

# What is Systemic Risk?

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# What went wrong with banking regulation?

- The focus of regulators was on microprudential regulation that involves ensuring no individual bank takes large risks
- This failed to prevent a financial crisis because it ignored systemic risk
- What are the sources of systemic risk?

# Sources of systemic risk

1. Panics – banking crises due to multiple equilibria
2. Banking crises due to asset price falls
3. Contagion
4. Foreign exchange mismatches in the banking system

# 1. Banking panics

- Two equilibria:
  - If everybody thinks the banking system is sound then only the people who need money will withdraw
  - If everybody thinks others will withdraw then it is optimal to withdraw and the panic equilibrium is self-fulfilling
- This was economists' traditional view of financial crises, e.g. Friedman and Schwarz (1963)

- Formal model: Diamond and Dybvig (1983)
  - Solution: Deposit insurance eliminates the bad equilibrium and is costless
- Deposit insurance for retail deposits no longer effective in preventing panics
  - Growing importance of wholesale funding
- Guarantee all short term debt? – If there are other types of systemic risk may be very costly, e.g. Ireland

## 2. Banking crises due to asset price falls

- If the prices held by banks and other financial institutions fall then there can also be a banking crisis
- Possible reasons for asset price falls
  - a. Business cycle
  - b. Bursting of real estate bubbles
  - c. Mispricing due to limits to arbitrage
  - d. Mispricing due to “flash crashes”
  - e. Sovereign default

## 2a. Business cycle

- Between 1836 and 1914 the US had no central bank and during this time it had many crises
- Gorton (1988) found that panics in the U.S. in the late 19<sup>th</sup> Century were systematic events: whenever the leading economic indicator represented by the liabilities of failed businesses reached a certain threshold, a panic ensued
- See also Calomiris and Gorton (1991) and Calomiris and Mason (2003)

Table 1  
National Banking Era (1865-1914) Panics

NBER Cycle Peak.Trough	Panic Date	%Δ(Currency/ Deposit)	%Δ Pig Iron
Oct. 1873.Mar. 1879	Sep. 1873	14.53	-51.0
Mar. 1882.May 1885	Jun. 1884	8.80	-14.0
Mar. 1887.Apr. 1888	No Panic	3.00	-9.0
Jul. 1890.May 1891	Nov. 1890	9.00	-34.0
Jan. 1893.Jun. 1894	May 1893	16.00	-29.0
Dec. 1895.Jun. 1897	Oct. 1896	14.30	-4.0
Jun. 1899.Dec. 1900	No Panic	2.78	-6.7
Sep. 1902.Aug. 1904	No Panic	-4.13	-8.7
May 1907.Jun. 1908	Oct. 1907	11.45	-46.5
Jan. 1910.Jan. 1912	No Panic	-2.64	-21.7
Jan. 1913.Dec. 1914	Aug. 1914	10.39	-47.1

