

# How can macro-prudential regulation be effective?

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- 1. Introduction: the financial crisis.**
- 2. Systemic risk surveillance and assessment  
- can we predict the financial cycle?**
- 3. Central banking, monetary policy and the  
institutional set-up for macro-prudential policy**
- 4. Macro-prudential policy instruments**
- 5. Conclusion**

# 1. Introduction

- The crisis that started almost 5 years ago was generated by the financial sector and triggered:
  - the largest world recession since the 1930s
  - an increase in Fiscal deficits in all countries
  - a sovereign debt crisis in Europe
- The crisis was preceded by excessive growth of credit and leverage; expansion of a “shadow banking sector”. The worldwide unprecedented increase in private (or inside) liquidity was facilitated by deregulation and financial innovations like securitisation and collateralised short-term borrowing (repos)
- The crisis itself was triggered by a collapse of the short-term funding structures that had been developed, leading to a strongly negative liquidity spiral (Brunnermeier, 2009)

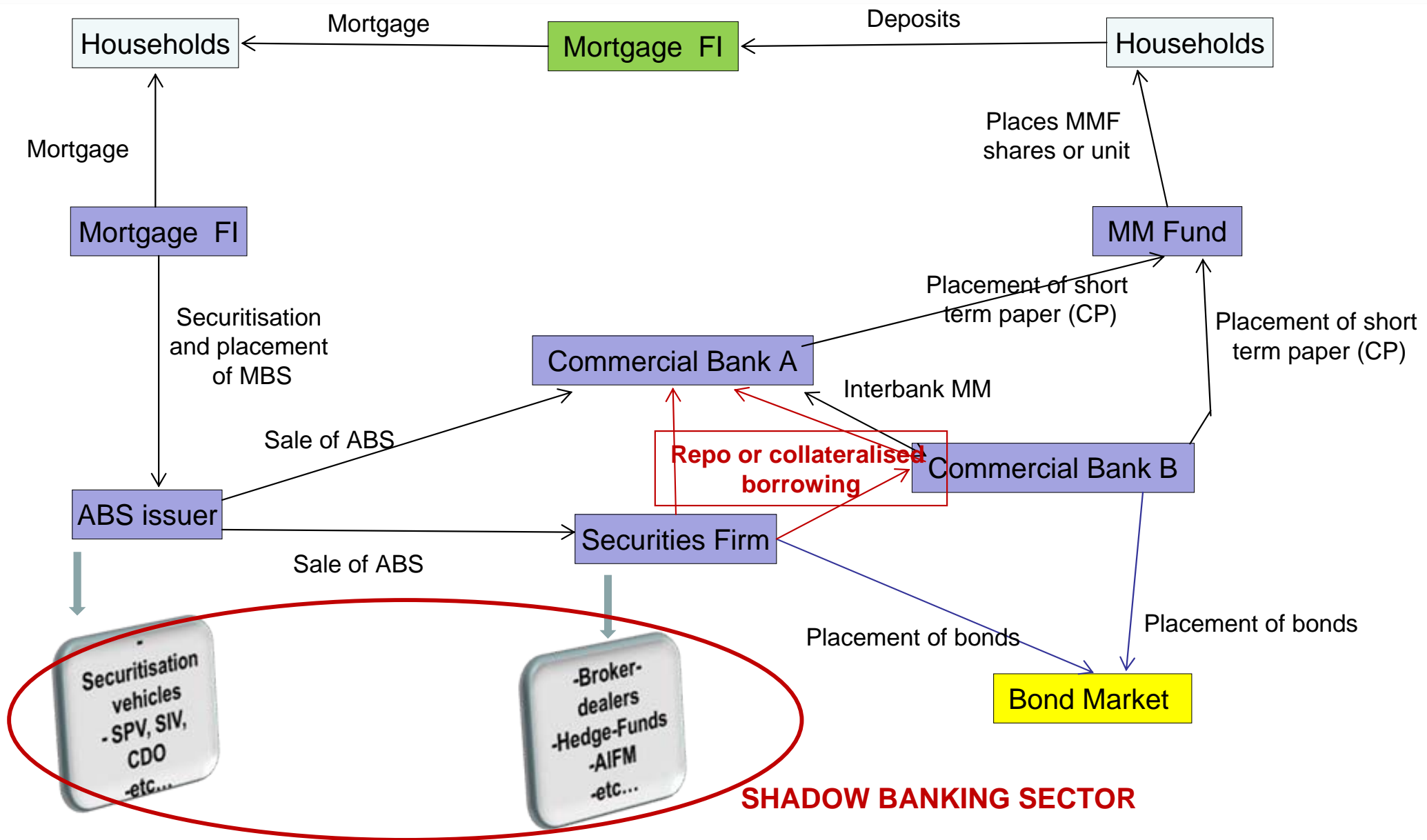
# I. Introduction

- There are two main views about the ultimate causes that created the conditions for the financial imbalances that led to the crisis:
  - 1) **the “savings glut”** (and current account surplus) that developed in Asia and oil producing countries and the subsequent outflows to the developed economies (specially the US), would explain the low market interest rates and the credit expansion.
  - 2) **The expansionary monetary policy** (starting in the US), the accompanied deregulation (vg abolition of Glass-Steagall) and several financial innovations stimulated the financial excesses.
- Both views have merits but the second is more important to understand the crisis. As Borio (2011a) reminded us, interest rates are very much influenced by monetary policy and *savings* has to be distinguished from *financing* on which expenditures depend and that later originate income and ...*savings*. So, what is important, for instance, for the *financing* of the US external account deficits are the **gross capital inflows**. From this perspective, :...”*By far the most important source was Europe, not emerging markets. Europe accounted for around one-half of total inflows in 2007 . Of this, more than half came from the United Kingdom, a country running a current account deficit, and roughly one-third from the euro area, a region roughly in balance. This amount alone exceeded that from China ...*(Borio (2011))

# I. Introduction

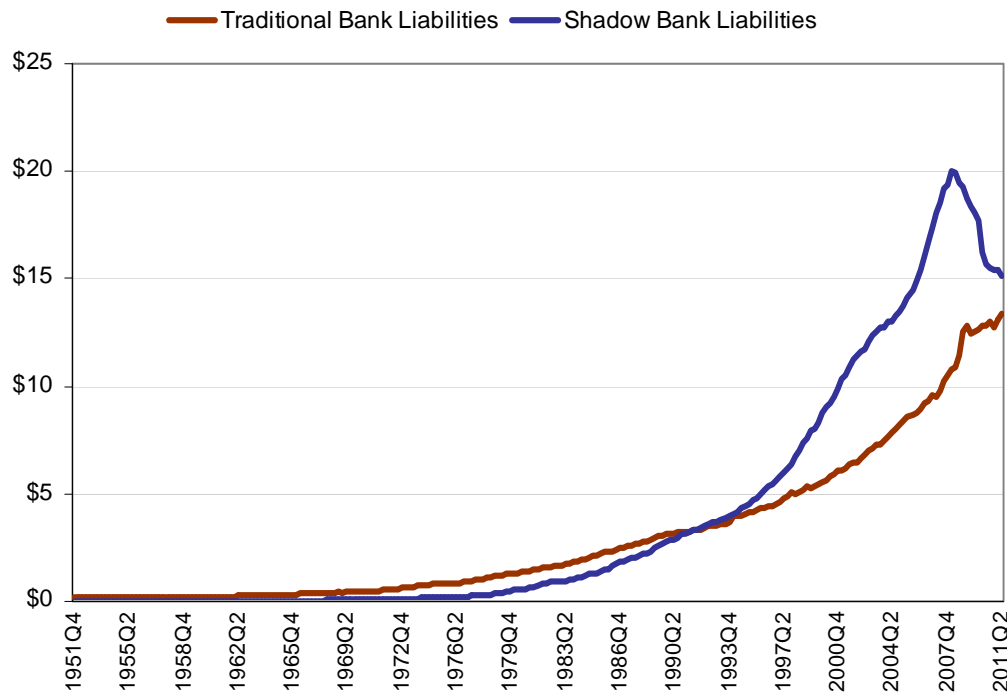
- The expansionary monetary policy fuelled leverage and search for yield. Financial innovation and changes in regulation allowed the lengthening of the intermediation chain which increased interconnectedness and contagion risk. Maturity transformation migrated to the shadow banking sector. Most of the new institutions and the new forms of funding them were not considered in any monetary or credit aggregate of MFIs that monetary policy considers. But all count for the total liquidity available for the economy...
- It was difficult to monitor this new environment, particularly in a framework of deregulation, trust in “efficient “ and self-correcting markets in the context of a dominant macroeconomic theory with no place for the financial sector as source of frictions and fluctuations in the economy. There was also a sort of “cognitive capture” of regulators that inhibited them even to fully use the available supervision tools. Systemic risk was rampant but a macroprudential view was missing and was no one’s particular responsibility. Systemic risk as possibility of disruption of the whole financial system with material consequences for the economy, has precisely two types of endogenous sources: financial imbalances and contagion.

