

See the Disclosure Appendix for the  
Analyst Certification and Other Disclosures



# Addicted to credit

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Citigroup Global Markets Ltd.



**Ever greater cravings**

**Coping with withdrawal**

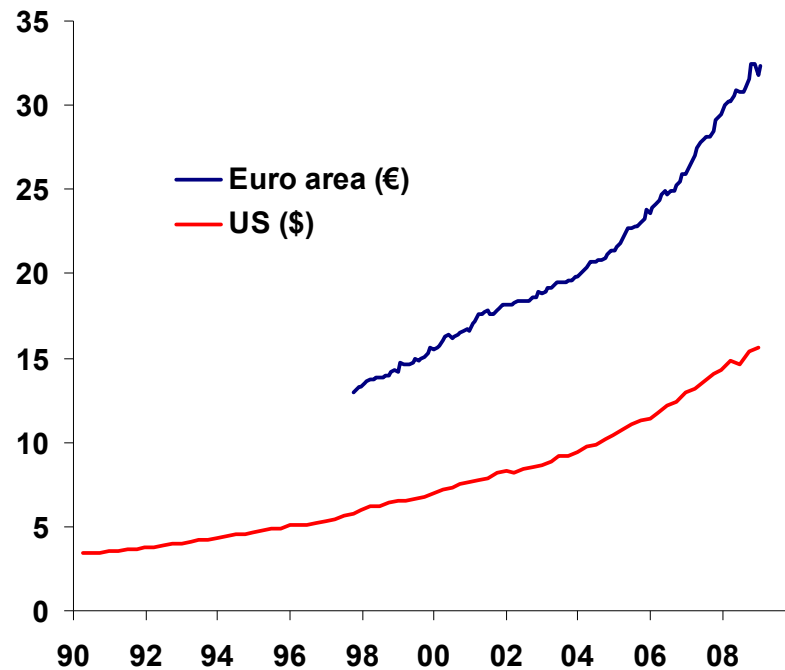
**Long-term rehab**

# A little of what you fancy ...



## Big Is Beautiful

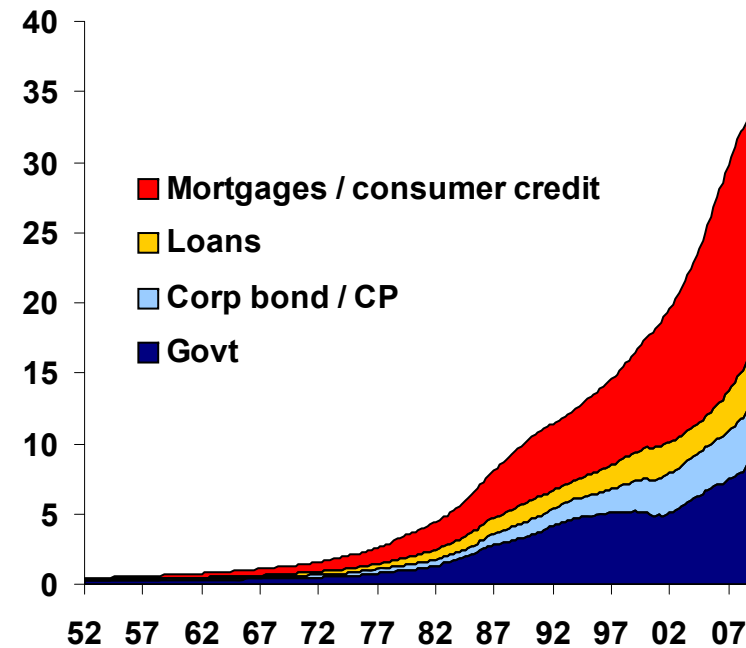
Bank Assets by Region, (ex Derivatives),  
Local Currency, Tn



Source: Federal Reserve.

## More and More Mortgages

US Credit Market Debt Owed by Non-Financials,  
\$ Tn



Source: Federal Reserve Flow of Funds, Table L2.

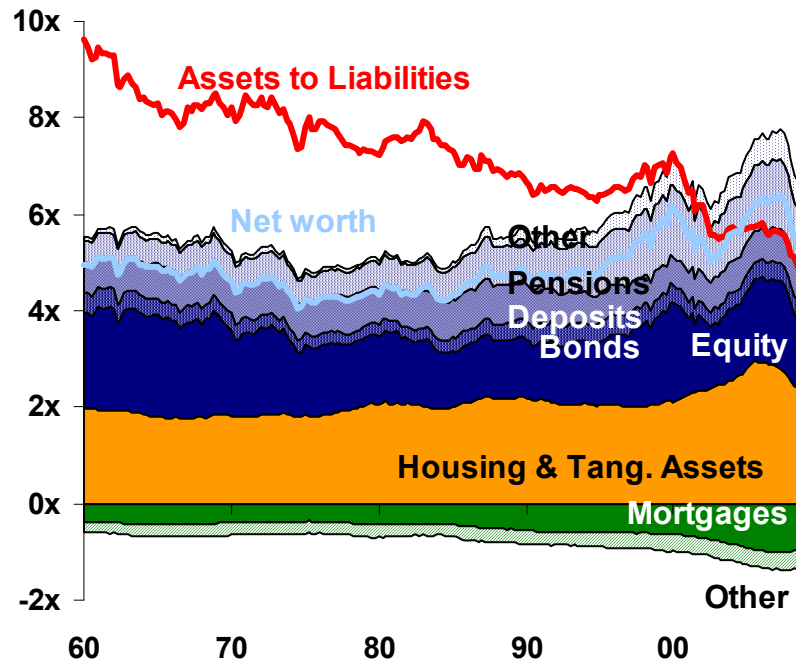
## Credit outstandings have doubled in a decade

# ... never did any harm



## How Do You Measure Leverage?

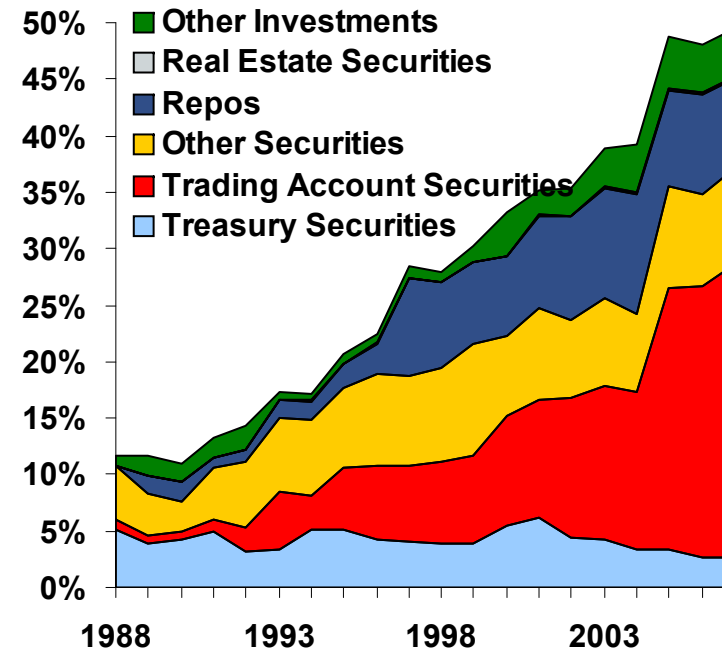
*Consumer Assets & Liabilities, Multiple of Disposable Income*



Source: Federal Reserve, Flow of Funds, EcoWin, Citi.

## European Bank Investment Holdings

*Percent Balance Sheet*



Source: Worldscope, Citi Investment Research.

**It looked sustainable because it was backed by assets**

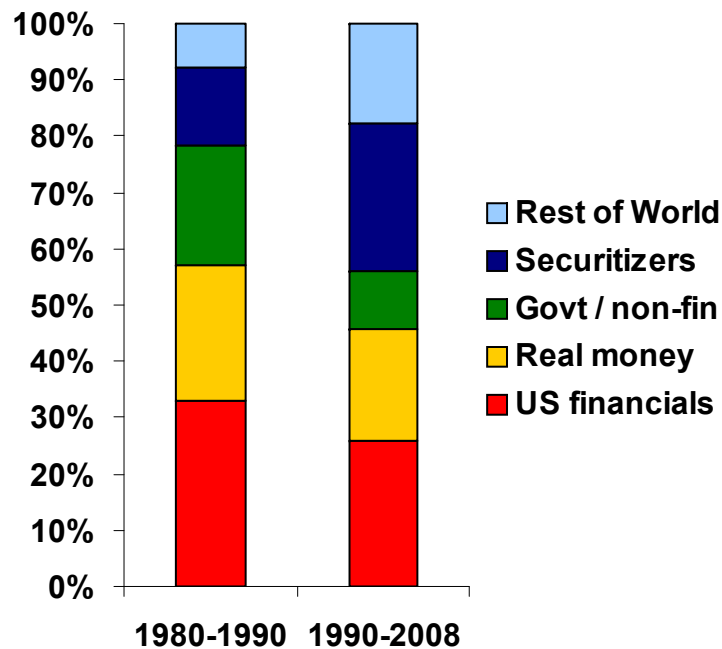
fixed income strategy and analysis

# Concealing the addiction



## Sources of Credit

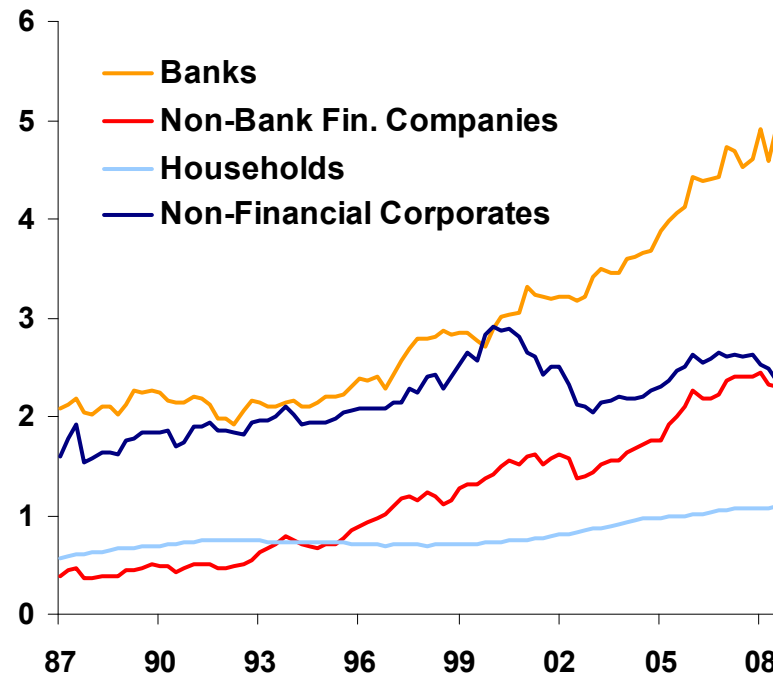
Cumulative Credit Supplied, US



Source: Federal Reserve Flow of Funds Table L.1, Citi.

## Just What Is a Non-Bank, Anyway?

UK Private Sector Debt, Percentage GDP



Source: Office of National Statistics.

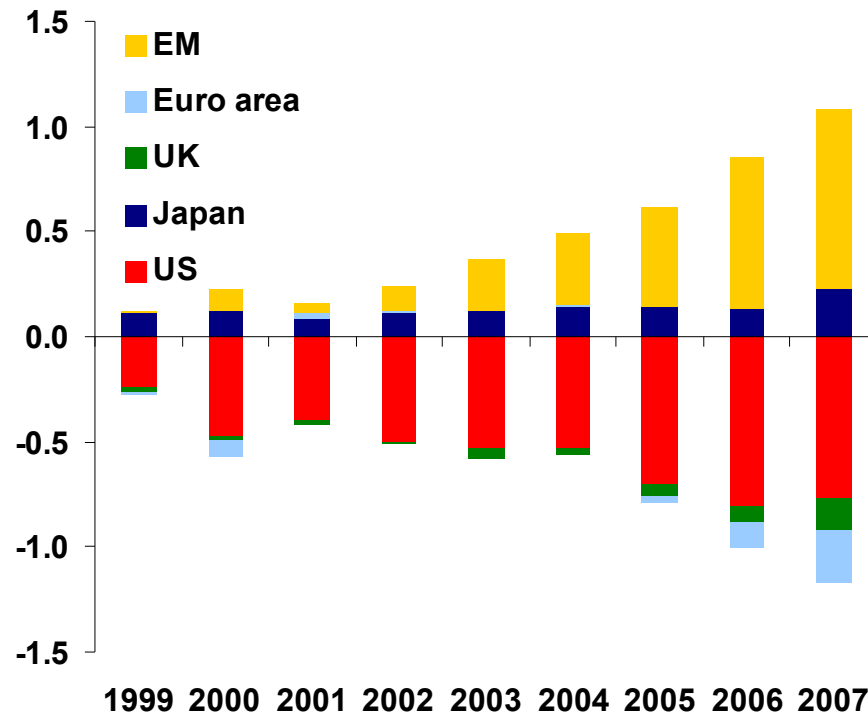
# Much came through the shadow banking system

# Know your supplier (1)



## Global Current Account

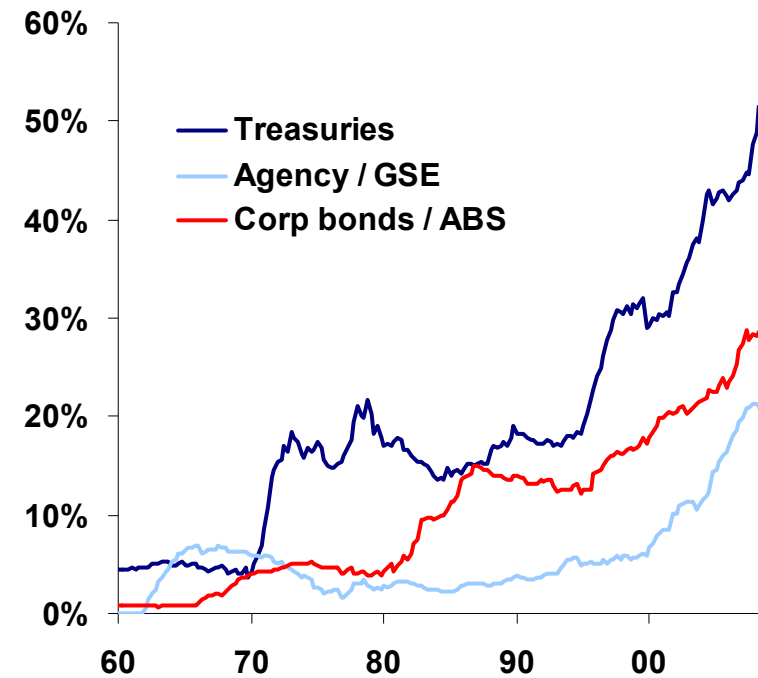
\$ Tn



Source: IMF. See also "The Financial Crisis and the Future of Financial Regulation", Adair Turner, 21 Jan 09.