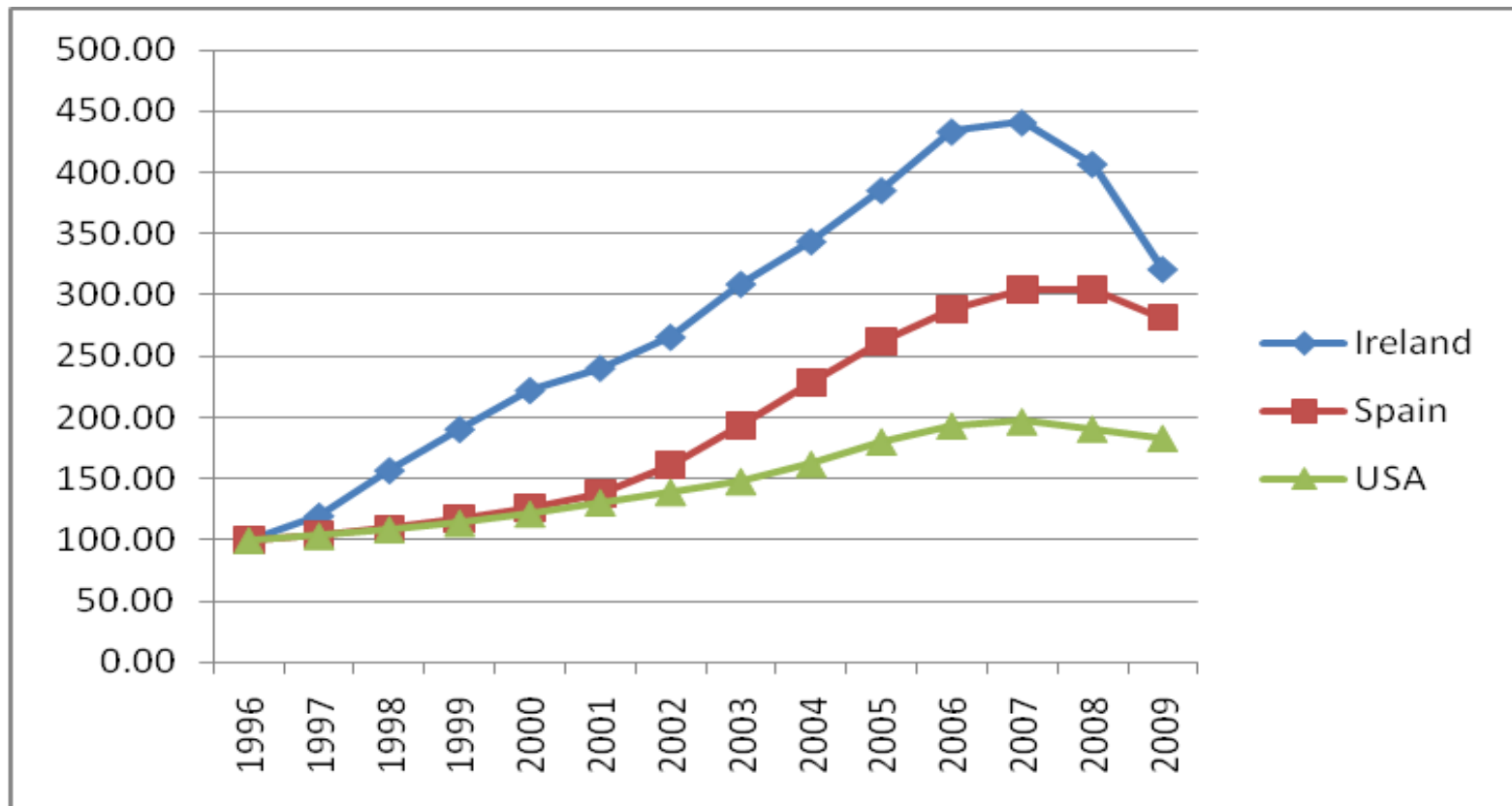
Source: Gorton (1988)