# I. The lengthening of the intermediation chain and the creation of inside (or private) liquidity

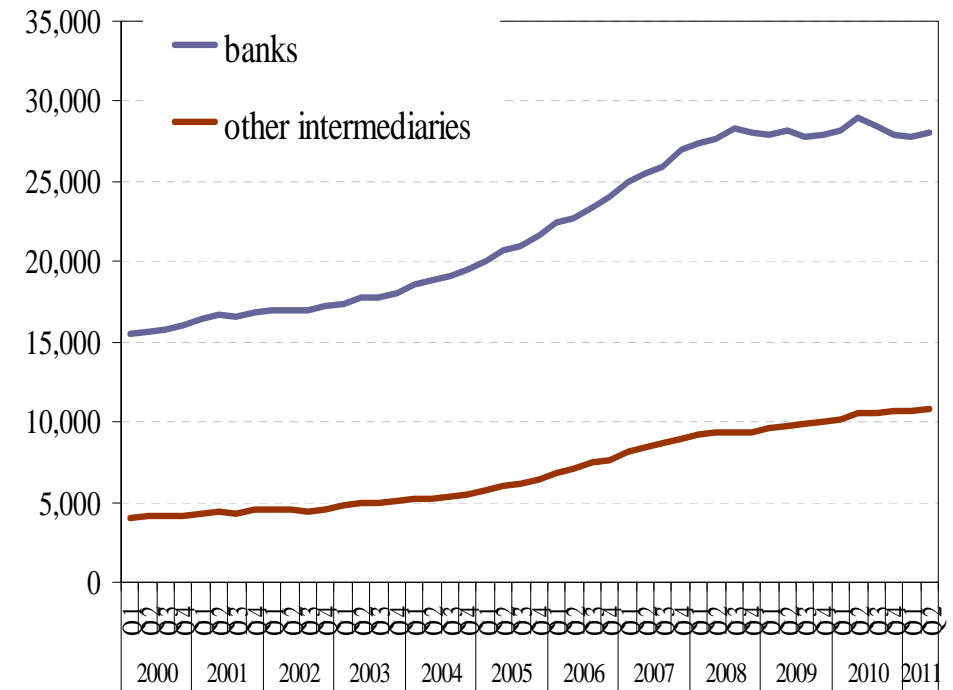


# I. Size of shadow banking in the US and EA

**Traditional bank liabilities and shadow banking liabilities in the US** (outstanding amounts in *USD trillions*)

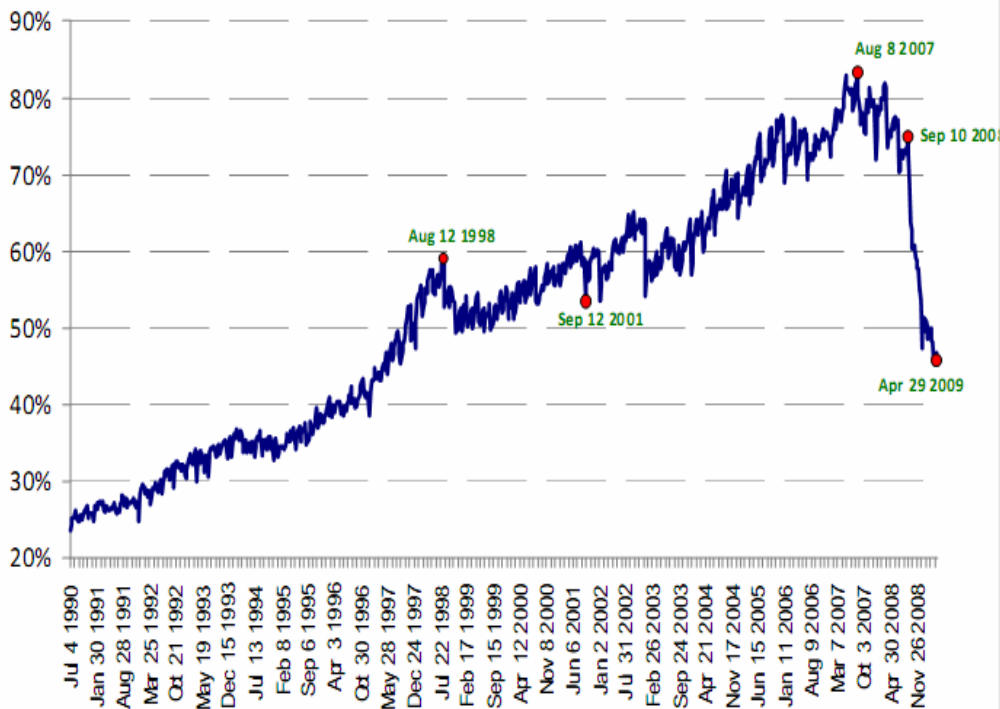


**Assets of banks and other intermediaries in the euro area** (outstanding amounts in *EUR billions*)

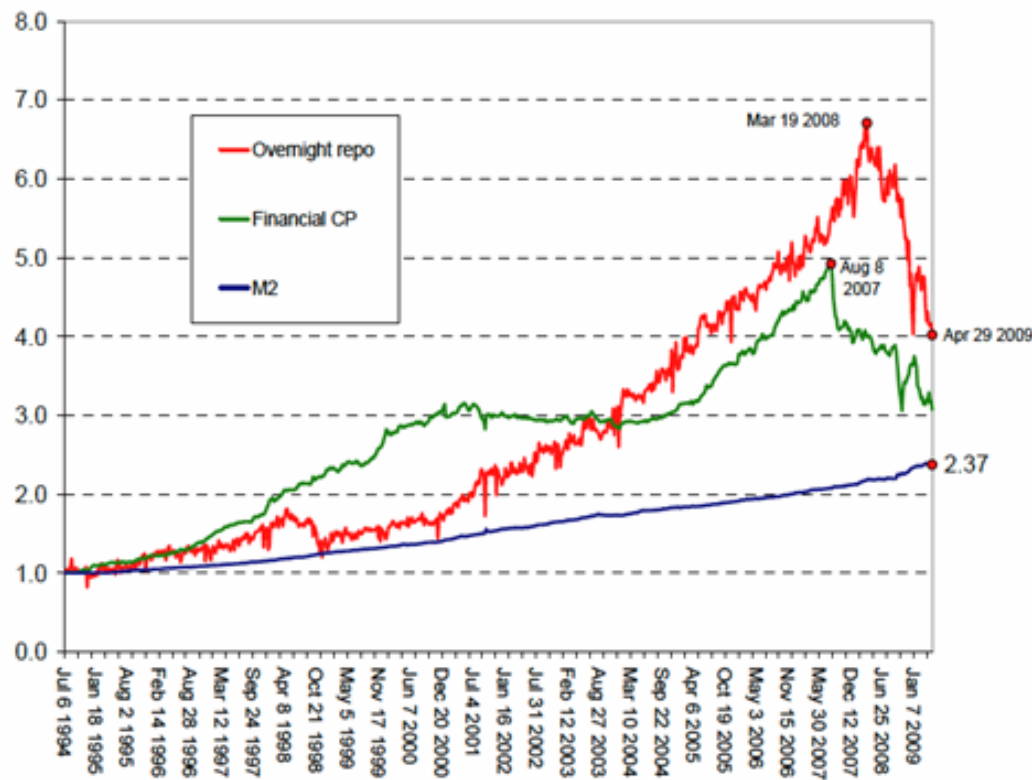


# I. Repos and M2 in the US

**Figure 4. Repos and Financial CP as Proportion of M2**  
(Source: US Federal Reserve)



**Figure 5. Overnight Repos and M2 (weekly data)**  
(Normalized to 1 on July 6<sup>th</sup> 1994. Source: Federal Reserve)