## In Foreign Hands

US Bond Markets, % Held by Rest of World



Source: Federal Reserve Flow of Funds, Citi.

# \$10tn in Asian savings fuelled a US & European binge

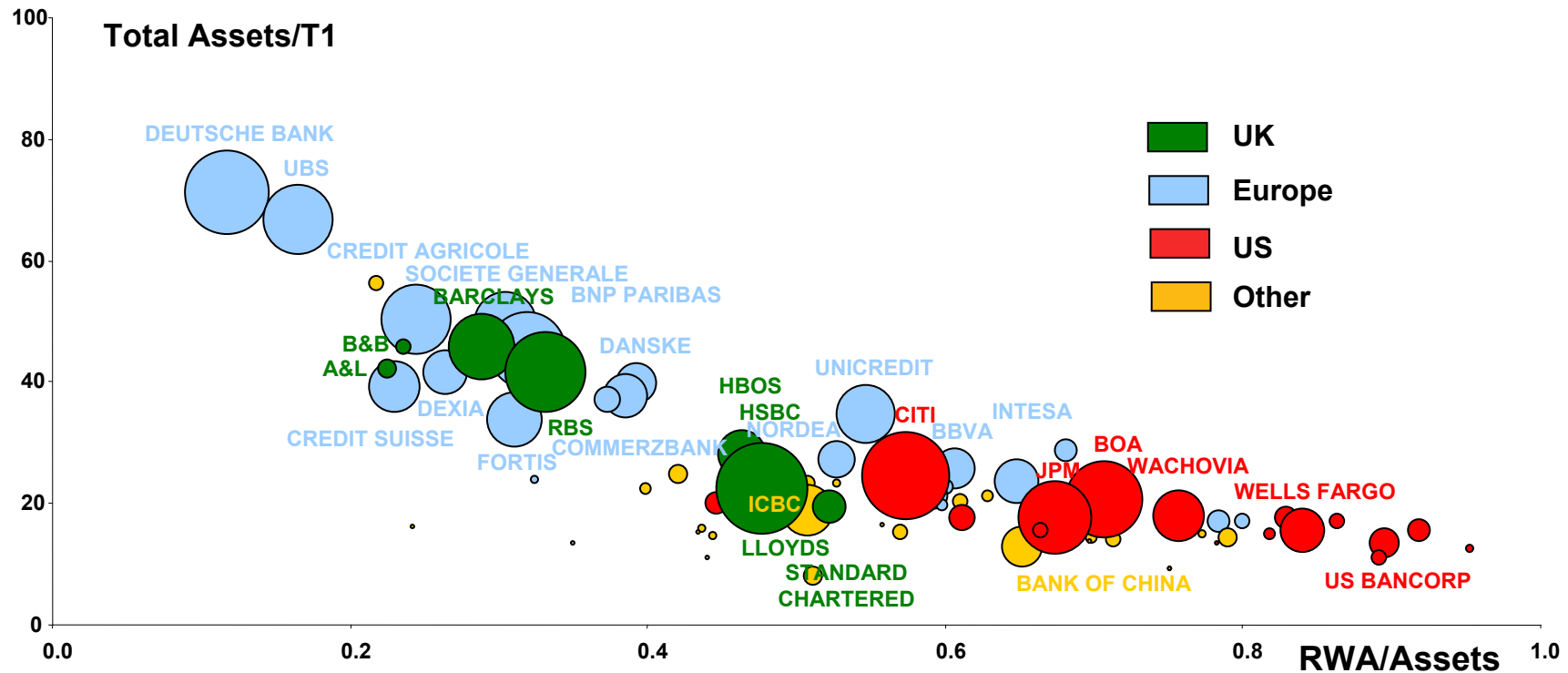
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# Know your supplier (2)



## Bank Bubbles

Global Bank Ratios Sized by Total Assets, end 2007



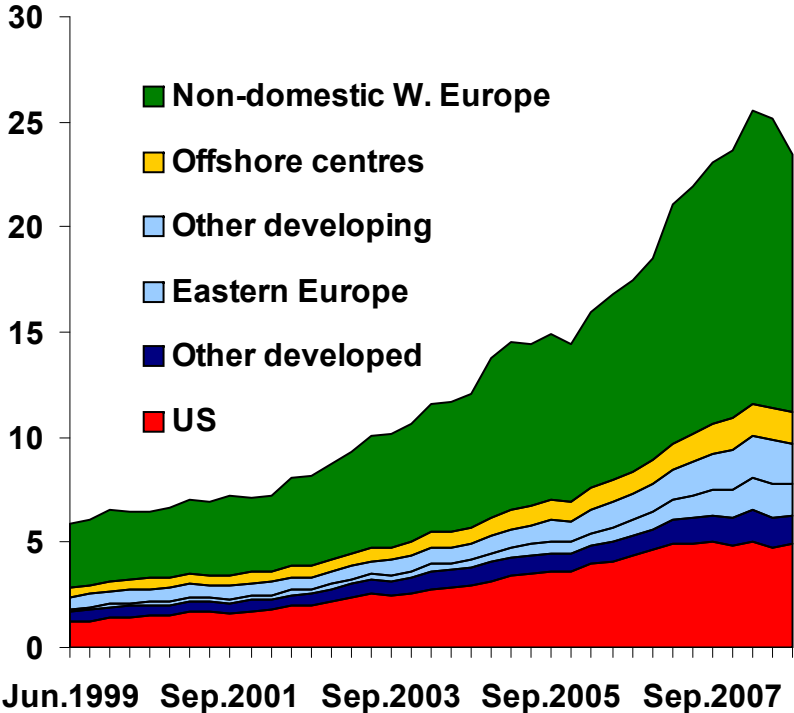
Source: Bloomberg.

The mismatch in regulations helped fuel global leverage

# I just can't get enough

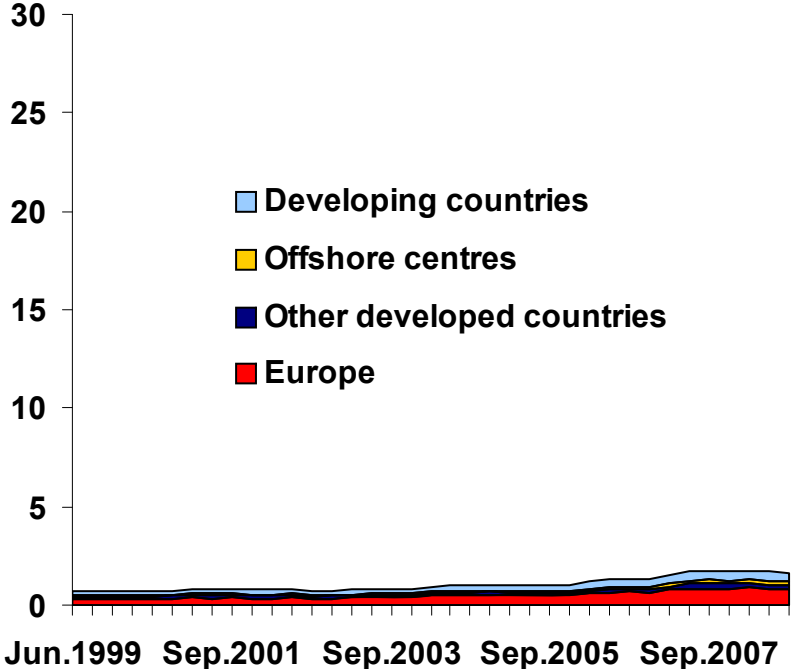


**European Banks**  
Total Foreign Claims, \$ Tn



Source: BIS.

**US Banks**  
Total Foreign Claims, \$ Tn



Source: BIS.

Europeans needed “safe” assets – whatever their

fixed income strategy and analysis **source**

# Ever higher highs



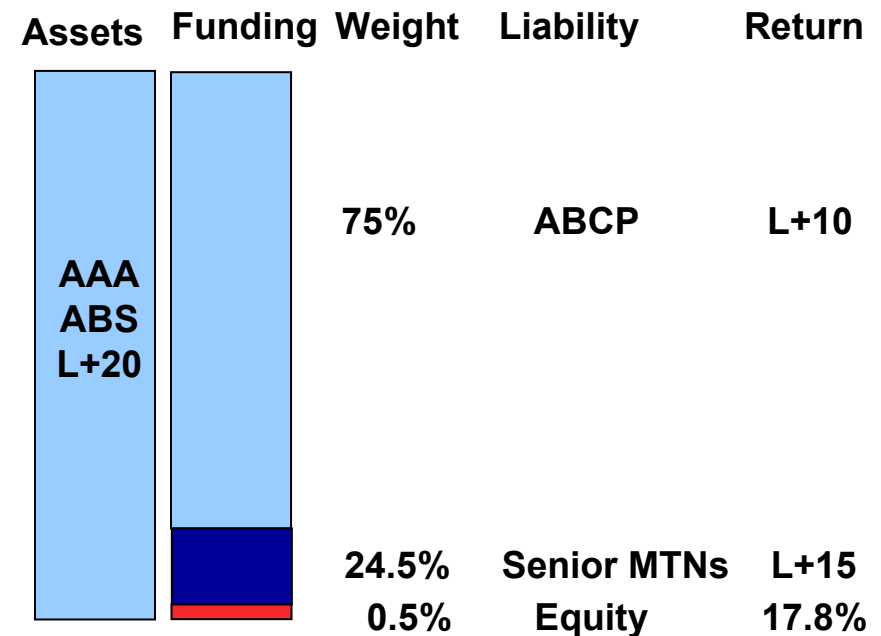
**When Balance Sheet Assets paid ...**  
*Typical 2003 Asset Spreads and On-Balance-Sheet Returns on Capital under Basel 1*

	Senior bank	AAA ABS*	Corp loan	Mortgage
Spread (bp)	40	40	60	75
Risk weight (%)	20	20	100	50
Cap charge (%)	1.6	1.6	8.0	4.0
Return on Cap (%)	25	25	7.5	18.75

Source: Citi.

\* Ordinary ABS charge is 100%, but AAAs are ranked at 20% if carried in the trading book.

**... and how to Lever Up when They Didn't**  
*Typical Conduit Structure with 2007 Spreads*



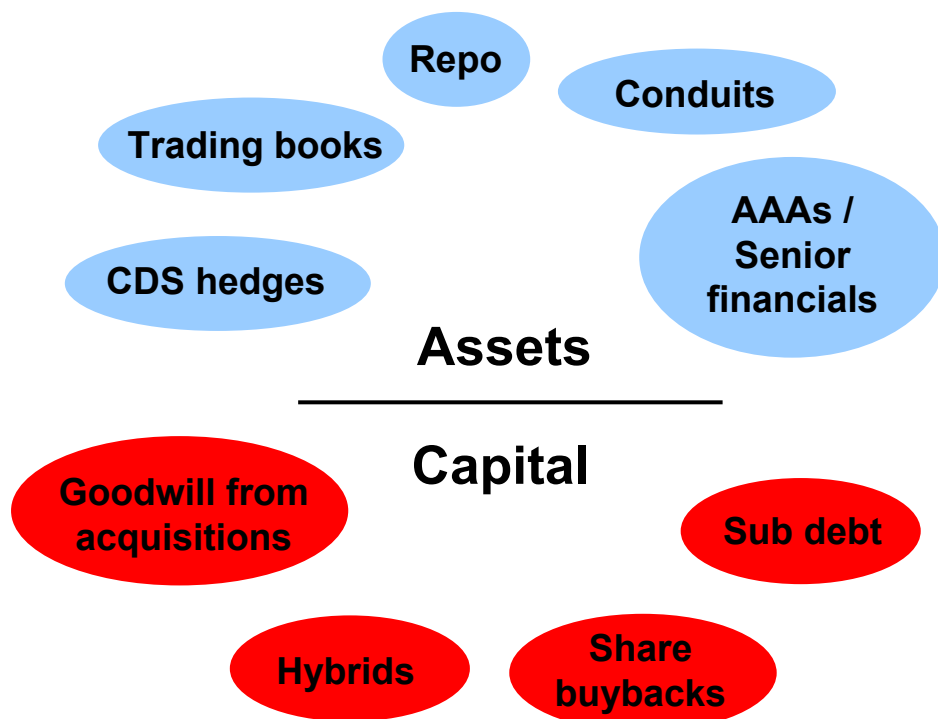
Source: Citi.