## 2b. Bursting of real estate bubbles

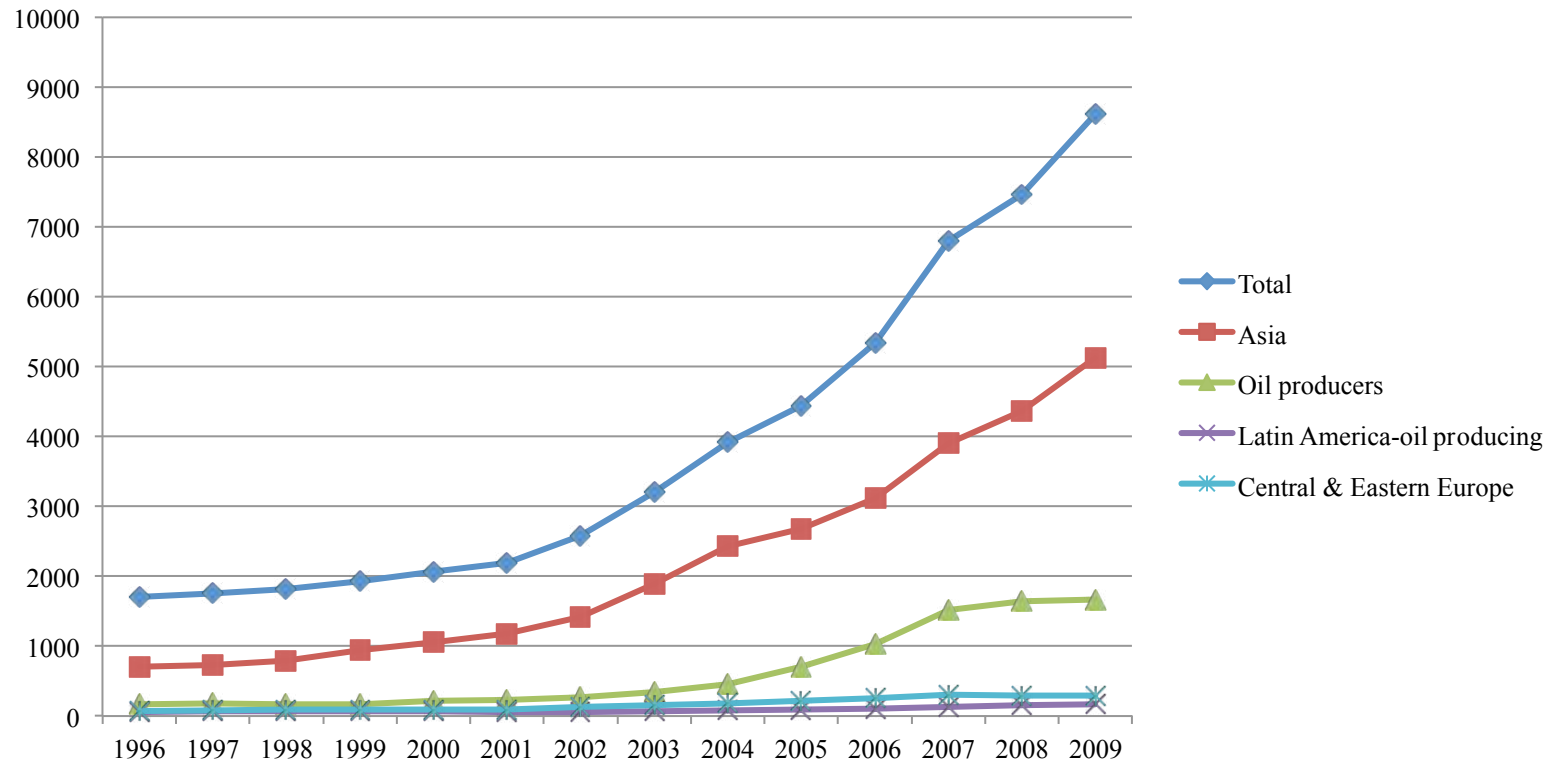
- Evidence from Reinhart and Rogoff (2009) suggests that historically this has been the most common cause of crises
- Current crisis is a good example of the effects of a collapse in real estate prices
- Apparent bubbles in real estate prices in Ireland, Spain, and the U.S.