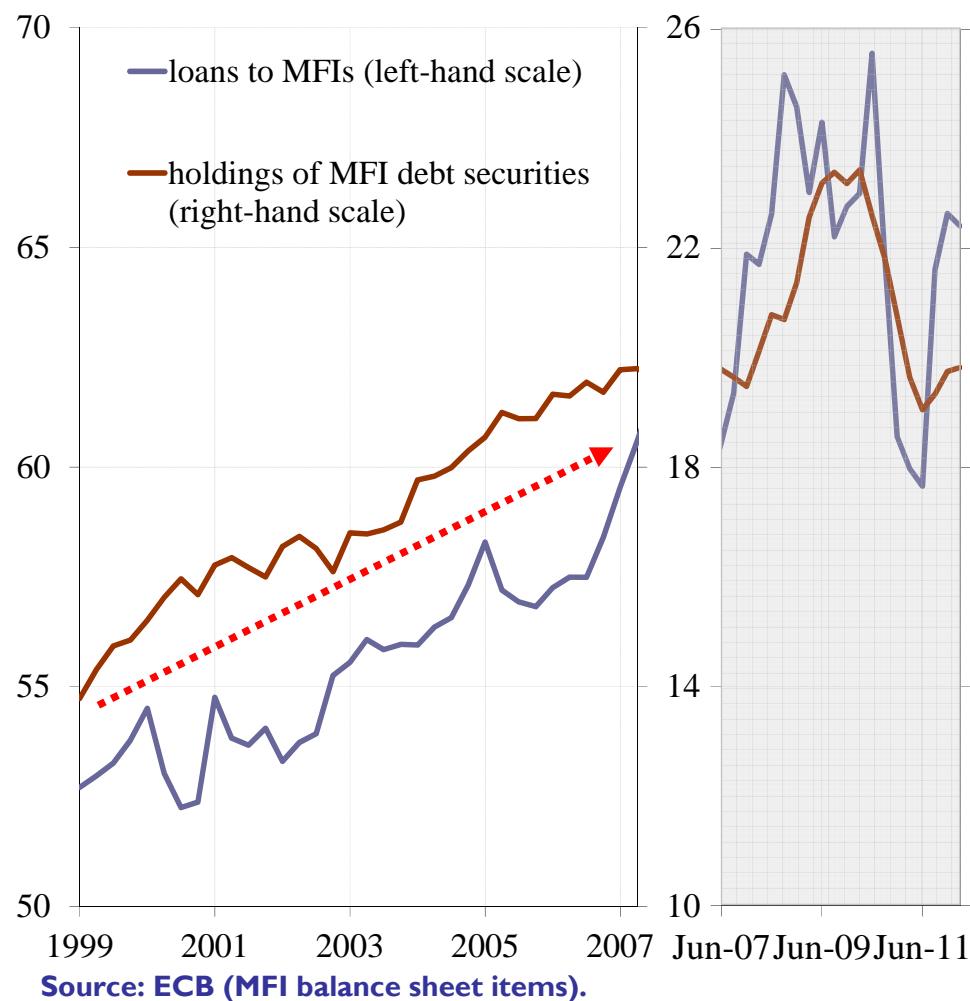
Source: H. Song Shin and K. Shin (2011) "Procyclicality and monetary aggregates" NBER WP 16836



# I. MFI Interconnectedness

- Higher debt levels within the financial sector were accompanied by increased interbank lending and cross-holdings of debt securities among banks
- The banking sector had become more interconnected

Euro area monetary financial institutions' (MFIs) lending to other MFIs and holdings of MFI debt securities  
(Q1 1999 – Q3 2011; percentage of GDP)

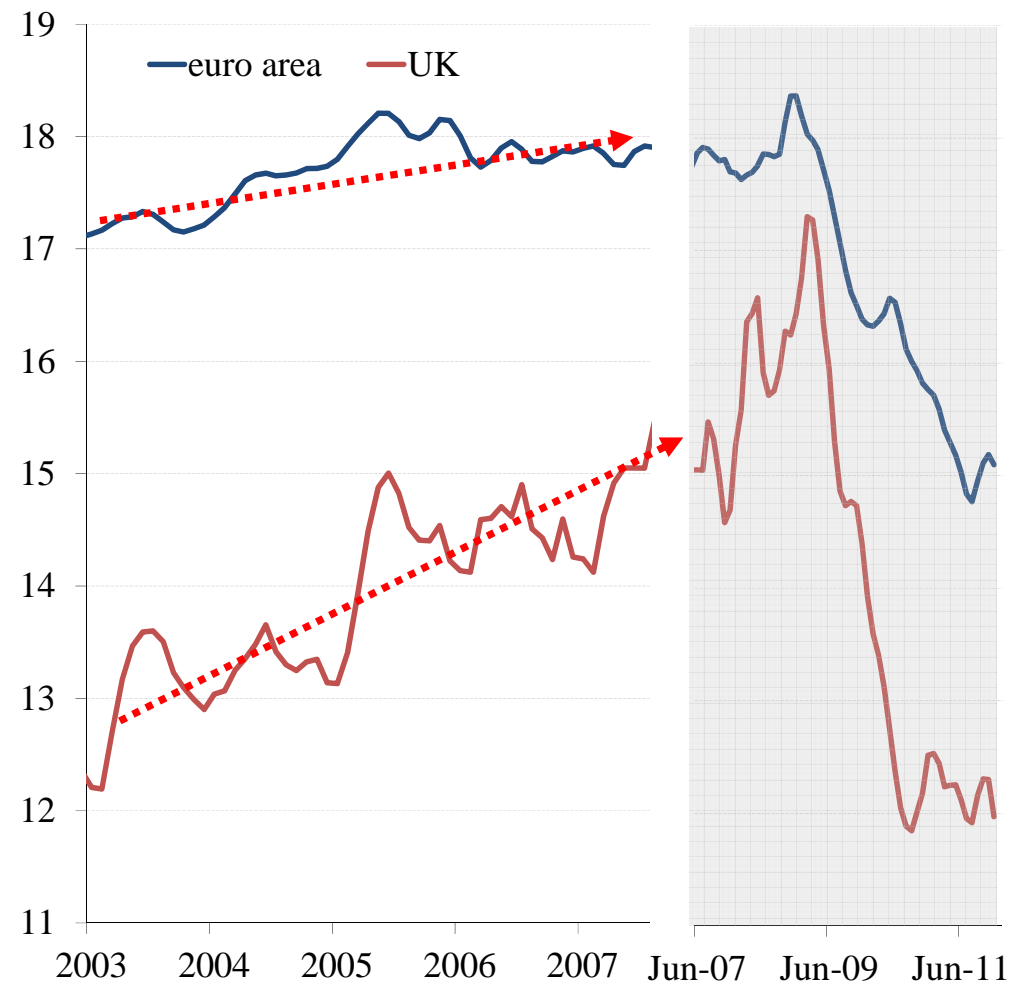


# I. Introduction

## Increased Banks' leverage

- Leverage in the banking sector had been building up before the financial crisis ( total assets/capital and reserves)

