



MAS

Monetary Authority of Singapore

financial ● stability



review

macroeconomic surveillance department

November 2008

financial stability

review



**November 2008**

Macroeconomic Surveillance Department  
Monetary Authority of Singapore

ISSN 1793-3463

Published in November 2008

Macroeconomic Surveillance Department  
Monetary Authority of Singapore

<http://www.mas.gov.sg>

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanised, photocopying, recording or otherwise, without the prior written permission of the copyright owner except in accordance with the provisions of the Copyright Act (Cap. 63). Application for the copyright owner's written permission to reproduce any part of this publication should be addressed to:

Macroeconomic Surveillance Department  
Monetary Authority of Singapore  
10 Shenton Way  
MAS Building  
Singapore 079117

Printed by Chung Printing Pte Ltd

## CONTENTS

	<b>PREFACE</b>	i
	<b>OVERVIEW</b>	ii
<b>1</b>	<b>MACRO ENVIRONMENT</b>	
1.1	Global Financial Markets	1
	<i>Box A: Liquidity Traps and the Credit Channel – A Framework for Understanding Monetary Policy Transmission and its Disruption</i>	15
1.2	Asian Financial System	19
	<i>Box B: Decomposing Movements in Asian Sovereign CDS Spreads</i>	26
	<i>Box C: Asian Financial Soundness Indicators – A Comparison with the Pre-Asian Financial Crisis Period</i>	28
<b>2</b>	<b>SINGAPORE'S MACROECONOMIC ENVIRONMENT AND FINANCIAL SYSTEM</b>	35
2.1	Financial Markets	35
	<i>Box D: Overview of MAS Liquidity Provisioning Measures</i>	37
2.2	Macroeconomic Developments	38
2.3	Corporate and Household Sectors	39
2.4	Banking Sector	43
	<i>Box E: Banks' Property Exposures</i>	46
	<i>Box F: Government Guarantee on Deposits</i>	47
2.5	Non-Bank Financial Sector	47
	<i>Box G: Issues Pertaining to the Sale of Structured Products in Singapore</i>	51
<b>3</b>	<b>SPECIAL FEATURE: Financial Sector Industry-wide Business Continuity Exercise 2008 Ex Raffles II</b>	53
	<b>STATISTICAL APPENDIX</b>	55

## LIST OF ABBREVIATIONS

ABCP	Asset-Backed Commercial Paper
ABS	Asset-Backed Securities
ACU	Asian Currency Unit
AFC	Asian Financial Crisis
ASEAN	Association of Southeast Asian Nations
BBA	British Bankers Association
BIS	Bank of International Settlements
B&C	Building and Construction
BOE	Bank of England
BOJ	Bank of Japan
CAR	Capital Adequacy Ratio
CDO	Collateralised Debt Obligations
CDS	Credit Default Swaps
CEIC	CEIC Data Company Ltd
CLO	Collateralised Loan Obligations
CLS	Continuous Linked Settlement
CP	Commercial Paper
CPF	Central Provident Fund
CPFF	Commercial Paper Funding Facility
CPI	Consumer Price Index
DBS	Development Bank of Singapore
DBU	Domestic Banking Unit
ECB	European Central Bank
EME	Emerging Market Economies
EU	European Union
EURIBOR	Euro Interbank Offered Rate
FDIC	Federal Deposit Insurance Corporation
FDI	Foreign Direct Investment
Fed	Federal Reserve Board
FOMC	Federal Open Market Committee
FSA	Financial Services Authority
FSR	Financial Stability Review
GDP	Gross Domestic Product
GFSR	Global Financial Stability Review
GST	Goods and Services Tax
HDB	Housing Development Board
ILF	Intra-day Liquidity Facilities
IMF	International Monetary Fund
IWE	Industry Wide Exercise
LBO	Leveraged-buyout
LIBOR	London Interbank Offered Rate
M-LEC	Master Liquidity Enhancement Conduit
MAS	Monetary Authority of Singapore
MBS	Mortgage-Backed Securities
MEPS+	MAS Electronic Payment System+
MSD	Macroeconomic Surveillance Department
MTI	Ministry of Trade and Industry
NBFI	Non-Bank Financial Institution
NEER	Nominal Effective Exchange Rate

NIE	Newly Industrialised Economies
NODX	Non-Oil Domestic Exports
NPL	Non-Performing Loans
OCBC	Overseas Chinese Banking Corporation
OIS	Overnight Index Swap
OIF	Offshore Insurance Fund
OMO	Open Market Operation
PD	Primary Dealer
QFB	Qualifying Full Bank
ROA	Return on Assets
SAAR	Seasonally Adjusted Annualised Rate
SEC	US Securities and Exchange Commission
SGS	Singapore Government Securities
SGX	Singapore Exchange
SIBOR	Singapore Interbank Offered Rate
SIF	Singapore Insurance Fund
SIV	Special Investment Vehicles
SLF	Standing Lending Facility
SME	Small and Medium-sized Enterprises
SNB	Swiss National Bank
STI	Straits Times Index
TARP	Troubled Assets Relief Programme
TRR	Total Risk Requirement
TSC	Transport Storage and Communication
TSLF	Term Securities Lending Facility
UOB	United Overseas Bank
URA	Urban Redevelopment Authority
VAT	Value Added Tax
VIX	Chicago Board Options Exchange Volatility Index

## PREFACE

The Monetary Authority of Singapore (MAS) conducts a regular assessment of Singapore's financial system. Potential risks and vulnerabilities are identified, and the ability of the financial system to withstand potential shocks is reviewed. The analysis and results are contained in the Financial Stability Review (FSR), which is currently published once a year. The FSR aims to contribute to a better understanding among market participants, analysts and the public of issues affecting Singapore's financial system.

Section 1 of the FSR provides a discussion of the macroeconomic environment and financial markets both globally and in Asia. Against this backdrop, Section 2 analyses Singapore's macroeconomic environment and financial system. The health of the non-financial sector, which includes both the corporate and household sectors, is reviewed. This is followed by an analysis of the banking sector, given its dominant role in Singapore's financial landscape. A review of the non-bank financial sector, which includes the insurance sector and capital market intermediaries, is also provided. The section concludes with an overview of the outlook and risks for Singapore's financial system. The Special Feature presents an overview of the Industry-Wide Exercise conducted by MAS to examine the resilience of Singapore's financial system under a scenario of non-financial distress.

The production of the Review was coordinated by the Macroeconomic Surveillance Department (MSD) team which comprised Chan Lily, Simon Wells, Cheo Yew-Jiun James, Fang Yihan, Foo Suan Yong, Hu Shilin, Kee Rui Xiong, Lim Ju Meng Aloysius, Patricia Chua, Puneet Gulati, Rishi Ramchand and Teo Wan Yuan under the general direction of Dr. Khor Hoe Ee, Assistant Managing Director (Economics) and Chia Der Jiun, Executive Director (MSD). Valuable statistical and charting support was provided by Alvin Jason John, Choo Woon Yuen Karen, Goh-Tan Mui Choo Jenny, Kuah Lifen Michelle, Low Lie En Elys, Tan-Liew Bee Lan Connie and Tan Yian Gwek Felicia. The Review also incorporates contributions from the following departments: Banking Supervision Department, Capital Markets Department, Capital Markets Intermediaries Department, Complex Institutions Supervision Department, Economic Policy Department, Insurance Supervision Department, Prudential Policy Department, Reserve and Monetary Management Department, Risk and Technology Office, and Specialist Risk Supervision Department. The FSR reflects the views of the staff of the Macroeconomic Surveillance Department and the contributing departments.

The FSR may be accessed in PDF format on the MAS website:

[http://www.mas.gov.sg/publications/MAS\\_FSR.html](http://www.mas.gov.sg/publications/MAS_FSR.html)

## OVERVIEW

The global financial landscape has changed dramatically since the December 2007 FSR. The previous FSR had noted increased turbulence in financial markets during H2 2007 amid write-downs and deleveraging by large international financial institutions.

In 2008, conditions in global financial markets worsened. Throughout the year, the US housing market continued to slow. As a result, losses continued to mount on US housing-related securities, further undermining confidence in financial institutions. As asset prices declined and losses mounted, financial institutions' capital buffers were eroded culminating in the failure or near-failure of several large financial institutions. This triggered a sharp rise in counterparty credit risk aversion and a seizure of money markets in the United States and Europe. In late September and early October, confidence evaporated and financial systems came close to a systemic collapse. This led authorities there to introduce extraordinary measures, such as the injection of liquidity into interbank and other distressed credit markets, guarantees on bank debt and deposits, recapitalisation and purchase of troubled assets, which have helped to avert a collapse of the global financial system. The turmoil in financial markets triggered a sharp deterioration in global economic prospects. In response, monetary policy has been eased and further fiscal stimulus appears likely. After the raft of policy measures, funding rates have eased and signs of thaw in money markets have emerged. Barring further disruptions, we expect risk perceptions and liquidity in interbank and credit markets to continue to recover gradually. Nevertheless, the central outlook ahead for the G3 still points to a recession in 2009, contributed in part by tight lending conditions constraining consumption and investment, as well as further financial sector write-downs and loan losses consistent with deteriorating economic activity.

Up to early 2008, Asia was relatively unaffected by the financial turmoil. Regional economies

were growing strongly, Asian financial institutions had reported only small direct exposures to the US subprime mortgage market and Asian corporate and household balance sheets were fairly healthy. While regional equity and currency markets had experienced higher volatility, they were in general not under major stress. Liquidity strains had not been pronounced in most regional money markets, and Asian capital inflows had held up well. Indeed, in H1 2008, policy actions across Asia were aimed at containing inflation amid rising commodity prices. In the second half of 2008 however, the deepening global financial turmoil and the prospect of an imminent G3 recession prompted a reappraisal of growth prospects in Asia and heightened risk aversion towards emerging market economies, which in turn triggered sharp declines in Asian asset markets. Some regional currencies have come under pressure and domestic liquidity strains have surfaced in some economies.

Asian economies are entering this period of weak global growth and volatile financial markets with stronger macroeconomic and financial fundamentals than prior to the Asian financial crisis, and also relative to emerging market economies in other regions. With stronger fiscal and current account balances, lower external liabilities, more flexible exchange rates, a higher level of foreign reserves, and a relatively strong medium term growth outlook, we expect the scale of capital withdrawal and pressures on currency and asset markets in Asia to be moderate and not destabilising.

There are however several downside risks to this external outlook which the FSR highlights.

### G3

- Government support measures appear to have helped ease conditions in bank funding markets. However, if the support measures do not facilitate a fall in risk aversion, wider capital markets could remain impaired for



some time, and banks may remain reluctant to lend. In turn, the high cost and constrained availability of credit could persist and worsen economic prospects.

- A degree of calm has returned to asset markets internationally, but further forced asset sales, particularly from hedge funds and other non-bank financials, could exert downward pressure on asset prices and increase volatility, setting back the process of normalisation.
- In the medium term, there is a risk of further entrenchment of the negative feedback loops between the real economy and the financial sector. If loan default rates rise sharply and recovery levels are low, banks may need to make further unexpected write-downs, prolonging the process of deleveraging. Loan losses may also be transmitted and amplified through the financial system to broad categories of investors through non-mortgage structured credit products.
- In the longer term, coordinated and timely international action will be needed to remove the extraordinary policy measures so that they do not promote moral hazard and encourage new excesses to build up in the financial system, and to preserve a level international playing field.

#### Asia

- Asia's growth prospects remain vulnerable to a sharper than expected slowdown in consumption and investment activity in the global economy, as well as to a potential weakening in domestic demand within Asia.
- Further shifts in the perceived riskiness of Emerging Market Economies' (EME) assets could trigger greater turbulence in currency and asset markets, particularly in economies perceived to have relatively less robust macroeconomic fundamentals.
- The current environment has made policymaking more challenging. Economies with relatively less robust fundamentals

whose markets are under more strain, face the greatest policy challenges and hence the highest risk of instability.

As a small open economy, Singapore has been affected by the financial turmoil. The domestic equity market fell, in line with the sell-offs in equity markets globally. As in other US\$ funding centres, strains were experienced in Singapore's Asian Dollar Market in mid-September before easing off after mid-October. The S\$ money market, on the other hand, was relatively calm throughout the period. The economy entered into a recession in Q3 2008. Singapore's GDP growth has been revised downward to around 2.5% for 2008 as a whole, and is expected to remain below trend in 2009. Slowing economic activity will be manifested in reduced corporate earnings and household income, while the unemployment rate is expected to rise. While there may be some specific instances of distress in the corporate and household sectors, we expect the sectors as a whole to weather the economic slowdown relatively well given the strength of their balance sheets.

Turning to the financial sector, earnings are likely to moderate in line with deteriorating economic prospects while non-performing loans are expected to rise. Financial market volatility will also continue to weigh on the valuation of assets on the books of insurers and banks. However, we do not expect these to be destabilising. The local banks are well-capitalised and have low reliance on wholesale funding. The banking system as a whole is financially sound with healthy asset quality. Similarly, the insurance sector has maintained high capital, solvency and liquidity ratios through the recent period of substantial market stress. Our assessment is that the banking and insurance sectors are resilient and should be able to weather the economic downturn and heightened market volatility.

The downside risks arising from the external economies mentioned previously, if they materialize, will affect Singapore. First, a worse

than expected deterioration in the global economy will deepen and prolong Singapore's recession, which in turn would weaken the corporate and households sectors and therefore affect the asset quality of financial institutions. Second, if risk aversion towards emerging market economies globally resurfaces with greater vigour, this could trigger capital outflows from Asia on a larger scale, including from Singapore, and the impact on the economies perceived to be least robust could be significant.

Singapore's strong macroeconomic fundamentals, sound financial system, and the recent precautionary measures taken such as the deposit guarantee scheme and the US dollar swap line with the US Federal Reserve Board, as well as an expected package of supportive fiscal measures, should enable the economy to ride through this financial turmoil. MAS will continue its enhanced surveillance of global developments and stands ready to address any potential threat to Singapore's financial system.

Macroeconomic Surveillance Department  
Monetary Authority of Singapore  
28 November 2008

## 1 MACRO ENVIRONMENT

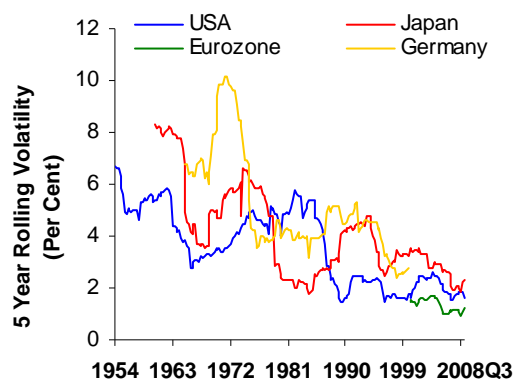
### 1.1 Global Financial Markets

During the past 18 months, the global financial system has experienced its worst financial turmoil in decades. For much of the past decade, however, the global economy enjoyed strong and stable economic growth coupled with low and stable inflation and interest rates, part of the so-called the 'Great Moderation' that began in the 1980s. (Chart 1.1) Widespread expectation that these favourable conditions would persist indefinitely led to increased risk-taking by investors (the 'search for yield') and credit expansion, which was aided by new financial instruments and vehicles. But as macroeconomic conditions changed and official interest rates rose, lending excesses became increasingly apparent, sowing the seeds of the current financial turmoil.

As US house prices started to fall in mid-2006, homeowners in negative equity walked away from subprime loans, creating a vicious circle of loan defaults, home foreclosures and falling home prices. In mid-2007, uncertainty over the value of substantial amounts of housing-related securities (particularly ABCP and CDOs) held by banks, conduits and SIVs triggered a sudden repricing of liquidity and counterparty credit risk as well as downgrades from credit rating agencies. The associated rise in bank funding costs and reduction in short-term lending set in motion a painful process of deleveraging forcing banks to write down large losses.

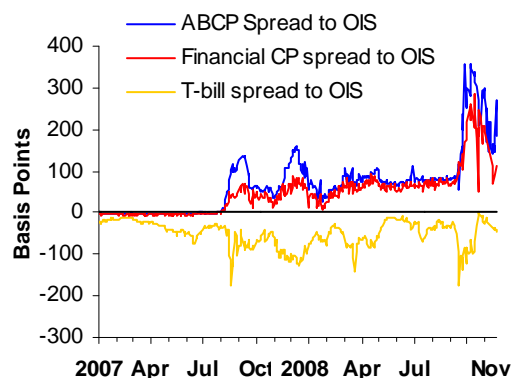
Strains in money markets have become more acute since the previous FSR. In particular, credit spreads widened sharply around the time of the rescue of Bear Stearns in March as money market participants became increasingly concerned about counterparty credit risks. (Chart 1.2) Credit markets subsequently recovered somewhat as central banks introduced new facilities to supply liquidity. (Table 1.1)<sup>1</sup> However, continued worsening in US housing market conditions – in particular losses spreading beyond

**Chart 1.1**  
**Volatility of G3 GDP Growth**



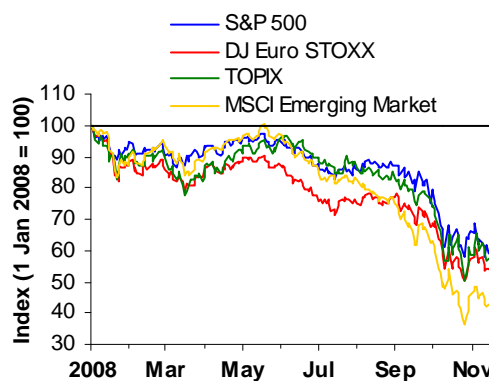
Source: Bloomberg, MAS estimates

**Chart 1.2**  
**Three-month US T-bill and CP Interest Rates less OIS Rate**



Source: Federal Reserve Board and Bloomberg

**Chart 1.3**  
**Equity Indices**



Source: Bloomberg

<sup>1</sup> Bear Stearns, a large US investment bank and broker-dealer, suffered a wholesale funding run in March. Owing to its interconnectedness with the financial system, it was supported by the Federal Reserve and JPMorgan Chase.

subprime and into Alt-A and prime – further undermined confidence in financial institutions exposed to this market.

### Severe stress in global financial markets ...

During September and October, heightened counterparty credit concerns and associated illiquidity in bank funding markets prompted extreme volatility and further sharp falls in risky asset prices. G3 equity prices fell sharply while measures of volatility spiked. (Charts 1.3 and 1.4) Credit spreads on investment grade and high-yield corporate debt widened to record levels. (Chart 1.5) This led to a series of failures or near-failures of financial institutions that threatened a global systemic crisis. (Chart 1.6)

### ... led to the failure of several financial institutions and threatened systemic collapse...

In particular, large falls in the share prices and rising debt funding costs of US mortgage agencies Fannie Mae and Freddie Mac led the US Government to place them into conservatorship in early September. Shortly after this, Washington Mutual (WaMu) became the largest bank to fail in US history. However, it was the collapse of Lehman Brothers and near-failure of AIG in mid-September that triggered a widespread breakdown of confidence in global financial markets.

Following these calamitous events, interbank funding markets seized. Significantly, a large money market mutual fund failed ('broke the buck') and others closed or needed support. Fear of further defaults and investor redemptions prompted money funds to shift out of risky assets into government securities. As a result, US T-Bill yields fell close to zero whereas rates on three-month interbank lending and financial commercial paper (CP) rose more than 250 basis points (bps) above the expected policy rates. (Chart 1.2)

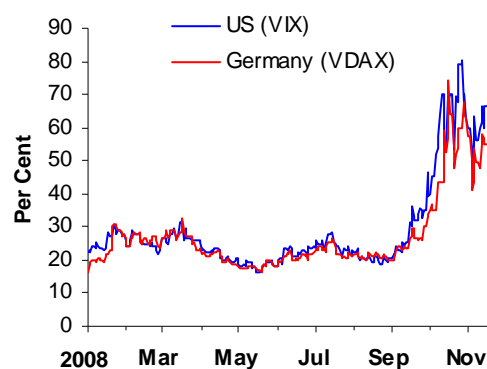
The seizure of US dollar funding markets was quickly transmitted into Europe given that many European institutions have sizeable US dollar funding requirements. Difficulty in rolling US dollar CP and a

**Table 1.1**  
Summary of Selected Liquidity Measures Announced in March-April 2008

	Facility	Purpose
11 Mar	Fed announces Term Securities Lending Facility	Facility for primary dealers to swap wider collateral for US treasuries.
16 Mar	Fed announces Primary Dealers Credit Facility	Facility for primary dealers to borrow funds against wider collateral
28 Mar	ECB announces 6-month OMOs, continues 3-month OMOs	Provide additional liquidity to money markets at longer maturities.
21 Apr	BoE announces special liquidity scheme	Allow banks to swap legacy MBS assets for UK T-bills

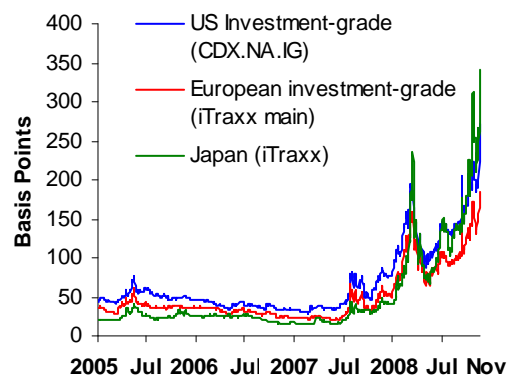
Source: MAS, IMF

**Chart 1.4**  
Equity Implied Volatility (VIX and VDAX)



Source: Bloomberg

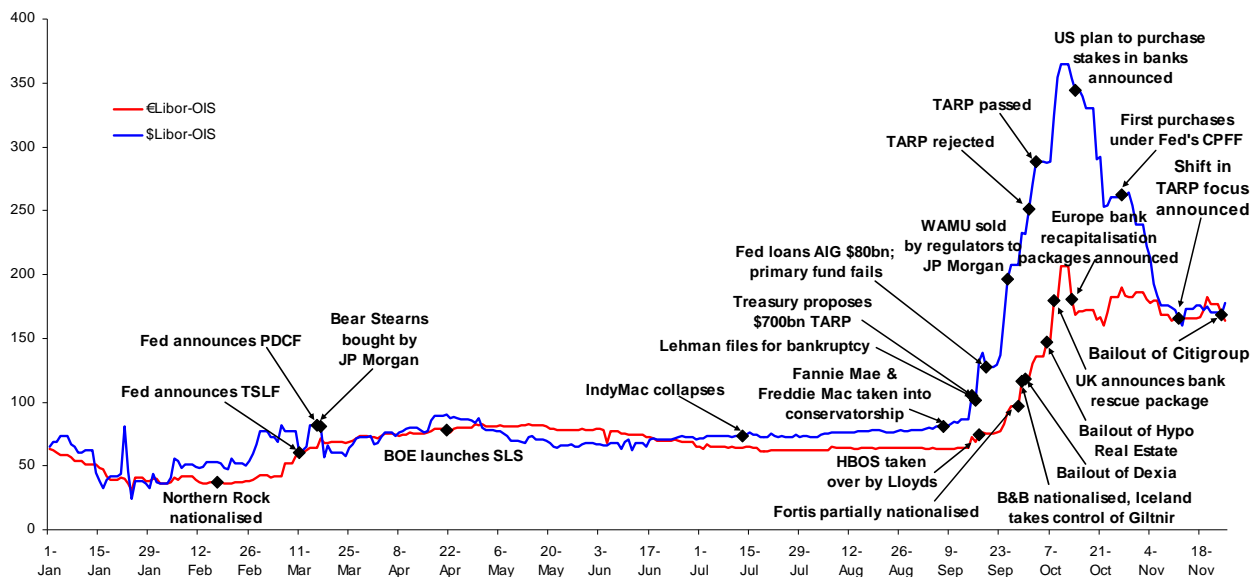
**Chart 1.5**  
CDS Index Spreads



Source: Bloomberg

sharp rise in the cost of obtaining dollars via FX swaps (Chart 1.7) meant they too faced the prospect of liquidity-driven stresses.

**Chart 1.6**  
**Key Financial Market Events and Three-month Libor-OIS Spreads during 2008**



Source: BBA, Bloomberg and MAS estimates

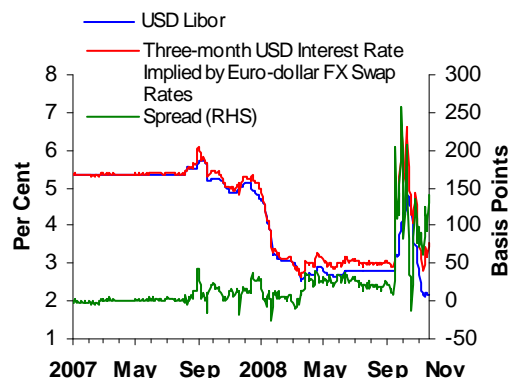
Bank share prices collapsed raising solvency fears and several European banks needed explicit government support or were acquired by better capitalised rivals. The heightened risk of systemic banking crises pushed global markets into a downward spiral of plummeting asset prices and collapsing confidence.

**... and prompted widespread action by authorities to support banking systems.**

To avert a complete collapse in financial intermediation, governments and central banks responded with a large and comprehensive set of measures to meet the exceptional demand for liquidity and bolster confidence in the financial system. (Table 1.2) These included introducing or increasing reciprocal funding agreements (FX swap lines) between central banks and lending more funds at longer durations. In Europe, the range of eligible collateral was widened further and in the US, the set of institutions with access to Federal Reserve funds was enlarged via facilities to finance CP and money fund liabilities.