## Housing Prices in Ireland, Spain and the U.S.

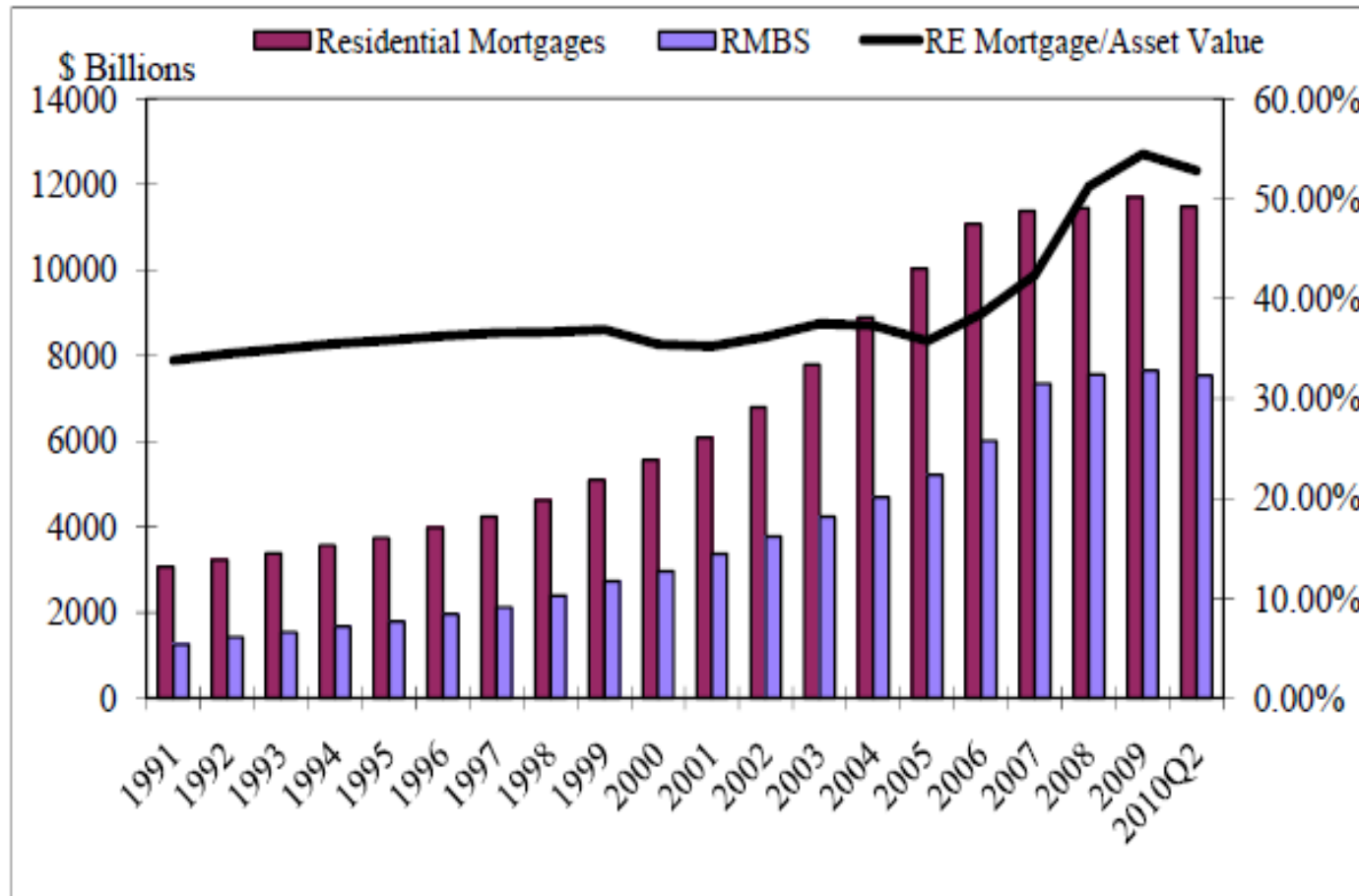


- What caused these bubbles?
- Returns on housing are positively serially correlated so in contrast to stocks the market is inefficient
- It appears that lowering interest rates at a time when property prices are rising rapidly can lead to a bubble
- Easy availability of credit due to large foreign exchange reserves of Asian central banks that resulted from IMF policies enacted during the 1997 Asian Crisis

# Total Reserves in Billions of US \$ 1996-2009



# U.S. Residential Mortgages



- Objective of policy should be to prevent bubbles occurring in the first place
- Use interest rate policy to prevent them?
  - Politically difficult
  - Perhaps possible and desirable in homogenous economic areas/countries (e.g., Sweden, maybe U.K.) but problem of capital inflows if interest rates are raised
  - In large heterogeneous economies like China, the Eurozone and the U.S. raising interest rates will damage areas without bubbles and macro-prudential policies need to be relied upon to a greater extent

# Macro-prudential policies

- Should eliminate speculators' incentive to enter the real estate market and create a bubble
  1. Mandatory reductions in loan-to-value ratios
  2. Increases in taxes on real estate transfers
  3. Increases in annual real estate taxes
  4. Direct restrictions on real estate lending