Leverage ratio for euro area and UK banks (Jan. 2003 – Dec. 2011; total assets/capital and reserves)



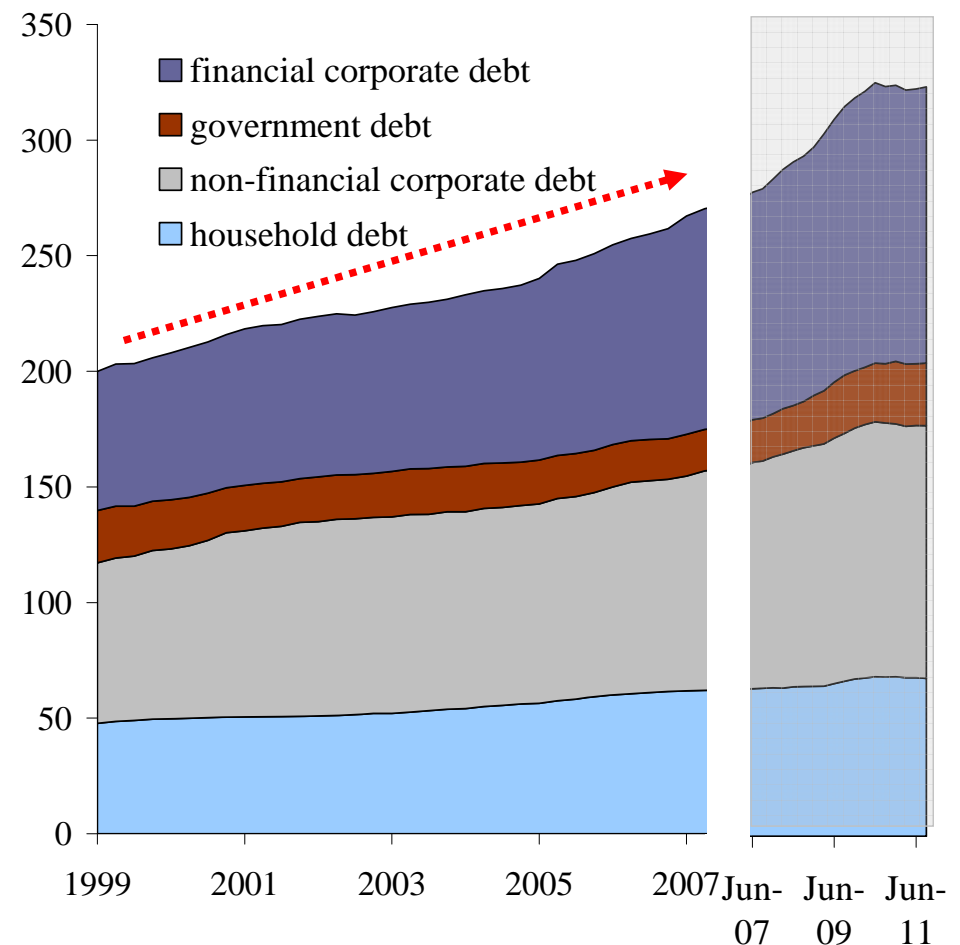
Source: ECB (MFI balance sheet items).

# I. Introduction

## Euro Area: Debt of the Financial Sector increased more than indebtedness of other sectors

- Indebtedness had been building up before the financial crisis
- Higher debt levels both within and outside the financial sector
- Increase as a share of GDP from 1999 to mid-2007:
  - Financials* = 35 %-points
  - Non-financials* = 25 %-points
  - Households* = 14 %-points
  - Governments* = -5 %-points

Sectoral breakdown of debt in the euro area (Q1 1999 – Q3 2011; percentage of GDP)



Source: ECB (euro area accounts).

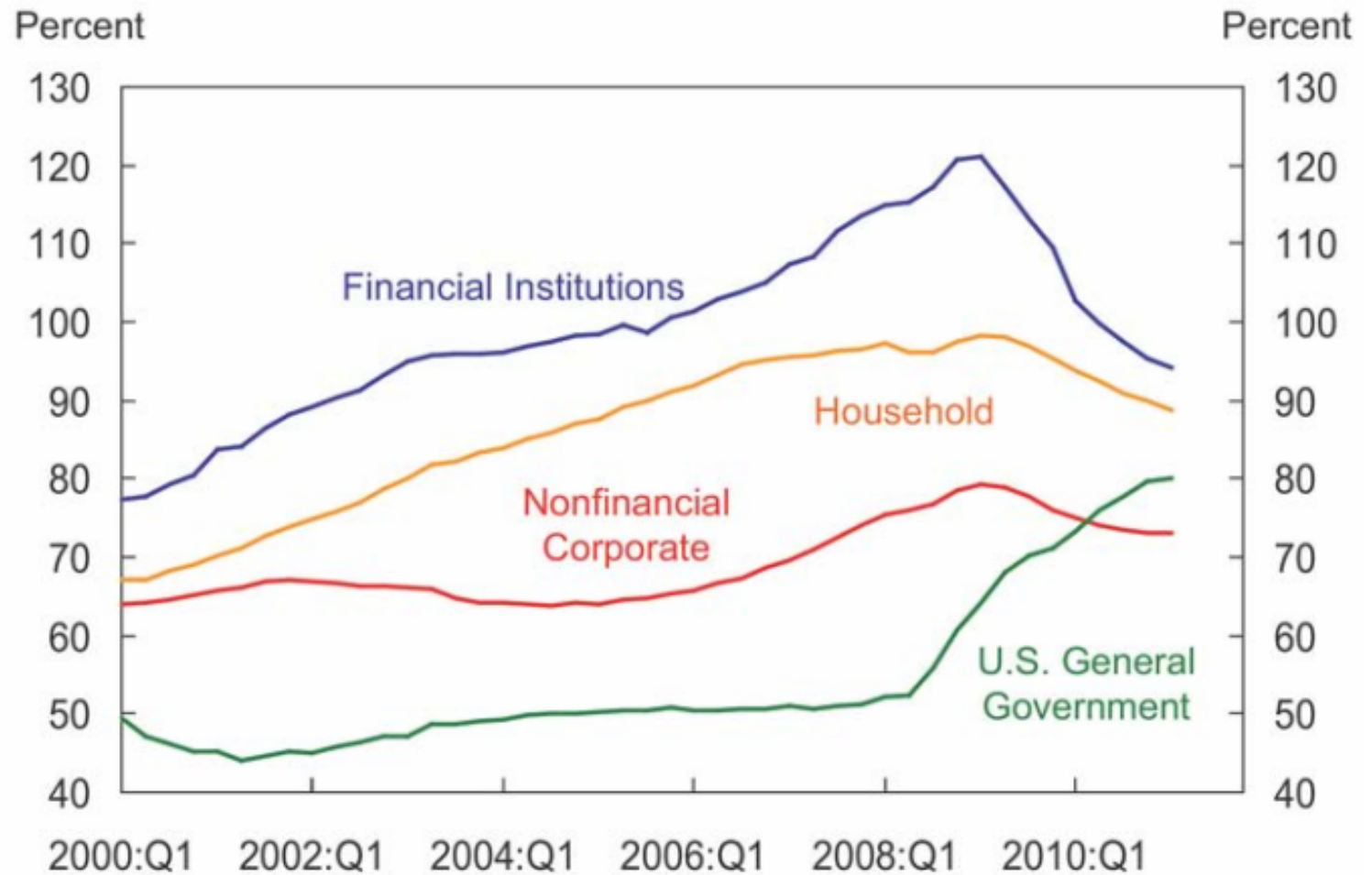
# I. Introduction

Chart 4.1.1 Net Debt Outstanding as a Percent of GDP



In the US there was the same pattern of indebtedness as in the EA

Source:  
FSOC 2011  
Annual  
Report



Source: Flow of Funds, BEA

## 2. Systemic risk surveillance and assessment - can we predict the financial cycle?

**The two first tasks of Macroprudential Oversight are:**

### **Surveillance:**

Aims to identify the building up of risks that can lead to systemic risk. Significant investment has been and continues to be made in developing analytical tools and models that can provide early warnings of the build-up of financial imbalances and possible sources of contagion risk