Governments announced massive programs to support the financial sector. (Table 1.2) Although

**Chart 1.7**  
**Three-month US Dollar Interbank Rates**



Source: Bloomberg, BBA and MAS estimates

**Table 1.2: Selected US and European Official Sector Responses since September 08**

	United States	Euro Area	UK	Other Europe
7 Sep	Fannie Mae and Freddie Mac taken into conservatorship.			
16 Sep	Fed extends \$85bn loan to AIG.			
17 Sep			BOE extends Special Liquidity Scheme to Jan 2009	
18 Sep	Announcement of reciprocal currency swap arrangements between the Fed and the BOJ, the BOE and the Bank of Canada. Existing swap lines with the ECB and the SNB expanded.			
19 Sep	US Treasury proposes \$700bn TARP and announces guarantee program for money market funds. Fed announces ABCP money market mutual fund liquidity facility. SEC issues order to halt short selling of financial stocks.		FSA tightens restrictions on net short positions on financial stocks.	
21 Sep	Goldman Sachs and Morgan Stanley approved to become bank holding companies.			
24 Sep	Fed expands temporary swap facilities to Australian, Danish, Norwegian and Swedish central banks.			
25 Sep	WaMu closed by regulators, deposits sold to JPMorgan			
28 Sep		Benelux €11.2bn bailout package for 49% ownership stake in Fortis.		
29 Sep	Fed increases swap lines to foreign central banks from \$290bn to \$620bn.	German government arranges initial €35bn support package for Hypo Real Estate bank.	Bradford and Bingley nationalised.	Iceland takes 75% stake in Glitnir Bank.
30 Sep		Irish govt. guarantees all deposits, covered bonds and debt for 6 Irish banks. Dexia receives €6bn from Belgian, French and Luxembourg govts. and main shareholders.		
3 Oct	Congress approves \$700bn TARP. FDIC deposit insurance increased temporarily from \$100,000 to \$250,000 until 31 Dec 2009. Fed granted ability to pay interest on reserves. SEC authorised to suspend mark-to-market accounting rules.	Netherlands government purchases Dutch operations of Fortis for €16.8bn.	BOE extends eligible collateral for its 3-month repo operations to include AAA-rated ABS and ABCP. FSA raises limit on of deposit guarantee to £50k.	
5 Oct		Germany guarantees all private bank accounts. German govt. €50bn bailout of Hypo Real Estate.		
7 Oct	Fed. announces Commercial Paper Funding Facility to purchase of 3-month unsecured CP and ABCP.	EU: Guarantee for savings accounts increased from €20 000 to €50 000.		Iceland takes control of Landsbanki.
8 Oct	Coordinated interest rate cuts 0.5% by Fed, ECB, BOE, Sweden, Switzerland			
8 Oct		Italy increases guarantee for all bank deposits to €103 000.	Support package announced, including £50bn to recapitalise banks, guarantees for new term debt, extension of BOE's special liquidity scheme.	
9 Oct				Iceland nationalises Kaupthing.
11 Oct	G7 releases five point plan			
13 Oct	Fed increases temporary swap facilities with BOE, ECB and SNB, BOE, ECB and SNB announce schedule for term and forward options of US\$ liquidity.	EU pledges guarantee of bank debt with maturities up to 5 years until end 09; France, Germany, Spain, Italy and Netherlands all announce measures to recapitalise banks.	Govt injects £20bn into RBS and £17bn into HBOS-Lloyds TSB.	
14 Oct	US Treasury to make available \$250bn to purchase stakes in banks. Increase in swap facilities with BOJ.			
16 Oct				\$5.2bn Swiss support for UBS.
19 Oct		ING receives €10bn capital injection from Dutch government		
20 Oct		Sweden announces measures to recapitalize banks.		

21 Oct	Fed announces Money Market Investor Funding facility.	€10.5bn for six banks by French govt.		
24 Oct				IMF outline plan for \$2.1bn loan to Iceland.
26 Oct				IMF outline plan for \$16.5bn loan to Ukraine.
28 Oct				IMF, EU and World Bank outline plan for \$25.1bn loan to Hungary.
30 Oct	Fed establishes swap lines with Brazil, Mexico, Korea and Singapore			
10 Nov	Fed expands AIG package, purchases AIG stock. AMEX granted approval to become bank holding company			
12 Nov	TARP changes focus from buying mortgage assets to bank recapitalisation and lending			
24 Nov	Treasury agrees to take additional \$20bn stake in Citigroup, and to provide insurance on \$306bn of Citigroup assets.			
25 Nov	Fed announces plans to buy \$600bn of mortgage related assets. With support from the Treasury, it creates the Term Asset-Backed Securities Loan Facility (TALF) to extend \$200bn of loans to holders of certain asset-backed securities backed by newly and recently originated consumer and small business loans.			

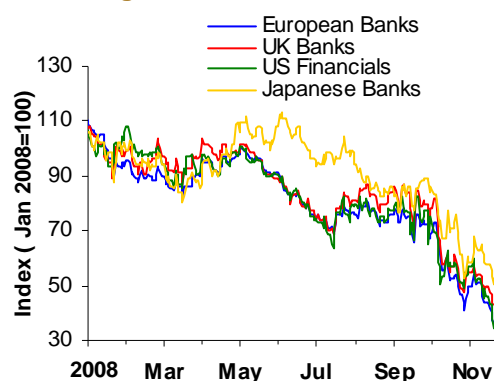
the details differ across jurisdictions, most initiatives involved recapitalising banks with public funds, guarantees of bank debt and interbank lending, and facilities to finance a wider range of assets on banks' balance sheets and/or purchase impaired assets outright.

Authorities across the world also introduced blanket guarantees or expanded existing guarantees on retail deposits. Initially at least, some of these guarantees were introduced in an ad hoc manner by some countries. One side effect was that other countries with relatively sound banking systems were forced to provide similar guarantees to prevent deposits shifting between banks or jurisdictions.

**Support measures have begun to ease money market conditions ...**

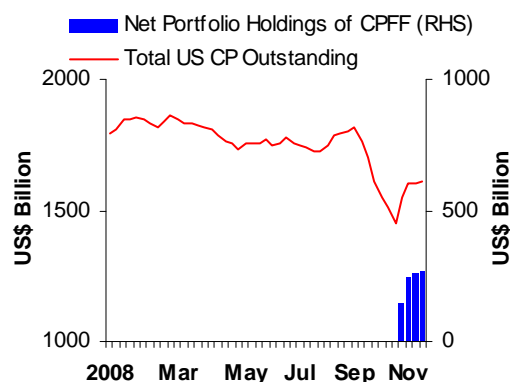
These unprecedented actions – at least in the near term – appear to have helped thaw money markets, although conditions have remained stressed and term interbank rates unusually high relative to policy rates. Since the announcements of measures to recapitalise banks, bank CDS spreads have narrowed although bank share prices continued to fall. (Chart 1.8) The Federal Reserve's CP funding facility has aided issuance, reducing the risk of a

**Chart 1.8**  
**Banking and Financial Stock Indices**



Source: Bloomberg

**Chart 1.9**  
**US\$ CP Outstanding and Size of Fed's Commercial Paper Funding Facility**



Source: Federal Reserve Board and Bloomberg



widespread funding squeeze in the corporate sector. (Chart 1.9)

**... although risk of further instability remains if wider confidence and risk appetite do not return.**

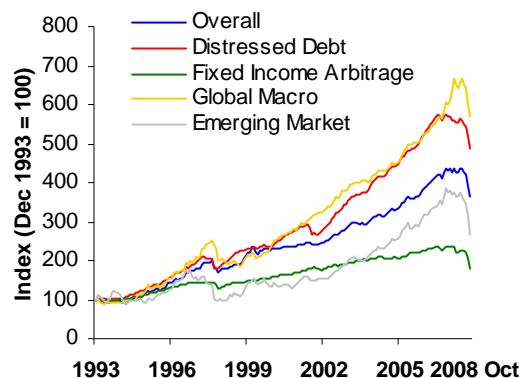
Despite these support actions, considerable short-term risks remain. The general level of risk appetite remains low and markets remain unusually vulnerable to further shocks. For example, a shift in the US Treasury's strategy for using TARP funds on 12 November reportedly contributed to a widening in structured credit CDS index spreads, and a slight widening in three-month US dollar Libor-OIS spreads, following over two weeks of uninterrupted gradual narrowing. (Chart 1.7)

Setbacks to the recovery and further falls in asset prices could also arise if non-bank financial firms are forced to deleverage and liquidate assets. For example, hedge funds and asset managers could face further investor redemptions, forcing them to liquidate assets.

Indices of hedge fund returns suggest that in September and October, the industry suffered its largest negative monthly returns since 1998. (Chart 1.10) If investors opt to cut their losses following this poor performance, hedge fund redemptions – which are often made at end quarter – could be particularly large at the end of December. Estimates of withdrawals from hedge funds in October were \$40-60 billion. But further redemptions are also expected – although estimates vary, several commentators have suggested that the hedge fund industry's assets under management, which were around US\$1.9 trillion in June 2008, could shrink 35% by the end of this year, and halve by the end of next year.

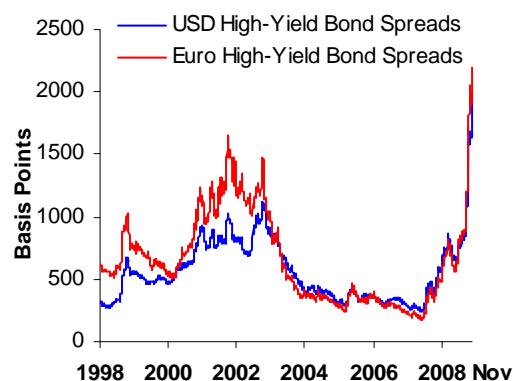
Moreover, if the gradual improvement in money markets does not prompt a rise in risk appetite in wider financial markets, then the cost of credit to the real economy may remain high and the availability of credit extremely tight. Indeed, despite the far-reaching support programs, fears of recession and, in turn reduced corporate earnings and higher defaults mean corporate credit spreads remain close

**Chart 1.10**  
**Selected Credit Suisse/Tremont Hedge Fund Indices**



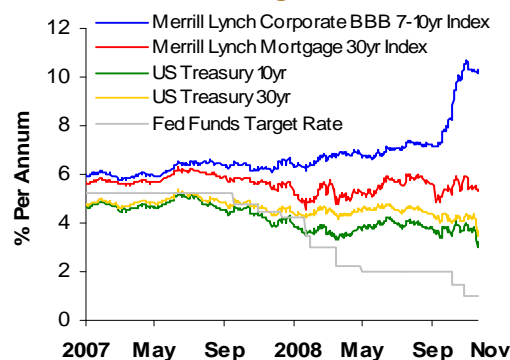
Source: Bloomberg

**Chart 1.11**  
**High-Yield Corporate Bond Spreads**



Source: Bloomberg

**Chart 1.12**  
**Selected US Interest Rates and Fed Funds Target Rate**



Source: Bloomberg, Merrill Lynch



to record highs (Chart 1.11) and equity prices around multi-year lows.

**Longer-term, the removal of support measures may need to be co-ordinated to prevent further destabilisation**

The funds provided to the financial system by central banks have eased liquidity stresses but have created unprecedented reliance on public provision of credit. In the longer term, there remain considerable risks surrounding the withdrawal of these special facilities and the orderly return of private sector intermediation in the money markets. The exit strategy from the current situation needs to be well planned and coordinated across countries to avoid instability.

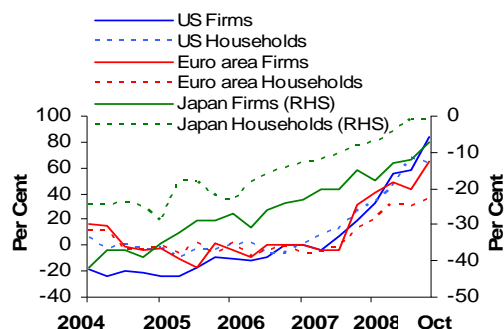
**US economic outlook weaker, primarily due to tighter credit conditions ...**

The speed with which financial market volatility and banking sector stress has impacted on the rest of the economy has accelerated. A further contraction in the supply of credit and associated rise in the effective cost of borrowing is likely to constrain consumption and investment going forward. In addition, wealth destruction arising from asset price falls will put further pressure on households' and firms' balance sheets.

Despite the financial sector deleveraging, US corporate balance sheets remained healthy in H1 2008. Indeed, the average earnings of most non-financial S&P 500 companies in H1 2008 were above H1 2007. However, the pace of the credit contraction poses a significant challenge. Despite a 325 bps reduction in the FOMC's target rate since the start of the year, effective rates paid by households and corporates have either remained the same or risen. (Chart 1.12) At the same time, lending standards have tightened sharply and availability of credit has declined. (Chart 1.13) Corporate earnings will also be under substantial pressure as the economy enters into a broad-based recession.

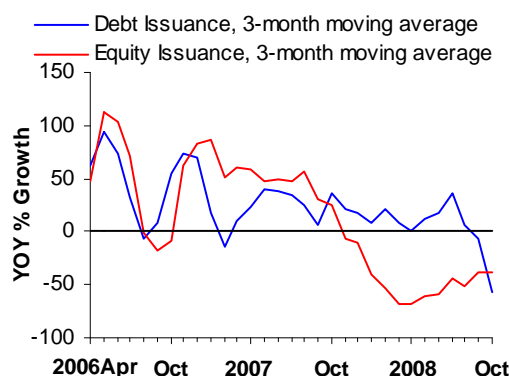
Along with more expensive bank borrowing, the cost of raising funds in capital markets has also

**Chart 1.13**  
**Net Percentage of Banks Tightening Lending Standards**



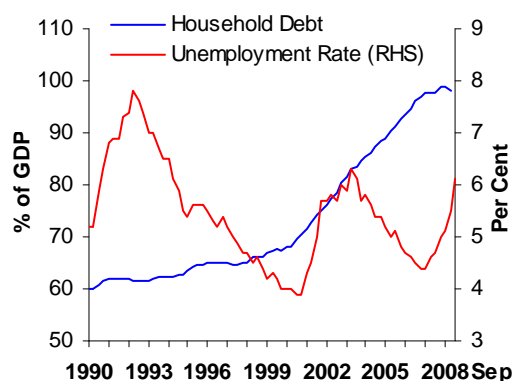
Source: Federal Reserve Board, ECB, Bank of Japan

**Chart 1.14**  
**Growth of Debt and Equity Issuance by US Non-financials**



Source: Dealogic

**Chart 1.15**  
**Household Debt and Unemployment**



Source: CEIC

increased. This is indicated by wider corporate credit spreads and implicit in lower and more volatile stock prices via higher equity risk premia. Reflecting this, both debt and equity issuance fell significantly for the non-financial corporate sector in Q3 2008. (Chart 1.14)

Unlike the corporate sector, the US household sector was quite highly leveraged entering this credit turmoil. Household debt rose from 68% to 98% of GDP between 2000 and 2008. Falling home prices have reduced or shut off access to home equity credit lines and mortgage refinancing. Sharply rising credit card delinquencies in H2 2008 may result in a pull back in credit card lending, further reducing credit availability.

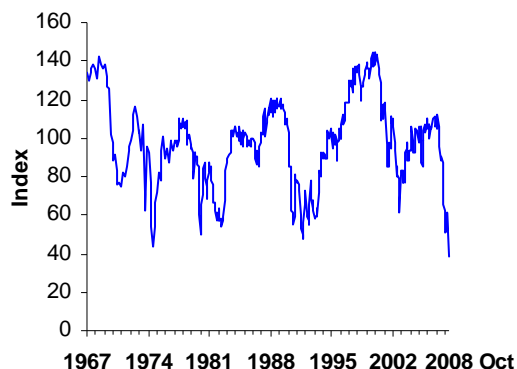
The reduced access to credit, together with rising unemployment (Chart 1.15), will cause households to restrain spending, suggesting that the outlook for consumption will remain weak as households deleverage and rebuild their balance sheets. Indeed, US consumption growth, which had held up well through Q2 2008, turned negative in Q3 for the first time since 1991. Meanwhile, US consumer confidence has fallen steadily since July 2007 and hit a record low in October. (Chart 1.16)

Reflecting these factors, consensus forecasts of US GDP growth for 2009 have been revised down sharply in recent months. (Chart 1.17)

### ... and downside risks remain from the property sector.

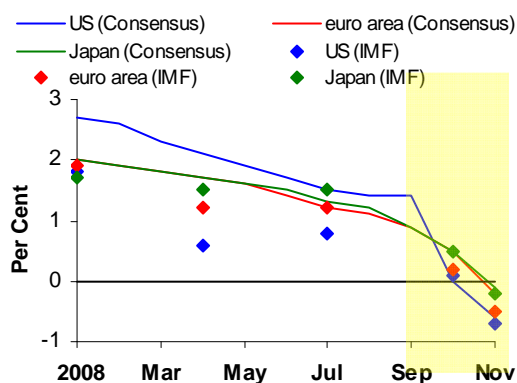
Alongside projected weaker growth, considerable downside risks remain. A sharper than expected fall in house prices, for example, could further reduce household wealth and, in turn, both consumption and residential investment. Futures prices on an index of house prices point to about an 8% drop by the end of 2009, on top of the 23% fall from its peak to date. However, uncertainty remains high, as reflected in the mixed performance of housing market indicators. In H2 2008, home sales stabilised and unsold inventory fell but house prices continued to fall. Mortgage delinquency rates also remained high. (Chart 1.18)

**Chart 1.16**  
**The Conference Board US Consumer Confidence Index**



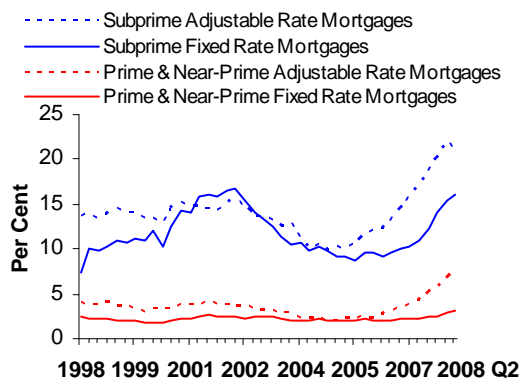
Source: Bloomberg

**Chart 1.17**  
**Evolution of 2009 GDP Growth Forecasts**



Source: Consensus Forecasts, IMF

**Chart 1.18**  
**US Mortgage Delinquency Rates**



Source: Datastream

As in the US, uncertainty surrounding both the residential and commercial property sectors in Europe – and in some European countries in particular – continued to weigh on the outlook for the region. The UK and Ireland have experienced particularly sharp falls in home prices. (Chart 1.19) It should be noted, however, that residential property bubbles did not occur uniformly across Europe, and in fact house prices decreased in Germany between 2003 and 2007. Banks and households, with their balance sheets already stretched, continue to be vulnerable to further falls in property prices.

**The slowdown in Europe accelerated...**

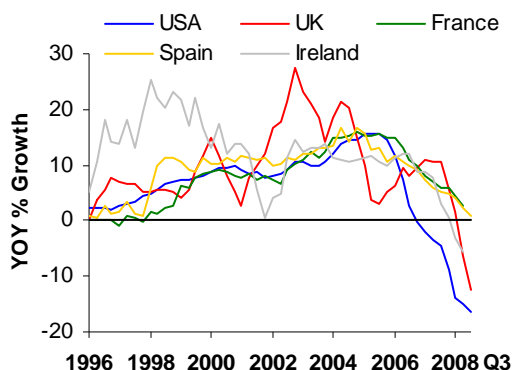
As the financial turmoil deepened and became more acute in Europe, the pace of transmission to the real economy quickened. Euro area GDP contracted 0.2% q-o-q in Q3, with several European economies entering technical recessions. Similarly, UK GDP contracted and analysts have revised sharply downwards European growth forecasts for 2009. (Chart 1.17) Survey data suggest further weakening of economic activity going forward. (Chart 1.20)

In Europe, as elsewhere, the significantly weaker economic prospects reflected actual and prospective credit tightening. In the wake of large losses in the banking sector, credit conditions surveys have pointed to further contraction in bank lending to both households and corporates, reflecting banks' concerns over residential and commercial property prices as well as the outlook for the broader economy. (Chart 1.13) It is possible that households in some European countries will be less affected than their US counterparts given their more conservative credit profile and higher savings rates, but for countries in which households are more highly leveraged, there are downside risks to consumption as households experience lower real income, higher mortgage payments, and falls in asset values.

**... and yen appreciation contributed to an export-led slowdown in Japan.**

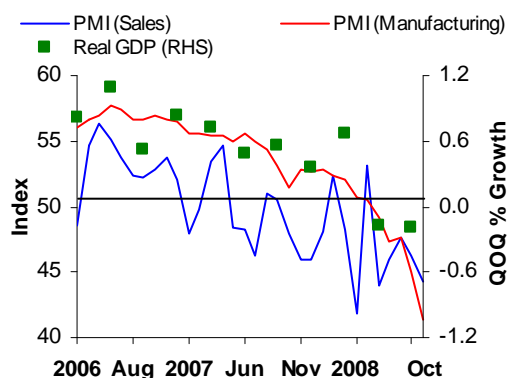
In Japan, economic conditions have been deteriorating since the start of the year. Yen appreciation has dampened export growth (Chart

**Chart 1.19**  
**US and European House Price Inflation**



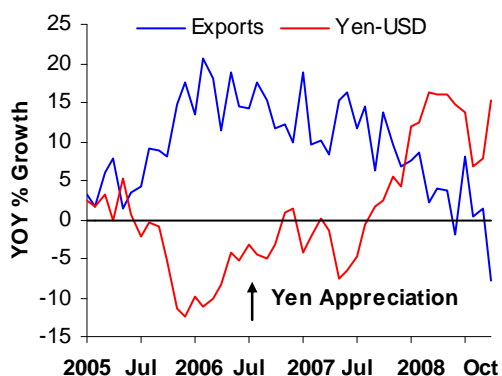
Source: Datastream

**Chart 1.20**  
**Eurozone Purchasing Managers Index (monthly) vs GDP Growth (quarterly)**



Source: Bloomberg

**Chart 1.21**  
**Yen Exchange Rate Movements and Japanese Exports Growth**



Source: CEIC

1.21) but has been insufficient to counteract the impact on costs of higher commodity prices. This has caused manufacturers' earnings to be squeezed by lower revenues and higher costs.

Escalating global financial sector turmoil in Q3 2008 strengthened the headwinds facing the Japanese economy. Tighter credit conditions and slowing growth prospects in export markets (the US, Europe and China account for around 50% of Japan's exports) weakened business and consumer sentiments. (Chart 1.22)

More recently, a sharp appreciation of the yen – reportedly related to the unwinding of carry trades – has put more pressure on the export sector while the steep falls in stock prices have put pressure on banks with significant domestic market exposure. Indeed, the Japanese economy contracted by 0.1% q-o-q in Q3 2008, following a 0.9% contraction in Q2, putting it in technical recession for the first time in seven years. In the face of rising downside risks to economic growth, the Bank of Japan cut the policy rate by 20bps to 0.3% in October.

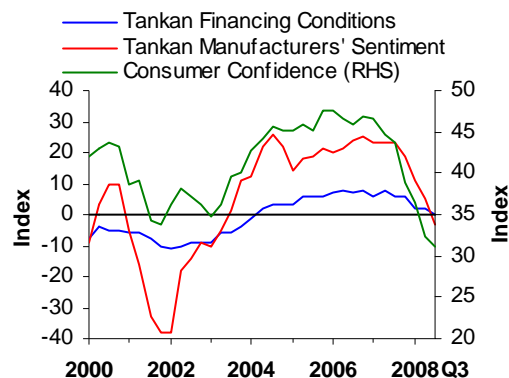
**The weaker global outlook poses risks of adverse feedback loops between the real economy and financial sector ...**

The financial turmoil and an expected G3 recession have already led some analysts to raise estimates of bank writedowns. (Chart 1.23) The risk of further unexpected house price falls and, in turn, losses and downgrades on related assets could increase writedowns still further, slowing the recovery of the banking sector. This would in turn cause banks to restrict lending further, exacerbating the credit crunch and causing a deeper and more protracted global recession. In other words, negative feedback loops between the financial sector and the real economy pose the risk of a more severe global recession.

**... and a sharper than anticipated pickup in corporate defaults.**

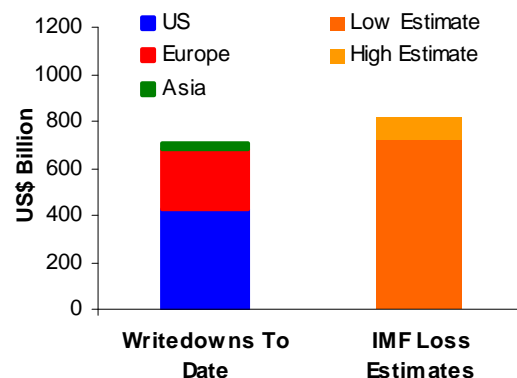
A significant rise in defaults on non-mortgage assets is also expected. (Chart 1.24) If the downside risks to the economy crystallise, the rise in defaults could

**Chart 1.22**  
**Japanese Business and Consumer Confidence Surveys**



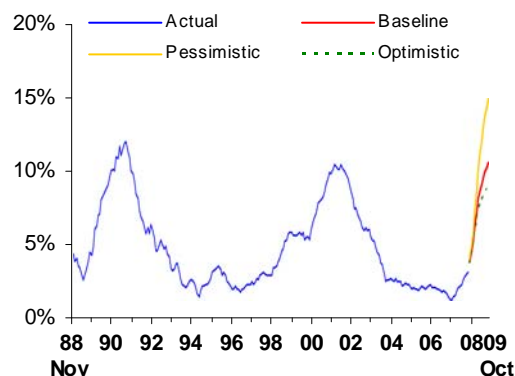
Source: CEIC

**Chart 1.23**  
**Bank Writedowns and Expected Losses**



Source: IMF GFSR, Bloomberg

**Chart 1.24**  
**Twelve-month Global Speculative Grade Corporate Default Rate**



Source: Moody's Investors Service

be particularly sharp.

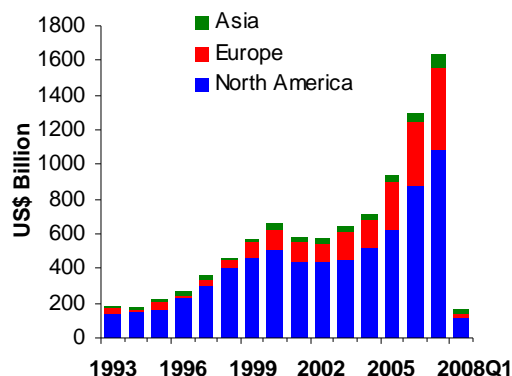
As well as losses arising from holdings of bonds, a sharp rise in defaults would trigger losses for some financial institutions on holdings of credit derivatives. European institutions, in particular, may have high exposures to synthetic CDOs, many of which have already been downgraded and/or suffered losses owing to significant exposures to failed financial institutions (e.g. Lehman Brothers and Icelandic banks). The search for yield led synthetic CDOs to include excessive exposures to these firms, which had provided a relatively high yield for their strong credit ratings ('cheap for the rating') during the credit boom. As a result, synthetic CDOs in general may be particularly exposed to more vulnerable firms. Moreover, many CDOs may enter an environment of rising corporate defaults having already experienced substantial losses.

Defaults on loans may also pick up more sharply than in previous credit cycles following significant growth in the leveraged loan market up to 2008. (Chart 1.25) Leveraged loan issuance exceeded US\$1.5 trillion in 2007, with non-bank investors accounting for a larger share of the primary market than ever before (reflecting the 'originate and distribute' model). (Chart 1.26) Reflecting this development, CLO issuance also increased sharply in recent years. (Chart 1.27) Loose credit conditions also led to the loans having fewer and/or less stringent covenants (so-called "cov-lite" loans). Fewer covenants imply that loans may take longer to default than in previous cycles, with the risk that when they do, recovery rates may be lower and investor losses higher.

**Monetary policy eased as inflationary pressures abated ...**

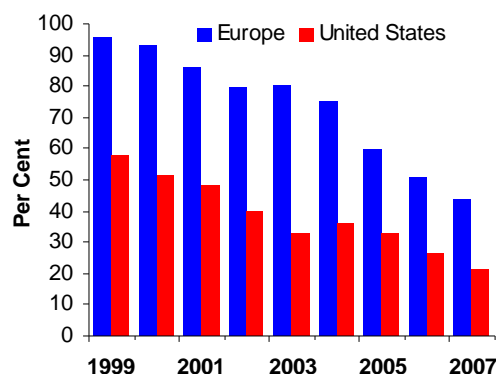
The prospect of a G3 recession triggered a sharp reversal in the expected path of monetary policy. (Chart 1.28) In the middle of the year, with oil prices still high and inflation rising, market participants expected only a moderate loosening in policy through 2008, and as late as July, the ECB raised interest rates.