# Implementation of macro-prudential

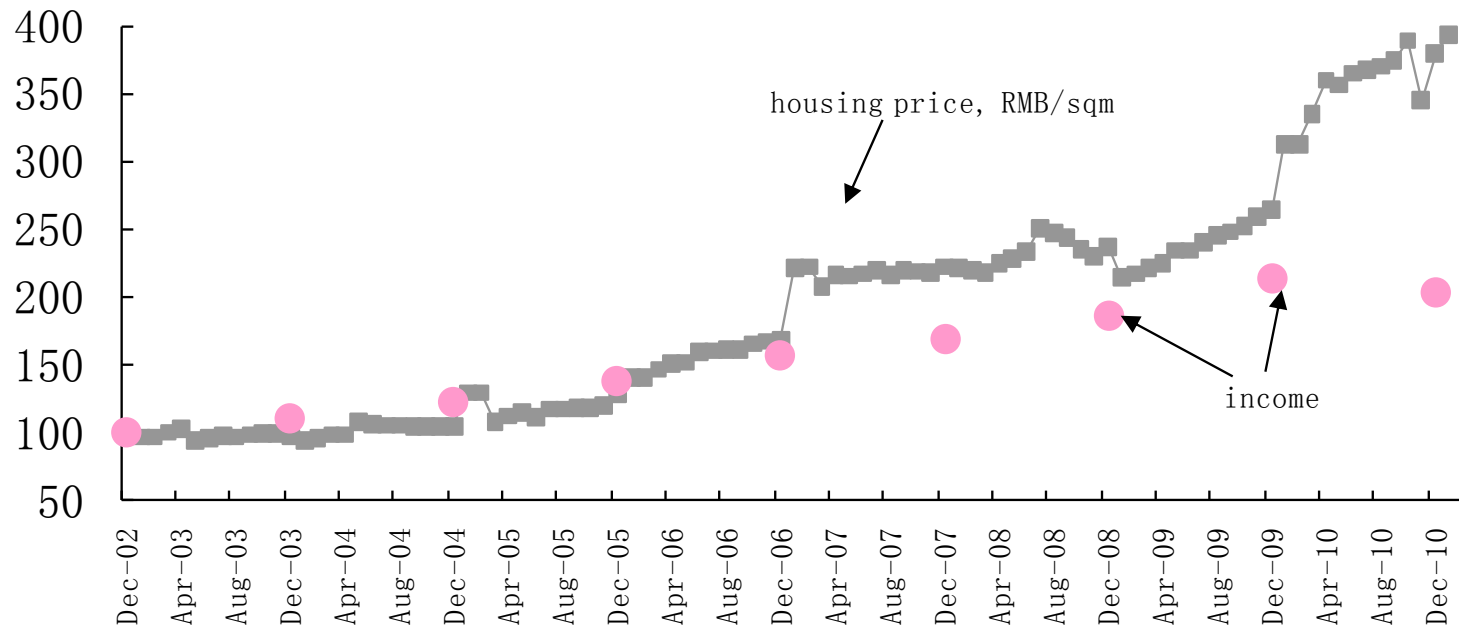
- Borio and Lowe (2002) and other papers from the BIS suggest difficult but not impossible to identify property bubbles
- Christensson et al. (2010) look at Financial Stability Reports of the Netherlands, Norway, Spain, Sweden, and the U.K. over the period preceding and during the crisis
- FSRs were successful in identifying risks and unsustainable trends but many were regarded as low probability events not worthy of action