## Dwindling spreads required ever greater leverage

# Leverage through sub debt

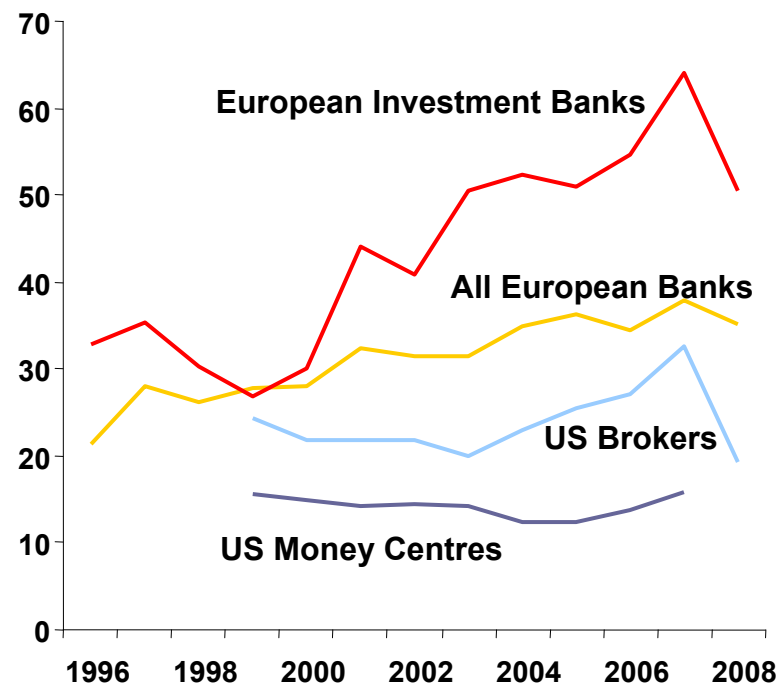


## Maximizing Your Bang for Your Buck *Ways of Improving Returns on Equity*



Source: Citi.

## Bank Leverage by Region & Type *Assets / Equity, Times*



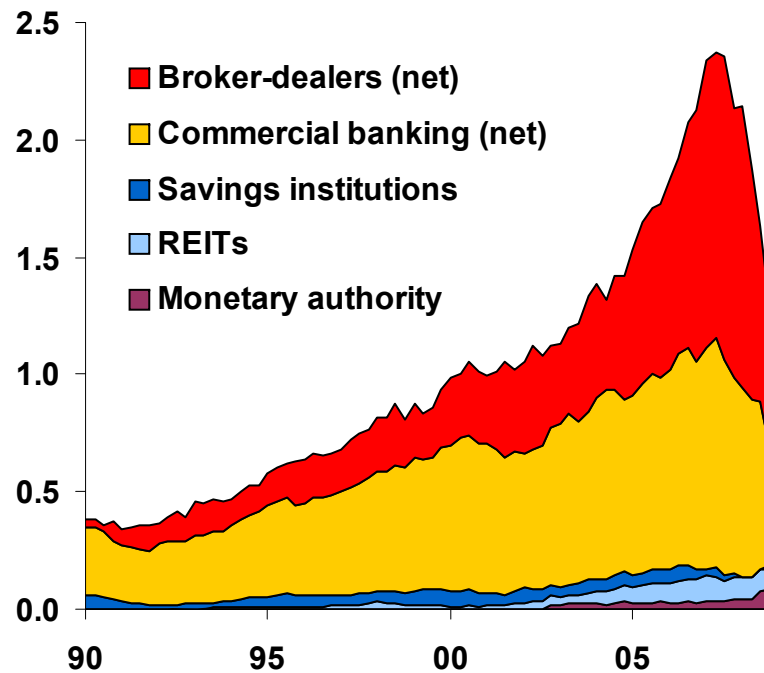
Source: Company data.

## Leverage both through assets and through capital

# The rise and rise of repo

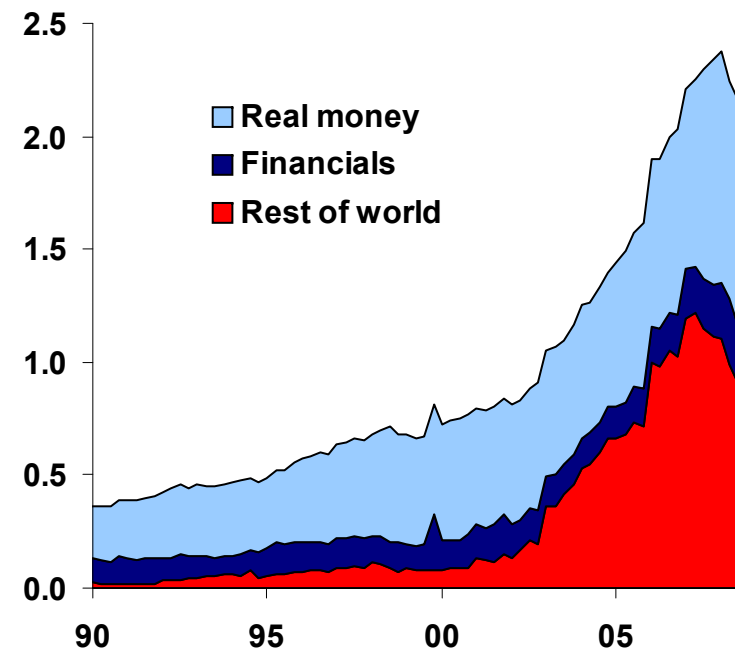


### Cash Borrowers in Repo \$ Tn, US



Source: Federal Reserve.

### Cash Lenders in Repo \$ Tn, US



Source: Federal Reserve.

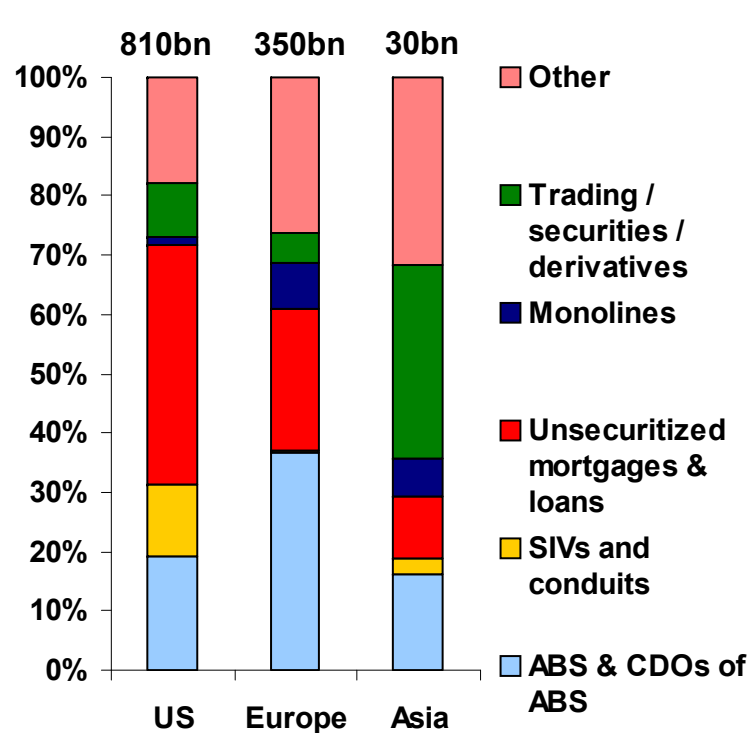
## Liquidity risk came cheap

# Analyzing the hangover



## Writedowns by Region

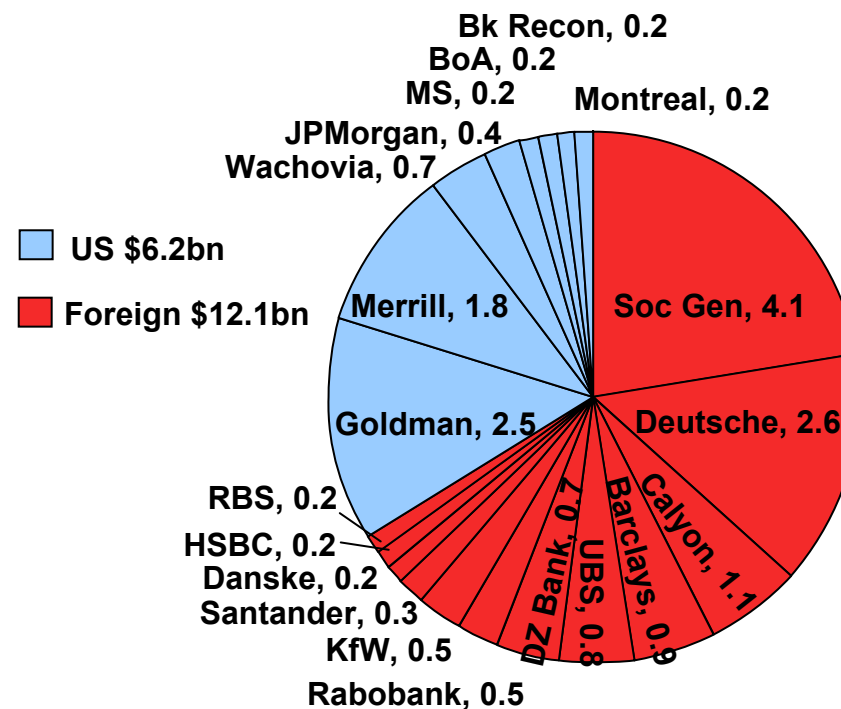
Proportion



Source: Bloomberg, Citi.

## Buy Assets, and Buy Protection

AIG Payments to Named CDS Counterparties, \$Bn\*



Source: AIG.

\*Deliberately excludes the Maiden Lane payments in return for unwinds and the sec-lending portfolio payments, both of which seem less likely to require further ongoing support.

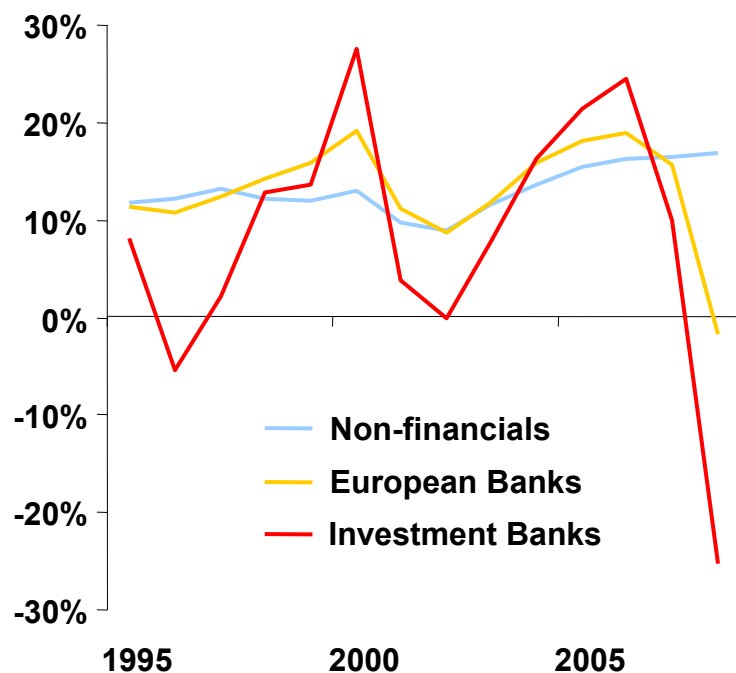
## Different patients had different addictions

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# Whose fault is it?

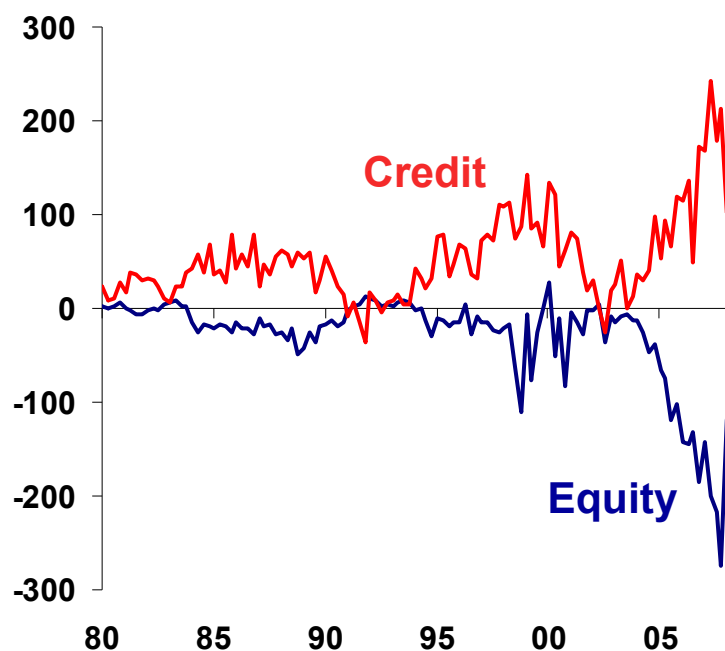


**Was 20% Ever Really Sustainable?**  
*Bank vs Non-Bank Returns on Reported Equity*



Source: Company data, Datastream.

**Slaves to the Leverage Cycle**  
*Net Issuance of Debt & Equity, US Non-Financials, \$ Bn, Quarterly*



Source: Federal Reserve.