### **Assessment:**

Aims to assess the possible impact of identified risks in the financial sector and in the economy as a whole, thus testing the ability of the financial system to cope with identified risks.

The major tool to perform such assessment is stress testing, primarily of the banking sector, including sensitivity and scenario analyses

Also, to take account of the channels through which risks can be propagated through the financial systems contagion and spillover models are used.

## 2. Systemic risk surveillance and assessment - can we predict the financial cycle?

### **Analytical tools and indicators used in systemic risk surveillance and assessment:**

- a. Excessive leverage and credit boom indicators
- b. Asset price disequilibria indicators to identify bubbles (in financial and property markets)
- c. Indicators of financial market stress
- d. Financial market liquidity condition indicators
- e. Stress testing models
- f. Interconnectedness and institutions' contribution to systemic risk indicators, as well as contagion and spillover models (

## 2. Systemic risk surveillance and assessment - can we predict the financial cycle?

**Some indicators did predict the last financial cycle**

**In terms of performance there are three types of indicators:**

- 1. Early Warning Models with structural indicators would have predicted financial crisis like many other past crisis, but give rise to a significant number of false alarms**
- 2. Structural indicators not evaluated in EWIs (mainly due to lack of data availability) e.g. leverage, house price valuation models: would have predicted crisis but it is difficult to decide on a threshold value.**
- 3. Market based indicators e.g. based on price, premia and volatilities are not very useful as early warning. They tend to be coincident indicators. This applies to various “financial stress” indices.**

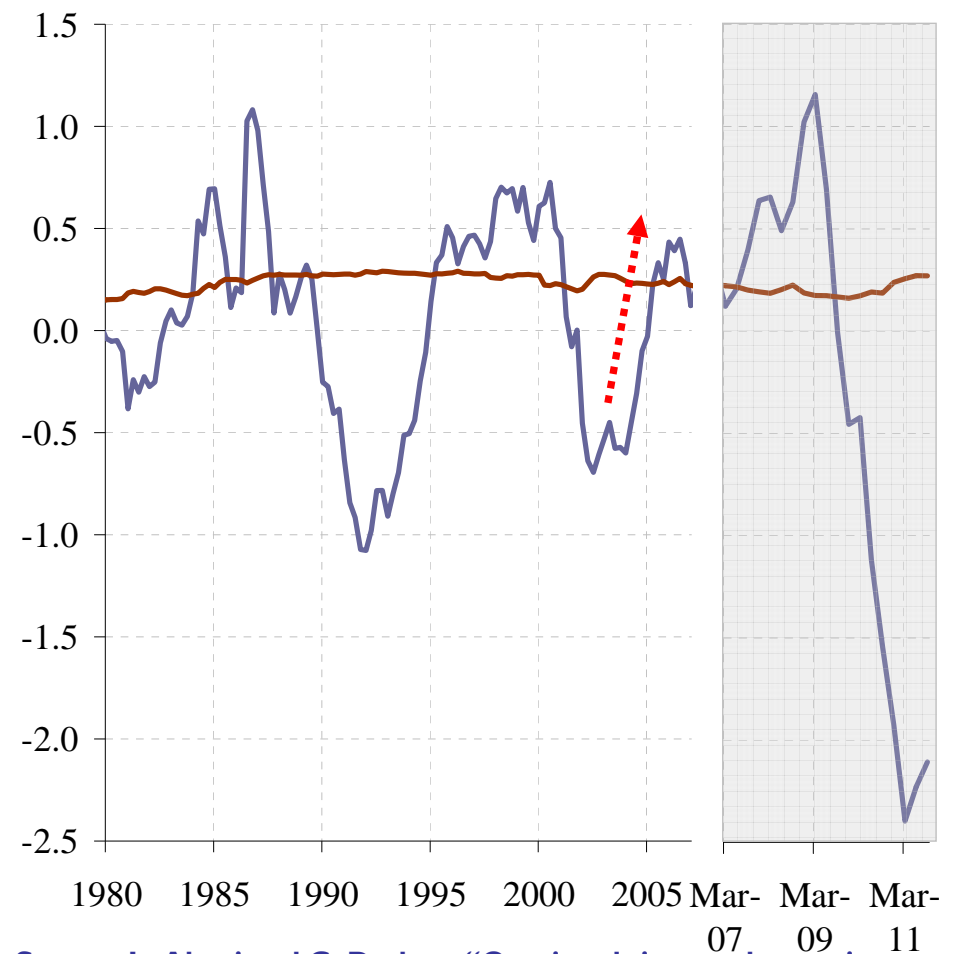
**All in all, credit-gap growth models and property prices seem to be the best predictors of the financial cycle that is normally longer than the business or economic cycle.**

## 2. Systemic risk surveillance and assessment - can we predict the financial cycle?

### Examples of credit boom indicators

- Some early warning indicators currently used by the ECB identified growing imbalances before the crisis
- Global credit gap rising from 2002 onwards and above threshold Q3 2005 - Q2 2009
- Real time performance since 1970:  
82% correct warnings  
32% false alarms  
95% of costly asset price booms predicted in at least one of 6 preceding quarters

### Global credit gap and optimal early warning threshold (Q1 1980 – Q3 2011; percentages)



Source: L. Alessi and C. Detken, "Quasi real time early warning indicators for costly asset price boom/bust cycles: A role for global liquidity", *European Journal of Political Economy*, 27(3), 520-533, September 2011.