**Chart 1.25  
Leveraged Loan Issuance (US\$ bn)**



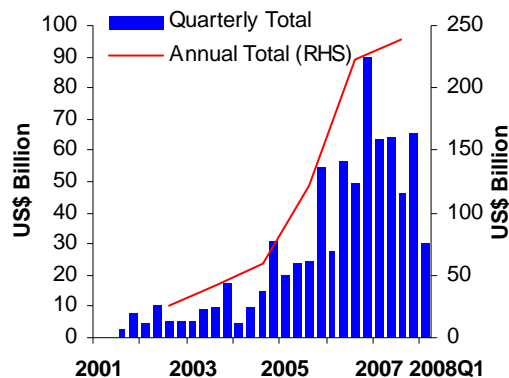
Source: BIS

**Chart 1.26  
Banks' Share in Leveraged Loan Primary Market**



Source: BIS

**Chart 1.27  
CLO Issuance**



Source: BIS

As the economic outlook weakened and oil and other commodity prices declined, the threat of inflation eased globally and policymakers turned their attention to cushioning the impact of the global slowdown. Against a backdrop of deep uncertainty over the soundness of the financial system and mounting concerns over growth, central banks around the world responded with a co-ordinated interest rate cut in October.

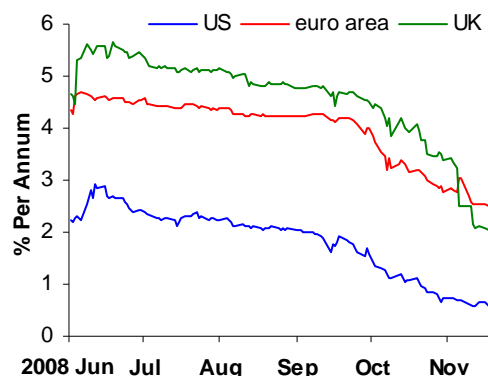
Recent CPI inflation outturns in the US and UK underline the sharp reversal in inflation risks. The UK inflation rate registered its largest decline in 16 years in October, while the US CPI dropped 1% pt between September and October, the steepest such decline in 61 years. Five-year breakeven inflation rates derived from index-linked and conventional bonds have fallen close to or even below zero, consistent with expectations of very low inflation over the medium-term. (Chart 1.29) However, these measures may be distorted given the recent illiquid market conditions.

**... although very low official interest rates risk a reduced effectiveness of monetary policy to stimulate economic activity.**

While the sharp reversal of inflation risks has allowed central banks to ease monetary policy significantly, they have also led to heightened fears of deflation. Indeed, forward interest rates point to the FOMC's target rate dipping below 1% in December, pushing it close to the 0% nominal interest rate floor and thus possibly limiting the scope for further 'conventional' monetary easing. When interest rates hit zero, agents may be indifferent between holding cash and other high-quality securities, implying conventional central bank open market operations have little effect on the economy (a so-called "liquidity trap").

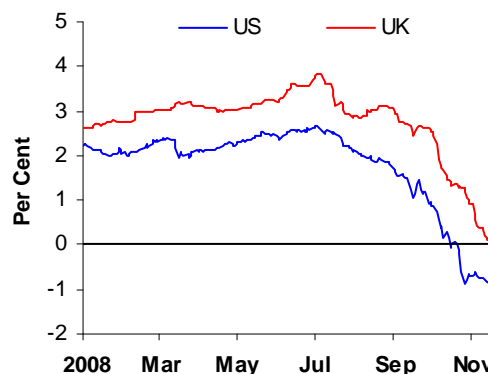
A combination of deflation and policy rates at near-zero could mean the *real* policy rate turned positive. This situation could risk pushing the economy into a deeper recession. Such concerns contributed to further falls in global asset prices in late November. However, central banks' recent use of unorthodox measures to supply liquidity through a broader range of instruments may help to overcome banks'

**Chart 1.28  
Implied Overnight Interest Rates  
Following December 2008 Policy  
Meetings**



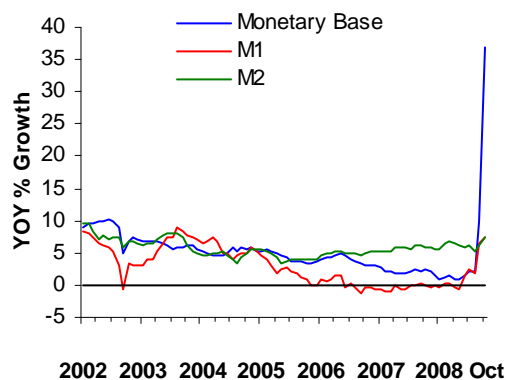
Source: Bloomberg

**Chart 1.29  
Five-year Breakeven Inflation Rates**



Source: Federal Reserve Board and Bank of England

**Chart 1.30  
US Money Growth**



Source: CEIC



reluctance to lend.

Reflecting these measures, including the Fed's move in October to start paying interest on bank reserves, the monetary base has expanded rapidly in the US. However, there has not yet been a sharp acceleration in broader money or credit growth. (Chart 1.30) As discussed in Box A on page 15, this phenomenon has most likely resulted from a breakdown in financial intermediation rather than the emergence of a "liquidity trap", although it is possible that the latter could emerge if the economy were to fall into a deep recession. In response, governments have recently adopted policy measures aimed at facilitating lending to the real economy.

**Fiscal expansion may boost growth and aid the efficacy of monetary policy**

The risk of diminished effectiveness of conventional monetary easing has prompted governments in the US, Europe and other countries to adopt expansionary fiscal policy to boost the economy. The G20 summit on 15 November had also endorsed the use of fiscal measures to stimulate domestic demand. As a result, government borrowing is projected to rise sharply in the US and some other advanced countries.

One by-product of increased government debt issuance, owing both to higher budget deficits and to the funding of support measures to banking systems, could be higher borrowing costs for governments as well as greater risks on public sector balance sheets. Perhaps partly reflecting this, sovereign CDS spreads have widened. However, it is not clear that borrowing costs for the government will rise, as it is possible that, with some investors repairing balance sheets and moving out of risky assets, the additional supply will be absorbed by rising demand.

### **Key financial stability risks stemming from global financial markets**

During the past 18 months, the global financial system has experienced its worst financial turmoil in decades. Following the collapse of Lehman Brothers and near-failure of AIG in mid-September, interbank funding markets seized and triggered a widespread breakdown of confidence in global financial markets. In response, Governments announced massive programs to support the financial sector. These measures appear to have prompted a gradual improvement in money markets, although conditions remain stressed. Going forward, the gradual process of normalisation should continue.

The speed with which financial market volatility and banking sector stress has impacted the rest of the economy has accelerated. A further contraction in the supply of credit and associated rise in the effective cost of borrowing is likely to constrain consumption and investment going forward. Reflecting this, there have been sharp downward revisions to economic growth forecasts in G3 economies and recession is expected. As a result, corporate defaults will rise and further losses on property exposures are possible.

Monetary policy has responded to the shift in the global economic outlook and official interest rates are expected to be reduced further. At the same time, fiscal expansion should help stimulate economic demand and cushion the extent of the downturn.

There are however, some downside risks to this central outlook:

- Government support measures appear to have helped ease conditions in bank funding markets. However, if the support measures do not facilitate a fall in risk aversion, wider capital markets could remain impaired for some time. In turn, the high cost and constrained availability of credit could persist.
- A degree of calm has returned to asset markets internationally, but further forced asset sales, particularly from hedge funds and other non-bank financials, could exert downward pressure on asset prices and increase volatility, setting back the process of normalisation.
- In the medium term, there is a risk of further entrenchment of the negative feedback loops between the real economy and the financial sector. If loan default rates rise sharply and recovery levels are low, banks may need to make further unexpected write-downs, prolonging the process of deleveraging. Loan losses may also be transmitted and amplified through the financial system to broad categories of investors through non-mortgage structured credit products.
- The aggressive monetary policy actions taken by G3 authorities may not be sufficient to prompt banks to increase lending. Other policy measures may be needed in conjunction with monetary policy to facilitate a normalisation of financial intermediation.
- In the longer term, coordinated and timely international action will be needed to remove the extraordinary policy measures so that they do not promote moral hazard and encourage new excesses to build up in the financial system, and to preserve a level international playing field.



**Box A****Liquidity Traps and the Credit Channel – A Framework for Understanding Monetary Policy Transmission and Its Disruptions**

Official interest rates have been cut sharply – to 1% in the US – and market prices indicate further reductions are expected. This, alongside an apparent reluctance of banks to lend, has led some commentators to note the possibility that a liquidity trap could develop<sup>2</sup>. Even before the swift easing of monetary policy in 2008 H2, the efficacy of monetary policy had already been questioned owing to the apparent unresponsiveness of long-term borrowing rates to changes in policy rates. (see Chart 1.12 in main text) The potential for a negative spiral of further credit contraction and economic deterioration underlines the need for policy measures to avert a sharp contraction in credit supply to the real economy. This box uses a simple textbook framework for the monetary transmission mechanism to set out the challenges facing policymakers and possible policy options. It implies that although liquidity traps are currently attracting headlines, fixing the ‘credit channel’ of monetary transmission remains the more important task.

**Background**

The transmission mechanism of monetary policy is complex and reflects the impact of changes in the policy instrument on a wide range of market interest rates and asset prices, as well as confidence and expectations. However, in a simple model, monetary policy can be thought to have two transmission mechanisms. The first is via the ‘cost of capital’ – changes in the policy rate affect market interest rates and in turn the savings and investment decisions of firms and households. The second is the so-called ‘credit channel’, which arises owing to informational asymmetries that result in an additional cost to raising finance externally relative to the opportunity cost of using internal funds (such as retained earnings). Changes in the policy rate can also influence the size of this ‘external financing premium’.

Despite the model’s shortcomings, it is useful to analyse monetary policy within a simple IS/LM framework. In this framework, the IS curve connects points at which the real economy is in equilibrium, where total spending equals total output. The LM curve connects points at which money demand and supply are in equilibrium<sup>3</sup>. The classic ‘cost of capital’ monetary transmission channel is reflected by shifts in the LM curve, while the credit channel of monetary policy would be reflected by shifts in the IS curve<sup>4</sup>. (Chart A1)

**Liquidity trap**

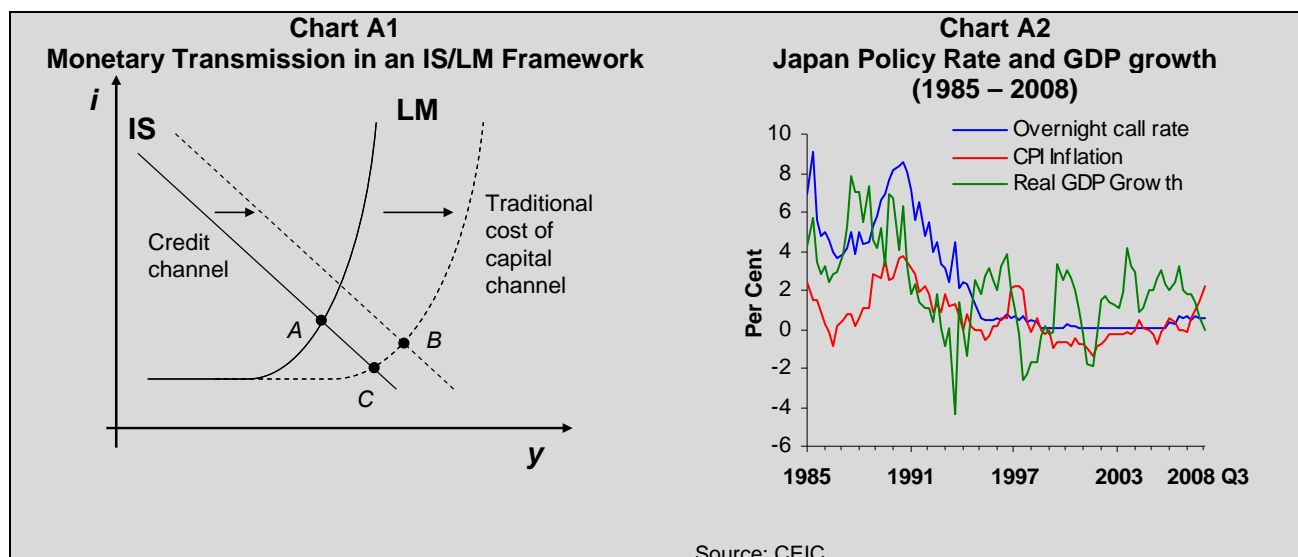
A liquidity trap is a concern in terms of the ‘cost of capital’ transmission channel of monetary policy. It arises when the LM curve is so far to the right of the IS curve that a lower bound to the nominal interest rate – typically zero – becomes binding. At that point, further monetary expansion (i.e. rightward shifts in the LM curve) no longer leads to output growth (point C in Chart A1) and monetary policy becomes ineffective.

The liquidity trap arises at a zero interest rate because individuals become indifferent between government bonds and cash, rendering conventional open market operations involving government bonds and bills ineffective. The LM curve should thus be flat at that boundary. Furthermore, if low interest rates were to be accompanied by entrenched deflationary expectations, then the real interest rate would be positive and monetary conditions could be overly restrictive, but central banks would be unable to ease monetary policy because of the “zero interest rate bound” on the policy rate. Indeed, Japan’s “lost decade” was characterised by a zero or near zero policy rate accompanied by generally negative inflation and low growth. (Chart A2)

<sup>2</sup> See, for example, “Ways Out of the Liquidity Trap,” *Financial Times*, 3 Nov 2008.

<sup>3</sup> Note that for the purposes of this discussion, we will use nominal interest rates on the y-axis of our IS/LM diagram, instead of real rates. See McCallum, B (1996), *International Monetary Economics*, pp 105-106 for a discussion of this representation.

<sup>4</sup> Strictly speaking, some modification of the IS curve is required. See Bernanke, B and Blinder, A (1988), “Credit, Money and Aggregate Demand”, *The American Economic Review*, May 1988, pp 435-439.



In the current environment, a global liquidity trap arising from the zero bound is perhaps a tail risk. First, among developed nations, only the US is facing the prospect of approaching the zero bound, while Japan has been hovering close to zero since the 1990s. Second, with the statement from the G20 Summit in November signalling the need to adopt fiscal stimulus measures, the IS curve could shift to the right, mitigating the liquidity trap risk. (point B in Chart A1)

#### Credit channel

Perhaps the greater risk for global economies lies in the weakening of the credit channel. Although the discussion below focuses on the US, other economies are experiencing similar factors that could weaken the credit channel.

In normal times, a cut in the policy rate should reduce the cost of external financing, via two sub-components of the credit channel. First, a cut in policy rates has a **balance sheet effect** – it should reduce interest payments for firms, while boosting profit outlooks via positive 'cost of capital' effects on the economy. (Chart A3) It should also increase collateral values by lowering the discount factor. Higher collateral values should in turn reduce monitoring costs associated with asymmetric information. These factors should allow firms (including financial institutions) to borrow more and at lower rates, in other words reducing their cost of external financing. The second sub-component is the **bank lending effect**<sup>5</sup>. When external financing premiums for banks decline as a result of the balance sheet effect, it allows the banks to increase the amount of loans they can provide.

The past few years have been characterised by a period of rapid credit expansion and rising asset prices. Other things being equal, this should have reduced borrowing costs via the credit channel. Conversely, the fall in asset prices and process of deleveraging may be responsible for effective rates being less responsive to changes in policy rate.

The effects of this turmoil can be seen in both balance sheets and bank lending. Firms' earnings, and thus ultimately their balance sheets, have been negatively impacted, weakening the link between policy rate cuts and improved prospects for firms. This can be seen in the separate paths taken by the Fed funds rate and the coverage ratio<sup>6</sup> since the onset of the current credit crunch. (Chart A3) More dramatically, the current turmoil has impaired the balance sheets of financial institutions, particularly broker-dealers which had

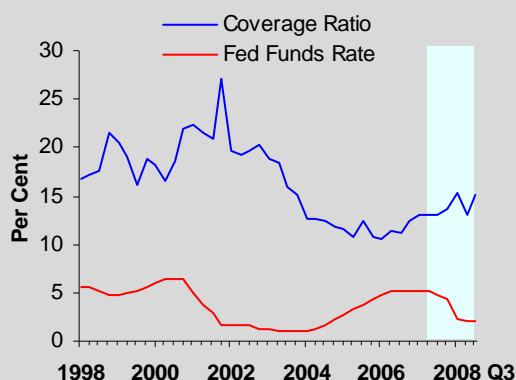
<sup>5</sup> Note that theoretical and empirical support for the bank lending effect is not unequivocal. The strength of the bank lending effect may also differ depending on the reliance of economies on banks as financial intermediaries.

<sup>6</sup> Defined as interest payments divided by interest payments plus profits.

become major credit providers in recent years<sup>7</sup>. The sharp fall in value of their assets led to a corresponding rise in their external financing costs, indeed to such an extent, that the broker-dealer funding model became unsustainable. The impairment of these balance sheets (Chart A4) in turn reduced the amount of credit available.

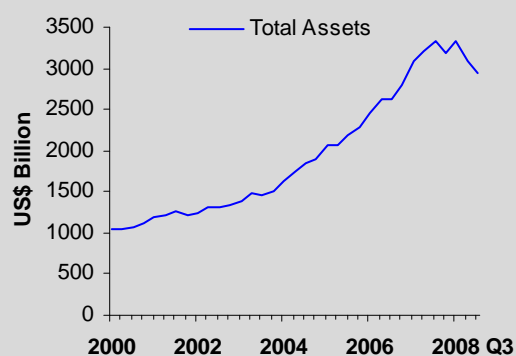
The impact of the turmoil on bank lending is equally salient. Banks' external financing premia have risen sharply, most clearly seen in the rise in Libor-OIS spreads, as the problem of informational asymmetry increased due to uncertainty about counterparty exposures to bad assets. At the same time, bank capital has been eroded by asset writedowns. Both phenomena suggest that bank lending will contract going forward, even as loan growth has remained positive to date. Considering banks more broadly as loan originators, and securitisation as a means with which banks finance loans<sup>8</sup>, the sharp drop in issuance of securitised products reflects a decrease in credit availability. The turmoil has temporarily weakened the link between lower policy rates and increased lending, whether via bank loans or securitised lending.

**Chart A3**  
**Fed Funds Rate versus Median Coverage Ratio of S&P 500 Companies**



Note: Coverage ratio defined as interest payments divided by the sum of interest payments and profits  
Source: Thomson Financial, MAS estimates

**Chart A4**  
**Broker-Dealer Balance Sheets**



Note: Only the three largest broker-dealers included, i.e. Goldman Sachs, Morgan Stanley and Merrill Lynch. In 3Q08 they were either acquired or became bank holding companies.  
Source: Bloomberg, MAS estimates

### Policy options

Recent government responses to repair the damage of the turmoil should help restore the functioning of the credit channel (see Chart A5 for stylised depiction of the credit channel and policy options for unblocking it). On the bank lending side, government guarantees on bank debt should help reduce funding costs, while publicly-funded bank capital injections should also bolster balance sheets and facilitate bank lending. The US Treasury has also announced measures to support the consumer loan securitisation market, which is a source of funding for loan origination. Going forward, initiatives to encourage further private recapitalisation of banks, and to revive securitised product markets, such as the possible introduction of covered bonds in the US, could further aid the recovery. For firms' balance sheets, fiscal stimulus measures should provide a boost to domestic demand and so cushion the adverse impact of the global slowdown.

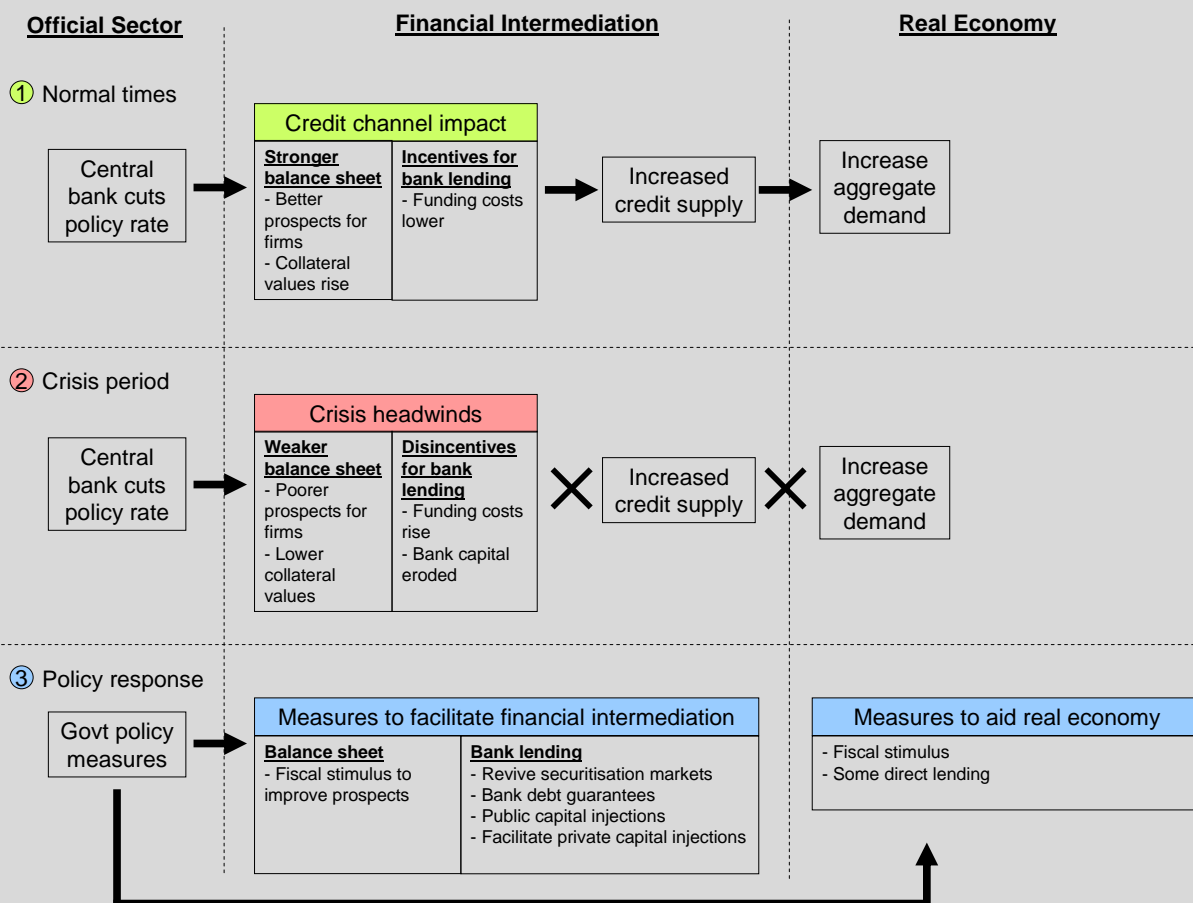
In a situation where both a liquidity trap and a credit crunch are in play, some have suggested that monetary policy can remain effective by switching from interest rate targeting to exchange rate management. However, while such a policy may work for an individual country, it would not work if all

<sup>7</sup> See Adrian, T and Shin, H (2008), "Liquidity and Leverage", Federal Reserve Bank of New York Staff Report no.328.

<sup>8</sup> See Bernanke, B (2007), "The Financial Accelerator and the Credit Channel", remarks at a conference on The Credit Channel of Monetary Policy in the Twenty-first Century, Federal Reserve Bank of Atlanta, 15 June.

countries were to switch to the exchange rate channel of monetary policy because exchange rates are by definition a relative concept and they cannot all depreciate at the same time.

**Chart A5**  
**Stylised Depiction of the Credit Channel**



**Conclusion**

A liquidity trap and the weakening of the credit channel are typically inter-related problems. It is possible that a weaker credit channel reduces the effectiveness of monetary policy, thus requiring larger rate cuts that bring the policy rate closer to its lower bound. Indeed, it can be argued that the US in the 1930s and Japan in the 1990s<sup>9</sup> exhibited signs of both problems. However, it is possible for one problem to exist without the other. For instance, the contraction of bank lending in the US in the early 1990s, an effect of the savings and loans crisis, suggested a weakening of the credit channel without the prospect of a liquidity trap. It is also useful to keep the conceptual distinction between the two transmission channels in mind – monetary policy is facing challenges in both channels, and government efforts can perhaps be better understood in light of how they contribute to the restoration of these separate channels. The current outlook suggests that measures aimed at fixing the credit channel are most pressing. But the longer the credit channel remains impaired, the more likely it is that nominal interest rates could hit a lower bound and, in turn, the greater the risk of a liquidity trap.

<sup>9</sup> See Hutchison, M (2000), "Japan's Recession: Is the Liquidity Trap Back?", Federal Reserve Bank of San Francisco Economic Letter, 16 June.

## 1.2 Asian Financial System

### Asia was in a resilient position at the start of 2008

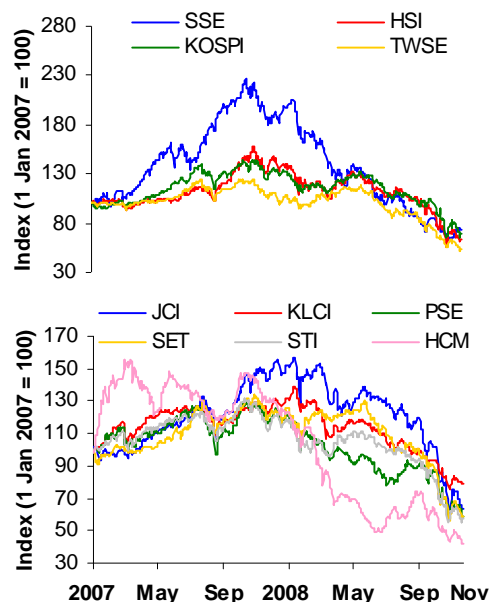
Asia began 2008 in a fairly resilient position, having been relatively unscathed by the international financial turbulence during the second half of 2007. Most Asian economies grew strongly through the first half of 2008. Although some initial signs of slowing growth began to emerge around the middle of the year, policymakers remained more concerned about mounting inflationary pressures. Against this backdrop, many commentators were optimistic that a certain degree of growth “de-coupling” between the region and advanced economies would allow economic activity to hold up and provide policymakers with sufficient flexibility to adopt tighter monetary policies to contain inflationary pressures.