**Turn on and tune in – or else drop out**

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# Overview

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Ever greater cravings

**Coping with withdrawal**

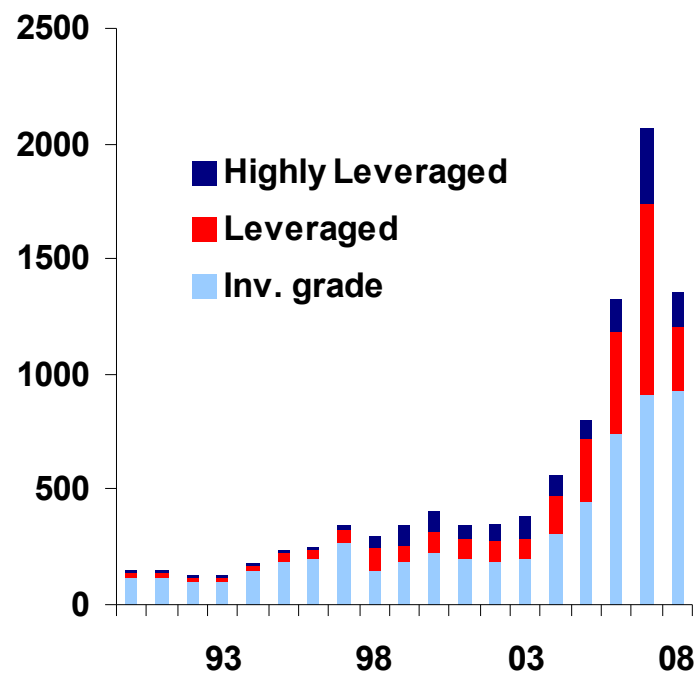
Long-term rehab

# Bank lending



## Collapse? What Collapse?

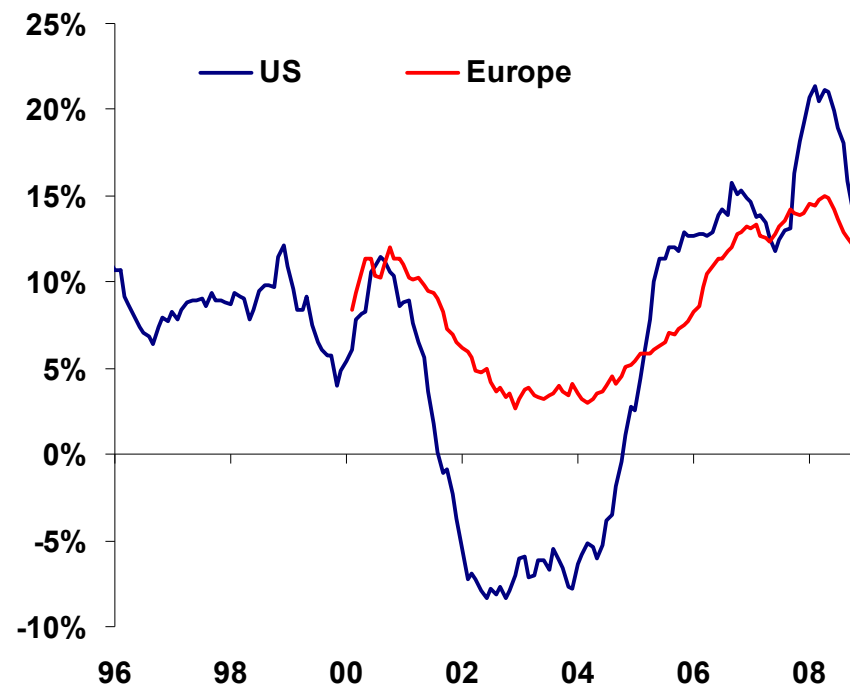
*New Issuance of Drawn Loans, Global, \$ Bn*



Source: Citi, Dealogic

## Growth in Non-Financial Loans

*Percent*



Source: Citi, EcoWin, Federal Reserve, ECB.

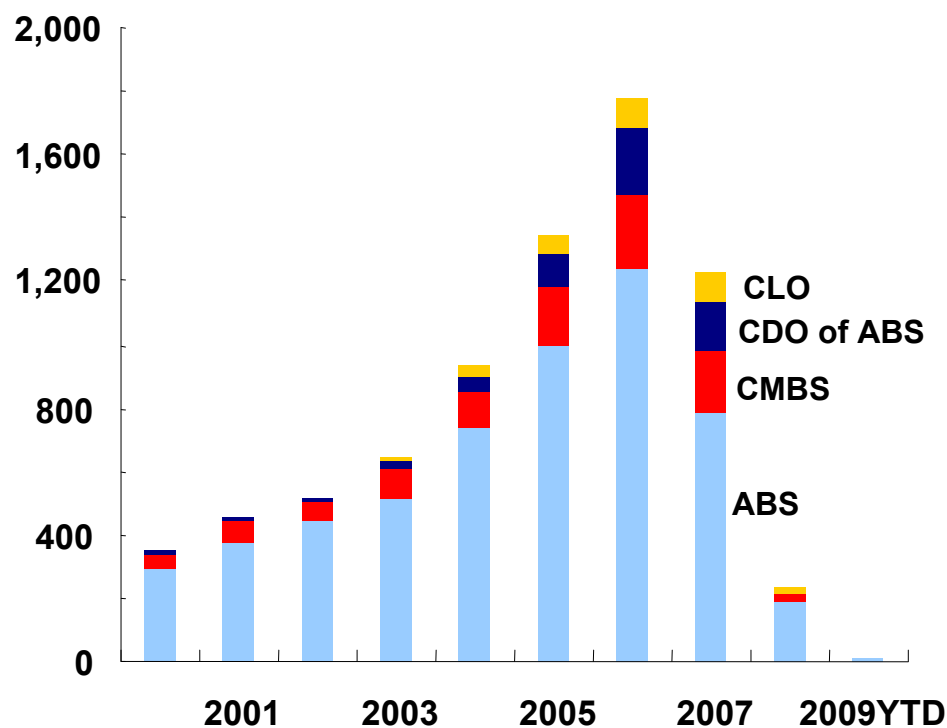
# Bank lending has contracted remarkably little

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# So where's the crunch?

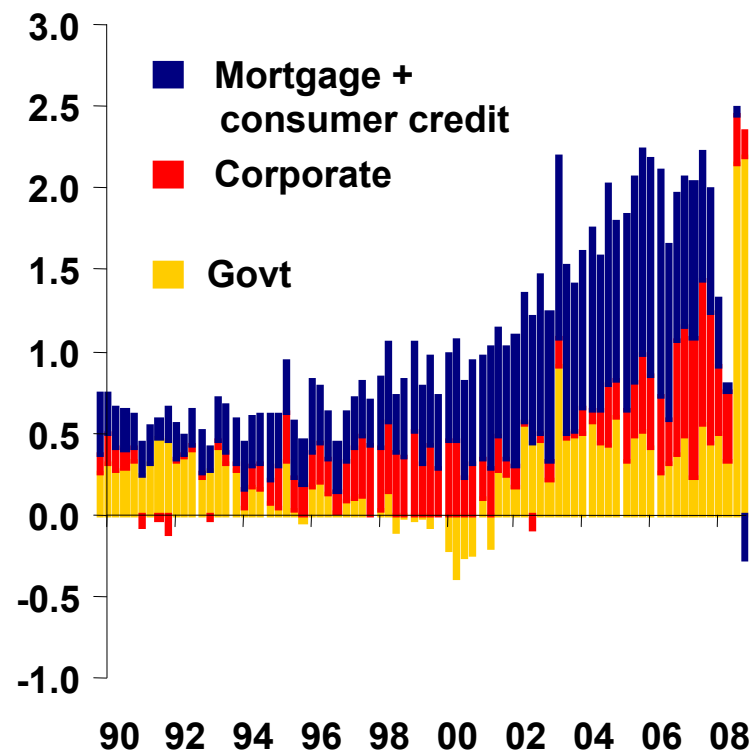


**Non-Agency Securitisation Issuance**  
\$ Bn



Source: SIFMA, Bloomberg, Dealogic, Citi.

**US Borrowing by Sector**  
\$ Tn, Quarterly Rates Annualised, SA



Source: Federal Reserve Flow of Funds, Table D2, Citi.

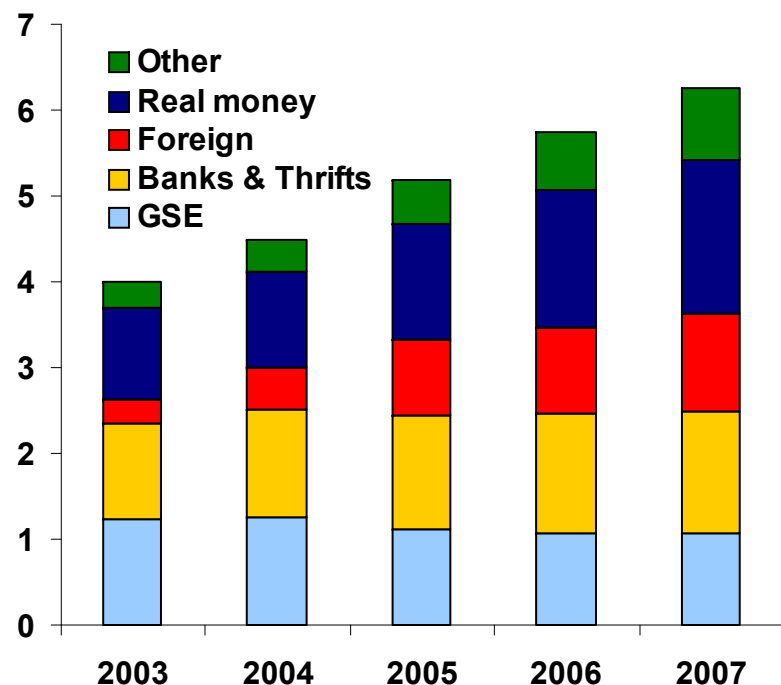
## Shadow bank lending has collapsed

# Where did it all go?



## US MBS Outstanding by Holder

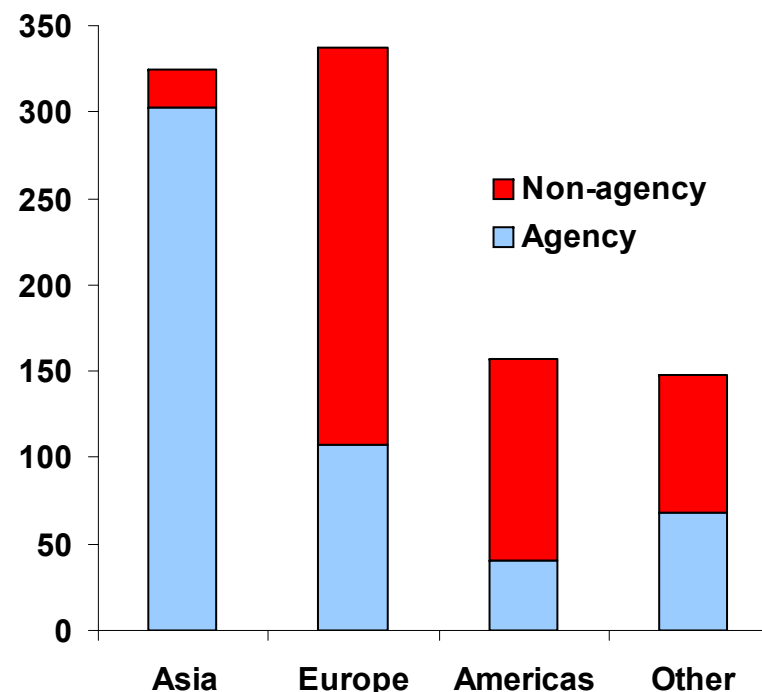
\$ Tn



Source: Federal Reserve, Citi. For more background, see [MBS and Real Estate ABS – Supply and Demand Projections for 2008](#), R. Parulekar & U. Bishnoi, 17 Jan 2008.

## US MBS Holdings by Foreign Investors

\$ Bn, as of Jun 07 (est from Jun 06)



Source: TIC, Citi. For more background, see [MBS and Real Estate ABS – Supply and Demand Projections for 2008](#), R. Parulekar & U. Bishnoi, 17 Jan 2008.