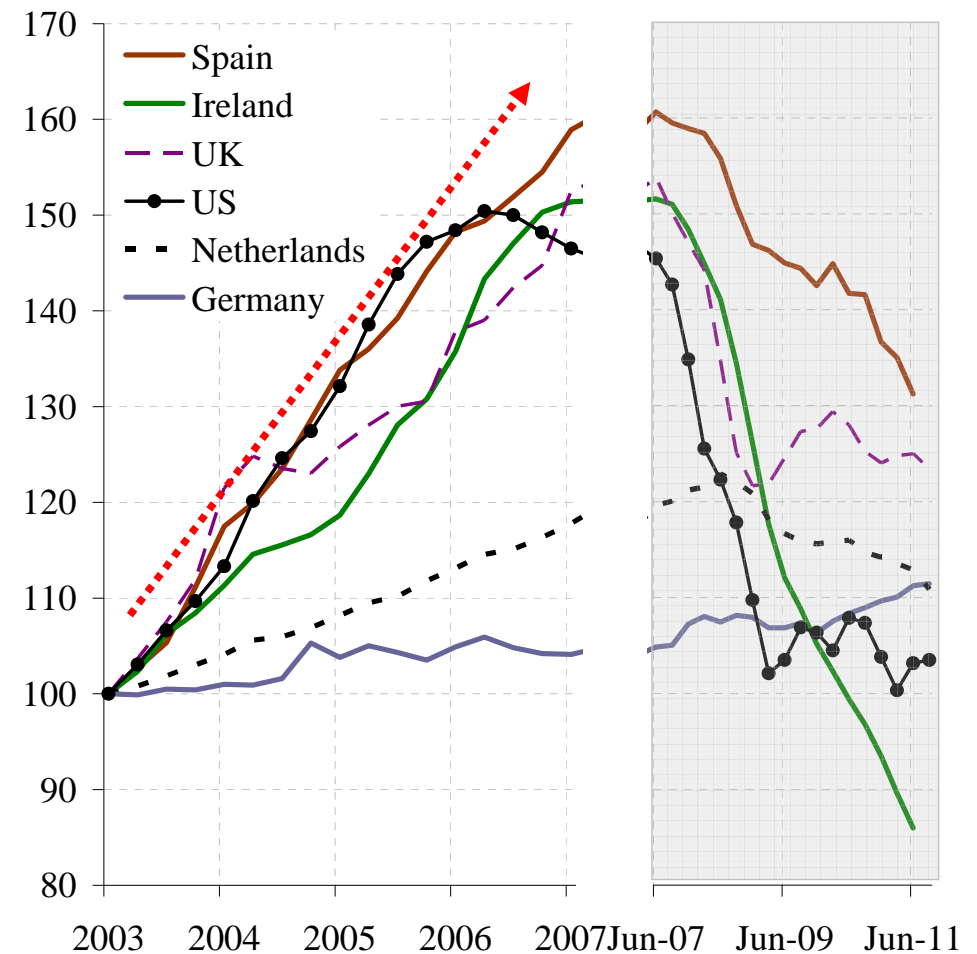


## 2. Systemic risk surveillance and assessment - can we predict the financial cycle?

### Examples of asset price disequilibria indicators

- Euro area residential property prices increased sharply in many countries before the crisis
- Developments were however very disperse across countries

### Residential property prices (Q1 2004 – Q4 2011; index: Q1 2004 = 100)



Sources: ECB and Bloomberg.

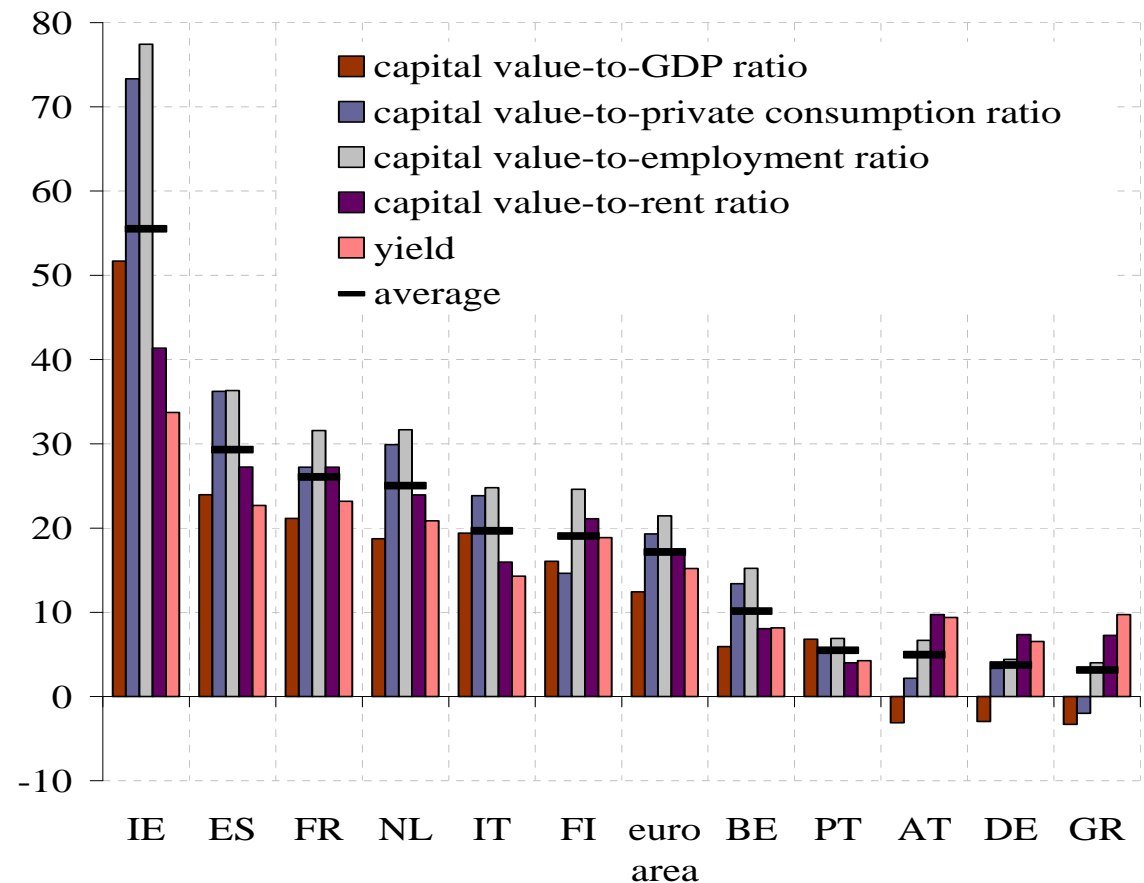
## 2. Systemic risk surveillance and assessment - can we predict the financial cycle?

### Examples of asset price disequilibria indicators

- Commercial property markets in several euro area countries showed clear signs of overvaluation in 2007, when comparing with fundamentals

### Value misalignment indicators for prime commercial property in selected euro area countries

(Q1 2007; percentage deviation from average values from Q1 1997 to Q1 2007)



Source: Jones Lange LaSalle, ECB and ECB calculations.

Note: For detail see Box 6 in the December 2011 ECB Financial Stability Review.

## 2. Systemic risk surveillance and assessment

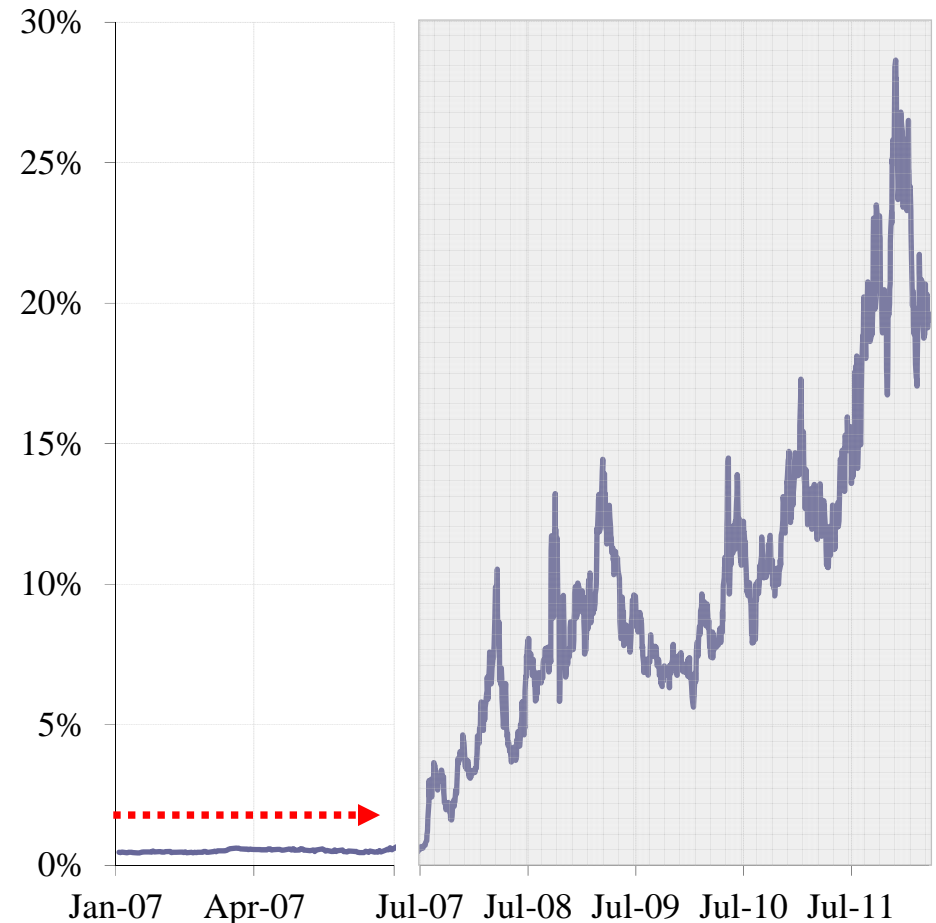
### - can we predict the financial cycle?