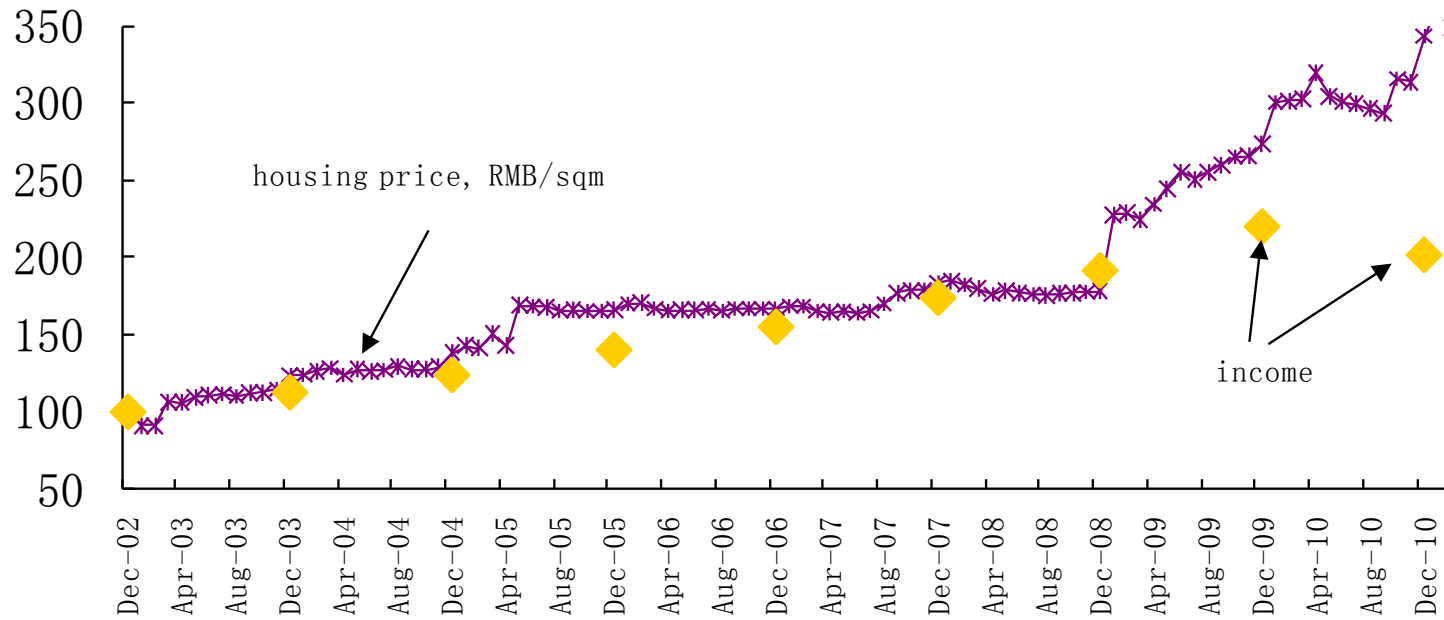
# Chinese experience

- The Chinese have tried a number of these measures
  - Lower loan-to-value ratios for second, third, and more houses
  - Taxes on resales of certain types of housing
  - Restrictions on foreigners buying
  - Loan restrictions on commercial property
- They have not worked very well in the major cities

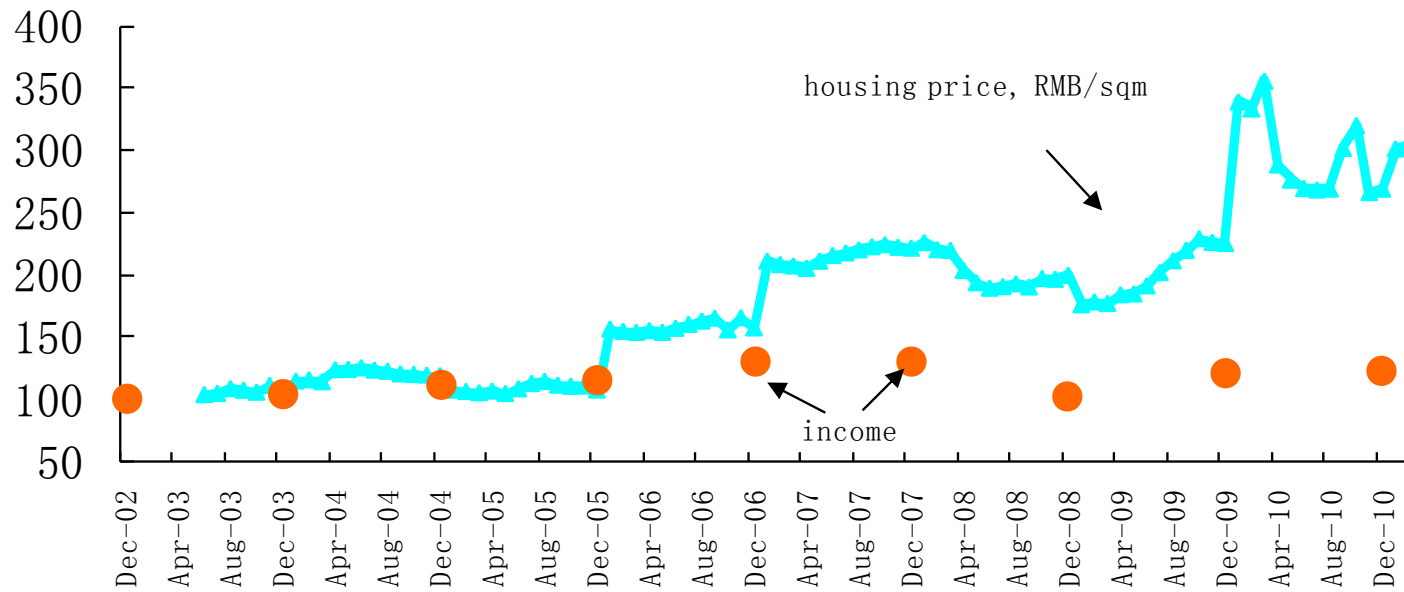
Beijing Housing Price vs Disposable Annual Income per capita  
adjusted by CPI, 2002=100