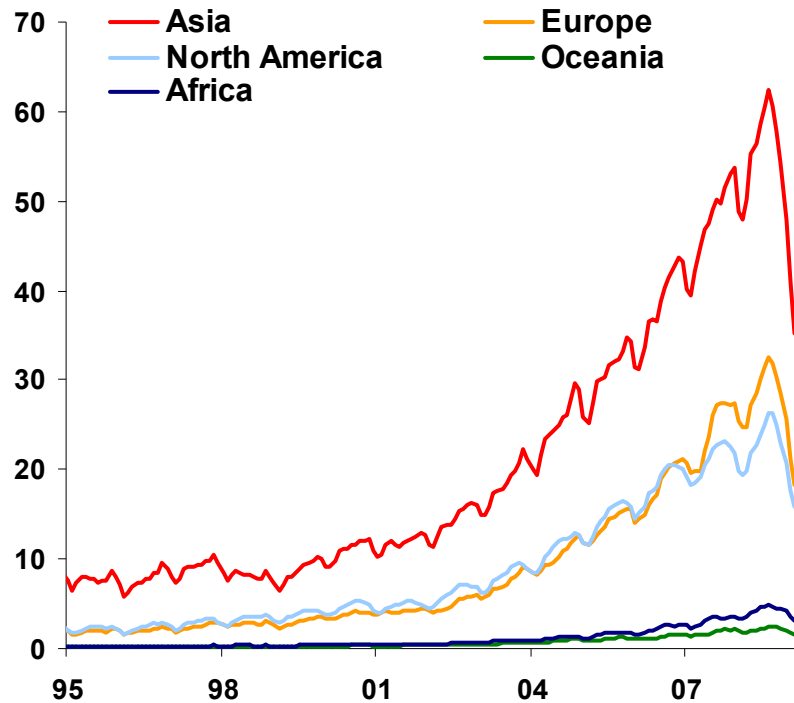
**Asian CBs bought agencies,  
foreign and domestic banks much of the rest**

# The collapse in global trade



## The Great Fall...

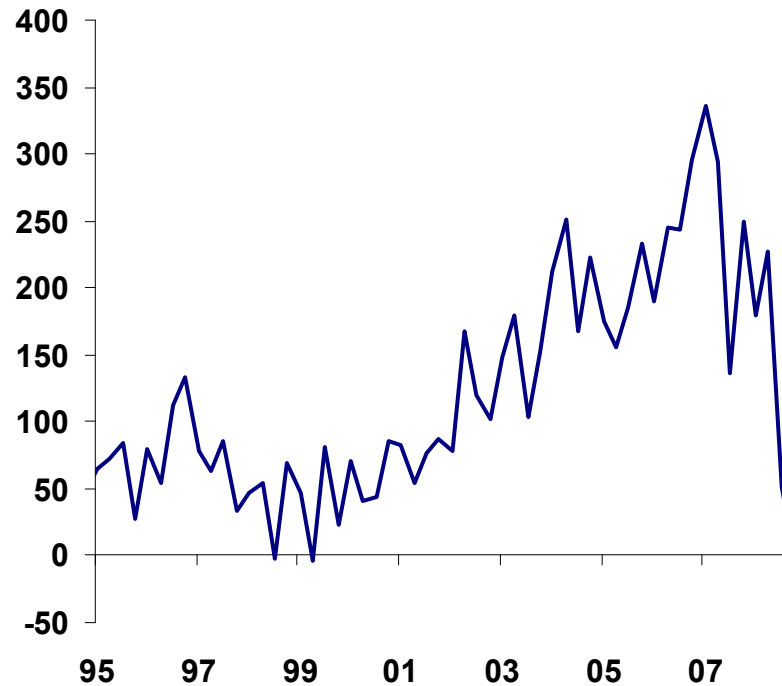
Chinese Exports by Destination, Monthly, \$ Bn



Source: Ecowin.

## ... and Humpty Dumpty

Foreign Purchases of US bonds, \$ Bn, Quarterly



Source: Federal Reserve.

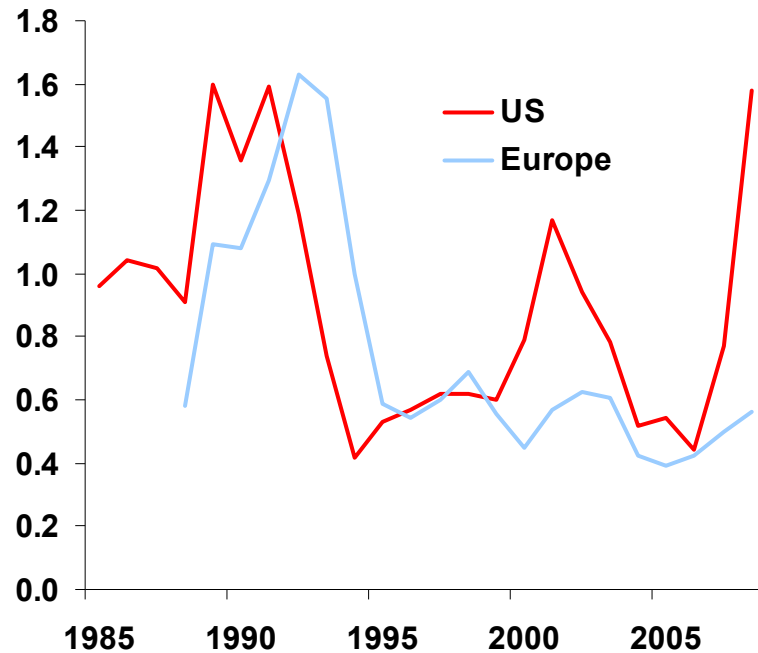
## Exporters and importers alike are suffering

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# The transfer to the real economy

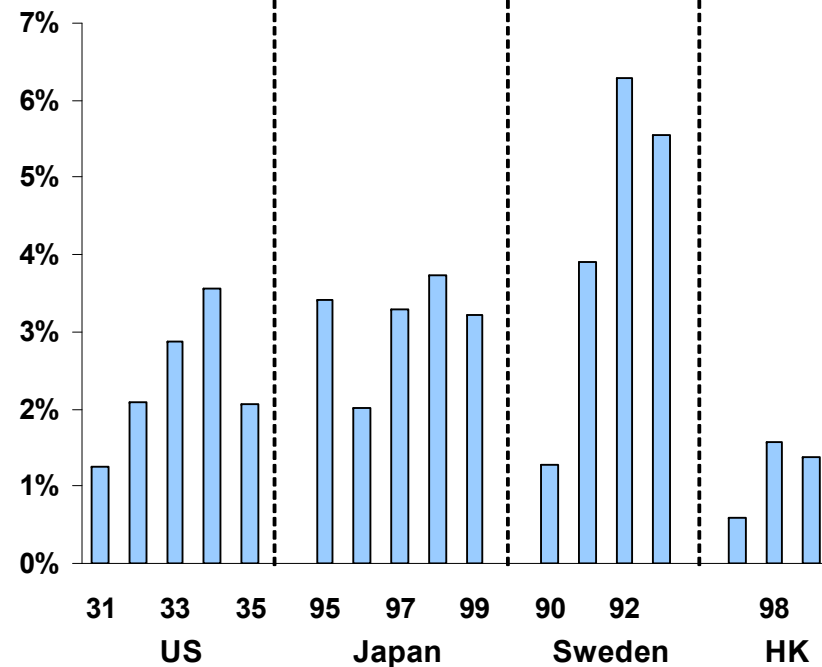


**Charge-Off Rates**  
*Percent of Loans*



Source: Federal Reserve, Company data, Citi Investment Research.

**Bad Debt Charges**  
*Percent of Loan Book*



Source: Federal Reserve, Riksbank, Company Data, HKMA, CIR

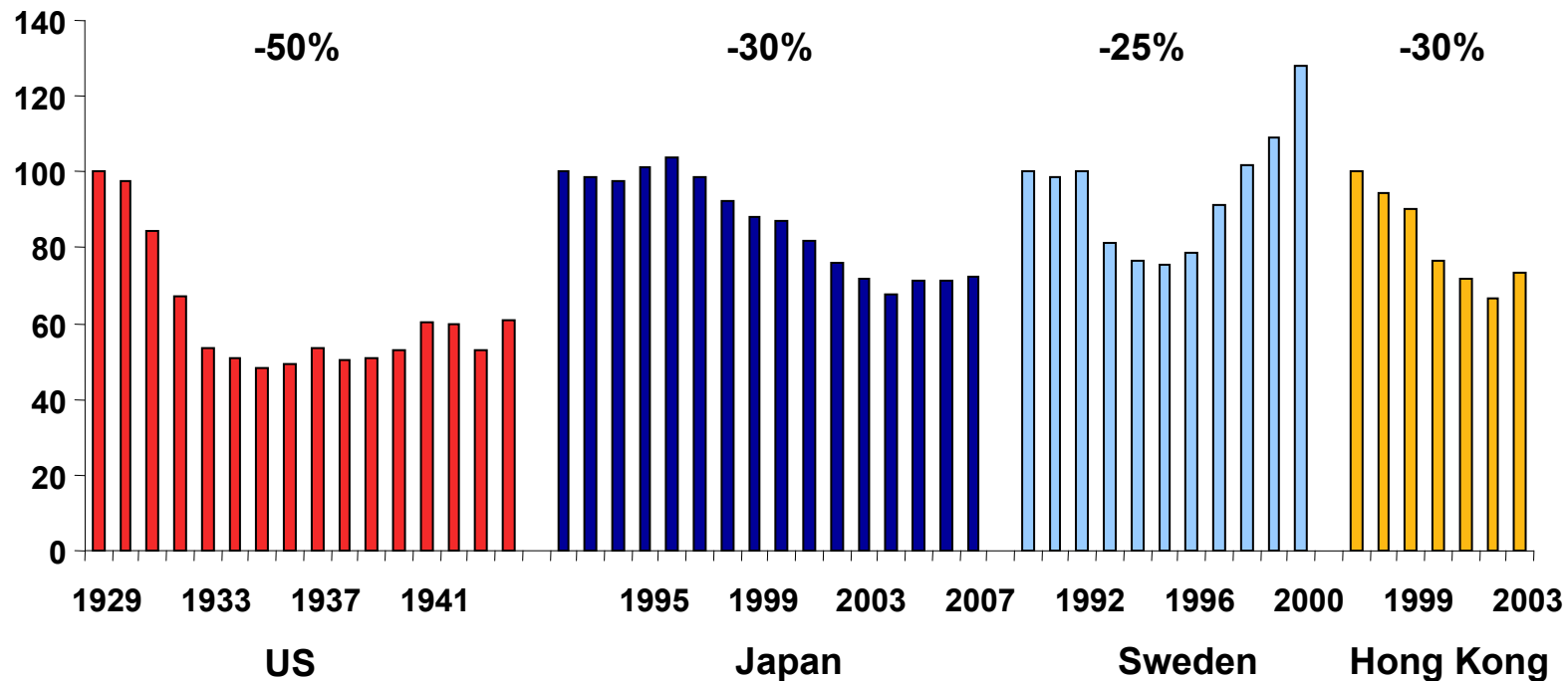
## Loan losses set to become much, much worse

fixed income strategy and analysis

# Learning from other addicts



## Total Bank Loans Outstanding *Indexed to 100*



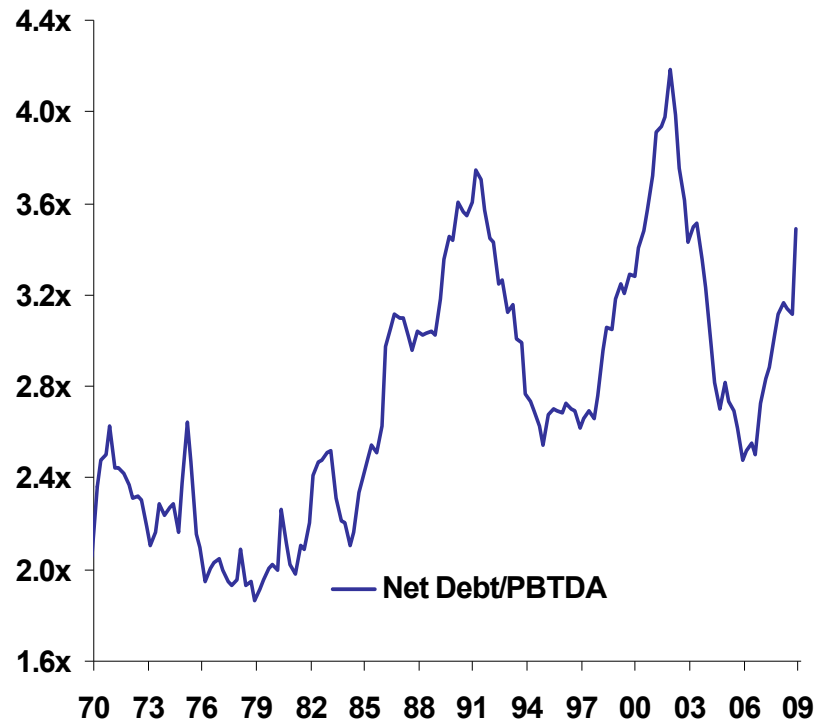
Source: Federal Reserve Archives, Company data, Riksbank, HKMA, Citi Investment Research.

## Total bank loans usually fall by 25-30%

# Friends and family affected too

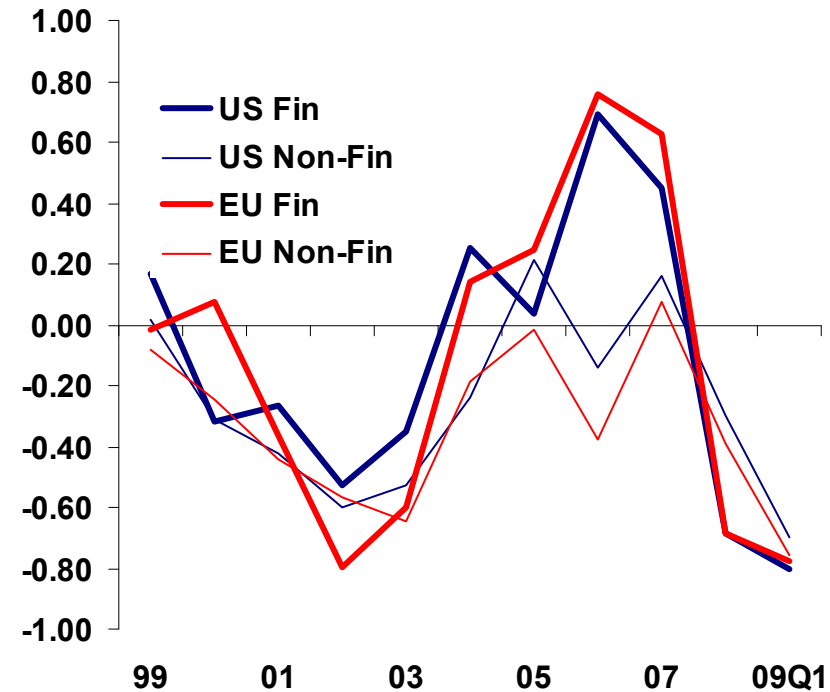


## Halfway Back to the Previous Peak US Non-Financial Corporate Leverage



Source: Federal Reserve.