### But market sentiment has deteriorated markedly in recent months...

The financial and economic environment worsened in the second half of 2008. As indications of a more protracted G3 recession became increasingly evident, the outlook for Asia deteriorated. Furthermore, the deepening financial crisis in the US and Europe spilled over, to varying degrees, into emerging markets economies (EMEs), including Asia. As a result, in mid-October, Asian equity markets plunged to multi-year lows (Chart 1.31) while volatilities spiked to the highest levels observed since the onset of the global financial market turbulence in July last year. (Chart 1.32)

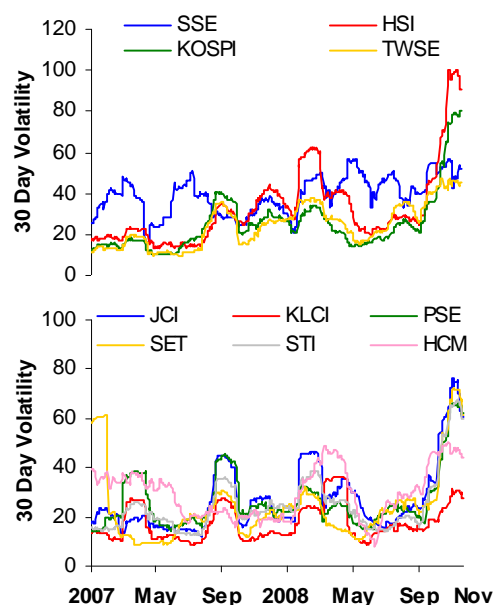
In the first half of 2008, Asian equity markets broadly tracked their US and European counterparts, as concerns about the liquidity and solvency of systemically important financial institutions deepened. Indeed, following the collapse of Bear Stearns in mid-March, major Asian equity indices fell sharply, underscoring high correlations between global equity markets in times of elevated stress. After the rescue of Bear Stearns, Asian equity markets stabilised, reflecting a short-lived expectation that the risk of a major stress event in

Chart 1.31  
Selected Asian Equity Indices



Source: Bloomberg

Chart 1.32  
Selected Asian Equity Index 30-Day Volatilities



Source: Bloomberg

the international financial system had receded.

### ... alongside sharp falls in Asian asset prices

In the second half of 2008, however, renewed concerns about the global financial system and the extent of the anticipated G3 slowdown began to affect Asian and other non-G3 asset markets adversely. Equity markets fell very sharply from late-September after the collapse of Lehman Brothers and the near-failure of AIG triggered a collapse in global confidence, before recovering somewhat in November following the raft of measures by the US and European authorities to stabilise key financial markets and institutions.

The market turbulence and heightened concerns about Asia's growth prospects also triggered a sharp fall in Asian bond prices. Corporate and sovereign spreads widened markedly in the early part of the year, and then very sharply in October before narrowing somewhat in November. (Charts 1.33 to 1.35)

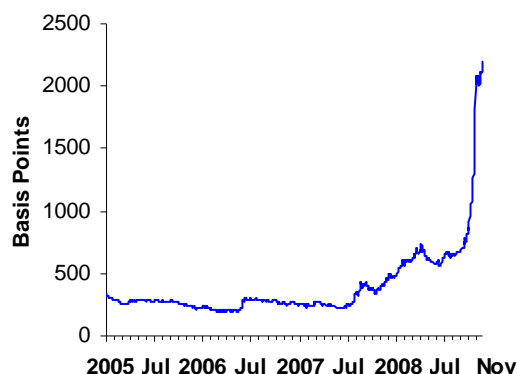
The sharp and sudden widening in sovereign spreads in October was broad-based across countries, consistent with a general repricing of risk to the region. And although the widening was most pronounced for countries perceived as having less robust macroeconomic fundamentals, the general indiscriminate nature of the widening of spreads is perhaps indicative of investors scrambling to hedge or capitulate positions rather than a sudden deterioration in macroeconomic fundamentals.

Overall the sharp falls in Asian asset markets during Q4 2008 largely reflected two factors: first, reduced economic growth prospects; and second, increased risk aversion and concerns about emerging markets in general. These factors are discussed in turn below.

### “Weak synchronicity” effect waning for export-dependent Asia ...

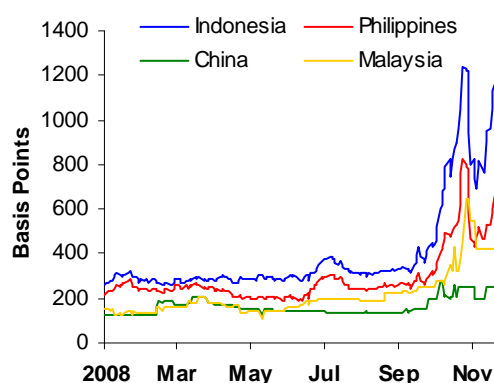
The recent deterioration in the economic outlook followed a sustained period of relatively strong growth in Asia. Over the past decade, several Asian

**Chart 1.33**  
**Corporate Credit Spreads: Asia**



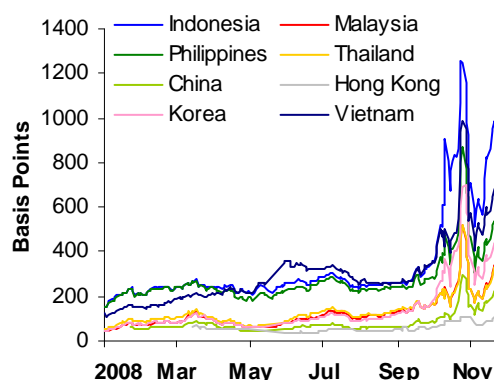
Source: Merrill Lynch

**Chart 1.34**  
**Sovereign Spreads: Selected Asian Countries**



Source: Credit Suisse

**Chart 1.35**  
**Sovereign CDS Spreads: Selected Asian Countries**



Source: Bloomberg



countries have rebuilt their financial systems, strengthened their external positions, and diversified their economies. As a result, many commentators had until recently suggested that Asia’s growth had “decoupled” from that of advanced economies, particularly the US. Indeed over the last two or three years, the relatively robust performance of the Asian economies suggested that the synchronicity of their business cycles with those of advanced economies had weakened.

However the scope for weak synchronicity to insulate Asia from an economic slowdown in the advanced economies depends on the nature and severity of the slowdown – as pointed out in the Oct 2007 and Oct 2008 issues of MAS’ Macroeconomic Review. In particular, Asia cannot be insulated from a severe downturn across all G3 countries because trade linkages have remained strong and export growth to G3 economies has continued to underpin robust Asian economic growth. (Charts 1.36-1.37)

**... and there are downside risks to Asia’s economic outlook**

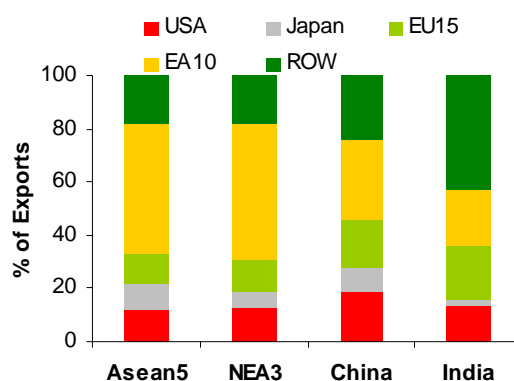
Reflecting a weaker outlook, growth forecasts for 2009 have been revised down for all Asian countries, although in general, Asian growth rates are still projected to be higher than for other regions. (Table 1.3) There is also evidence of greater uncertainty about the growth outlook, as the range of individual forecasts has widened for several economies.

Indeed, several components of GDP growth could surprise on the downside.

First, there remain significant downside risks to import demand from G3 economies, given the uncertainties surrounding the outlook for these economies as highlighted in Section 1.1. In particular, while consumer sentiment and leading indicators of industrial activity already point to a contraction in demand, the contraction may turn out to be larger than expected, owing to tighter credit conditions and negative feedback effects between the financial sector and the real economy.

Second, the growth of Asian exports to EMEs may

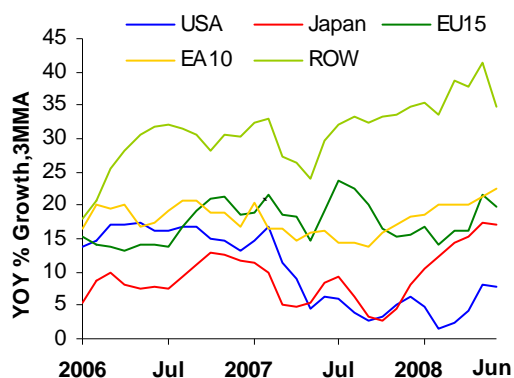
**Chart 1.36  
Asian Exports:  
Share By Destinations for 2007**



Source: CEIC

Note: Asia comprises China, Hong Kong, Indonesia, India, Korea, Malaysia, The Philippines, Singapore, Taiwan and Thailand

**Chart 1.37  
Asian Exports: Growth by Destinations**



Source: CEIC

Note: Asia comprises China, Hong Kong, Indonesia, India, Korea, Malaysia, The Philippines, Singapore, Taiwan and Thailand

**Table 1.3  
Consensus Forecasts of GDP Growth for  
2008 and 2009**

Country	Jan 08		Nov 08	
	2008	2009	2008	2009
Indonesia	6.2	6.1	6.0	4.7
Malaysia	5.7	5.9	5.3	3.3
Philippines	5.7	5.8	4.2	3.6
Thailand	4.8	4.9	4.5	3.2
Singapore	6.2	6.0	2.5	1.2
Hong Kong	5.2	5.3	3.6	1.4
Korea	4.9	5.0	4.2	2.8
Taiwan	4.4	4.7	3.7	2.5
China	10.4	9.8	9.5	8.1
India	8.2	8.4	7.1	6.6

Source: Asia Pacific Consensus Forecasts

also slow if the global downturn deepens and as commodity-exporting countries, that were previously buoyant, are negatively impacted by falling oil and commodity prices.

Third, domestic demand may be adversely affected by negative wealth effects, greater caution in expanding production capacity, and reduced fixed investment. Already, there have been some early signs that private consumption and gross fixed capital formation growth have begun to moderate. (Chart 1.38)

Fourth, while many Asian governments are expected to introduce fiscal stimulus and raise public investment in infrastructure, considerable uncertainties surround the effectiveness of such proposed measures.

**But Asian banking systems are generally well placed to cope with an economic downturn**

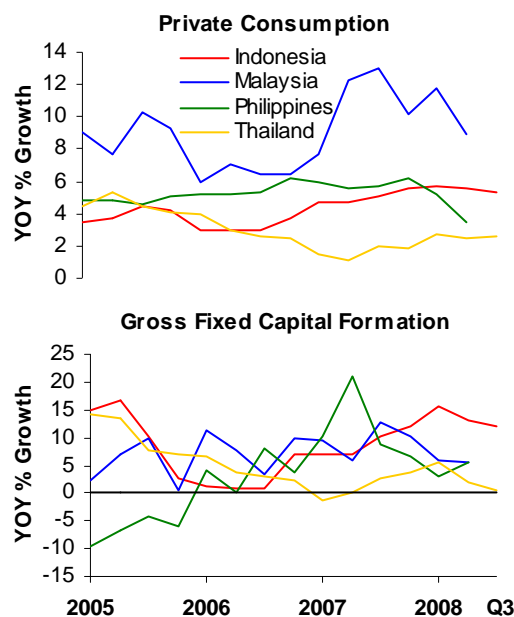
Should these downside risks crystallise, banking systems' non-performing loan (NPL) ratios (Table 1.4), which have generally been trending downward in the past few years, are likely to rise. However, most banks would face this development from a healthy position, as substantial capital buffers have been maintained (Table 1.4), and direct exposures to complex structured-finance assets and reliance on wholesale foreign-currency funding have been limited. Household and corporate balance sheets in several Asian countries are also stronger than they were prior to the Asian Financial Crisis.

**A widespread sell-off in emerging market assets occurred in mid-October ...**

Alongside weaker Asian growth prospects, a second key factor behind the sharp deterioration in asset prices was the general rise in risk aversion towards EMEs. The focus was initially on EMEs with weaker fundamentals such as Hungary, Turkey, and the Ukraine, but quickly spread to affect other EMEs, including those with relatively good fundamentals.

This rise in perceived emerging-market risk manifested itself in sharp currency depreciations,

**Chart 1.38  
Growth of Private Consumption and  
Gross Fixed Capital Formation:  
ASEAN-4**



Source: CEIC

**Table 1.4  
Commercial Banks' NPL and Capital  
Adequacy Ratios**

	2005	2006 Q4	2007 Q1	2007 Q2	2007 Q3	2007 Q4	2008 Q1	2008 Q2
<b>NPL Ratio (%)</b>								
NEA	1.4	1.2	1.2	1.2	1.1	1.0	1.0	0.9
SEA	7.4	6.4	6.2	6.1	5.7	5.0	4.7	4.4
<b>CAR (%)</b>								
NEA	12.7	12.6	12.0	11.9	12.1	12.1	12.0	12.0
SEA	15.7	16.0	16.0	16.3	16.1	15.8	15.5	14.9

Source: CEIC, MAS estimates  
Note: NEA comprises Hong Kong, Korea & Taiwan.  
SEA comprises Indonesia, Malaysia & Thailand.



stock price falls and widening of sovereign spreads across regions. Equity indices of EMEs in Asia, Latin America, Europe and the Middle East plunged between mid- and end-October (Chart 1.39) and sovereign spreads widened abruptly. (Chart 1.40) The currencies of many EMEs globally came under severe downward pressure recently, due to fairly large capital outflows, including withdrawals from region-specific emerging-market equity funds. (Table 1.5)

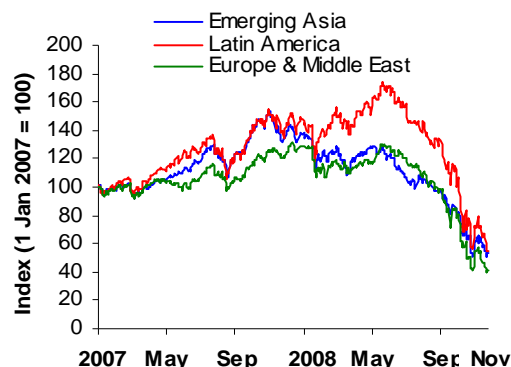
At the same time, investor surveys such as the Merrill Lynch Global Fund Managers Survey indicate that investors' medium-term views of EMEs' growth prospects and riskiness in general have also dimmed.

**... and many Asian financial markets were affected by heightened risk aversion towards EMEs**

The impact was greatest for EMEs with relatively weak external positions, for example lower foreign-reserve coverage of short-term external liabilities (Chart 1.41) and weaker fiscal balances (Chart 1.42) – notably those in Eastern and Central Europe. However, the shift in sentiment against EMEs has affected all Asian markets, consistent with the fall in EME asset prices reflecting a broad-based repricing of risks. Indeed, a simple regression model (described in Box B on page 26) suggests that the recent widening of some Asian sovereign spreads reflected a rise in global risk aversion rather than any marked deterioration in fundamentals.

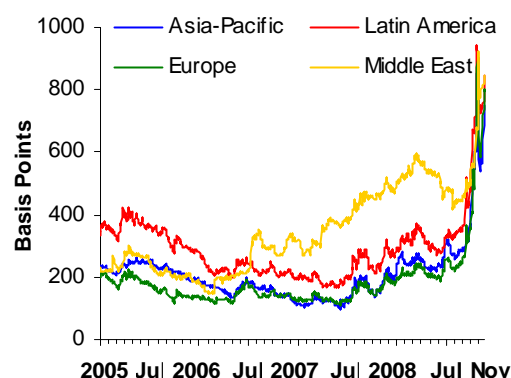
That said, as with non-Asian markets, Asian EMEs that market participants perceived as having less robust macroeconomic and/or financial fundamentals have experienced the greatest price declines. For example, the currencies of some countries with smaller reserves and/or more limited fiscal resources or specific financial-system concerns, have come under greater downward pressure (Chart 1.43) and experienced higher volatility. (Chart 1.44) But even for these economies, the recent price falls appear to be larger than would be warranted by changes in macroeconomic fundamentals alone.

**Chart 1.39**  
**MSCI Equity Indices: Emerging Asia, Latin America and Europe & Middle East**



Source: Bloomberg

**Chart 1.40**  
**Emerging Market Economies Sovereign Spreads: Asia Pacific, Latin America, Europe and the Middle East**



Source: Credit Suisse

**Table 1.5**  
**Emerging-Market Equity Fund Flows**

	Flows, US\$ Millions		Stocks, US\$ Millions
	Week beginning 5 Nov.	Ten-week average (to 5 Nov.)	Assets under management, 5 Nov.
Global EM funds	1,250	70	114,000
Dedicated Asia ex. Japan	-520	-700	84,000
Dedicated Latin America	-10	-320	20,000
Dedicated EMEA	-310	-410	23,000
<b>Total EM</b>	<b>410</b>	<b>-1360</b>	<b>241,000</b>

Source: EPFR Global

Most Asian economies, including those that have been under greater market pressure, have stronger fundamentals than EMEs in Latin America and Eastern and Central Europe. Moreover, the region as a whole is generally more robust than it was in the period preceding the Asian financial crisis (see Box C on page 28 for a comparison of key indicators in 1996-97 and 2006-07).

**Some financial systems have experienced liquidity strains, reflecting a shortage of US dollars**

Reflecting the soundness of the financial systems, Asian money markets have not experienced strains of a similar magnitude to those seen in the US and Europe. Nevertheless, they have not been entirely immune from the turmoil.

In domestic-currency markets, the cost of obtaining short-term liquidity has risen in some countries due to greater reluctance of banks to lend to one another owing to heightened risk aversion, and unsterilised interventions by central banks to support domestic currencies. For example, in India the call rate rose from about 8% at the start of the year to well above 20% by end-October. Likewise, Korean and Indonesian domestic-currency overnight interbank rates at times rose significantly above policy rates for a considerable period of time.

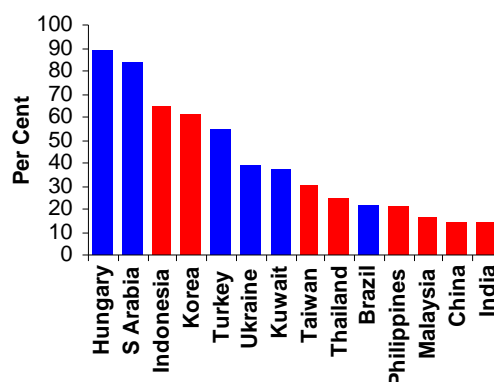
In foreign-currency markets, funding conditions tightened considerably owing to hoarding of US dollars by major financial institutions. This was felt most acutely in countries whose banking systems have higher net foreign currency liabilities. (Chart 1.45)

The rise in risk aversion globally and associated pullback in interbank lending and increase in bank funding costs, will have knock-on implications for the wider economy. There have already been reports of cutbacks on trade-finance facilities internationally. There is therefore a risk of a reduction in trade credit disrupting trade activity, putting corporates, especially small- and medium-sized enterprises (SMEs), under considerable stress. Indeed, some governments in the region have already announced

or implemented targeted measures to ensure that viable SMEs continue to be able to access funding.

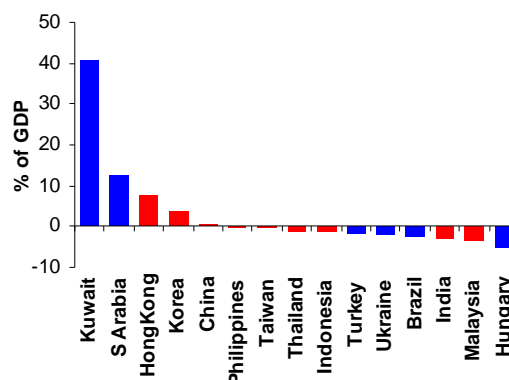
Larger corporates that raise funds from money markets by issuing CP may also experience an increase in funding cost as existing paper mature and new paper is issued. Indeed, if market strains worsen, they may experience difficulties rolling over their CP.

**Chart 1.41**  
**Short-Term External Liabilities as a Percentage of Foreign Reserves: Selected EMEs, 2007**



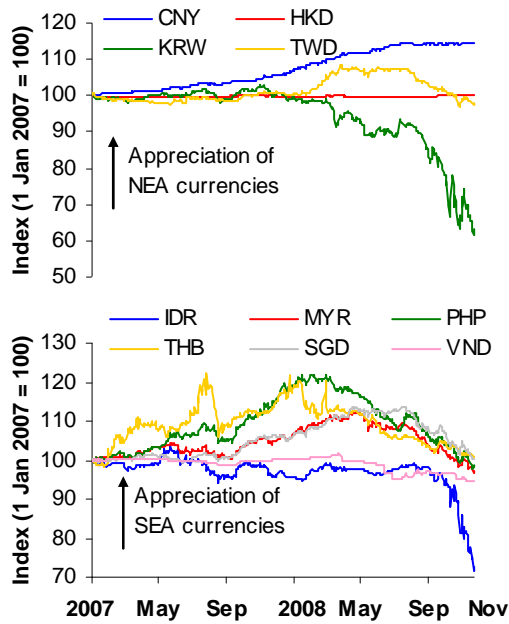
Source: CEIC, Institute of International Finance, National Official Sources

**Chart 1.42**  
**Fiscal Balances as Percentage of GDP: Selected Emerging Market Economies for 2007**



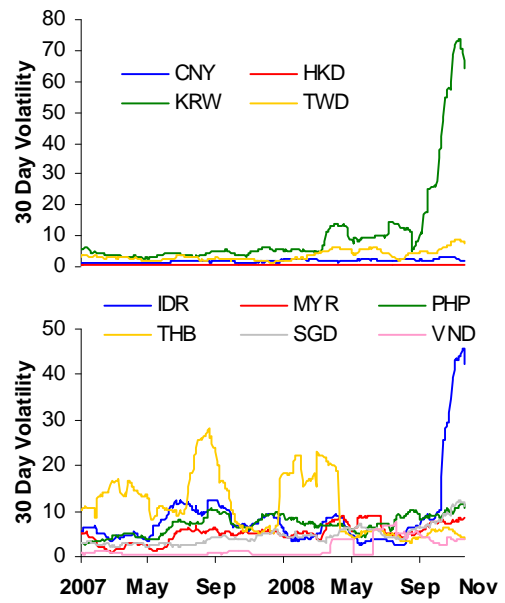
Source: CEIC, Institute of International Finance, National Official Sources

**Chart 1.43**  
**Currency Indices: Selected Asian Countries**



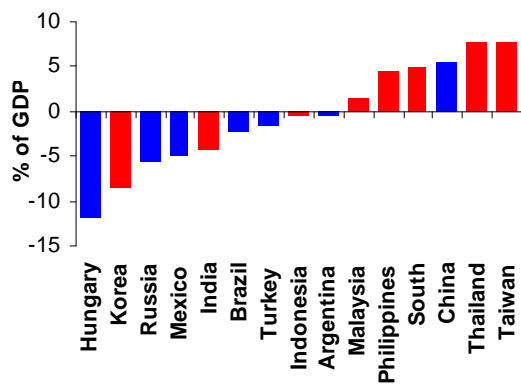
Source: Bloomberg

**Chart 1.44**  
**Currency-Index 30-Day Volatilities: Selected Asian Countries**



Source: Bloomberg, MAS estimates

**Chart 1.45**  
**Banking Sector Net Foreign Assets\* as Percentage of GDP: Selected Emerging Markets**



Source: IMF

\*Foreign assets minus foreign liabilities

### Box B Decomposing Movements in Asian Sovereign CDS Spreads

Asian sovereign credit default swap (CDS) spreads have widened sharply since the start of the year as the impact of the credit crunch has spread. This box attempts to identify the main driving force behind this widening. A simple regression model suggests that the rise in global risk aversion was the main factor up to September 2008, rather than deterioration in fundamental creditworthiness of the countries concerned.

This result is consistent with an analysis of macroeconomic indicators, which suggest that the initial conditions of Asian economies coming into the current turmoil were more favourable than they were before the onset of the Asian Financial Crisis (AFC) (see Box C). However, the deteriorating and uncertain global macro outlook means that risks specific to individual economies may crystallise rapidly. The general level of spreads also remains vulnerable to further swings in global risk appetite and risk perceptions of emerging markets.

A CDS spread should compensate the protection seller for default risk. CDS spreads can thus be thought of as reflecting three components. First, the risk-neutral probability that the borrower will default, and the recovery value in the event of default. Second, risk-averse investors will require additional compensation for bearing the uncertainty about default. This credit risk premium should be a function of the general level of uncertainty and risk aversion in the economy. Third, CDS spreads may include a liquidity premium.

Following earlier studies<sup>10</sup>, these three factors are used to explain CDS spreads. The factors are proxied as follows:

- 1) Probability of default, which is captured by average credit ratings (*CR*) of the 5 Asian sovereigns used in this regression<sup>11</sup>.
- 2) General level of risk appetite, which is proxied by the VIX index (*VIX*).
- 3) General level of global liquidity, which is proxied by G3 broad money supply (*LIQ*)<sup>12</sup>.

With these three independent variables, we use an average of five Asian countries' sovereign CDS spreads (*CDS*) as a dependent variable in the following regression model<sup>13</sup>:

$$CDS_t = \alpha + \beta_1 CR_t + \beta_2 VIX_t + \beta_3 LIQ_t + \varepsilon_t$$

The coefficients are statistically significant and signed as expected. (Table B1) They suggest that over the sample period<sup>14</sup>, a one notch downgrade in credit rating applied to all sovereigns in the sample is associated with a 57bps widening in spreads<sup>15</sup>; a one percentage point rise in VIX typically leads to a six bps widening in spreads; and a one percentage point decrease in money growth is associated with a 17bps widening in spreads.

The regression results can be used to decompose the movement of the CDS spread since the start of the subprime crisis (July 2007 to September 2008). The regression suggests that the rise in the VIX index during this period accounts for almost the entire widening in CDS spread, with liquidity playing a small role. (Table B2) Credit ratings actually improved slightly and so do not appear to have contributed to the rise in spreads. This simple model therefore suggests that CDS spread movements up to September could be explained principally by the general rise in global risk aversion rather than by a marked deterioration in

<sup>10</sup> 'A simple model for emerging market bond spreads', Bank of England Quarterly Bulletin Spring 2006. 'Interpreting Sovereign Spreads', BIS Quarterly Review March 2007.

<sup>11</sup> The countries are China, Korea, Malaysia, Philippines and Thailand, chosen based on maximum data availability.

<sup>12</sup> An alternate specification using Asian money growth yielded qualitatively similar results.

<sup>13</sup> Within the sample, all variables are I(1) except the VIX index. However, credit ratings and credit spreads may be I(0) in the long run. As such we use levels for all variables except money supply, for which we use y-o-y growth.

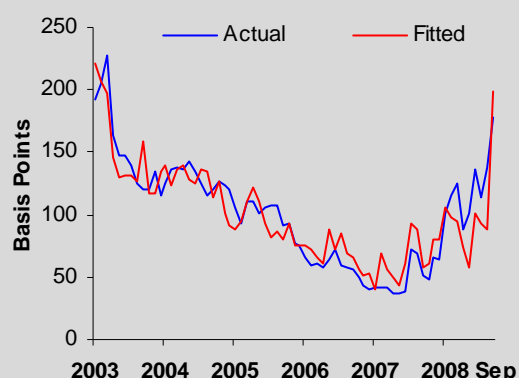
Asian macro-fundamentals.

**Table B1**  
Estimated model coefficients

Dependent variable: CDS spreads		
Period: Jan 2003 – Sep 2008		
	Coeff	T-stat <sup>16</sup>
Credit rating	-57.8	-5.4
Risk appetite (VIX)	6.1	11.8
Liquidity (G3 broad money growth)	-16.9	-6.4
$R^2$	0.82	

Source: MAS estimates

**Chart B1**  
Sovereign CDS spread – actual versus fitted



Source: Bloomberg, MAS estimates

\* Note: Sovereign CDS spread is the average of China, Korea, Malaysia, Philippines and Thailand. Value for September 2008 is estimated using extrapolated money growth data.