Shanghai Housing Price vs Disposable Annual Income per capita  
adjusted by CPI, 2002=100



Shenzhen Housing Price vs Disposable Annual Income per capita  
adjusted by CPI, 2002=100



- Global imbalances need to be reduced
  - Self-insurance by Asian countries through large reserves is optimal for them but very inefficient globally
- Reform governance structure of the IMF
  - Reduce European representation e.g. Votes in the IMF:
    - Belgium 2.08%
    - Netherlands 2.34%
    - China 3.65%
- Concerning Chinese reserve accumulation
  - Rmb as a reserve currency

## 2c. Asset mispricing due to limits to arbitrage

- Evidence was that not only did prices of securitized products seem very low but correlations between residential mortgage-backed assets, commercial mortgage-backed assets, and corporate credit securitizations markedly increased
- “Cash-in-the-market” pricing and limits to arbitrage
- The apparent mispricing contributed significantly to banks’ problems because of mark-to-market accounting

## Possible solutions to mispricing due to limits to arbitrage

- TARP-type programs can help restore market functioning and correct pricing
  - Difficult to implement and uncertain effects
  - Should the Treasury or the central banks implement them?
- Mark-to-market may need to be suspended when markets are not efficient
  - For example, when there is significant divergence between market prices and model based prices (more than 2%)

## 2d. Asset mispricing due to “flash crashes”

- Around 60% of trading volume in the U.S. is by high frequency traders
- On May 6 2010 over 20,000 trades across more than 300 securities were executed at prices more than 60% away from their values just moments before. Many were executed at prices of a penny or less, or as high as \$100,000, before prices of those securities returned to their “pre-crash” levels.
- Should high frequency trading be regulated?



## 2e. Sovereign Default

- Problems in Greece in the first part of 2010 underlined the difficulties associated with sovereign default within the Eurozone
- Related problems in Ireland, Portugal and Spain have underlined the importance of this issue
- Political economy factors in Germany are key and quite uncertain

# 3. Contagion

- A very important systemic risk
- At least three different types:
  - Domino effects through the payments system or interbank markets
  - Common asset exposure
  - Uncertainty about how events will play out because of a lack of precedent
- Solution: High bank capital requirements?

