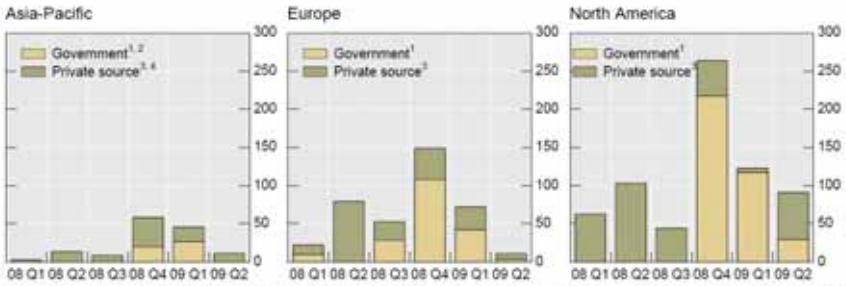
BANK FOR INTERNATIONAL SETTLEMENTS

Sources of capital raised by financial institutions

In billions of US dollars



[1] Includes capital injections by the government into state-owned financial institutions. For Europe and North America, also includes capital injections by parent companies. [2] Actual capital injection completed for China and Korea; plans to inject capital announced in Q1 2009 for India and Japan. [3] Public offerings, strategic buyers, sovereign wealth funds and private placements. [4] Raised by selected banks, brokers and insurance companies in Australia, China, Chinese Taipei, Hong Kong SAR, Japan, Korea and Singapore.

Sources: Bloomberg, Fitch ratings, national sources, BIS calculations.

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BANK FOR INTERNATIONAL SETTLEMENTS

Banking soundness indicators II[1]

	Bank return on assets				Bank regulatory capital to risk-weighted assets			
	2000	2007	2008	2009[2]	2000	2007	2008	2009[2]
Emerging Asia[3]	0.4	1.3	1.0	1.8	13.5	13.4	13.8	14.2
China	0.1	0.9	1.0	...	13.5	8.4	12.0	...
Hong Kong SAR	0.8	1.9	1.9	...	17.8	13.4	14.2	...
India	0.7	0.9	1.0	...	11.1	12.3	13.0	...
Indonesia	0.3	2.8	2.3	2.7	21.6	19.3	16.8	17.8
Korea	–0.6	1.1	0.5	...	10.5	12.3	12.3	12.9
Malaysia	1.5	1.5	1.5	...	12.5	13.2	12.7	14.2
Philippines	0.4	1.3	0.8	0.8	16.2	15.7	15.5	...
Singapore	1.3	1.3	1.1	...	19.6	13.5	14.3	...
Thailand	–1.7	0.1	1.0	...	11.9	14.8	13.8	...
Latin America[3, 4]	0.9	2.5	1.6	1.9	13.6	13.6	13.4	14.8
Others[3, 5]	1.0	1.6	1.7	1.1	13.3	12.4	12.7	13.6
Median EMs above	0.8	1.5	1.5	1.2	13.5	13.3	13.4	14.3

[1] Due to differences in national accounting, taxation, and supervisory regimes, FSI data are not strictly comparable across countries. [2] Latest available. [3] Median of the economies listed. [4] Argentina, Brazil, Chile, Colombia, Peru and Venezuela. [5] The Czech Republic, Hungary, Poland, Russia, South Africa and Turkey.

Source: IMF *Global Financial Stability Report*.

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BANK FOR INTERNATIONAL SETTLEMENTS

Banking soundness indicators I[1]

	Bank nonperforming loans to total loans				Bank provisions to nonperforming loans			
	2000	2007	2008	2009[2]	2000	2007	2008	2009[2]
Emerging Asia[3]	14.1	4.1	2.4	4.1	65	84	107	125
China	...	6.2	2.4	1.8	...	39	116	134
Hong Kong SAR	6.1	0.8	0.9	...	...	...	...	...
India	12.7	2.5	2.3	...	...	56	53	...
Indonesia	18.8	4.1	3.2	4.1	89	121	153	132
Korea	6.6	0.7	1.1	1.5	82	205	146	125
Malaysia	15.4	6.5	4.8	4.6	41	77	89	89
Philippines	16.6	5.8	4.5	4.7	44	82	86	84
Singapore	3.4	1.5	1.4	...	87	116	120	...
Thailand	17.7	7.9	5.7	...	47	87	98	...
Latin America[3, 4]	8.4	2.7	2.7	3.4	94	169	151	139
Others[3, 5]	9.4	2.7	3.7	5.2	52	79	74	70
Median EMs above	9.8	2.7	3.2	4.4	68	121	120	120