## Credit Rating Downgrades across the Board (Upgrades-downgrades)/Total Changes



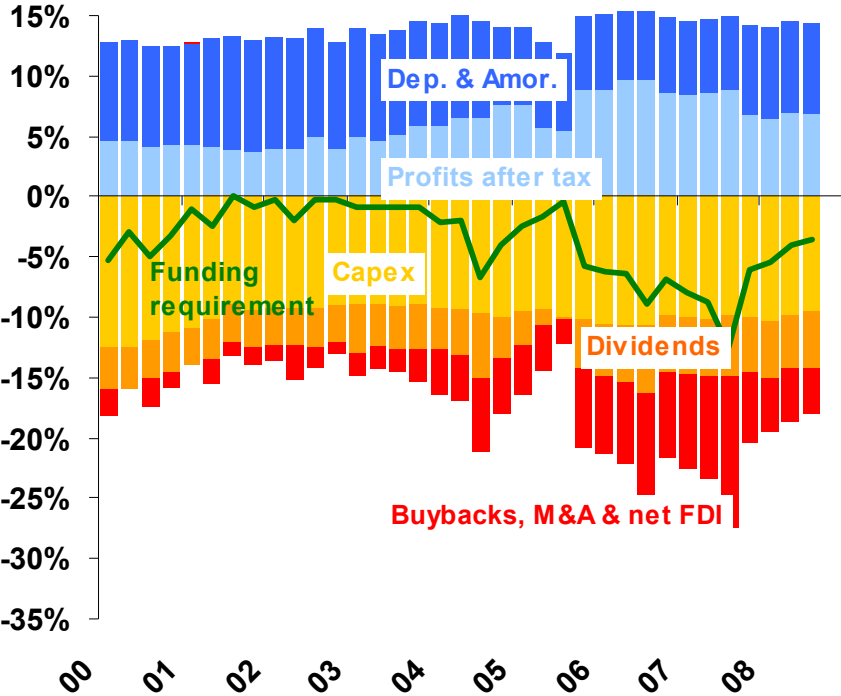
Source: S&P, Bloomberg.

## Lower earnings means much higher leverage

# The effect of corporate cutbacks

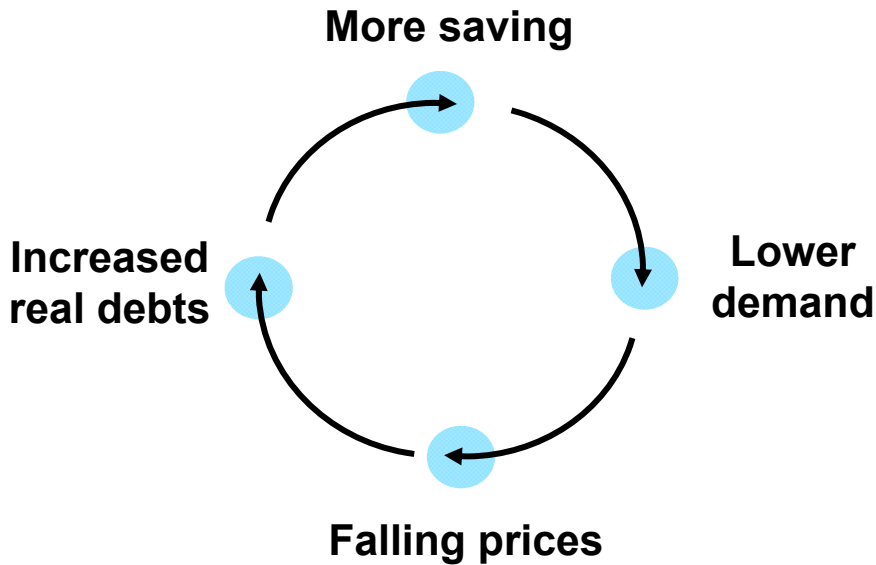


US Non-Financial Funding Requirements  
(Percent of Corporate GDP)



Source: Federal Reserve, Flow of Funds, EcoWin, Citi

Recipe for Depression



Source: Citi.

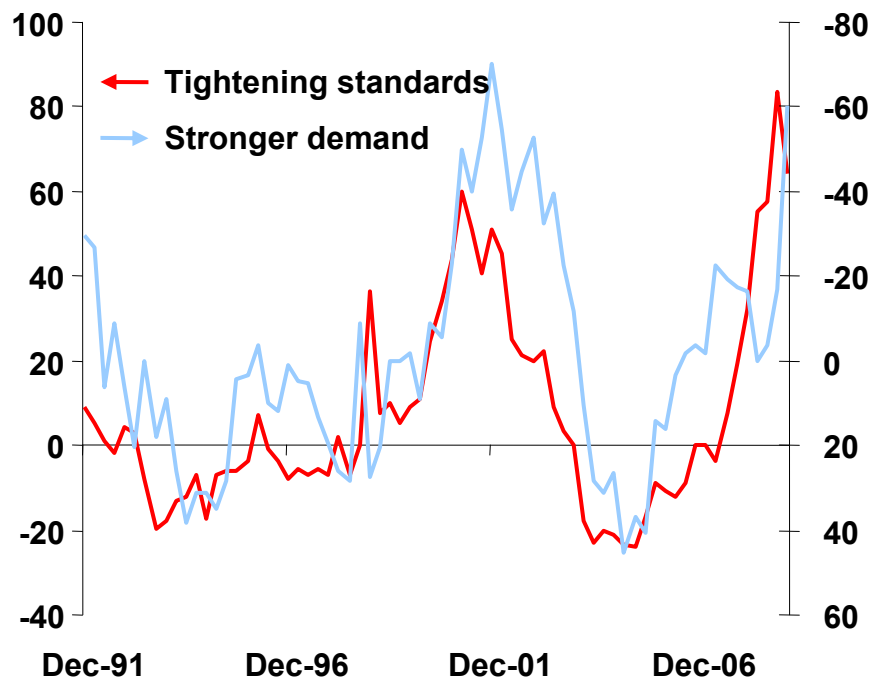
## Sudden drug withdrawal may lead to depression

# Supply and demand



## Patient Recognises his Affliction ...

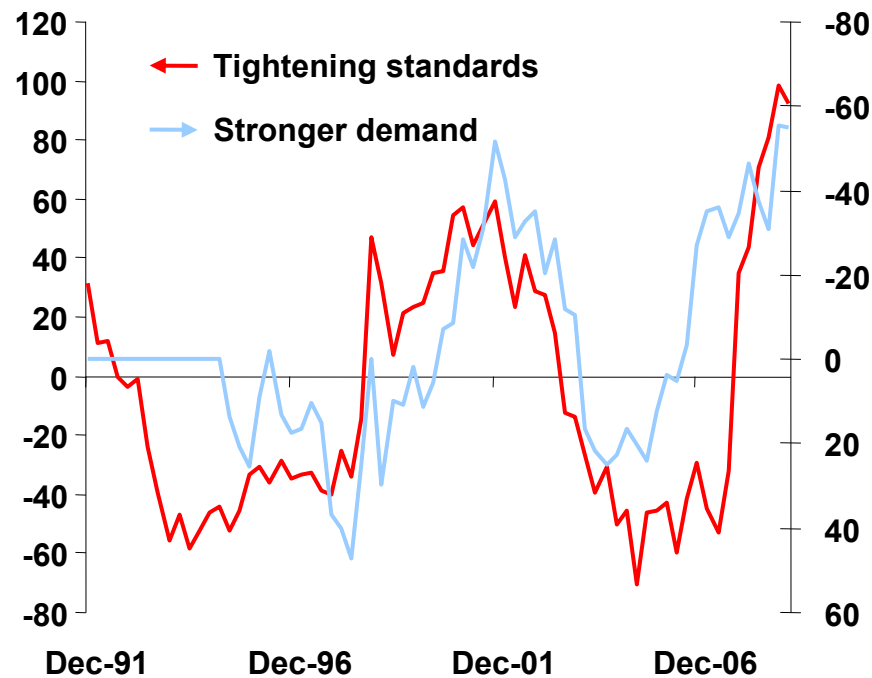
*US FRB Senior Loan Officer Survey,  
Corporates & Industrials*



Source: Federal Reserve.

## ... even Before the Supplier Cuts Back

*US FRB Senior Loan Officer Survey,  
Commercial Real Estate*



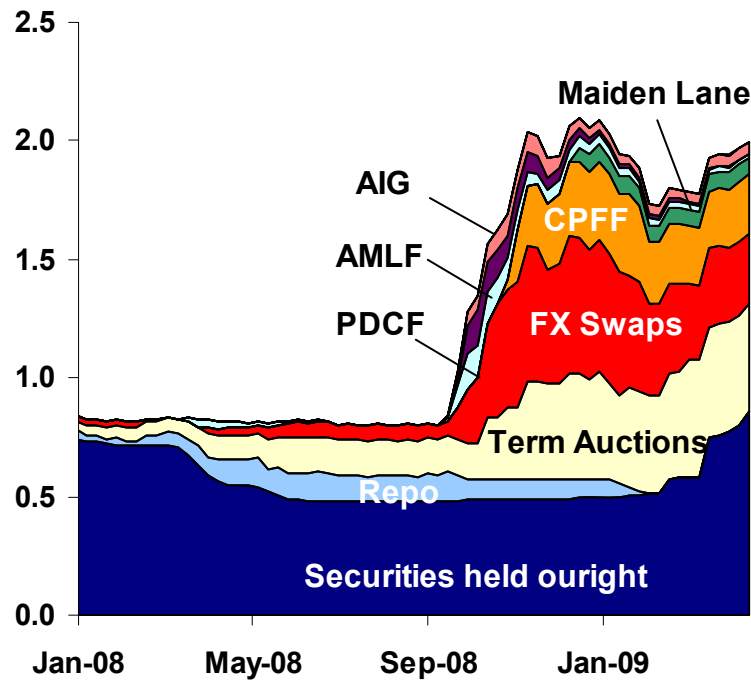
Source: Federal Reserve.

***Demand* has fallen at least as fast as supply**

# Put the patient on a drip

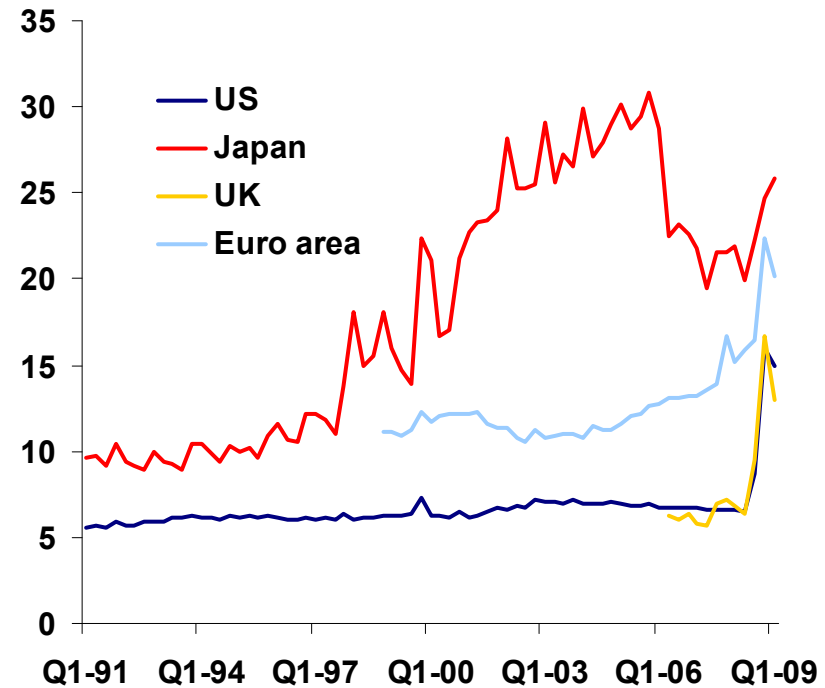


## Maintaining Hydration Federal Reserve Assets, \$ Tn



Source: Federal Reserve.

## Man the Pumps Central Bank Balance Sheet Sizes, Percent GDP



Source: Haver Analytics.