In October, as mentioned in the main text, a widespread sell-off in emerging market assets prompted a further widening in Asian sovereign CDS spreads. This also appeared to be driven by reduced risk appetite, in this case directed more specifically towards emerging markets. Indeed, although global growth forecasts were revised down during this period, stability indicators for Asia such as foreign reserves to foreign liabilities ratios remained robust.

**Table B2**  
Change in Asian sovereign CDS spread accounted for by model factors  
(July 2007 to September 2008)

Percentage contribution of:	
Credit rating	-7%
Risk appetite (VIX)	92%
Liquidity (G3 broad money growth)	16%
Unexplained	-1%

Source: MAS estimates

Certain caveats to this model should be noted. First, a deepening in the market liquidity of Asian sovereign CDS within the sample time period may have been a factor in determining the spreads, but was not included in the regression. Second, credit ratings are used in this regression as a sufficient statistic for default probability, but alternative specifications with macroeconomic indicators are possible.

The deteriorating global growth outlook and lingering market uncertainty suggest that Asian macroeconomic fundamentals could be tested going forward. Nevertheless this simple model provides tentative evidence that the widening in sovereign CDS spreads up to September was largely a reflection of rising global risk aversion.

<sup>14</sup> The model was estimated for the period January 2003 to September 2008 using OLS.

<sup>15</sup> This assumes a one-notch downgrade has the same impact on spreads regardless of the starting level of the rating. In reality, this is unlikely to be the case.

<sup>16</sup> Standard errors adjusted using the Newey-West HAC method.

## Box C

**Asian Financial Soundness Indicators: A Comparison with the Pre-Asian Financial Crisis Period**

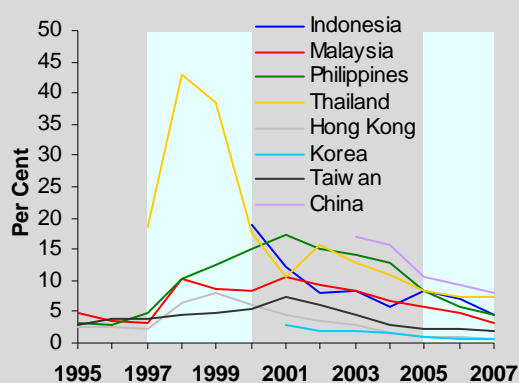
Asian financial systems have so far been fairly resilient to the financial turmoil in the US and Europe that began last summer. But the recent increased asset price volatility and risk aversion toward EMEs have led some commentators to speculate that Asia may be next to experience financial distress, noting the sudden unravelling of Asian financial systems during the Asian Financial Crisis (AFC).

While there are broad similarities in terms of the fundamental causes of the current turmoil and the AFC – namely high leverage and imprudent credit expansion – the shocks are very different in nature. Broadly, Asian financial systems are experiencing the contagion effects of a financial turmoil emanating from the US and Europe. In contrast, the AFC was ‘home-grown’, reflecting domestic financial imbalances that resulted from a sharp rise in bank lending in Asia. This box looks at a set of financial and economic indicators (Table C1) to compare the state of Asian economies now with that prevailing at the start of the AFC, and suggests that the region is in a stronger position to weather shocks.

Asian banking systems have made considerable progress in repairing their balance sheets and tightening lending standards over the past decade. Prior to the AFC, loan to deposit ratios were close to 100% with many banks resorting to foreign currency borrowing to meet their funding needs. This reflected a ‘search for yield’ that led to lax lending to large corporate entities or to mega-projects and property developments that were of questionable commercial viability. The sharp spike in non-performing loans (NPLs) once the crisis unfolded underlined the questionable quality of these loans and the currency mismatch. (Chart C1)

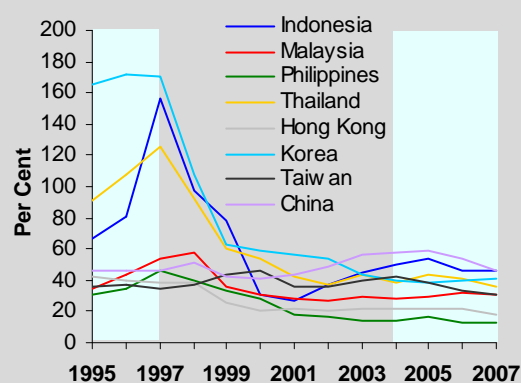
In contrast, lower loan-to-deposit ratios, together with limited off-balance-sheet or low reliance on external financing have helped banks avoid major liquidity and funding stress in the current credit turmoil. However, the expected economic downturn is likely to cause NPLs to rise moderately going forward.

**Chart C1**  
Non-performing Loans (% of Total Loans)



Source: CEIC

**Chart C2**  
Debt to Equity Ratios



Source: Thomson Financial

Corporate balance sheets also look less vulnerable now compared to before the AFC. Debt-equity ratios have improved greatly for corporates in many countries, with most ratios substantially below 50%. (Chart C2) Ratios of household debt to GDP have also been stable over recent years.

During the AFC, property prices crashed following a period of rapid price increases – strong double-digit annual credit growth pushed residential property prices up by more than 25% in some cities from 1995 to 1997. In contrast, recent domestic credit growth, while robust, has not increased as rapidly as it did in the years leading up to the AFC. Nevertheless, residential property prices across Asia have risen significantly

in recent years. This could be a source of stress if these prices were to fall abruptly. However, a study conducted by the BIS<sup>17</sup> concluded that the recent run-up in Asian house prices reflected mainly an adjustment to improved economic fundamentals, suggesting a correction on the scale experienced during the AFC is unlikely.

Many governments have strengthened their balance sheets. During the AFC, Asian governments incurred large deficits because of the need to recapitalise the banks and stimulate the economies. Since then, fiscal balances have improved to an average surplus of 1.5% of GDP in 2007, even higher than the average surplus of 0.6% of GDP before the AFC. As a result, public debt-to-GDP ratios have declined significantly for most countries.

**Table C1: Financial Soundness Indicators**  
(Ratios in Percentage Terms Unless Otherwise Indicated)

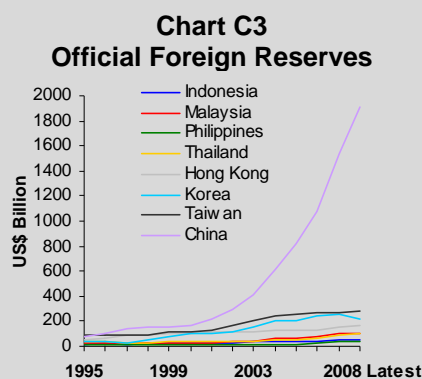
	Loan/ deposit		Debt/Equity		Fiscal Balance		Reserves		Narrow BOP/GDP		Short-term ext. debt/Reserves		Ext. debt/ GDP	
	1996-97	2006-07	1996-97	2006-07	1996-97	2006-07	1996-97	2006-07	1996-97	2006-07	1996-97	2006-07	1996-97	2006-07
Indonesia	105	63	119	46	0	-1	18	50	-	3	178	71	51	33
Malaysia	96	71	49	32	2	-3	24	92	-	15	45	16	40	32
Philippines	99	59	41	13	0	-1	10	28	-3	5	59	21	49	42
Thailand	136	91	117	39	0	-1	33	77	-4	7	133	26	66	27
Singapore	111	74	48	28	3	1	74	150	18	31	-	166	-	212
Hong Kong	156	51	39	20	4	6	78	143	-	14	-	303	-	303
Korea	99	136	171	40	-1	2	27	251	-3	0	268	54	31	34
Taiwan	107 <sup>2</sup>	88	36	32	-4	0	91	273	2	7	-	29	-	24
China	91 <sup>2</sup>	67	46	50	2	5	126	1303	7	13	13	16	14	12
Average	111	78	74	33	1	1	54	263	2	11 <sup>1</sup>	116	34 <sup>1</sup>	42	30 <sup>1</sup>

<sup>1</sup>excludes countries which do not have data for 1996-97

<sup>2</sup>excludes 1996's data

Source: CEIC, Thomson Financial

Most Asian countries have also strengthened their external positions, thereby decreasing their vulnerability to shocks from capital outflows or tighter credit supply. During the AFC, Asian economies were subject to massive capital outflows, and financial institutions and corporates were unable to roll over external short-term liabilities. Since then, Asian authorities have run current account surpluses, reduced short term debt, and built up their foreign reserves as a buffer against capital outflows. (Chart C3)



Source: CEIC

The basic balance of payments (current account balance + net FDI flow) has improved greatly, in many cases reflecting a reduced overall external borrowing/portfolio financing requirement. While changes in risk perceptions of Asian economies could prompt capital outflows, external positions are stronger than

<sup>17</sup> See "Determinants of House Prices in Nine Asia-Pacific Economies" (Glindro et al 2008).



before.

The buildup of reserves has also allowed Asian central banks to intervene when necessary to minimise disruptions in the foreign exchange markets. The shift to more flexible exchange rate regimes after the AFC has also provided central banks with more options in managing the sell-off in emerging markets during October, which put downward pressure on Asian currencies. During the AFC, most Asian currencies were tightly pegged to the US dollar, and large sums of reserves were spent defending the pegs, which turned out to be unsustainable.

The recent volatility in financial markets and concern over capital outflows have caused some to draw parallels between the current situation in Asia and the AFC. However, a broad range of financial soundness indicators suggest Asia is better placed currently to weather financial shocks.

### Responses by authorities have greatly mitigated risks arising from tighter bank funding markets

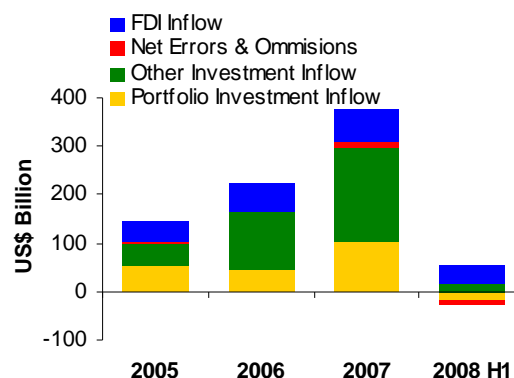
Crucially, authorities in the region moved quickly to address these strains. In particular, the establishment of reciprocal currency swap facilities between some central banks in the region and the US Federal Reserve appear to have alleviated concerns over a shortage of US dollars. These measures – and the IMF's Short-Term Liquidity Facility (SLF) for qualifying EMEs announced on 29 October – should help limit the risk of US dollar-funding difficulties spreading to countries with fundamentally sound and well-managed banking systems.

In domestic markets, central banks have eased the strains by injecting additional liquidity into banking systems, and enhancing guarantees on bank deposits. (Table 1.7) As in the US and Europe, many Asian countries have introduced blanket deposit guarantees or expanded the scope of existing deposit insurance schemes.

### Changes in sentiment and economic prospects pose a heightened risk of sharp capital outflows

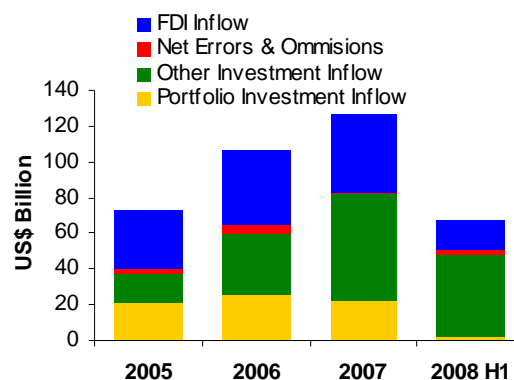
The combined impact of reduced growth prospects and higher risk aversion has caused a deterioration from the previous environment when Asia experienced strong capital inflows. (Charts 1.46 and 1.47) As noted in the December 2007 FSR, any event inducing spikes in risk aversion could cause a sudden and sharp reversal of capital flows across all

**Chart 1.46**  
Capital Inflows to Northeast Asia



Source: IMF Balance of Payments, CEIC  
Note: Northeast Asia comprises Hong Kong, Korea and Taiwan

**Chart 1.47**  
Capital Inflows to Southeast Asia



Source: IMF Balance of Payments, CEIC  
Note: Southeast Asia comprises Indonesia, Philippines, Thailand and Singapore



markets and regions. At this juncture, emerging market risk aversion, the possibility of further dislocations in international financial markets, as well as the ongoing deleveraging by financial institutions and the continued unwinding of carry trades, pose the risk of renewed and accelerated pull-outs from Asian asset markets.

However the probability of large reversal of capital flows, whilst non-negligible, is currently low, reflecting several mitigating factors. The near and medium-term growth outlook for Asia remains positive *relative* to other regions. Foreign direct investments (FDI) have held up well and equity outflows have been limited so far (Chart 1.48), indicating that investor confidence, even if less strong, is still intact.

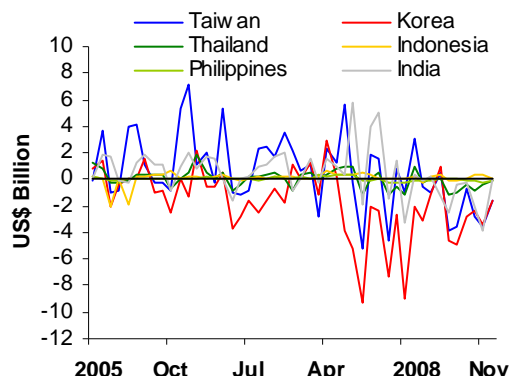
**Some Asian financial markets remain unusually vulnerable to shocks to risk appetite**

Nevertheless, as long as global risk appetite remains low and the macroeconomic outlook uncertain, EMEs will be susceptible to shocks to risk appetite. The risk and scale of further turbulence are likely to be greater for countries perceived to have weaker macroeconomic and macro-financial fundamentals. For these countries, substantial capital outflows could result in a marked worsening of fundamentals, such as external debt positions and currency values, which could in turn trigger further capital outflows.

**Policymaking has become even more challenging than it was even a few months ago and at the time of the last FSR**

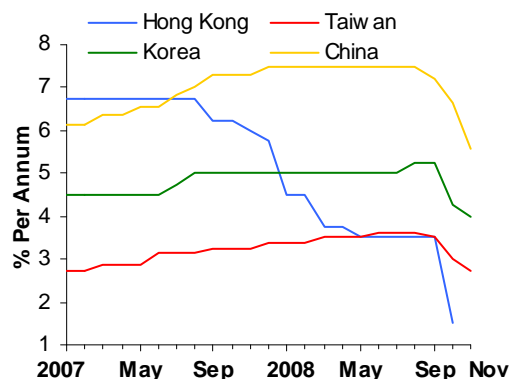
Appropriate and timely policy responses should help to mitigate these risks. But policymaking has become extremely challenging in the past year. Policy-makers face three, sometimes conflicting, policy objectives, namely reducing downside risks to growth while controlling inflation and maintaining financial stability. Between the first and second half of this year, the policy focus has shifted from combating rising inflationary pressures to mitigating downside risks to growth. This shift has led to reductions in policy rates (Charts 1.49 and 1.50),

**Chart 1.48**  
**Net Foreign Purchase of Selected Asian Equities**



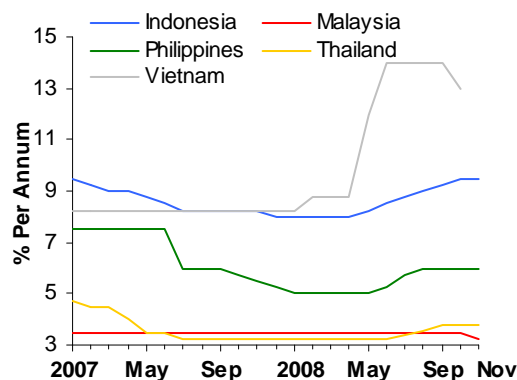
Source: Bloomberg

**Chart 1.49**  
**Changes in Policy Rates: Selected Northeast Asian Countries**



Source: CEIC, National Official Sources

**Chart 1.50**  
**Changes in Policy Rates: Selected Southeast Asian Countries**



Source: CEIC, National Official Sources

reflecting a general move from a tightening to a neutral or easing bias.

However, for some countries, an easing in monetary policy may run counter to the immediate financial stability objective of averting currency weakness and large-scale withdrawal of capital. Consequently, it may be necessary for the authorities to consider fiscal measures and administrative tools that could complement or support monetary measures.

Finally, in some countries, it is possible that fiscal or unconventional administrative measures might be ineffective or even counterproductive. There is a risk that some of these measures may weaken fiscal balances, distort price mechanisms, restrict capital mobility and thereby undermine investor confidence more broadly. If so, they could precipitate the risk that they sought to avert in the first instance.

The uncertainty in the external environment and the competing policy objectives have made it more challenging to determine the appropriate mix of policy measures to achieve economic and financial stability.

**Table 1.7**  
**Some Recent Policy Measures by Asian Authorities**

Country	Deposit Guarantee Schemes	Monetary Policy/ Liquidity Measures	Fiscal Measures	Other Policy Measure
<b>Northeast/ South Asia</b>				
India		<ul style="list-style-type: none"> <li>Cut interest rates, liquidity ratios and cash ratios for banks</li> <li>Introduced additional liquidity support measures and refinancing facilities for (some) banks</li> <li>Started swap facilities to provide foreign exchange liquidity to some banks</li> <li>Raised deposit interest rates</li> </ul>	<ul style="list-style-type: none"> <li>Targeted widening of fiscal deficit (as % of GDP) from 2008/9 to 2009/10</li> </ul>	<ul style="list-style-type: none"> <li>Extended period and increased refinancing limit for export credit</li> <li>Decided to provide funds to recapitalise some state-owned and private banks</li> <li>Started deliberating on plans to liberalise FDI rules</li> </ul>
China		<ul style="list-style-type: none"> <li>Cut 1-yr lending rate, deposit ratio and reserve requirement ratio</li> </ul>	<ul style="list-style-type: none"> <li>Announced 4trn RMB fiscal stimulus plan, along with 10 measures to boost domestic demand</li> <li>Announced increases in VAT rebates for some exporters</li> <li>Support measures for agriculture and property sector</li> </ul>	<ul style="list-style-type: none"> <li>Allowed resumption of issuance of corporate mid-term notes in interbank market and permitted the money raised to be invested in stock market for share buyback</li> <li>Eliminated stamp duty on stock purchase and waived fees for bond transactions</li> <li>Support measures for SMEs facing difficulties securing credit</li> </ul>
Hong Kong	Introduced guarantee of most customer deposits in authorised institutions including HK branches of overseas institutions until end-2010	<ul style="list-style-type: none"> <li>Cut base rate</li> <li>Introduced (then expanded) scale and scope of liquidity assistance facilities to banks</li> </ul>	<ul style="list-style-type: none"> <li>Committed to proceeding with a number of previously-announced infrastructure projects</li> <li>Announced plans to introduce economy-wide minimum wage</li> </ul>	<ul style="list-style-type: none"> <li>Established facility to provide additional capital to locally-incorporated licensed banks if necessary</li> </ul>
Taiwan	Introduced blanket guarantee on all deposits and interbank loans of all financial institutions including credit unions and cooperatives until end-2008	<ul style="list-style-type: none"> <li>Cut key discount rates and reserve requirement ratio on TWD deposits</li> <li>Expanded lending via repos to insurers</li> <li>Injected liquidity into foreign-currency interbank market</li> </ul>	<ul style="list-style-type: none"> <li>5-yr tax break for new investments of traditional companies and SMEs</li> </ul>	<ul style="list-style-type: none"> <li>Banned short selling of stocks</li> <li>Instructed major funds and state-owned banks to buy shares</li> <li>Announced state-owned National Stabilization Fund was ready to buy stocks in the local stock market</li> </ul>
Korea	Included local foreign-exchange deposits under deposit guarantee scheme	<ul style="list-style-type: none"> <li>Cut base rate and interest rates on aggregate credit ceiling loans</li> <li>Established US\$30bn swap line with US Federal Reserve</li> <li>Injected liquidity into won-dollar swap market</li> <li>Eased liquidity ratio requirements</li> </ul>	<ul style="list-style-type: none"> <li>Announced 14trn won 'pump-priming' package</li> <li>Announced acceleration of tax relief totaling KRW 13trn and expansion of fiscal stimulus plans</li> </ul>	<ul style="list-style-type: none"> <li>Issued guarantees for new foreign-exchange debt for 3 years up to US\$100bn by all Korean banks until Jun 2009</li> <li>Temporary ban on short-selling of stocks</li> <li>Announced provision of up to 12 trillion won in loans to SMEs</li> <li>Korea Housing Guarantee Co. to spend KRW 2tn on idle housing stock from troubled developers</li> <li>Established bond fund to purchase commercial paper</li> </ul>
<b>Southeast Asia</b>				
Indonesia	Raised retail deposits guarantee to 2bn rupiah	<ul style="list-style-type: none"> <li>Cut reserve requirement ratio for foreign exchange deposits and bank reserve ratio</li> <li>Extended foreign-exchange swap tenor and abolished limit of daily balance position</li> <li>Enhanced bank-liquidity facilities for commercial banks, including one for emergency funding</li> </ul>	<ul style="list-style-type: none"> <li>Cut export tax on crude palm oil cut to zero</li> </ul>	<ul style="list-style-type: none"> <li>Exempted banks from mark-to-market accounting rules</li> <li>Banned short selling of stocks, eased rules for share buy-back</li> <li>Announced ten measures to stabilise currency and stock market</li> <li>Tightened regulations on purchase of foreign currency against the rupiah through banks</li> <li>Deposit Insurance Corporation took over PT. Bank Century TBK</li> <li>Explored options of loans from Australia, Japan, World Bank and Asian Development Bank</li> </ul>
Malaysia	Introduced blanket guarantee on all ringgit and foreign currency deposits in banks and deposit taking institutions until Dec 2010	<ul style="list-style-type: none"> <li>Liquidity facility for insurance companies and takaful operators</li> <li>Reduced reserve requirement</li> <li>Reduced policy rate</li> </ul>	<ul style="list-style-type: none"> <li>Announced supplementary budget for 2009 worth RM7 billion, and readiness to run larger fiscal deficit</li> </ul>	<ul style="list-style-type: none"> <li>Launched RM200 million Micro Enterprise Fund to increase access to micro financing for micro enterprises with viable businesses</li> </ul>
Philippines	Proposed doubling of deposit-insurance coverage to PS500,000 on all peso and foreign currency retail deposits in BSP/PDIC-authorized and insured banks	<ul style="list-style-type: none"> <li>Opened US\$ repo facility for banks to tap for dollar liquidity</li> <li>Reduced reserve requirement on bank deposits and deposit substitutes</li> <li>Upped peso rediscounting facility budget</li> </ul>		<ul style="list-style-type: none"> <li>Allowed financial institutions to reclassify financial assets</li> </ul>
Thailand	Introduced blanket guarantee for all deposits in FIs until 2011 with coverage reduction thereafter		<ul style="list-style-type: none"> <li>Added Bt100bn (US\$3bn) to initial budget expenditure in late October</li> </ul>	<ul style="list-style-type: none"> <li>Set up THB110 billion fund to shore up stock market</li> <li>Increased tax-allowance limit for long-term stock investment</li> </ul>

### **Key financial stability risks stemming from the Asian financial system**

Asia began 2008 in a fairly resilient position, having been relatively unscathed by the international financial turbulence during the second half of 2007. However, during the second half of 2008, several adverse developments unfolded in quick succession and weighed heavily on Asian financial systems. Expectations of a more protracted G3 recession led to a marked deterioration in market sentiments towards Asia and a downward revision of its growth outlook. However, Asian economies are entering this period of weaker global growth and volatile financial markets with stronger macroeconomic fundamentals than prior to the Asian Financial Crisis, and relative to emerging market economies (EMEs) in other regions. While Asian growth forecasts for 2009 have been revised downwards significantly, they remain positive and high relative to other regions. With the exception of EMEs perceived to have relatively less robust macroeconomic fundamentals, the scale of capital withdrawals and pressures on currency and asset markets appear consistent with a widespread reappraisal of risk globally and in EMEs. In general, these pressures have been moderate and not destabilising. Asian banking systems are also generally well capitalised, and while loan losses are expected to rise, they should not be destabilising for financial systems. Moreover, the policy actions taken by authorities in both G3 and Asian countries have helped stabilise institutions and markets.

There are however, a few downside risks to this central outlook:

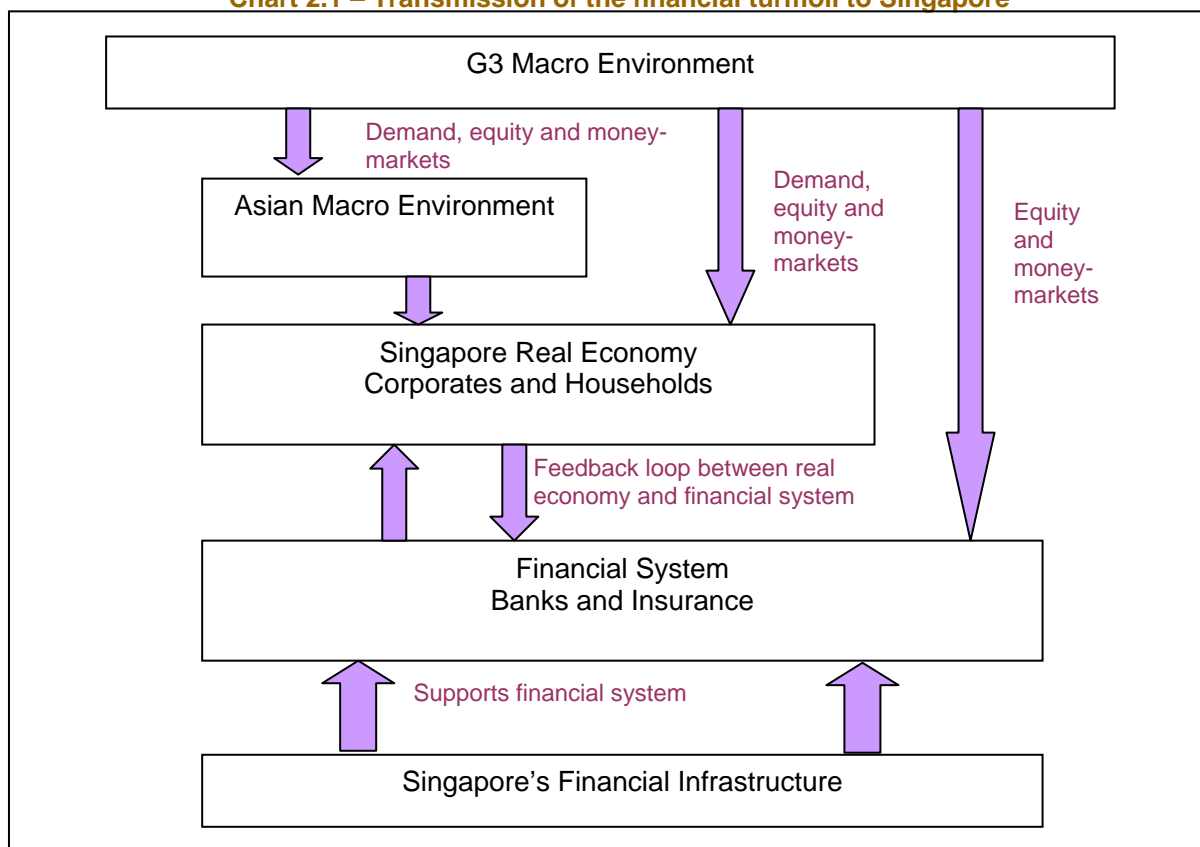
- Asia remains vulnerable to a sharper than expected slowdown in consumption and investment activity in the global economy, as well as to a potential weakening in domestic demand within Asia.
- Further shifts in the perceived riskiness of EME assets could trigger renewed turbulence in currency and asset markets, particularly in economies perceived to have relatively less robust macroeconomic fundamentals. Sharp swings in risk aversion could also trigger liquidity strains in cross-border banking flows as banks internationally seek to reduce their counterparty credit exposures.
- The current environment has made policymaking more challenging than it was even a few months ago. Countries with relatively less robust economic fundamentals face the greatest policy challenges and hence the highest risk of instability.