[1] Due to differences in national accounting, taxation, and supervisory regimes, FSI data are not strictly comparable across countries. [2] Latest available. [3] Median of the economies listed. [4] Argentina, Brazil, Chile, Colombia, Peru and Venezuela. [5] The Czech Republic, Hungary, Poland, Russia, South Africa and Turkey.

Source: IMF *Global Financial Stability Report*.

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BANK FOR INTERNATIONAL SETTLEMENTS

Monetary policy transmission

- Pass through of policy rates
- Credit growth

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BANK FOR INTERNATIONAL SETTLEMENTS

Table 4: Interest rates decreases since 1 October 2008

In per cent

	Policy or short-term rate[1]	Interbank 3-month	Lending rate	Local currency bonds[2]	Foreign currency bonds[3]
China	–1.9	–2.5	–1.4	–0.7	–2.0
Chinese Taipei	–1.8	–1.9	...	–1.2	...
Hong Kong SAR	–2.3	–3.5	–0.3	–0.8	...
India	–4.3	–7.5	–1.8	–1.4	...
Indonesia	–2.8	–4.1	–0.2	–3.6	–2.8
Korea	–3.3	–3.0	–2.3	–0.9	...
Malaysia	–1.5	–1.5	–1.0	–0.3	–0.7
Philippines	–2.0	0.1	–1.1	...	–1.2
Singapore	–1.0	–1.3	0.0	–1.2	...
Thailand	–2.5	–2.6	–1.4	–1.0	...

[1] China, benchmark one-year lending rate; for Chinese Taipei, overnight interbank rate; for Hong Kong SAR, overnight interbank rate; for India, repo rate; for Indonesia, one month official discount rate; for Korea, target for the overnight call rate; for Malaysia, overnight policy rate; for the Philippines, mid point of repo and reverse-repo rates range; for Singapore, overnight interbank rate; for Thailand, overnight repo rate. [2] 5-year government bond yield. [3] EMBI Global.

Sources: IMF, *International Financial Statistics*; Bloomberg; CEIC; Datastream; JPMorgan Chase; national data.

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Role of monetary policy during a crisis

- Monetary policy responses (i) in Asia: lowered rates immediately; (ii) in Latin America did not lower rates during peak of turmoil (Oct-Nov 2008): Considerations (i) High inflation and monetary credibility; (ii) risk of downward spiral in exchange rates due to risk aversion.
- Other responses: In both regions, authorities used supplementary measures (eg intervention in foreign exchange markets, adjustments in operating procedures, guarantees or financing via state-owned banks) to preserve the flow of foreign and domestic currency financing.
- Policy assignment question during a crisis: Should interest rate policy focus largely on macroeconomic considerations and supplementary policies focus on financial stability and preserving monetary policy transmission?

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Medium-term: Role of monetary and prudential policy in dealing with macroprudential issues

- Need to adopt macro-prudential perspective, but which tool?
- Recall issue of procyclicality of financial system: Expansions: Declining risk perceptions, rising risk tolerance, weakening financing constraints, rising leverage, higher market liquidity, booming asset prices, and growing expenditures mutually reinforce each other, potentially leading to the overextension of balance sheets. Contractions: Reverse process, amplifying financial distress.
- Which indicators? (1) long-term interest rates; (2) equity prices; (3) real estate prices; (4) credit growth (and particularly combinations).
- Possible instruments: (1) policy interest rates; (2) prudential tools to curb credit (eg dynamic provisioning or more direct controls); (3) restrictions on markets (eg margin trading, LTVs).