#### Examples of indicators of financial market stress

- Financial market stress and risk aversion indicators were at historically low levels before the outbreak of the financial crisis
- Probability of a simultaneous default of two or more large euro area banks very low
- The indicator is basically a coincident indicator

Probability of a simultaneous default of two or more large euro area banks within two years

(Jan. 2007 – Mar. 2012; probability; percentages)



Source: Bloomberg and ECB calculations.

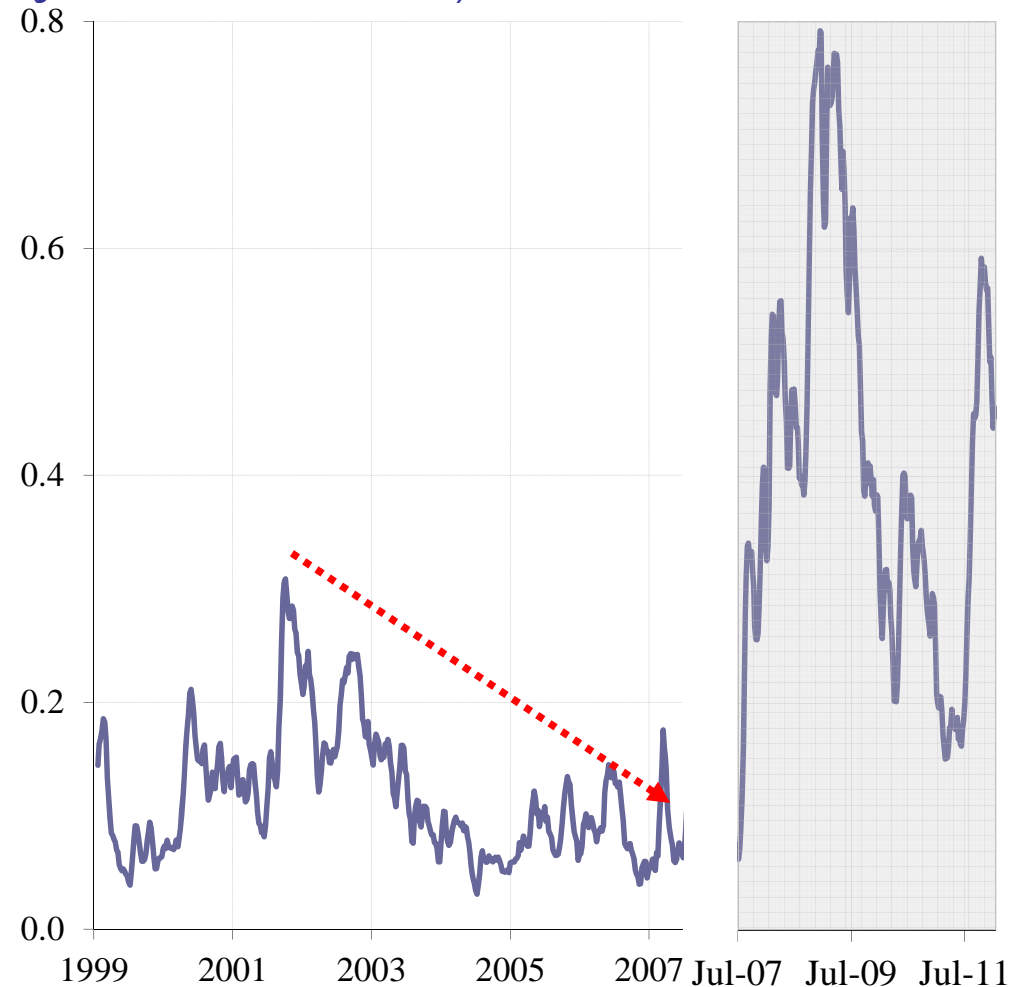
Notes: For further details of the indicator, see Box 16 in ECB, Financial Stability Review, December 2007.

## 2. Systemic risk surveillance and assessment - can we predict the financial cycle?

### Examples of indicators of financial market stress

- Composite financial market stress indicators had been on a declining trend from 2002 to mid-2007
- The indicator is basically a coincident indicator

Composite indicator of stress (CISS) for the euro area  
(Jan. 1999 – Mar. 2012)