## First, keep the patient alive

# Overview

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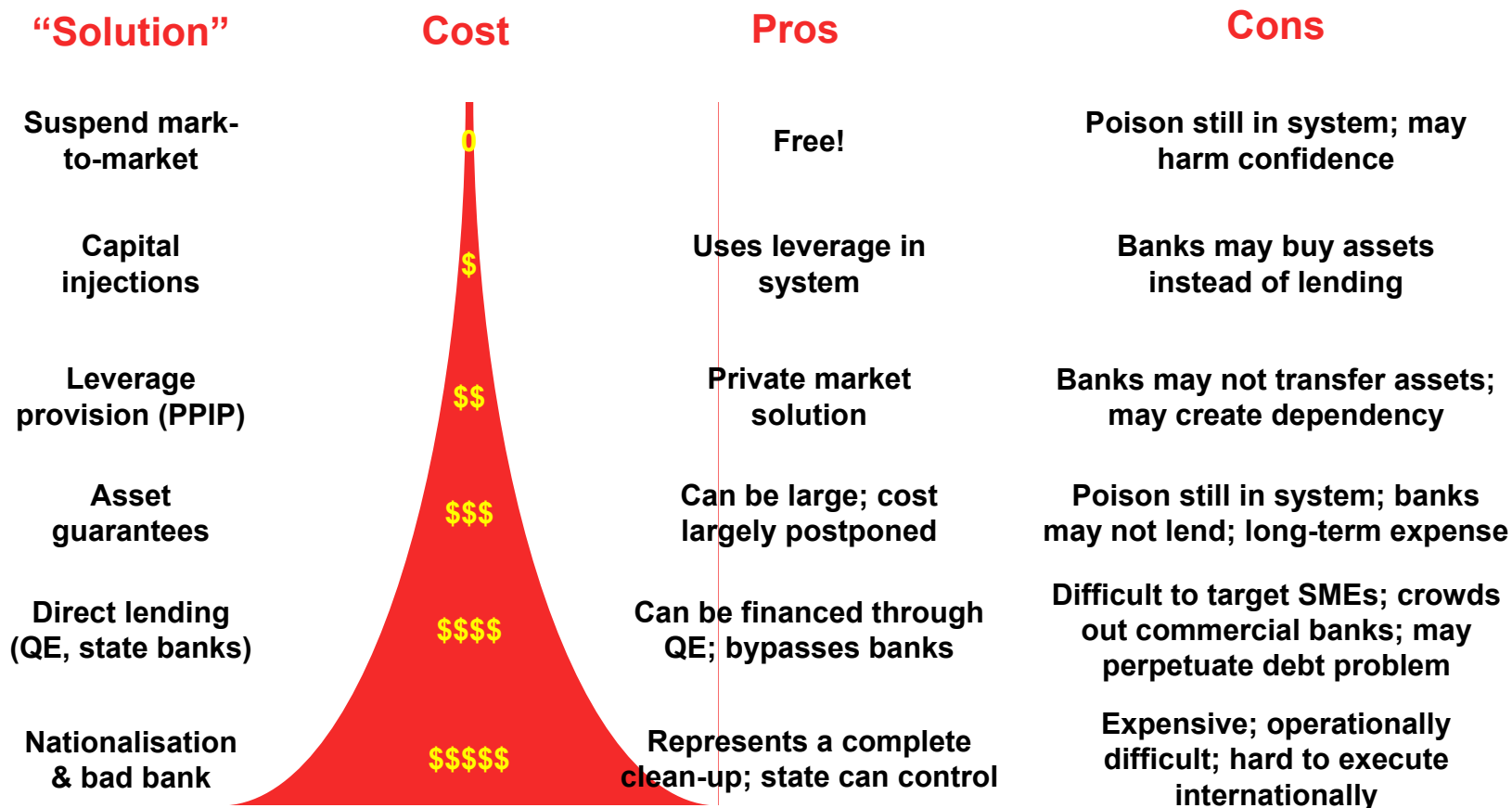


Ever greater cravings

Coping with withdrawal

**Long-term rehab**

# Methods of treatment



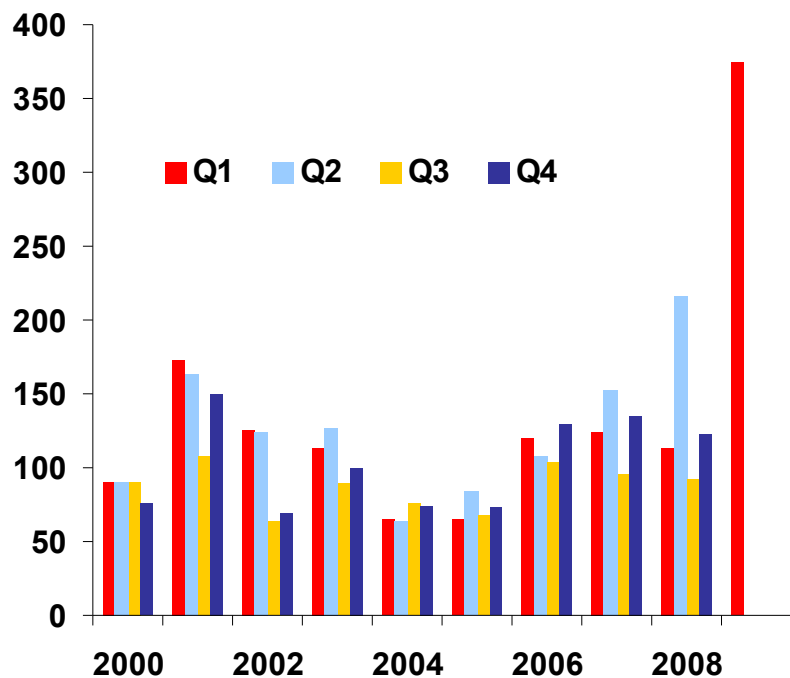
Source: Citi

## Opinions are divided on the appropriate treatment

# Plan A: emergency bypass

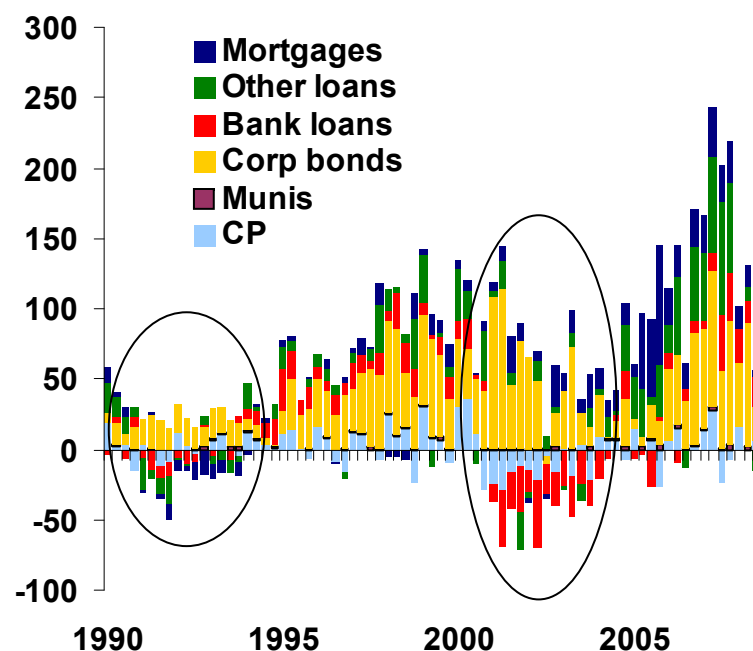


**Corporate Bond Supply**  
Global Non-Financial, \$ Bn



Source: Dealogic.

**Pay Down Bank Debt, Issue Bonds**  
US Non-Financial Borrowing, Quarterly, \$ Bn



Source: Federal Reserve.

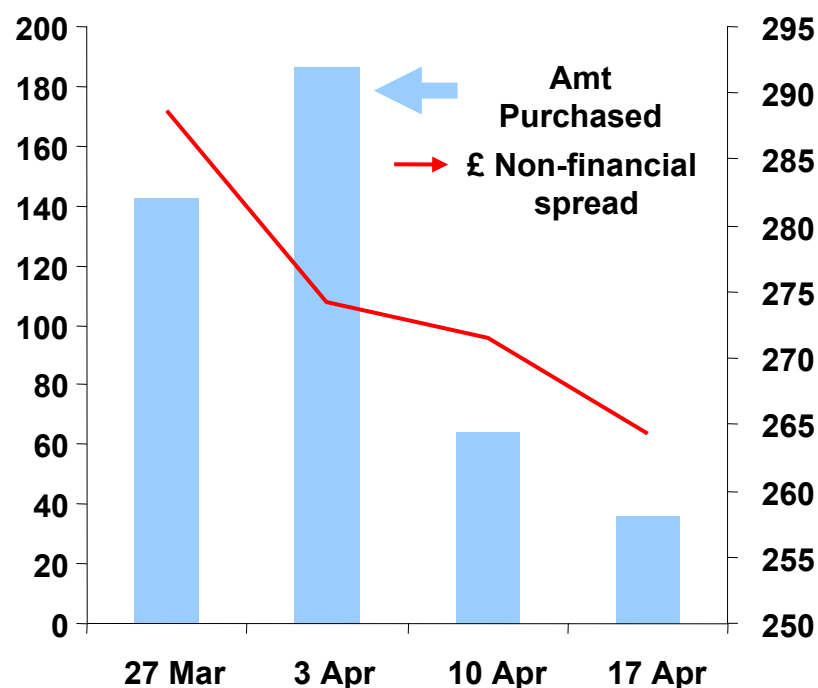
## Corporate bond issuance to go through the roof

# Plan B: Doctor to the World



## Don't Fight the Central Bank

*Outright APF Corp Bond Purchases (£ M) by Week vs £ Spreads (BP)*



Source: Bank of England, iBoxx.

- BoE and BoJ already buying corporate bonds
- Other central banks seem likely to follow suit
- "Potential measures could include ... purchases of private debt securities in the secondary market"  
– L. Papademos, ECB

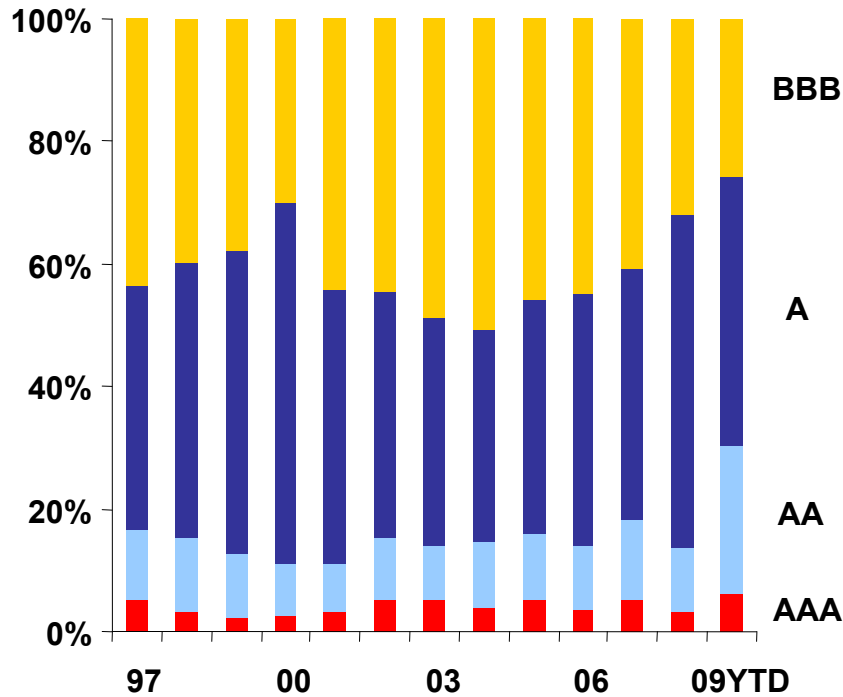
## Use QE to ensure direct supplies of credit

# Unwanted side effects (1)



## Mind the Edge!

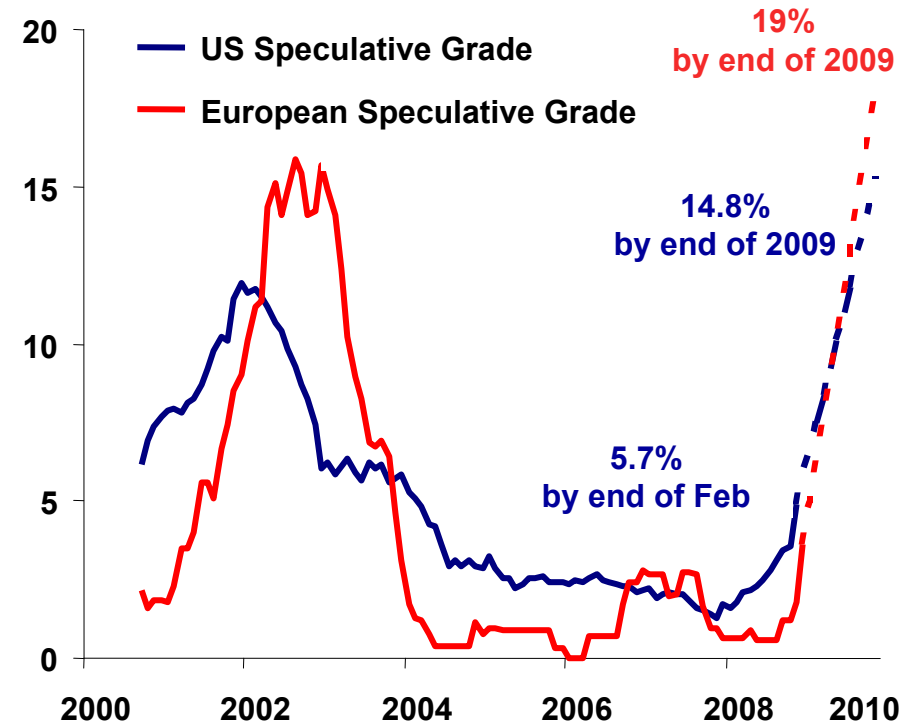
Non-Financial Issuance by Rating, Global



Source: Dealogic.

## HY Bond Default Rate to Exceed 2002

Moody's Speculative Grade Default Rate & Forecasts



Source: Moody's.