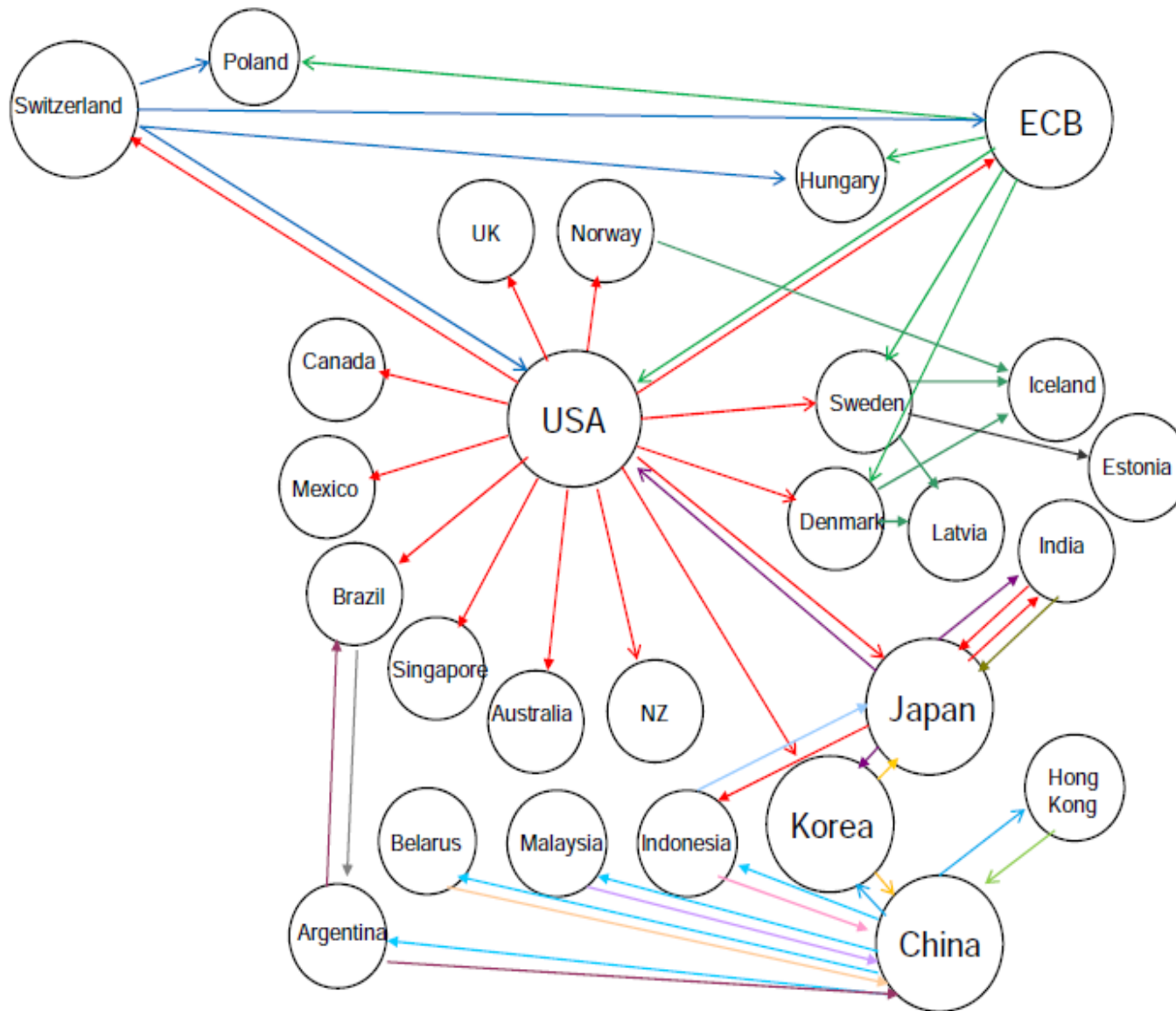
# Resolution mechanism

- Large institutions are saved to avoid contagion at the cost of moral hazard
  - Large institutions hold less capital and are riskier as they internalize that are “too big to fail”
- “Too big to fail” is not “Too big to liquidate”
- Government should orderly resolve failing institutions
  - Guarantee short term commitments to avoid contagion
  - The top 5 executives should be removed immediately
  - All employee pension claims should be eliminated
  - Over the next few years the bank should be liquidated

## 4. Foreign exchange mismatches

- Arguably the 1997 Asian Crisis was due to the lack of access to foreign exchange by banks and firms in Thailand, Korea, Indonesia and other countries
- Within Europe prior to the current crisis many banks had made foreign currency loans funded by foreign currency deposits – when the crisis struck many deposits were not rolled over
- Largest liquidity shortage was \$400 billion dollars in the Eurozone, next was \$70 worth of euros in the U.S. and then \$30 billion of Sfrs in Eurozone

- Not a significant problem in the current crisis because central banks introduced foreign currency swaps
- There were four overlapping networks:
  - The Fed network to supply U.S. dollars
  - The ECB network to supply Euros
  - The Swiss Franc network
  - The Latin American and Asian networks



## Solutions to foreign exchange mismatches

- IMF liquidity facility
  - Governance issues?
  - Will it be like central banks' discount windows with stigma?
- Guaranteed swaps going forward is arguably a better solution and the G-20 is pursuing this

# Concluding remarks

- Systemic risk is a complex phenomenon and our understanding of it is limited
- Other exacerbating factors
  - High leverage in financial services of firms
  - Compensation policies
- Checks and balances on central banks – how do we deal with divergence of opinion?



## Further reading

Allen, F. and E. Carletti (2010). “An Overview of the Crisis: Causes, Consequences and Solutions,” *International Review of Finance* 10, 1-27.

Allen, F. and D. Gale (2007). *Understanding Financial Crises*, Clarendon Lecture Series in Finance, Oxford: Oxford University Press.

Reinhart, C., and K. Rogoff (2009). *This Time is Different: Eight Centuries of Financial Folly*, Oxford and Princeton: Princeton University Press.