## 2. SINGAPORE’S MACROECONOMIC ENVIRONMENT AND FINANCIAL SYSTEM

As a small open economy with strong linkages to international financial markets and the global economy, Singapore has been affected by the global financial turmoil through various channels. (Chart 2.1) In particular, the sell offs in global equity markets and strains in US dollar funding affected the local stock market and the Asian Dollar Market. The Singapore economy went into a recession in Q3 on the back of a slowdown in external demand.

The slowing real economy would in turn affect Singapore’s financial system through a negative feedback loop. In addition, Singapore would continue to be vulnerable to volatilities in the global financial markets. This chapter presents our assessment of the impact of the turmoil on different segments of Singapore’s financial system.

**Chart 2.1 – Transmission of the financial turmoil to Singapore**



### 2.1 Financial Markets

**Singapore’s equity and money markets were affected by the global financial turmoil**

The domestic equity market has experienced sharp declines alongside sell-offs in equity markets globally. The STI has fallen by around 50% since

the middle of the year as risk aversion heightened among investors. (Chart 2.2)

The Asian Dollar Market experienced strains in tandem with tight liquidity conditions in other U.S. dollar funding centres. The US\$ SIBOR rose in line with the US\$ LIBOR in mid-September but eased after mid-October, following coordinated central bank actions which helped to restore market confidence. (Chart 2.3)

On 30 October 2008, MAS established a swap line with the US Federal Reserve. In doing so, MAS joined 13 other major central banks to have such a facility with the US central bank. The swap line was established as a precautionary measure, rather than in response to any shortage of US dollar in the Asian Dollar Market. In fact, rates in the Asian Dollar Market had eased after mid-October in line with global developments. MAS had assessed that while it was unnecessary to draw on the swap facility, the US\$30 billion swap line would enhance confidence in the robustness of the Asian Dollar Market for US dollar funding and in the resilience of the foreign exchange markets in Singapore. These markets are a significant part of the global financial system, and Singapore is the largest US dollar and foreign exchange centre in Asia outside of Japan.

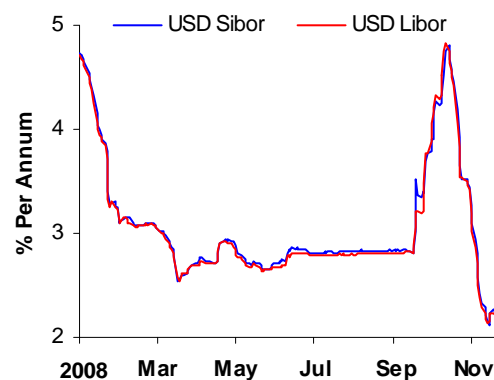
The Singapore dollar money market, in contrast, has remained relatively calm. (Chart 2.4) In a move that was initiated prior to the onset of the credit turmoil, MAS expanded the Standing Facility to include all participating banks of the MAS Electronic Payment System (MEPS+) in July 2008. This provided banks with the assurance that they would be able to access central bank liquidity if the need arises. (see Box D) Towards end-September, there was increased pressure on S\$ SIBOR rates from quarter-end funding needs, and MAS responded by keeping a higher level of liquidity in the banking system. S\$ SIBOR rates have since eased. While S\$ SIBOR-OIS spread did widen somewhat during the year in line with global developments, it was significantly less compared to the LIBOR-OIS spreads observed for other major currencies. (Chart 2.5)

**Chart 2.2**  
**STI**



Source: Bloomberg

**Chart 2.3**  
**Three Month US\$ SIBOR and LIBOR**



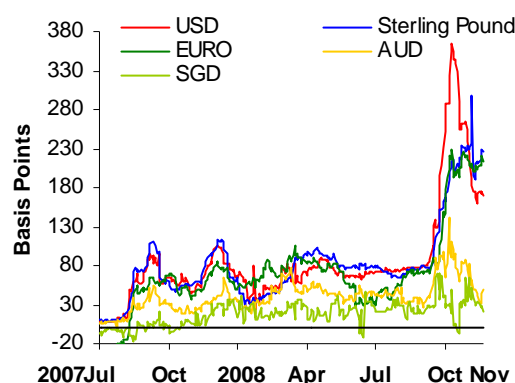
Source: Bloomberg

**Chart 2.4**  
**Three Month S\$ SIBOR**



Source: Bloomberg

**Chart 2.5**  
**Spreads of S\$ SIBOR-OIS and Other**  
**Currencies LIBOR-OIS**



Source: Bloomberg

#### **Box D** **Overview of MAS Liquidity Provisioning Measures**

At the close of the third quarter this year, money markets globally were under strain on the back of US\$ funding stresses and quarter-end financing activities. This was exacerbated by bank balance sheet and counterparty credit uncertainties – given the ongoing credit crunch and de-leveraging process which heightened the demand for liquidity.

This implied that more liquidity was needed at the margin to buffer any risk of scrambling for liquidity for settlement purposes. MAS accordingly kept higher levels of liquidity within a defined range, sufficient for settlement purposes and to address the market's increased frictional liquidity demand. This resulted in S\$ money markets remaining relatively calm.

MAS provides and manages the supply of liquidity primarily through – (1) Money Market Operations (MMOs) and (2) the MAS Standing Facility. As part of ongoing efforts to ensure the robustness of the banking system, in July this year MAS expanded the Standing Facility to include all MEPS+ participants, effectively quadrupling the number of market players with direct access to the facility.

#### **Money Market Operations (MMOs)**

Money Market Operation is ordinarily conducted once every morning, but can be conducted twice a day. In the context of an exchange-rate centered monetary policy, MAS conducts MMO to ensure that there is adequate liquidity in the banking system to meet banks' demand for reserve and settlement balances. Banks are required to maintain a minimum cash balance of 3% of their liabilities base – averaging over a 2 week period – with MAS. This ratio is allowed to fluctuate between 2% to 4% on a daily basis.

MAS broadly manages the liquidity of the domestic banking system at 3.1-3.3% based on historical evidence that the additional buffer is adequate to alleviate any frictional liquidity in the banking system. In times of stress, MAS can withdraw less to maintain a higher stock of reserve funds, or inject more funds into the system. For instance, towards the end of September 2008 when global money markets came under strain, MAS responded by keeping a higher level of liquidity in the banking system through its market operations, bringing the ratio of bank balances to total liabilities above 3.5% to meet banks' requirements for excess liquidity.

In addition, Singapore is a major Asian dollar market and when US\$ funding stresses surface, MAS can



choose to carry out additional FX swaps of various durations in its MMO to supply US\$ (in exchange for S\$).

### MAS Standing Facility

The Standing Facility was launched in 2006 to manage intra-day interest rate volatility by complementing MMO and serves as a safety valve for the banking system. At its inception, the Standing Facility was originally intended to allow the Primary Dealer (PD) banks to place excess funds with or borrow from MAS against Singapore Government Securities (SGS) collateral.

As MAS does not have an interest rate policy target, the facility uses a market reference rate, derived using the weighted average rate of successful bids for S\$500 mn of overnight uncollateralised borrowing conducted daily during MMO. The borrowing rate is 50 bps above, while the deposit rate is 50 bps below the reference rate.

In July 2008, MAS expanded participation in the facility beyond the PD banks to include all banks using MEPS+. While the existing arrangement had worked well in moderating interest rate volatility, MAS recognized that extending the reach of the facility enhanced liquidity management and reinforced confidence in the market. Non-PD banks that have unanticipated changes in their liquidity positions or experience tighter credit lines in unusual credit conditions can now come directly to lend to or borrow from MAS.

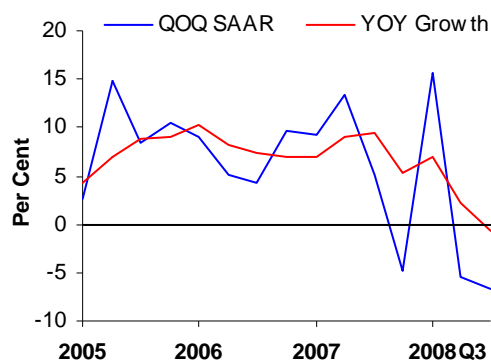
The existing measures in place, coupled with the willingness to enhance liquidity provisioning measures where necessary, have proven effective in dealing with and anticipating tight liquidity conditions. Markets have generally been orderly with sufficient liquidity maintained in the banking system. MAS remains in close contact with market participants and stands ready to inject additional liquidity as may be required.

## 2.2 Macroeconomic Developments

**GDP contracted in Q2 and Q3. The growth outlook has weakened in line with the external environment**

The global financial turmoil has affected the economy. Singapore's GDP growth moderated from 7.7% y-o-y in 2007 to 4.5% in H1 2008 and -0.6% y-o-y in the third quarter. (Chart 2.6) The manufacturing sector was the major drag on GDP growth in Q3 2008, on the back of declines in the biomedical and electronics clusters. In line with a contraction in the manufacturing sector, non-oil domestic exports (NODX) fell by 4.5% y-o-y in the first nine months of 2008. Growth in financial services has generally held up, driven by strong loan growth, although the sentiment-sensitive, capital market-related segments have been adversely affected by the global financial turmoil. Nevertheless, financial intermediation activity, both

**Chart 2.6**  
Singapore's GDP Growth

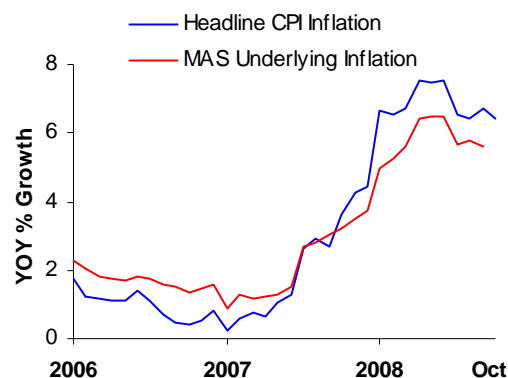


Source: Department of Statistics

domestic and offshore, is expected to ease going forward reflecting the downturn in the economy. MTI forecasts Singapore's GDP growth to come in at around 2.5% in 2008, and at -1.0% to 2.0% in 2009.

CPI inflation, which was a concern in H1 2008, started to ease in Q3 as oil prices fell and the GST effect dissipated. (Chart 2.7) Inflation is projected to decline further as the pace of global inflation moderates and domestic cost pressures diminish. CPI inflation is expected to come in at around 6-7% this year, before falling to 1-2% in 2009.

**Chart 2.7**  
**Headline CPI and MAS Underlying Inflation**



Source: Department of Statistics

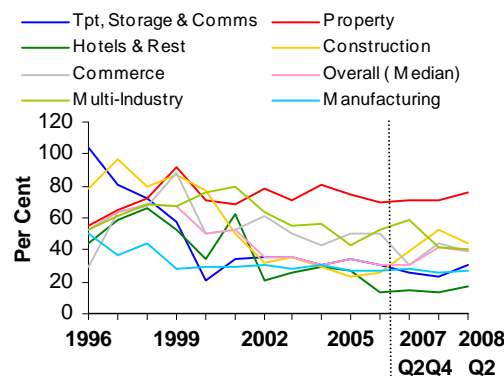
## 2.3 Corporate<sup>18</sup> and Household<sup>19</sup> Sectors

The slowdown in the Singapore economy is expected to affect corporate profitability, employment and income. The extent to which corporates and households will be affected in this challenging environment would depend on the strength of their balance sheets.

**Balance sheets of corporates have improved since Asian Financial Crisis with lower leverage and better debt servicing ability**

Since the Asian Financial Crisis (AFC), balance sheets of firms in Singapore have improved. Firms have gradually reduced their leverage, with the corporate sector's median debt-to-equity ratio at around 40% in Q2 2008, down from over 60% in the pre-Asian Crisis period. (Chart 2.8) The share of short-term debt in total debt has remained relatively stable, at around one-third. (Chart 2.9) The lower leverage together with higher profits, have improved the debt servicing capacity of firms, with the interest coverage ratio rising to 6.1 in Q2 2008 from around 3 just before the AFC. (Chart 2.10) Moreover, the current ratios (i.e. current assets over current liabilities) suggest that firms have sufficient liquid

**Chart 2.8**  
**Leverage Ratios (Median)**



Source: Thomson Financial

Note: Leverage Ratio is Debt-to-Equity Ratio

<sup>18</sup> All corporate data cover listed companies only. The latest data point provided is Q2 2008 as most of the companies that are not required to do quarterly reporting tend to report in Q2 and Q4 of each year only.

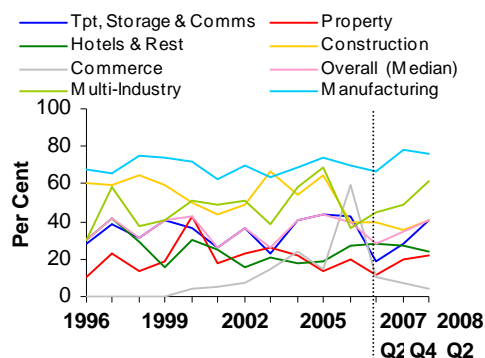
<sup>19</sup> Data in this section are mostly MAS' estimates using data from other statutory boards and ministries.

assets to cover short-term liabilities. (Chart 2.11)

The leverage ratio in the property sub-segment has remained at almost the same level as pre-Asian Crisis, at around 60-80%. Generally, the small property developers are more highly geared than the large property developers, with the small developers' debt to equity ratio at 76%, compared to the large developers' 62% in Q2 2008. While there has been a substantial moderation in the interest coverage ratio since Q2 2007 for both small and large property developers, their earnings are still more than adequate to cover their interest liabilities in Q2 2008, with earnings at about 8.6 times of interest expense. In light of the economic slowdown which is projected to continue into H1 2009, corporate profitability is expected to decline going forward. Some signs of weakening are already evident in certain sectors such as property, manufacturing, commerce, and transport, storage and communication (TSC). (Chart 2.12)

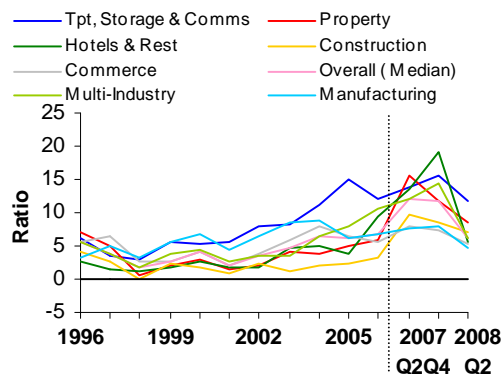
In addition, firms will be facing higher costs of credit and refinancing of debt as credit spreads have widened in the wake of a global reassessment and repricing of risk. A limited dataset suggests that the spreads for corporate debt issued in Singapore have increased by two to three times that seen at the start of the year, although this has been offset to some extent by a reduction in the base rates. Corporates that are refinancing this quarter and next year may face refinancing constraints in the current tight credit market. Nevertheless, barring a deep and prolonged recession, a healthy balance sheet built up over the past few years of strong economic growth, together with enhanced business financing schemes from the Government, will help the corporate sector to weather the current turmoil well, without a destabilising impact on the financial system.

**Chart 2.9**  
Short Term Debt and Current Portion of Long Term Debt as % of Total Debt



Source: Thomson Financial

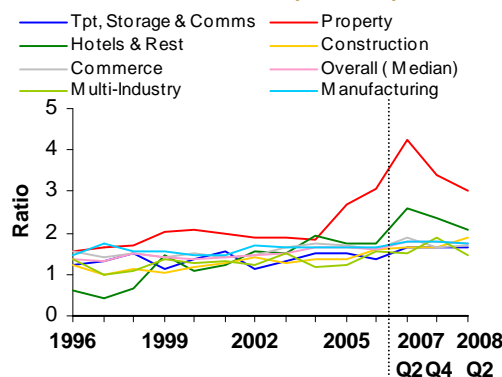
**Chart 2.10**  
Interest Coverage Ratio (Median)



Source: Thomson Financial

Note: Interest Coverage Ratio is earnings before interest and tax divided by interest expense

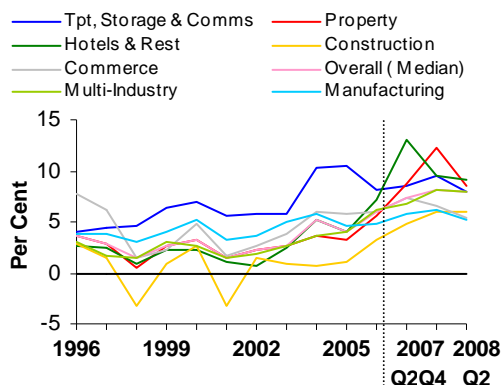
**Chart 2.11**  
Current Ratio (Median)



Source: Thomson Financial

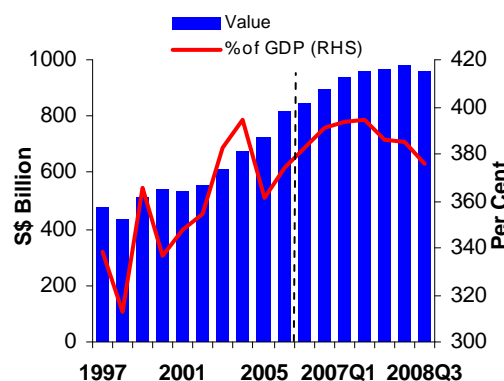
Note: Current Ratio is current assets divided by current liabilities

**Chart 2.12**  
**Return on Assets**



Source: Thomson Financial

**Chart 2.13**  
**Household Net Wealth**



Source: MAS estimates

Note: Net household wealth = household assets - liabilities

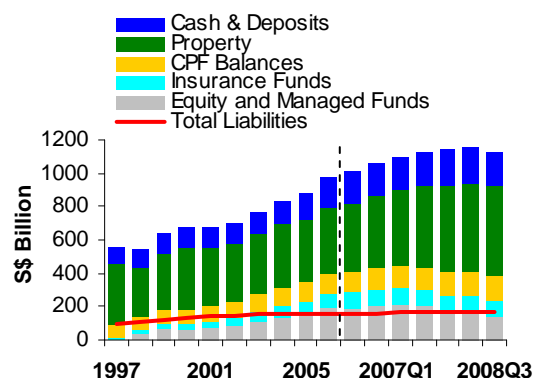
**Households would also be facing the challenging environment with a strong balance sheet**

Likewise, households would be entering the challenging economic environment with a relatively strong balance sheet. This is a positive factor for the banking sector which extends two-fifths of non-bank loans to households, and relies on household deposits as a primary source of funding.

Household net wealth, defined as assets less liabilities, is currently at around 3.8 times of GDP. (Chart 2.13) Asset price appreciation has contributed to the rise in the value of household assets and net wealth (Chart 2.14), with the result that household assets are now about seven times household liabilities. (Chart 2.15) In addition, cash and CPF balances alone exceed the entire household liabilities. In the past few years, the rate of growth of household remuneration has also outpaced that of household debt such that the household debt to remuneration ratio has fallen from a 10-year high of 208% in 2003 to 166% in 2007. (Chart 2.16)

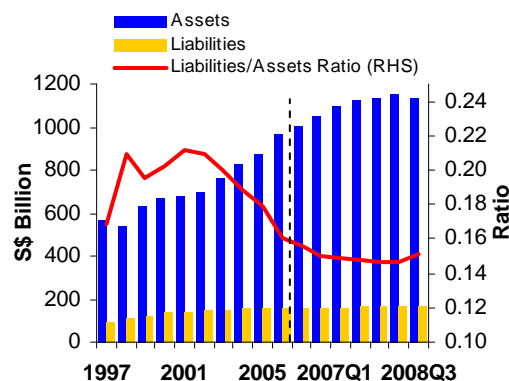
Moreover, the growth in household liabilities is expected to slow going forward. The growth of housing loans, which account for most of households' borrowing, has already moderated from around 15% in Q4 2007 to 10% in Q3 2008. (Chart 2.17)

**Chart 2.14**  
**Household Assets and Liabilities**



Source: MAS estimates

**Chart 2.15**  
**Household Liabilities To Assets Ratio**

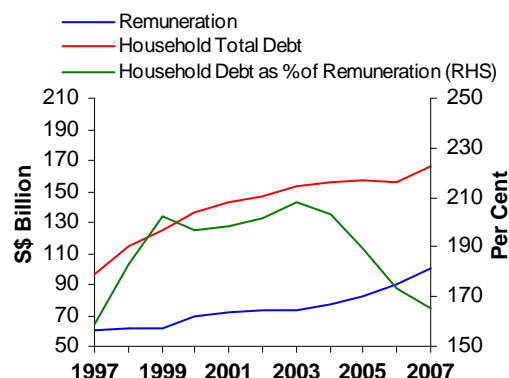


Source: MAS estimates

Looking ahead, even as unemployment rises moderately in tandem with weaker economic activity, the current healthy financial position of the household sector suggests that the impact on households is likely to be manageable. The percentage of housing loans that is delinquent is low, at less than 1%, (Chart 2.18) and most housing loans have low loan to value ratios. (Chart 2.19) The charge-off rate for credit cards is also low, at around 3-4%. We expect the banking system's non-performing loans (NPL) from households to rise moderately and should not materially affect the soundness of the banking system.

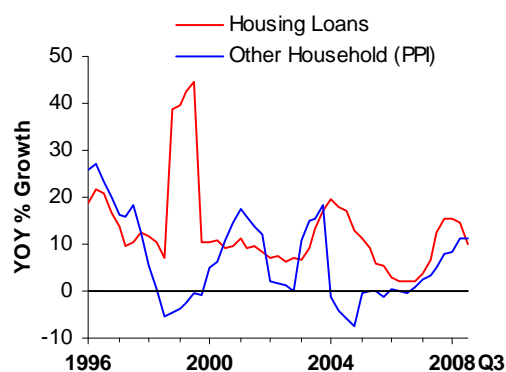
To recap, the household balance sheet is healthy as the coverage of assets over liabilities is ample, the debt to remuneration ratio is low, and the loan to value ratio is also low for a large share of housing loans. On the whole, households are much better placed to face the current economic slowdown relative to their position before the Asian Financial Crisis. However, the impact may not be uniform across different household income groups. There is likely to be distress among those who are retrenched or those who rushed into the recent property boom and leveraged up beyond their means. However, as robust lending standards in the banking sector were maintained, the loan exposure to this vulnerable group will be limited, and should not affect the stability of the banking system.

**Chart 2.16**  
**Household Debt and Remuneration**



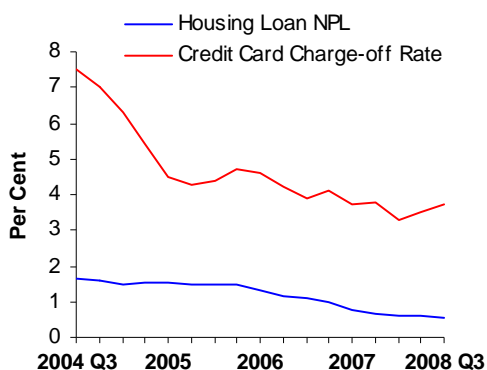
Source: Department of Statistics, MAS estimates  
Note: Remuneration is used as a proxy of household income.

**Chart 2.17**  
**Housing and Other Household Loans**



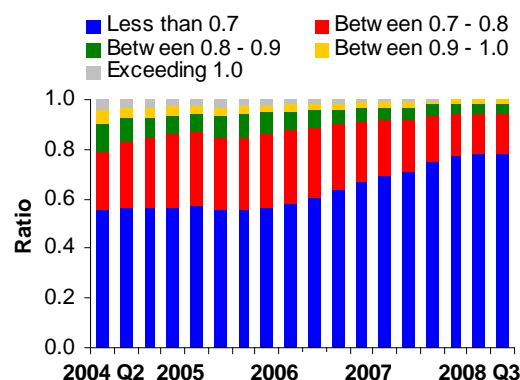
Source: MAS

**Chart 2.18**  
**Housing NPL Ratio and Credit Card Charge-Off Rate**



Source: MAS  
Note: Charge-off rate is calculated by annualising the ratio obtained from dividing bad debts written off with the average rollover balance

**Chart 2.19**  
**Outstanding Housing Loans by LTV Ratios**



Source: MAS

## 2.4 Banking Sector

### Loan growth expected to slow...

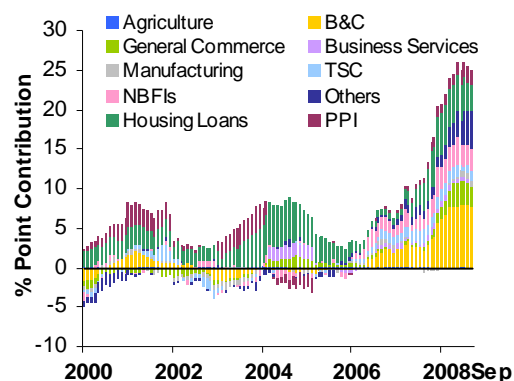
Spurred by robust economic growth, Domestic Banking Units' (DBU) non-bank loans accelerated in H1 2008. (Chart 2.20) While property-related loans, namely loans to the Building & Construction (B&C) sector and housing loans, were the main drivers, a number of other sectors such as Non-Bank Financial Institutions (NBFI) and General Commerce also contributed significantly to the growth in DBU non-bank loans. Despite the strong growth in property-related loans, banks' exposure to the property sector remained within regulatory limit and banks' loan books remained well-diversified. (see Box E) The growth of DBU non-bank loans has slowed in recent months and is expected to moderate further going forward, due to dampened business sentiment, reduced loan demand for the period ahead, as well as greater cautiousness on the part of the banks.

In the Asian Currency Units (ACUs), interbank lending activity has moderated since the start of the year, in line with tight US\$ interbank liquidity globally. The contribution of ACU interbank loans to overall loan growth in the past few months was near zero to negative primarily due to retrenchment in cross-border ACU interbank lending. (Chart 2.21) ACU non-bank loans growth, on the other hand, has held up so far, contributing to about half of the overall loan growth in recent months, as the global economic slowdown has yet to fully impact many regional economies. With growth prospects internationally revised downwards, we expect ACU non-bank loans growth to moderate as well.