**Many patients will not survive**

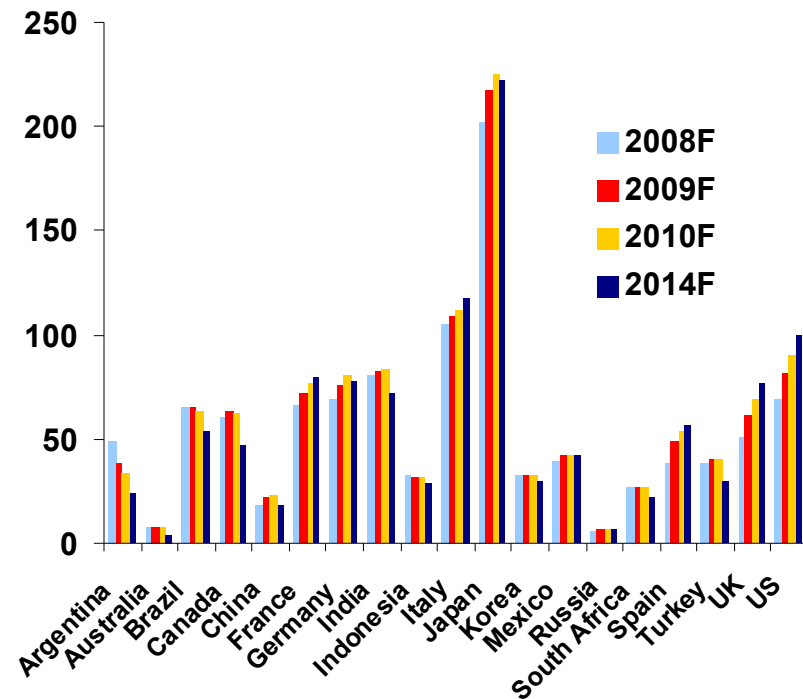
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# Unwanted side effects (2)



## Japan, Here We Come

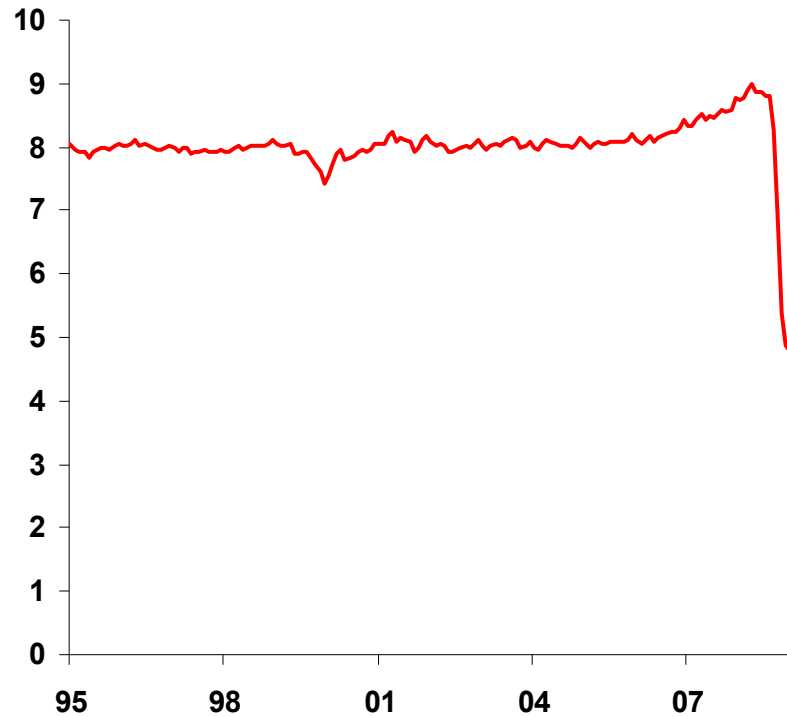
Government Debt/GDP Forecasts, percent



Source: IMF. "The State of Public Finances: Outlook and Medium-Term Policies After the 2008 Crisis." March 6, 2009.

## My Multiplier Doesn't Work

M2/M0, US



Source: Ecwin.

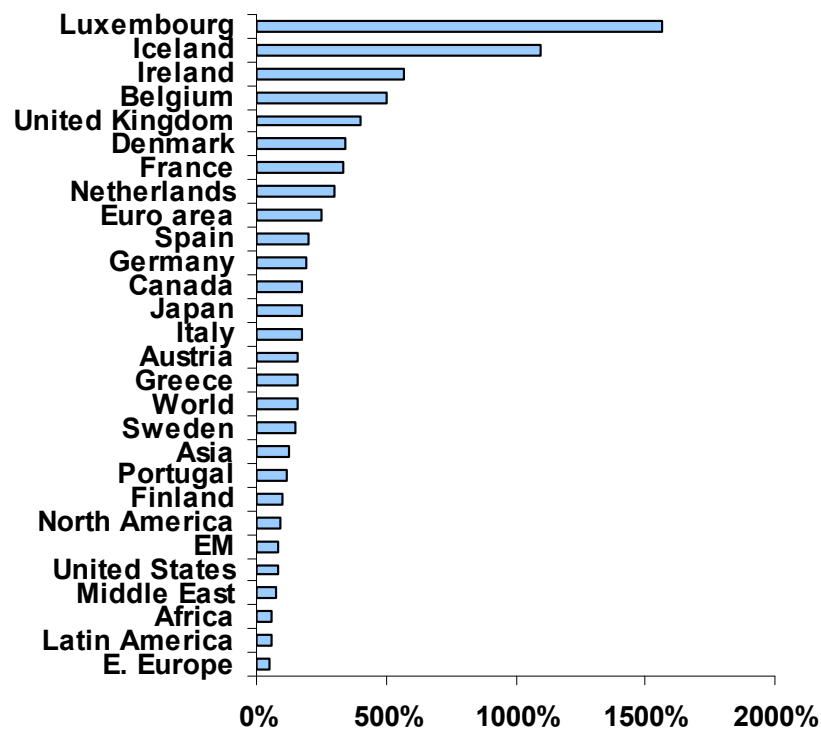
**The stimulus must eventually be removed**

# Doctors at risk of infection



## Bulge Bracket

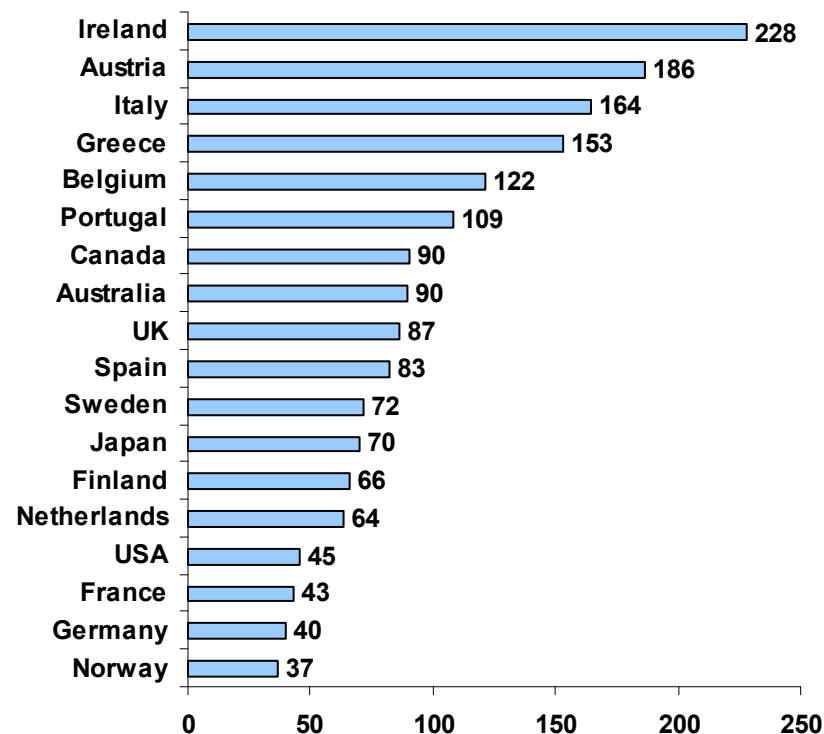
Bank Assets / GDP, 2007



Source: IMF.

## Sovereign CDS

5-Year, Basis Points



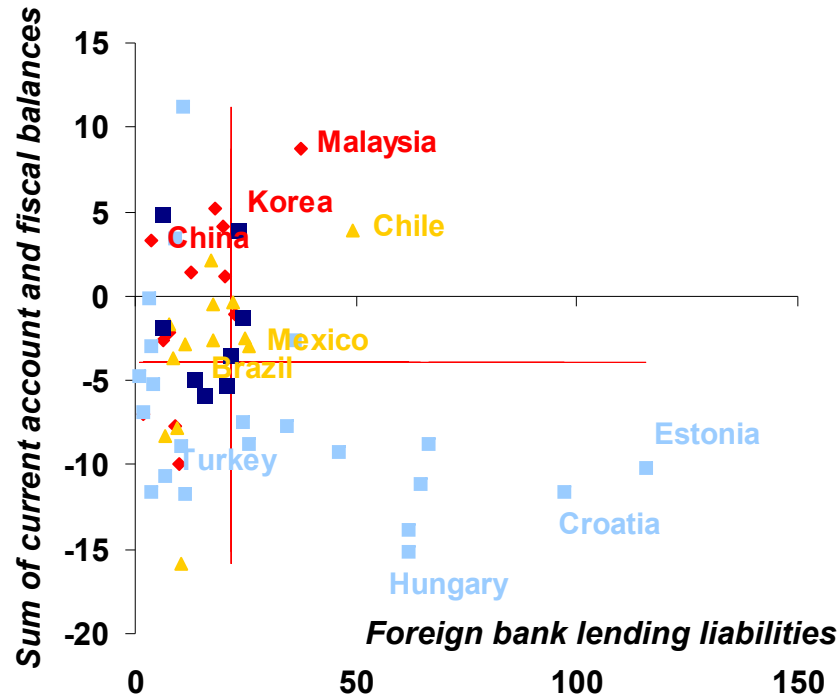
Source: Markit.

## The doctor may become the patient

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## EM Vulnerabilities

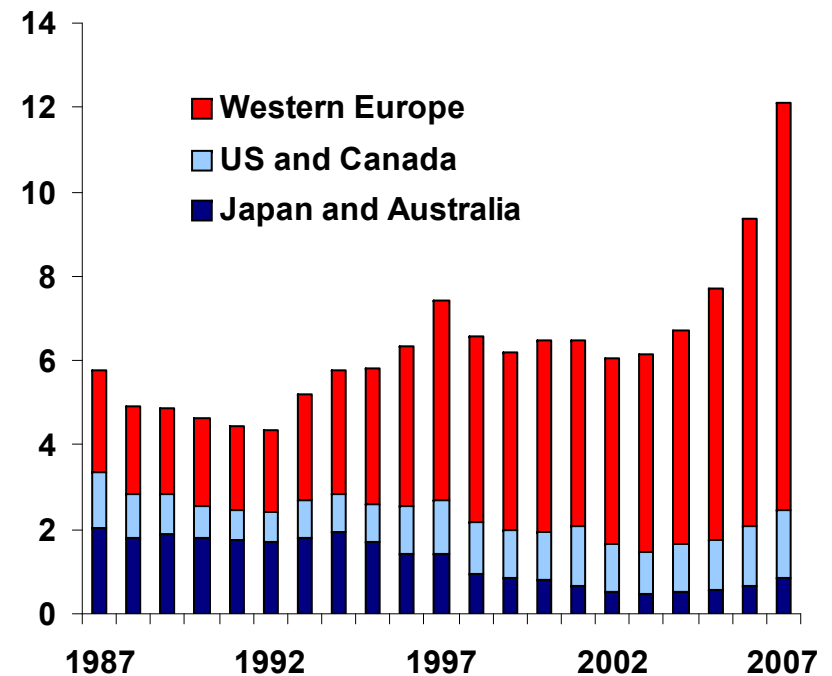
Percent GDP



Source: IMF.

## Love Thy Neighbour as Thyself

Bank Assets in EM, % Lenders' GDP



Source: IMF.

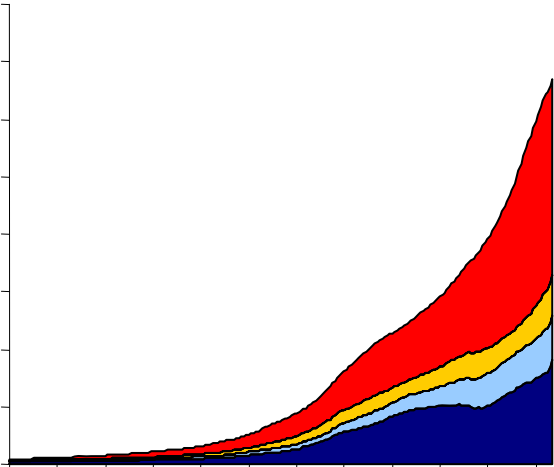
# Can politicians be trusted to operate internationally?

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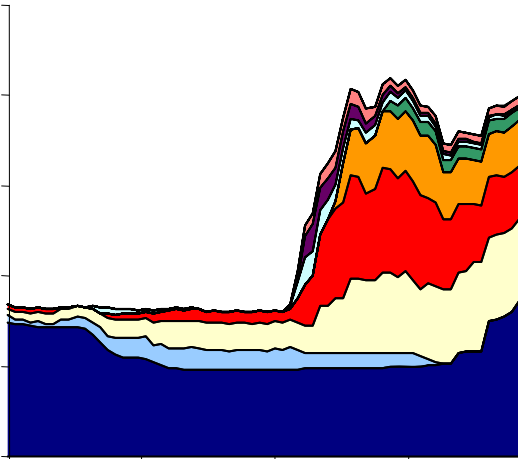
# Conclusion



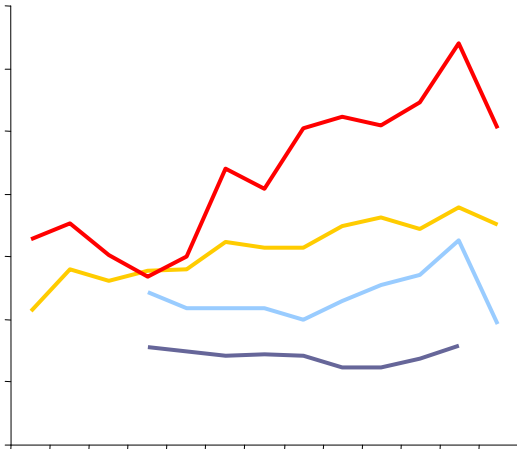
In need of a massive fix



We can ease the adjustment ...



... but the world will be a more sober place



**Position for a revival - but don't expect a cure**



# Disclosure Appendix A1

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