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Question: can monetary policy rate curb market "exuberance"

- Asset price bubbles or low long-term rates may reflect underpricing of risk or lowered risk aversion
- US experience (graph)

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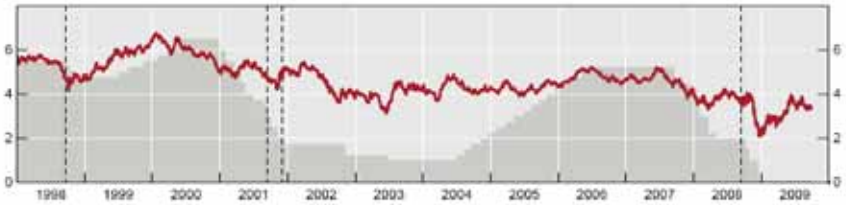
Interest rates and risk aversion

Ten-year US government bond yield[1]

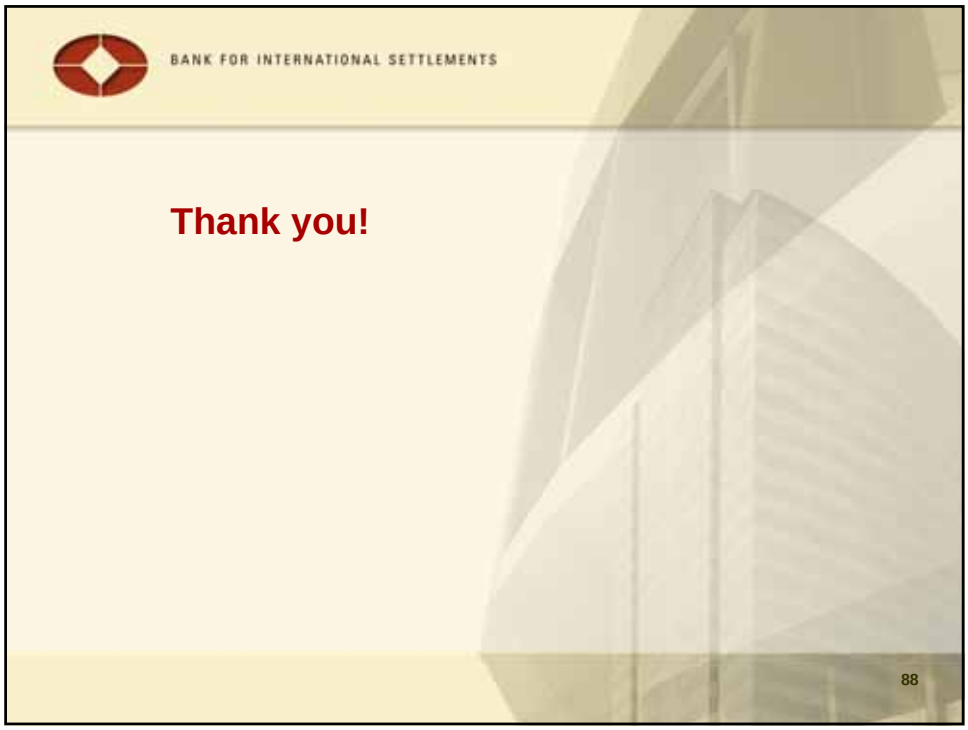


Composite indicator of risk aversion renormalised as a credit spread[2]

The shaded area represents the target federal funds rate. The vertical dotted lines mark the dates of the bailout of LTCM on 23 September 1998, 11 September 2001, of the Enron bankruptcy on 2 December 2001 and of the Lehman bankruptcy on 15 September 2008.

[1] In per cent. [2] Simple average of standardized scores of EMBI Global spread, US corporate high yield spread (Merrill Lynch US High Yield index), implied volatility of US equities (VIX index), implied volatility of US Treasury bonds (Merrill Lynch MOVE index) and implied volatility of G10 exchange rates (JPMorgan GVXF7 index); in percentage points.

Sources: Bloomberg; national data.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Thank you!
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