### ...and asset quality expected to deteriorate

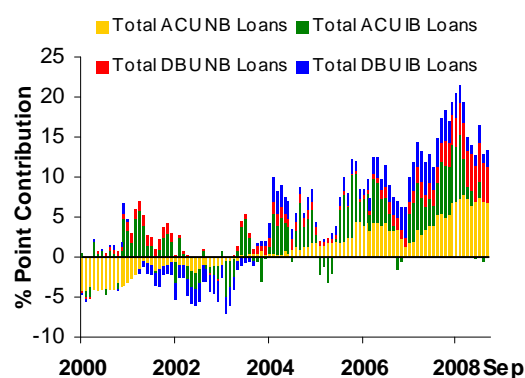
The banking system's NPL ratio is at a historical low after a sustained period of buoyant growth in Singapore and globally. The NPL ratio is expected to rise moderately as the economy slows further, and loan delinquencies and defaults rise. Indeed, a slight uptick was already seen in the overall NPL ratio, which rose from 0.9% in March to 1% in

**Chart 2.20**  
Components of DBU Non-Bank Loan Growth (By Sector)



Source: MAS

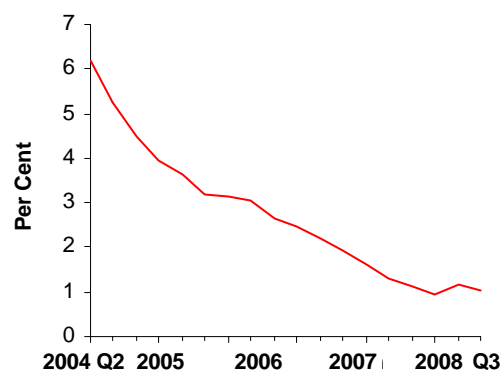
**Chart 2.21**  
Components of Overall Loans Growth



Source: MAS

Note: NB refers to Non-bank; IB refers to Interbank

**Chart 2.22**  
Overall NPL Ratio



Source: MAS



September. (Chart 2.22)

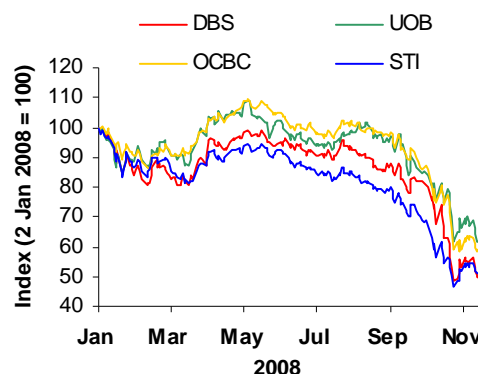
**Local banks weathered the turmoil so far...**

The impact of the global financial turmoil on the local banks has remained contained so far given their limited direct exposures to securities linked to US home mortgages, or to distressed or failed financial institutions such as Bear Stearns and Lehman Brothers. Local banks have not had to make large writedowns. To date, the allowances for their CDO portfolios totalled S\$937 million or around 10% of the banks' operating profits in the past four quarters, bringing their outstanding CDO exposures down to less than 0.4% of total assets. The local banks are still focused primarily on commercial banking, with interest income accounting for four-fifths of gross income, even though they have been growing their investment banking and fee-based businesses over the years. So far, the impact on the local banks has been mainly on their share prices (Chart 2.23) and CDS spreads, reflecting the higher risk premium now required globally and the constrained earnings outlook going forward. Their share prices have fallen by about 50% from the peaks this year, in line with the broader STI Index, while CDS spreads have widened to 260-280 bps. Non-interest incomes such as trading, investment and fee incomes, which are more sensitive to market conditions, have also been adversely affected. (Chart 2.24)

**...but profitability and asset quality would weaken going forward**

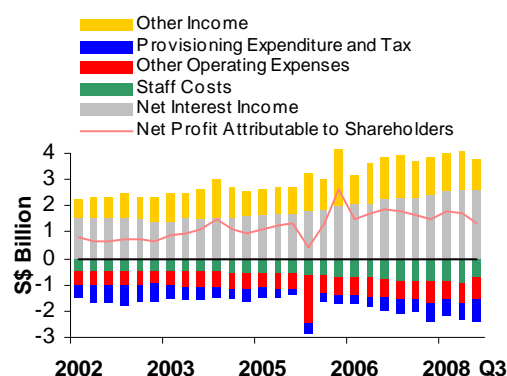
Going forward, local banks' revenues are expected to decline, and their NPLs are expected to rise, on the back of a slowdown in the domestic economy and in regional economies where local banks have operations. However, the local banks would face these risks from a position of strength. They have strong capital, with the Tier-1 capital ratio averaging 11.3%, well above the MAS' minimum requirement of 6% and BIS' recommendation of 4%. (Chart 2.25) Their NPL ratio is at an all-time low of 1.4%, some 10 percentage points below the levels seen during the Asian Financial Crisis. (Chart 2.26) From our estimates, even if NPLs were to reach the elevated

**Chart 2.23  
Local Banks' Share Prices & STI**



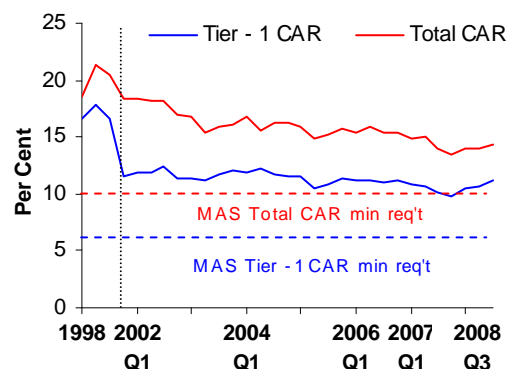
Source: Bloomberg

**Chart 2.24  
Local Banks' Profit Components**



Source: Local Banks' Financial Statements

**Chart 2.25  
Local Banks' CAR**



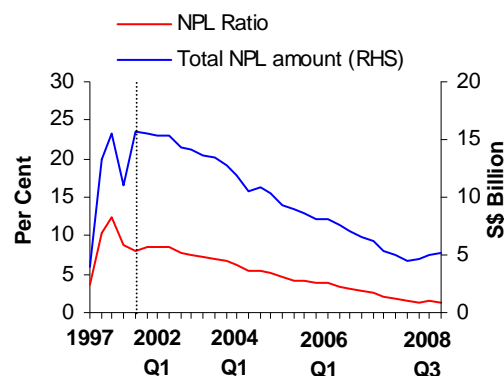
Source: Local Banks' Financial Statements  
Note: Data to the left of the line are annual data while that to the right of the line are quarterly data



levels seen during the Asian Financial Crisis, the local banks would remain well-capitalised and sound. The local banks also have healthy Loan-to-Deposit ratios, averaging 86% in Q3. (Chart 2.27) A stable retail deposit base forms the primary source of their funding implying that they have low reliance on wholesale funding. Foreign banks here, particularly the Qualifying Full Banks (QFBs) which have a retail presence, also have maintained CAR ratios that are well above the BIS recommendation as at end-Q3 2008. (Chart 2.28)

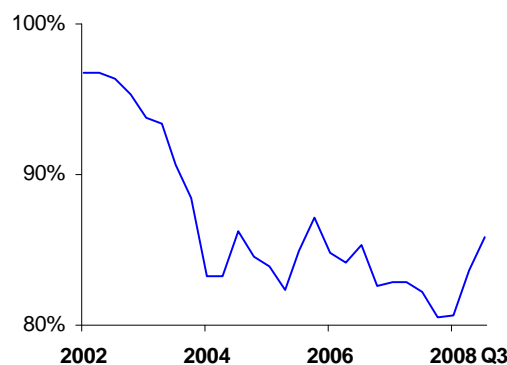
Although the domestic banking sector is resilient and sound, the Singapore Government on 16 October 2008 guaranteed all domestic and foreign currency deposits of non-bank customers following earlier moves by other governments in the region. This was a precautionary measure to ensure that banks here were not disadvantaged in retaining their deposit base and continued to operate on a level international playing field. (see Box F) This measure should bolster the stability of the local banks' deposit funding base.

**Chart 2.26  
Local Banks' NPLs**



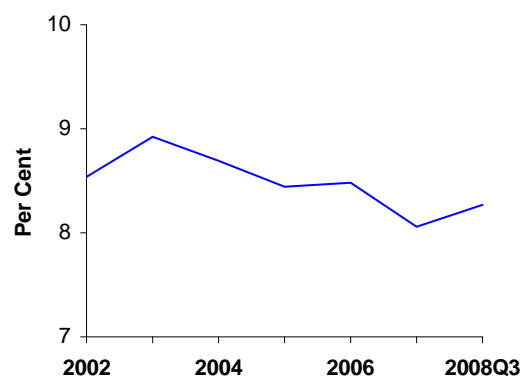
Source: Local Banks' Financial Statements  
Note: Data to the left of the line are annual data while that to the right of the line are quarterly data

**Chart 2.27  
Local Banks' Loan-to-Deposit Ratio**



Source: Local Banks' Financial Statements

**Chart 2.28  
QFBs' Tier-1 CAR (Asset-Weighted)**

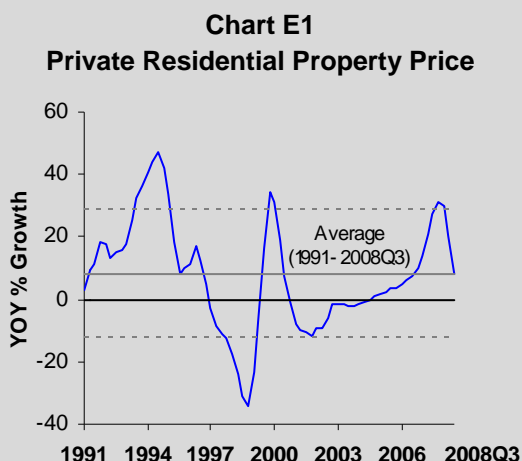


Source: MAS  
Note: One of the QFBs has been excluded due to lack of current data. Q2 data has been used where Q3 data is unavailable

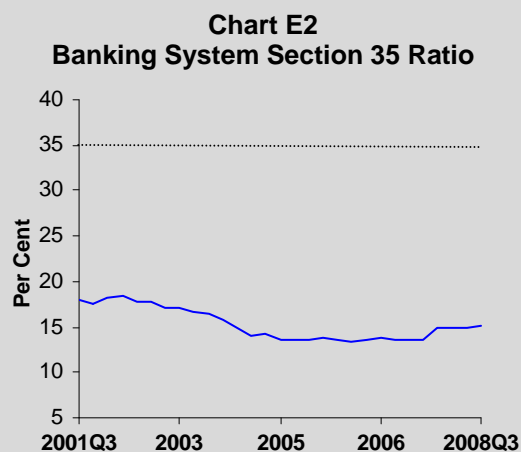
**Box E**  
**Banks' Property Exposures**

In line with a recovery in the property market in 2005 following a slump in 2001-2004 (Chart E1), property-related loans (i.e. Building & Construction and Housing loans) have grown steadily and were the key drivers of DBU non-bank loan growth in the past two years. Throughout this period of strong growth, the banking system's property exposure was well within the regulatory limit of 35%. (Chart E2) Most banks' property exposures were well below the limit, with a few banks' property exposure closer to the limit.

Banks' exposures to Building & Construction (B&C) firms are generally well-diversified with no bank having exposures concentrated in any particular property firm. Indeed, there are regulations in place to safeguard against the risk of concentration in a single borrower. Likewise, the banking system's loans are also diversified, with lending to the B&C sector accounting for 18% of total DBU non-bank loans in September 2008. (Chart E3) The asset quality of B&C loans has remained high, with the NPL ratio remaining low at less than 1%. (Chart E4) Going forward, the NPL ratio of B&C loans is expected to rise given the economic downturn and ongoing corrections in the property market. However, we do not expect this to affect the financial soundness of the banks as their loan portfolios are generally well diversified.

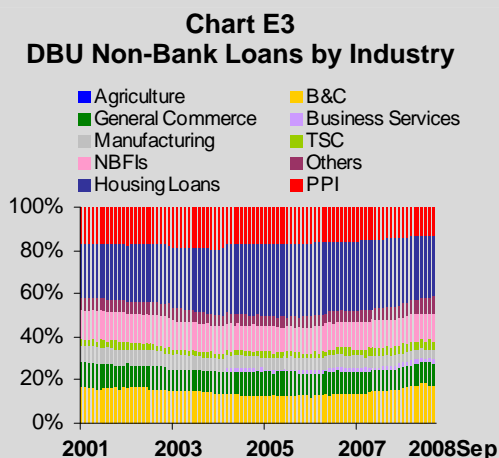


Source: URA

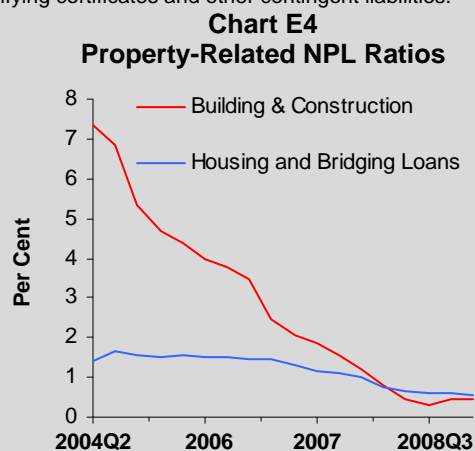


Source: MAS

Note: Property exposures include loans to property and non-property corps., housing loans for invt. purpose, property-related debt instruments, guarantees, performance bonds, qualifying certificates and other contingent liabilities.



Source: MAS



Source: MAS

While housing loans account for a larger proportion of DBU non-bank loans at 28.4%, they typically turn in

low single-digit NPL ratios and have a low risk profile with 75% of housing loans accounted by owner-occupied residential properties. In addition, Singapore banks' mortgage exposures are currently in the form of direct loans. Unlike in the US, there has been no securitisation of mortgages and repackaging into complex products, which had contributed to lax lending standards, and the mis-pricing of risk.

The growth of property-related loans has tapered off recently reflecting falling home demand and property transactions amid a slowing economy.

### Box F

#### Government Guarantee on Deposits

Amidst the slowing global economy and international financial turmoil, the financial system in Singapore has remained stable and robust. Financial institutions in Singapore continue to be sound and to operate normally. Singapore has not had to take extraordinary measures to maintain stability in the financial system.

Nevertheless, in response to announcements by jurisdictions in the region of blanket government guarantee on deposits, Singapore announced on 16 October 2008, a guarantee by the Singapore Government on deposits of individuals and non-bank customers of banks licensed in Singapore. This was aimed at ensuring a level international playing field for banks in Singapore.

The guarantee, which will be in place until 31 December 2010, is backed by S\$150 billion of the reserves of the Singapore Government. This amount does not reflect an estimate of the likely draw on the guarantee. Singapore is in a strong fiscal position to provide the guarantee. The guarantee does not affect at all MAS' ability to defend the Singapore dollar.

Singapore's guarantee of deposits demonstrates its confidence in the soundness of the financial system, and helps contribute towards restoring confidence in the international financial system.

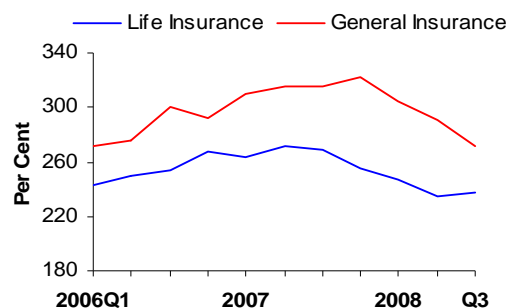
## 2.5 Non-Bank Financial Sector

### 2.5.1 Insurance

Similar to the banking sector, Singapore's insurance sector is well-capitalised and has remained resilient to the ongoing financial turmoil. Capital Adequacy Ratio of life insurers averaged 240% from Q1 to Q3 2008. Over the same period, general direct insurers' CAR averaged 289%. (Chart 2.29) These ratios are well above the minimum regulatory requirement of 100%.

**Insurers affected by investment losses and reduced demand for investment-linked insurance products. AIA was also affected by adverse developments at AIG**

**Chart 2.29**  
Capital Adequacy Ratio



Source: MAS

Note: Ratio of available Financial Resources to Total Risk Based Capital Requirements

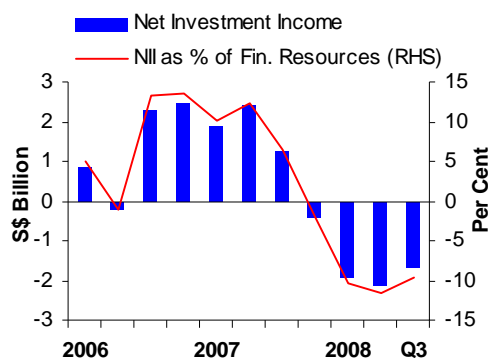
However, given its strong linkages to the global financial sector, Singapore’s insurance industry was not unaffected by the global financial turmoil. The turmoil has affected the industry mainly through three channels.

Firstly, in August 2008, as concerns in the market grew over the exposure of the AIG group to credit derivatives, the Singapore operations of AIA received higher than normal policy redemption requests, which subsequently eased following the bailout of AIG by the US authorities. MAS’ clarification that regulatory safeguards prevented the co-mingling of assets in the Singapore branch’s insurance funds with that of the parent company’s, and that the Singapore Insurance Fund (SIF) of AIA continued to meet and exceed solvency requirements, helped to calm concerned policyholders.

Secondly, the sell-offs in financial markets have negatively impacted the investment portfolios of insurers, particularly life insurers, given their large holdings of bonds and equities. Life insurers have recorded unrealised losses on their investment portfolio and these have led to a negative net investment income since Q4 2007. (Chart 2.30) The cumulative negative net investment income for the non-investment linked SIF business in the first three quarters of 2008 constituted about a third of the SIF’s total financial resources. Nevertheless, there is adequate cushion in financial resources to buffer further unrealised losses in the current turbulent environment. Moreover, the industry does not have any material exposure to structured-finance assets which have been at the centre of the financial storm in the US and Europe.

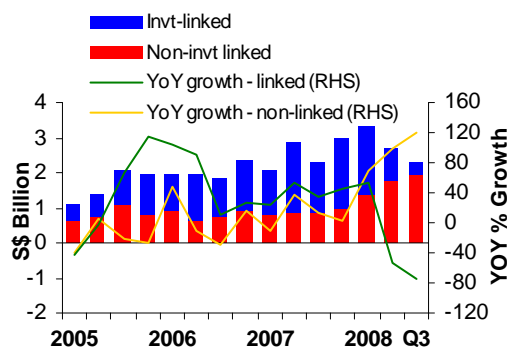
Lastly, the global financial turmoil has impacted consumer sentiment negatively over investment-linked insurance products. Steep declines in global equity markets, increased risk aversion among

**Chart 2.30**  
**Direct Life Insurance: Net Invt. Income (SIF, Non-Invt. Linked Funds)**



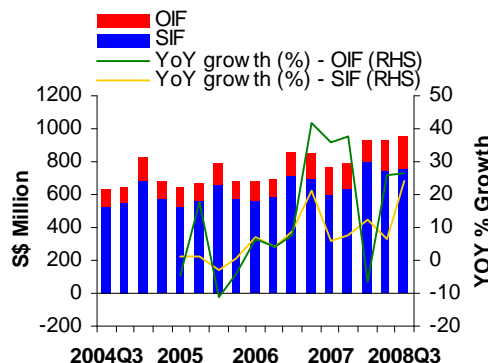
Source: MAS

**Chart 2.31**  
**Direct Life Insurance: New Business for Non-linked & Investment Linked Products (SIF)**



Source: MAS

**Chart 2.32**  
**General Direct Insurance: Gross Premiums (SIF & OIF)**



Source: MAS

investors and a new CPF rule<sup>20</sup>, have led to a decline in the popularity of such products in Singapore. Sales of investment-linked insurance products registered a sharp decline in Q2 and Q3 2008. (Chart 2.31) However, the fall in the popularity of investment-linked policies was somewhat compensated by a stronger demand for non-investment linked policies, which registered 97% y-o-y growth in the first nine months of 2008.

General direct insurers saw fairly strong overall premium growth of 14% y-o-y in the SIF in the first nine months of 2008 largely due to growth in selected lines of business. (Chart 2.32) Despite the increase in premium rates in these lines of business, it was not sufficient to offset the escalating claim costs. This led to low underwriting profits throughout the year with an outright underwriting loss in Q3 2008. (Chart 2.33) While the industry is adequately capitalised to absorb these losses, general direct insurers need to maintain underwriting discipline and ensure adequate pricing to regain profitability, given the greater uncertainty in investment income.

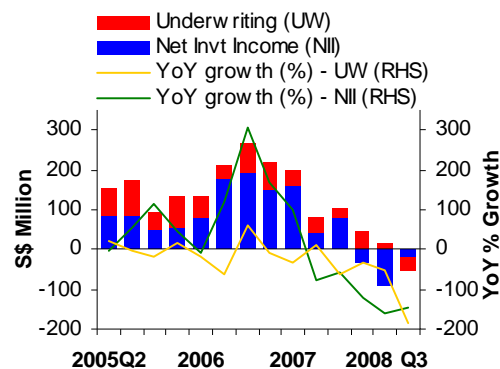
Overall, this year has been challenging for the insurance sector in terms of top-line as well as bottom-line growth. Going forward, the slowing economy is expected to moderate demand for insurance policies, and if an elevated level of volatility in the financial markets persists, the investment portfolios of insurers will remain under some pressure. The strong solvency position of insurers will enable them to weather these headwinds.

## 2.5.2 Capital Market Intermediaries

**SGX members have weathered market volatilities well and investment managers have seen orderly redemptions**

Compared to banks and insurance companies, capital market intermediaries account for a smaller

**Chart 2.33**  
**General Direct Insurance: Operating Results (SIF+OIF)**



Source: MAS

<sup>20</sup> The new CPF rule requires Singapore citizens and permanent residents to not invest the first twenty thousand dollars of their CPF ordinary account or special account funds under the CPF Investment Scheme.

share of financial sector assets. Nevertheless, MAS and SGX have continued to closely monitor the financial position of intermediaries in Singapore's capital markets. SGX securities and derivatives members have weathered the stock market volatility well and trades have been cleared and settled smoothly. They have continued to maintain adequate financial resources, in accordance with regulatory requirements, and have remained vigilant in managing their risks and exposures to customers. SGX members have continued to actively monitor customer margins and exposures to mitigate the effect of defaults. So far, there has been no need to call on the clearing funds of SGX's clearing houses.

To aid in ensuring the integrity of the securities settlement system, SGX increased its penalties for failed delivery of securities for settlement in September. This measure has helped to reduce the incidence of settlement failures caused by short selling on the SGX securities market.

Following the collapse of Lehman Brothers in September 2008, structured products linked to the firm have been adversely affected. Many retail investors in Singapore have been affected by the collapse in value of their investments. MAS appointed three well-respected independent individuals to oversee that the complaints handling and resolution processes of the FIs for these products are independent, fair and transparent. MAS has also set a clear timeline for the FIs to resolve customers' complaints. (see Box G)

Most investment managers have noted declines in their assets under management in the first nine months of 2008 in line with global trends. A few managers have reported a temporary suspension in redemptions, while others have indicated plans to close some of their funds. Redemptions have been handled in an orderly manner and investment managers have maintained sufficient liquidity in anticipation of increased redemption requests.

**Box G****Issues pertaining to the sale of structured products in Singapore**

With Lehman Brothers filing for bankruptcy in Sep 2008, the value of structured products that were linked to Lehman Brothers was adversely affected. These products included the Lehman Minibond Programme Notes, DBS High Notes 5, Merrill Lynch Jubilee Series 3 LinkEarner Notes. A number of Singapore investors have invested in these products.

**Lehman Minibond Programme Notes**

- Issue size: S\$508m, with S\$375m sold to about 8,000 retail investors through 9 distributors.
- Over 80% of investors invested up to S\$50,000, with 28% having bought S\$10,000 or less.

**DBS High Notes 5**

- Issue size: S\$103m, sold to over 1,400 investors.
- More than half of the investors invested S\$50,000 or less.

**Merrill Lynch Jubilee Series 3 LinkEarner Notes**

- Issue size: S\$28m, S\$23m sold to about 350 investors through 6 stockbroking firms.
- Over 80% of investors invested up to S\$50,000, with 28% having bought S\$10,000 or less.

**MAS' response**

What MAS did from the start was to ensure that the financial institutions (FIs) that distributed the products and trustee for the Lehman Minibond Programme Notes communicate clearly with investors and provide timely updates.

In dealing with complaints by investors, MAS' priority is to ensure that the process is fair. In consultation with the relevant FIs, MAS identified and appointed three well-respected independent individuals to oversee that the complaints handling and resolution processes of the FIs for these products are independent, fair and transparent. MAS has also set a clear timeline for the FIs to resolve customers' complaints.

If investors are not satisfied with the outcome of the FIs' complaints resolution process, they can refer their complaints to the Financial Industry Disputes Resolution Centre (FIDReC). FIDReC provides investors with an affordable and impartial avenue to pursue their claims and the FIDReC adjudicators are all well-respected professionals. This is a serious and impartial process that MAS has put in place.

At the same time, MAS has been conducting formal inquiries into allegations of breaches of the law, inadequate internal controls by the FIs, and poor sales practices by their representatives.

A number of credit events have occurred in relation to the underlying securities of the Morgan Stanley Pinnacle Notes Series 9 and 10, triggering an early redemption. MAS has required FIs that sold the Pinnacle Notes Series 9 and 10 to handle investors' complaints according to the same serious and impartial process.

**Review of regulatory and supervisory approach**

The current regime on the sale of structured products adopts an approach that balances regulation with the responsibility on the part of the financial institution (FI) to ensure that consumers are given a fair deal, and the responsibility on the part of the investor to understand the products he invests in. In this approach, FIs and issuers are required to properly disclose to investors the features and risks of products they distribute. FIs and their representatives must have a reasonable basis for recommending investments, taking into consideration the investment objectives, financial situation and needs of the investor. In addition, MAS launched the MoneySENSE national financial education programme in 2003 to enhance the financial literacy of consumers and to empower investors to take greater responsibility for their own investment decisions.

MAS' existing approach is generally in line with those in other major, reputable jurisdictions. As investors



have different needs and risk appetites, a one-size-fits-all rule is not desirable. This approach also allows a wider range of investment options for Singaporeans to cater to their diverse needs.

MAS is undertaking a review of the sales and marketing of investment products in light of recent developments, not just in Singapore, but globally. Such a review may include stronger suitability requirements for certain types of products, clearer product labeling, and simpler descriptions of the features and risks of products so that they can be more readily understood. MAS will be careful not to come up with overly prescriptive rules which may not serve all investors. MAS will study the specific refinements that need to be made carefully so as to avoid making hasty changes that may have unintended consequences in the future.

### **Key risks to Singapore arising from the global financial turmoil**

The Singapore economy and financial system have weathered the recent turmoil on global financial markets relatively well. While the local equity market has fallen by 50% in line with the world-wide sell-offs in global equity markets, and domestic credit conditions have tightened somewhat, our financial system has remained sound and the credit and money markets have continued to function smoothly, albeit with higher volatility. However, the economy has slowed down sharply and is likely to weaken further in the period ahead with adverse implications for the financial system.

As economic activity slows, unemployment is expected to rise and incomes moderate. Corporate earnings are also expected to decline. Amid the slowdown, banks' asset quality is likely to deteriorate and non performing loans (NPLs) should rise moderately. Loan growth will moderate and profitability of banks will be constrained. Insurance companies are expected to face lower demand for new policies and continued pressure on investment income. We do not expect these challenges to be severe or to significantly undermine the soundness of Singapore's financial system. However, there are two downside risks to this central outlook.

- A worse than expected deterioration in the global economy will adversely affect the growth outlook of Asian economies. Singapore too will be significantly affected through the trade channel, given our dependence on exports. This in turn would more severely dampen economic activity, corporate revenue and household income, which could lead to a sharper than expected rise in defaults of loans extended by banks, which form the core of Singapore's financial system. There will also be greater downward pressure on asset markets under such conditions.
- A broader loss of confidence in emerging market economies could precipitate large capital outflows from Asia and put severe strain on asset and currency markets, particularly in economies perceived to have relatively less robust economic and financial conditions.

The probability of these downside risks materialising is assessed to be low at the moment. Our strong economic fundamentals, substantial reserves, sound financial system, coupled with the precautionary measures taken to guarantee deposits and establish the US\$ swap line with the US Fed, as well as the Government's fiscal measures, will enable Singapore to weather this global turmoil.

### 3 SPECIAL FEATURE

## Financial Sector Industry-wide Business Continuity Exercise 2008 Ex Raffles II

Financial infrastructure is indispensable for ensuring financial stability especially in the current environment of heightened volatility and stresses in the financial markets. Although currently the focus of most discussions is on the ongoing global financial turmoil, Singapore's financial system may be exposed to other stresses of non-financial nature as well. This Special Feature presents an overview of the recently conducted Industry-Wide Exercise (IWE) for testing business continuity plans of the financial industry under a scenario of bird-flu pandemic. Singapore's financial sector must stand ready for these stresses as well so that if any such stresses were to materialise, they wouldn't aggravate the already challenging situation in the financial markets.

As part of the ongoing initiatives to enhance the resilience of Singapore's financial sector to major operational disruptions, an industry-wide business continuity exercise (IWE 2008) was conducted from 28 Aug to 11 Sep 2008. IWE 2008, which was based on a flu pandemic scenario, was the second industry-wide business continuity exercise for the financial sector after the first one in May 2006, which tested financial sector's response to terrorist attacks in the financial district. It was jointly organized by the Monetary Authority of Singapore (MAS), Ministry of Home Affairs (MHA) and the Association of Banks in Singapore (ABS) in a close public-private partnership to better prepare financial institutions (FIs) for a potential threat with large-scale financial and economic stability implications.

IWE 2008 was designed for FIs to test their crisis management and business continuity plans to enhance: (i) the understanding of systemic risks to the financial sector during a flu pandemic outbreak impacting Singapore; (ii) the preparedness of the financial sector by providing

the opportunity for organisations of all sizes within the sector to test their plans; and (iii) the overall flu pandemic readiness by aligning FIs' flu pandemic plans and crisis responses with those of the government and MAS. Over the period of two weeks, exercise participants tested their influenza pandemic plans and validated key issues through four exercise components, comprising two simulated interactive sessions, an industry-wide practical drill and a cluster discussion session. (See Chart 3.1 on the exercise format of IWE 2008.)

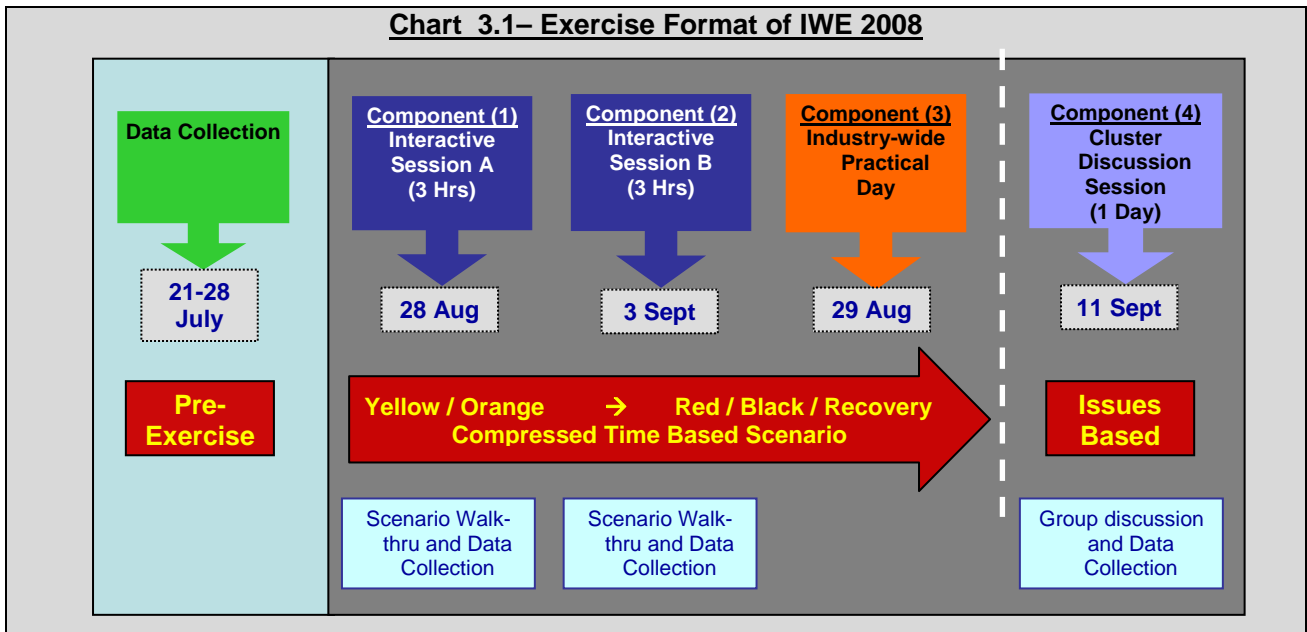
The exercise scenarios were designed to provide meaningful play and learning for all sectors of the financial industry, viz. banks, insurance companies and capital market intermediaries, covering the following areas: (i) organisation-specific issues, (ii) sector-specific issues (i.e. banking, securities, insurance), (iii) coordination within the financial sector, (iv) coordination between FIs and Government agencies, and (v) testing of recovery phase.

IWE 2008 involved the participation of about 144 FIs, including banks, finance companies, insurance companies, securities and broking houses, the Singapore Exchange (SGX), as well as infrastructure providers such as NETS and the Automated Clearing House. A flu pandemic exhibition (from 1-9 Sep) was also set up in the financial district to improve visibility and raise public awareness. Through this exhibition, the general public was educated on possible response measures taken by the government during a pandemic.

The large scale exercise tested the effectiveness of the financial sector's operational response plans to handle a flu pandemic scenario. It also highlighted that the financial industry take contingency planning seriously, and underpinned the financial

industry's efforts in better appreciating the systemic risks engendered by a major operational disruption. Behind the scenes, employees at each of the firms and government agencies put into motion existing plans to ensure that operations which are crucial to the normal

functioning of the financial sector, such as the clearing of cheques, can continue even if large numbers of staff are absent. The exercise also contributed towards MAS' business outcome of fostering a sound and reputable financial centre.



---

## Statistical Appendix

### SINGAPORE NON-FINANCIAL SECTOR

**Table A.1: Corporate Sector's Financial Ratios and Insolvency**

**Table A.2: Household Sector's Financial Indicators**

### SINGAPORE FINANCIAL INSTITUTIONS

**Table B.1: Banking Sector's Financial Soundness Indicators**

**Table B.2: Local Banks' Selected Financial Soundness Indicators**

**Table B.3: Life Direct Insurers: Total New Business Gross Premiums**

**Table B.4: Life Direct Insurers: Assets Distribution of Singapore Insurance Fund (Non-Linked Assets)**

**Table B.5: General Direct Insurers: Gross Premiums**

**Table B.6: General Direct Insurers: Composition of Net Premiums of Singapore Insurance Fund**

**Table B.7: General Direct Insurers: Incurred Loss Ratio of Singapore Insurance Fund**

## SINGAPORE NON-FINANCIAL SECTOR

**Table A.1: Corporate Sector's Financial Ratios and Insolvency**

	Q4 2004	Q2 2005	Q4 2005	Q2 2006	Q4 2006	Q2 2007	Q4 2007	Q2 2008
<b>Median Return on Assets (Per Cent)</b>								
Transport, Storage & Communications	10.5	9.4	11.1	8.9	8.8	8.5	9.4	8.0
Property	3.8	3.3	3.8	4.8	5.6	8.7	12.2	8.4
Multi-Industry	3.6	3.4	4.1	4.6	6.1	6.8	8.1	8.0
Manufacturing	6.1	5.1	4.5	4.6	5.5	5.7	6.3	5.1
Hotels & Restaurants	3.3	5.0	3.9	5.1	7.2	13.0	9.5	9.1
Construction	0.7	0.4	1.2	1.7	3.7	4.9	6.0	6.1
Commerce	5.4	5.5	5.9	6.9	6.6	7.4	6.6	5.4
<b>Median Current Ratio (Ratio)</b>								
Transport, Storage & Communications	1.3	1.5	1.6	1.4	1.5	1.6	1.6	1.6
Property	1.9	2.3	2.2	2.9	3.0	4.2	3.4	3.0
Multi-Industry	1.2	1.2	1.2	1.4	1.6	1.5	1.9	1.5
Manufacturing	1.6	1.7	1.7	1.6	1.6	1.8	1.8	1.8
Hotels & Restaurants	1.7	2.1	1.9	2.0	1.9	2.6	2.4	2.1
Construction	1.3	1.3	1.2	1.3	1.5	1.6	1.7	1.9
Commerce	1.7	1.8	1.7	1.7	1.6	1.9	1.7	1.7
<b>Median Total Debt/Equity (Per Cent)</b>								
Transport, Storage & Communications	27.8	22.9	28.4	28.8	32.8	26.0	23.0	31.2
Property	76.8	89.7	84.3	103.1	76.0	70.8	70.4	76.2
Multi-Industry	56.4	53.3	52.4	50.5	52.2	59.4	41.9	40.1
Manufacturing	29.4	30.1	28.4	31.1	26.9	28.5	25.4	27.4
Hotels & Restaurants	46.9	22.4	41.5	34.2	20.8	14.6	13.5	16.7
Construction	49.3	37.5	28.6	40.4	46.8	39.5	52.3	43.7
Commerce	38.4	38.1	39.4	44.8	45.0	31.0	43.8	39.7
<b>Median Interest Coverage Ratio * (Ratio)</b>								
Transport, Storage & Communications	11.9	16.6	19.2	8.5	7.3	13.9	15.5	11.8
Property	5.4	5.5	8.4	5.1	6.2	15.5	11.7	8.6
Multi-Industry	4.1	7.9	4.6	8.6	9.6	12.2	14.5	6.1
Manufacturing	7.0	6.7	5.8	5.8	7.6	7.8	7.9	4.8
Hotels & Restaurants	2.2	3.9	2.5	3.9	12.6	13.6	19.0	5.4
Construction	2.2	2.0	1.6	3.5	3.2	9.6	8.6	7.2
Commerce	6.7	7.0	6.1	6.0	6.2	8.0	7.4	5.4
<b>Insolvency **</b>								
Companies Wound-up	117	89	73	66	64	60	46	65

Source: Thomson Financial, Ministry of Law

\*Earnings before interest and tax divided by interest expense

\*\* Number of companies wound-up in the six months ended that quarter

**Table A.2: Household Sector's Financial Indicators**

	Q1 2006	Q2 2006	Q3 2006	Q4 2006	Q1 2007	Q2 2007	Q3 2007	Q4 2007	Q1 2008	Q2 2008	Q3 2008
<b>Per Cent (unless otherwise stated)</b>											
Household Assets (S\$ billion)	898.2	908.3	931.3	968.0	1003.4	1052.2	1095.7	1124.6	1134.2	1149.6	1131.0
Household Residential Property Assets as % of Total Assets	42.3	42.1	41.6	40.9	40.6	40.5	41.8	43.3	45.5	46.1	47.4
Household Liabilities (S\$ billion)	156.0	155.8	155.4	155.8	156.0	157.9	162.6	166.0	166.5	169.0	170.9
Household Liabilities to Assets Ratio (%)	17.4	17.2	16.7	16.1	15.5	15.0	14.8	14.8	14.7	14.7	15.1
Household Liabilities as % of GDP	76.3	74.6	72.9	71.8	70.4	69.0	68.6	68.3	66.4	66.4	66.9
<b>Per Cent (unless otherwise stated)</b>											
Credit Card Charge-Off Rate *	4.4	4.7	4.6	4.2	3.9	4.1	3.7	3.8	3.3	3.5	3.7
Housing & Bridging Loan NPL	1.5	1.5	1.3	1.2	1.1	1.0	0.8	0.6	0.6	0.6	0.5
Professional & Private Individuals Loan NPL	1.8	1.6	1.5	1.4	1.2	1.0	0.8	0.7	0.6	0.6	0.9
Number of Individual Bankruptcy Orders	744	708	751	780	727	687	673	680	590	586	649

Source: MAS estimates, Ministry of Law, Ministry of National Development, Urban Redevelopment Authority and Singapore Department of Statistics.

\* Charge-off rate for the quarter is calculated by annualising the ratio obtained from dividing bad debts written off for the quarter by the average rollover balance for the same quarter.

## SINGAPORE FINANCIAL INSTITUTIONS

**Table B.1: Banking Sector Financial Soundness Indicators**

	2005	2006	2007	Q1 2007	Q2 2007	Q3 2007	Q4 2007	Q1 2008	Q2 2008	Q3 2008
<b>Loan Concentrations (% of Total Commercial Bank Loans)</b>										
Bank Loans	64.2	64.1	61.2	64.0	62.5	62.2	61.2	59.7	56.4	56.7
Non-Bank Loans	35.8	35.9	38.8	36.0	37.5	37.8	38.8	40.3	43.6	43.3
<b>Loans through the Asian Dollar Market (% of Total Commercial Bank Loans)</b>										
Total ADM Loans	73.3	70.2	70.7	70.6	70.2	71.2	70.7	69.6	68.4	68.9
<b>Of which to (% of Total Asian Dollar Market Loans):</b>										
United Kingdom	13.5	15.0	12.8	14.0	13.1	14.4	12.8	10.8	10.6	11.0
Japan	20.3	11.2	9.7	14.1	11.5	12.4	9.7	10.3	9.3	10.1
Hong Kong	7.8	8.0	8.5	7.3	7.9	7.5	8.5	7.9	7.9	7.4
USA	6.5	7.5	7.0	7.5	7.6	6.7	7.0	6.8	6.4	5.5
Switzerland	5.8	6.3	7.0	6.3	6.3	6.0	7.0	6.3	5.5	4.9
Banks	76.2	75.1	71.3	74.8	72.6	72.2	71.3	69.3	65.9	66.0
Non-Bank	23.8	24.9	28.7	25.2	27.4	27.8	28.7	30.7	34.1	34.0
<b>Loans through Domestic Banking Units (% of Total Commercial Bank Loans)</b>										
Total DBU Loans	26.7	29.8	29.3	29.4	29.8	28.8	29.3	30.4	31.6	31.1
<b>Of which to (% of Total DBU Loans):</b>										
Manufacturing	3.8	3.4	2.8	3.2	3.0	2.9	2.8	2.8	2.9	2.8
Building & Construction	8.6	8.3	10.1	8.7	8.9	9.2	10.1	10.9	11.6	11.4
Housing	23.2	20.1	19.8	19.8	19.4	20.2	19.8	18.5	18.6	18.2
Professionals & Private Individuals	12.2	10.2	9.5	10.0	9.6	9.7	9.5	8.8	9.1	8.8
Non-Bank Financial Institutions	8.2	7.5	8.5	8.2	8.0	7.8	8.5	8.2	8.0	7.8
Banks	31.3	38.4	36.9	38.0	38.8	37.3	36.9	37.9	35.9	36.0
<b>Profitability (Per Cent)</b>										
DBU Net Interest Income to Total DBU Loans	2.26	2.28	2.18	2.20	2.21	2.16	2.18	2.16	2.05	2.09
<b>Liquidity (Per Cent)</b>										
Liquid DBU Assets to Total DBU Assets	10.3	9.8	10.1	10.0	10.5	10.8	10.1	9.5	9.6	9.0
Liquid DBU Assets to Total DBU Liabilities	11.3	10.6	10.8	10.9	11.3	11.7	10.8	10.3	10.3	9.6
All DBU Loans to All DBU Deposits	96.3	92.8	96.1	92.2	91.4	93.0	96.1	98.0	97.3	98.1
DBU Non-bank Loans to DBU Non-Bank Deposits	81.8	71.4	74.1	69.2	68.3	70.8	74.1	75.4	78.4	79.9
DBU Non-Bank Loan Growth (YOY)	2.2	6.3	19.9	10.3	10.3	12.8	19.9	23.8	24.9	24.8
DBU Non-Bank Deposit Growth (YOY)	8.5	21.8	15.6	25.7	26.0	22.0	15.6	13.7	8.9	10.7

Source: MAS

\* Data relates to all commercial banks, Singapore operations only.

\* Annual Figures are as at Q4



**Table B.2: Local Banks' Selected Financial Soundness Indicators**

	2005	2006	2007	Q1 2007	Q2 2007	Q3 2007	Q4 2007	Q1 2008	Q2 2008	Q3 2008
<b>Capital Adequacy (Per Cent)</b>										
Regulatory Capital to Risk-Weighted Assets	15.8	15.4	13.5	14.9	15.0	14.0	13.5	14.1	13.9	14.3
Regulatory Tier I Capital to Risk-Weighted Assets	11.4	11.2	9.8	10.9	10.6	10.1	9.8	10.5	10.6	11.3
Shareholders' Funds to Total Assets	9.6	9.6	9.2	9.6	9.3	9.3	9.2	8.7	8.5	8.5
<b>Asset Quality (Per Cent)</b>										
Non-Bank NPLs to Non-Bank Loans	3.8	2.8	1.5	2.5	2.1	1.8	1.5	1.4	1.4	1.4
Total Provisions to Non-Bank NPLs	78.7	89.5	115.6	94.4	98.6	105.9	115.6	118.9	117.2	119.9
Specific Provisions to Non-Bank NPLs	41.1	41.3	39.9	42.7	39.0	38.7	39.9	38.8	41.4	43.5
<b>Loan Concentrations (% of Total Loans)</b>										
Bank Loans	24.1	22.8	16.2	21.1	20.7	19.5	16.2	17.7	17.1	16.6
Non-Bank loans	75.9	77.2	83.8	78.9	79.3	80.5	83.8	82.3	82.9	83.4
<b>Of which to (% of Total Loans):</b>										
Manufacturing	7.6	8.4	9.2	9.0	9.1	9.2	9.2	9.1	8.9	9.4
Building & Construction	8.8	9.5	11.4	9.5	10.1	10.2	11.4	12.1	12.3	12.3
Housing	21.7	21.0	20.6	20.8	20.6	20.6	20.6	19.8	19.7	19.2
Professionals & Private Individuals	9.4	8.7	8.6	8.6	8.5	8.6	8.6	8.2	8.4	8.1
Non-Bank Financial Institutions	10.0	10.5	12.3	11.7	11.1	11.3	12.3	11.8	11.4	11.2
<b>Profitability (Per Cent)</b>										
ROA (Simple Average)	1.2	1.4	1.3	1.4	1.4	1.4	1.3	1.2	1.2	1.1
ROE (Simple Average)	11.2	13.7	12.9	13.8	14.1	13.4	12.9	12.2	12.5	11.9
Net Interest Margin (Simple Average)	1.9	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2
Non-Interest Income to Total Income	39.0	42.6	39.1	41.6	40.7	39.5	39.1	36.5	36.4	34.2

Source: Local Banks, MAS estimates

\* Local banks' global operations

\* Annual figures are as at Q4

**Table B.3: Life Direct Insurers: Total New Business Gross Premiums**

	2005	2006	2007	Q4 2006	Q1 2007	Q2 2007	Q3 2007	Q4 2007	Q1 2008	Q2 2008	Q3 2008
<b>Year-on-Year % Change</b>											
Policies	288.9	-67.5	17.3	-59.2	5.4	11.2	15.4	35.7	35.3	12.0	0.0
Annual Premiums	60.8	-16.4	31.4	-9.4	28.8	25.4	22.3	43.7	49.1	45.3	34.1
Single Premiums	-11.0	29.4	27.6	25.0	5.5	50.4	27.0	27.5	60.3	-10.2	-5.5
Sum Insured	177.5	-55.2	24.1	7.1	-0.8	17.7	1.3	80.3	21.5	17.2	100.7

Source: MAS

**Table B.4: Life Direct Insurers: Assets Distribution of Singapore Insurance Fund (Non-Linked Assets)<sup>†</sup>**

	2005	2006	2007	Q4 2006	Q1 2007	Q2 2007	Q3 2007	Q4 2007	Q1 2008	Q2 2008	Q3 2008
<b>S\$ Million (% of Total Assets)</b>											
Debt Securities	41,936 (61.6)	43,697 (59.6)	47,857 (59.7)	43,508 (59.5)	45,508 (58.7)	47,038 (59.6)	47,245 (58.9)	47,882 (59.6)	47,404 (60.4)	46,346 (59.1)	46,738 (60.2)
Equity Shares	15,131 (22.2)	17,572 (24.0)	19,450 (24.3)	17,549 (24.0)	18,175 (23.5)	19,547 (24.8)	19,928 (24.8)	19,661 (24.5)	17,458 (22.2)	17,504 (22.3)	15,558 (20.0)
Cash & Deposits	3,887 (5.7)	4,462 (6.1)	3,428 (4.3)	4,428 (6.1)	5,921 (7.6)	4,103 (5.2)	4,863 (6.1)	3,517 (4.4)	3,936 (5.0)	4,235 (5.4)	5,187 (6.7)
Loans	3,380 (5.0)	3,391 (4.6)	3,633 (4.5)	3,398 (4.6)	3,332 (4.3)	3,545 (4.5)	3,586 (4.5)	3,635 (4.5)	3,679 (4.7)	3,898 (5.0)	3,834 (4.9)
Land & Buildings	1,997 (2.9)	2,139 (2.9)	3,319 (4.1)	2,147 (2.9)	2,246 (2.9)	2,292 (2.9)	2,130 (2.7)	3,315 (4.1)	3,315 (4.2)	3,305 (4.2)	3,302 (4.2)
Other Assets	1,751 (2.6)	2,029 (2.8)	2,426 (3.0)	2,152 (2.9)	2,313 (3.0)	2,363 (3.0)	2,479 (3.1)	2,315 (2.9)	2,705 (3.4)	3,173 (4.0)	3,071 (4.0)
Total Assets	68,082 (100.0)	73,290 (100.0)	80,114 (100.0)	73,182 (100.0)	77,496 (100.0)	78,888 (100.0)	80,231 (100.0)	80,324 (100.0)	78,497 (100.0)	78,461 (100.0)	77,690 (100.0)

Source: MAS

<sup>†</sup> Since 2005, assets have been evaluated based on the Risk Based Capital (RBC) framework which requires assessment of assets at "fair value". Prior to 2005, under the old framework, assets were reported using the "lower of cost or market value".

**Table B.5: General Direct Insurers: Gross Premiums\***

	2005	2006	2007	Q4 2006	Q1 2007	Q2 2007	Q3 2007	Q4 2007	Q1 2008	Q2 2008	Q3 2008
<b>S\$ Million</b>											
Total Operations	2,818.0	2,850.5	3,224.5	697.9	853.1	848.6	761.7	785.4	931.4	931.9	947.9
SIF	2,346.7	2,385.9	2,621.9	585.6	716.9	695.9	603.6	630.9	804.4	739.9	748.3
OIF	471.3	464.6	602.6	112.3	136.2	152.7	158.1	154.5	127.0	192.0	199.6

Source: MAS

\* Gross premium figures are according to the new RBC approach whereby SIF and OIF gross premiums for general business are derived from gross premiums in respect of direct business and total reinsurance business accepted. Prior to the new framework, gross premiums typically excluded reinsurance accepted or ceded in Singapore.

**Table B.6: General Direct Insurers: Composition of Net Premiums of Singapore Insurance Fund**

	2005	2006	2007	Q4 2006	Q1 2007	Q2 2007	Q3 2007	Q4 2007	Q1 2008	Q2 2008	Q3 2008
<b>S\$ Million</b>											
Marine & Aviation											
- Cargo	110.7	111.7	117.0	27.5	30.4	28.0	31.1	28.4	34.2	30.7	34.5
- Hull & Liability	51.9	59.1	72.1	19.5	11.9	17.1	20.3	22.4	11.6	16.7	23.7
Fire	110.1	113.9	119.1	24.4	33.5	32.6	27.0	26.2	34.3	32.6	30.1
Motor	644.2	655.5	710.9	164.4	187.8	184.5	163.7	180.7	222.0	205.2	210.9
Work Injury Compensation	136.5	140.7	178.9	28.8	54.5	51.9	38.4	35.5	64.3	63.5	58.5
Personal Accident**	177.4	164.4	188.9	44.3	55.0	50.3	44.5	40.5	52.4	57.0	51.3
Health**	109.2	138.2	165.0	27.2	50.1	37.5	38.4	40.0	68.1	51.5	48.6
Miscellaneous	209.5	231.2	277.6	52.5	65.7	79.1	67.7	66.5	77.6	80.7	87.6
<b>Total</b>	<b>1,549.5</b>	<b>1,614.7</b>	<b>1,829.5</b>	<b>388.6</b>	<b>488.9</b>	<b>481.0</b>	<b>431.1</b>	<b>440.2</b>	<b>564.5</b>	<b>537.9</b>	<b>545.2</b>

Source: MAS

**Table B.7: General Direct Insurers: Incurred Loss Ratio of Singapore Insurance Fund**

	2005	2006	2007	Q4 2006	Q1 2007	Q2 2007	Q3 2007	Q4 2007	Q1 2008	Q2 2008	Q3 2008
<b>Per Cent</b>											
Marine & Aviation											
- Cargo	23.0	26.6	27.3	32.1	20.6	27.0	36.0	23.3	27.3	23.2	47.1
- Hull & Liability	40.0	35.0	41.4	42.1	14.3	39.2	52.9	56.1	62.1	39.5	70.2
Fire	22.2	24.5	20.0	29.7	16.1	25.7	24.9	27.5	13.5	15.6	19.1
Motor	64.3	68.7	88.8	71.4	76.9	83.7	96.1	84.7	87.2	98.8	101.7
Work Injury Compensation	92.5	95.0	74.0	71.1	69.0	84.0	86.3	71.4	65.1	79.6	80.0
Personal Accident**	29.6	21.3	30.2	22.7	28.0	27.4	24.6	35.8	22.1	19.6	36.5
Health**	59.6	74.4	60.1	57.9	51.0	55.1	51.5	90.4	57.5	57.6	52.5
Miscellaneous	39.3	25.2	25.1	15.8	22.5	34.1	23.4	18.5	22.3	35.5	31.9
<b>Total</b>	<b>52.6</b>	<b>51.8</b>	<b>58.1</b>	<b>50.2</b>	<b>50.8</b>	<b>58.7</b>	<b>60.8</b>	<b>59.8</b>	<b>57.1</b>	<b>62.3</b>	<b>68.4</b>

Source: MAS

\*\* Individual data for Personal Accident and Health lines of businesses is available only since Q1 2005. Prior to this, figures for Net Premiums (SIF) and Incurred Loss Ratio (SIF) for these two lines of businesses were reported under Miscellaneous.