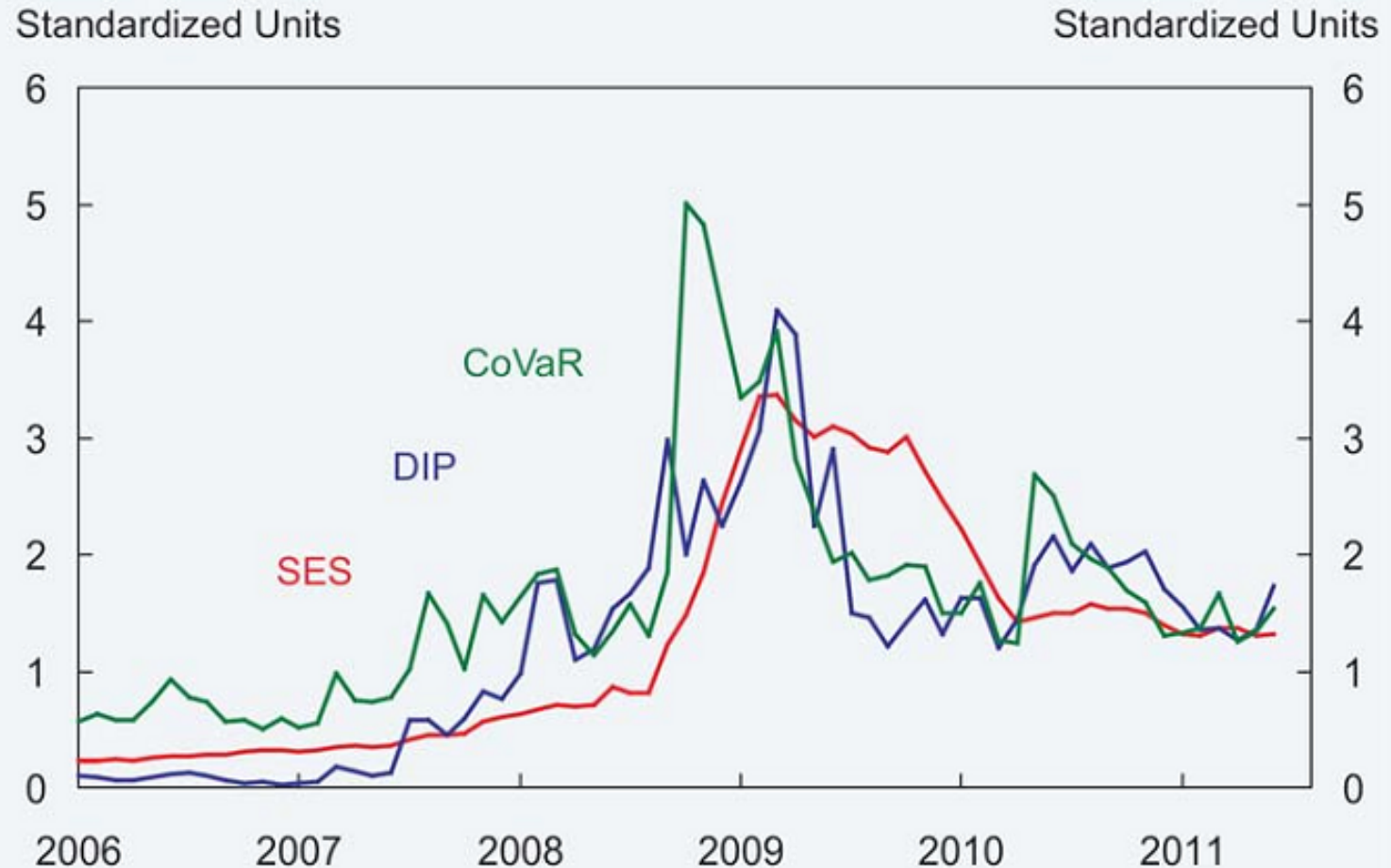


Source: D. Hollo, M. Kremer and M. Lo Duca, "CISS - a composite indicator of systemic stress in the financial system", ECB Working Paper, No 1426, March 2012.

## 2. Systemic risk surveillance and assessment - can we predict the financial cycle?

**Example of indicators of financial institutions contributions to systemic risk. Like the precedent indicators, also based on market prices, premia or volatilities, this set of indicators are basically coincident ones.**

Chart J.1 Average Risk Measures Across the 5 Largest BHCs



Source: FRBNY Calculations

Note: 5 largest BHCs by total assets.

Source: Financial Stability Oversight Council 2011 Annual Report, FSOC 2012

### 3. Central banking, monetary policy and the institutional set-up for macro-prudential policy

- Monetary policy matters for financial stability ; Affects asset prices; Affects liquidity conditions (Adrian and Shin (2010)); Affects bank risk taking (Borio and Zhu (2008), Adrian and Shin (2009)Maddaloni and Peydro (2010), Jimenez et al (2011)): low interest rates leads to increased leverage and riskier lending practices. Beyond the traditional transmission channels, a new “risk-taking channel” has been theorized:
  - Short-term monetary rates → term spread → profitability → leverage and risk-taking → balance- sheet expansion funded by unstable, short-term instruments if the traditional stable ones (v.g. deposits ) are not enough.
  - As Adrian and Shin (2009) underline what is significant is that the short term interest rate has a **direct effect** on monetary- financial conditions not waiting for the indirect effect on medium term term and expenditure decisions. There is a credit-supply friction that commands leverage and inside liquidity (Jean Tirole) not included in monetary policy aggregates.

### 3. Central banking, monetary policy and the institutional set-up for macro-prudential policy

- Traditionally monetary policy is only about price stability, particularly in the inflation targeting regime, even if central banking has since the XIX century cared for financial stability in the form of lender-of-last-resort for banks in times of liquidity distress. This asymmetric policy of only “mopping-up” with liquidity in financial market downturns but ignoring the risks of the upside booms creates moral hazard and provides a significant “liquidity subsidy” to the financial sector.
- The arguments against doing otherwise have been centred in the difficulty to “identify bubbles” or in the danger of “pricking bubbles”.
- The on-going change in macroeconomic theory and the development of macro models with financial sector frictions puts the question in different terms, as the result of the new models are optimal monetary policy rules that add financial conditions terms to the rule (v.g. banks and credit spreads in Christiano, Motto, Rostagno (2009), Curdia and Woodford (2010) or Gertler and Karadi (2011)) The new models are nevertheless not mature enough and do not include all relevant financial frictions. A pure “leaning against the wind” policy is possible but has limitations.
- Monetary policy must become less asymmetric after the crisis is overcome but cannot substitute an appropriate regulatory macro-prudential policy

# 3. The institutional set-up for macro-prudential policy

**Central banks are well placed to play an important role in macro-prudential surveillance (BIS 2011, ESRB 2011, IMF 2011)**

- *Synergies with other central bank tasks:*
  - Financial stability analysis as reflected in Financial Stability Reviews/Reports
  - Oversight of market infrastructures
  - Prudential supervision
- *Strong independence*

**Key role of central banks reflected in *ESRB Recommendation on macro-prudential mandate of national authorities***

**Yet macro-prudential oversight entails *new elements* for central banks**

- Extension of the surveillance to the *whole financial sector*
- Focus on *policy action*
- Safeguards not to affect the *monetary policy* mandate (e.g. separate committees)



# 3. The institutional set-up for macro-prudential policy

## Different set-ups for macro-prudential policy

- Responsibility for macro-prudential policy has been attributed to a committee, new agency or the central bank.

	<b>European Systemic Risk Board (ESRB) in the EU</b>	<b>Financial Stability Oversight Council (FSOC) in the US</b>	<b>Financial Policy Committee (FPC) in the UK</b>
<b>Composition</b>	National central banks, supervisors and Ministries of Finance, but voting powers limited to central bank representatives and EU authorities (ESAs and EC)	Secretary of the Treasury (chair), Federal Reserve, the federal financial regulators, and state regulators (as non-voting members)	Placed inside the Bank of England that is taking also the role of Bank Supervision and Macro-prudential authority.
<b>Mandate</b>	Monitor the financial system in view of identifying and assessing systemic risks and select the most appropriate policy tools to address such systemic risks	Identify risks and respond to emerging threats to financial stability, including eliminating regulatory gaps and weaknesses	Remove or reduce systemic risks with a view to protecting and enhancing the resilience of the UK financial system
<b>Powers</b>	Issue policy recommendations and warnings to competent authorities (mainly supervisory but also regulatory authorities)	Coordination among its members, recommendations for regulatory policy, subject nonbank financial institutions specific financial market infrastructures to regulatory oversight	Make Recommendations and Directives to the Prudential Regulation Authority (PRA) and the Financial Conduct Authority (FCA) to adjust specific macro-prudential tools or instruments

### 3. The institutional set-up for macro-prudential policy

- The new Macro-Prudential Authorities face several challenges:
  - 1. They appear in a period of crisis management, not imbalances prevention
  - 2. Most of the regulatory reform already well advanced and designed from a macro-prudential perspective.
  - 3. Overall difficulty in *measuring* the success and failure of macro-prudential policies and related accountability. Is the objective of the policy to increase the resilience of the system for crisis times or to smooth the financial cycle and mitigate boom-bust pattern ?
  - 4. Shared instruments with other micro regulators
  - 5. In many cases, disposing only of warnings and recommendations
  - 6. Need to establish a macro-prudential policy toolkit and understand the impact of the instruments.

# 4. Macro-prudential regulatory instruments

MACRO-PRUDENTIAL INSTRUMENTS		
	Balance-Sheet	Financial transactions conditions
Leverage	Capital ratios- static or time-varying (CCB); Leverage ratio; dynamic provisioning; time-varying risk weights; limits to some exposures; restrictions on earnings distribution; provision accounting standards	Limits to LTV, DTI or LTI; Maturity caps
Liquidity and maturity transformation	Liquidity ratios (static or time-varying) LCR, NSFR, Core FR, LaR ; liquidity risk surcharges	Margins and haircuts in secured lending; levies on volatile funding sources
Interconnectedness	SIFI's surcharge; restrictions on cross exposures; Resolution regime for big, cross-border institutions	
Market structures	OTC derivatives move to CCPs and organised exchanges; Volcker rule; Vickers ring-fencing; regulation of shadow banking	

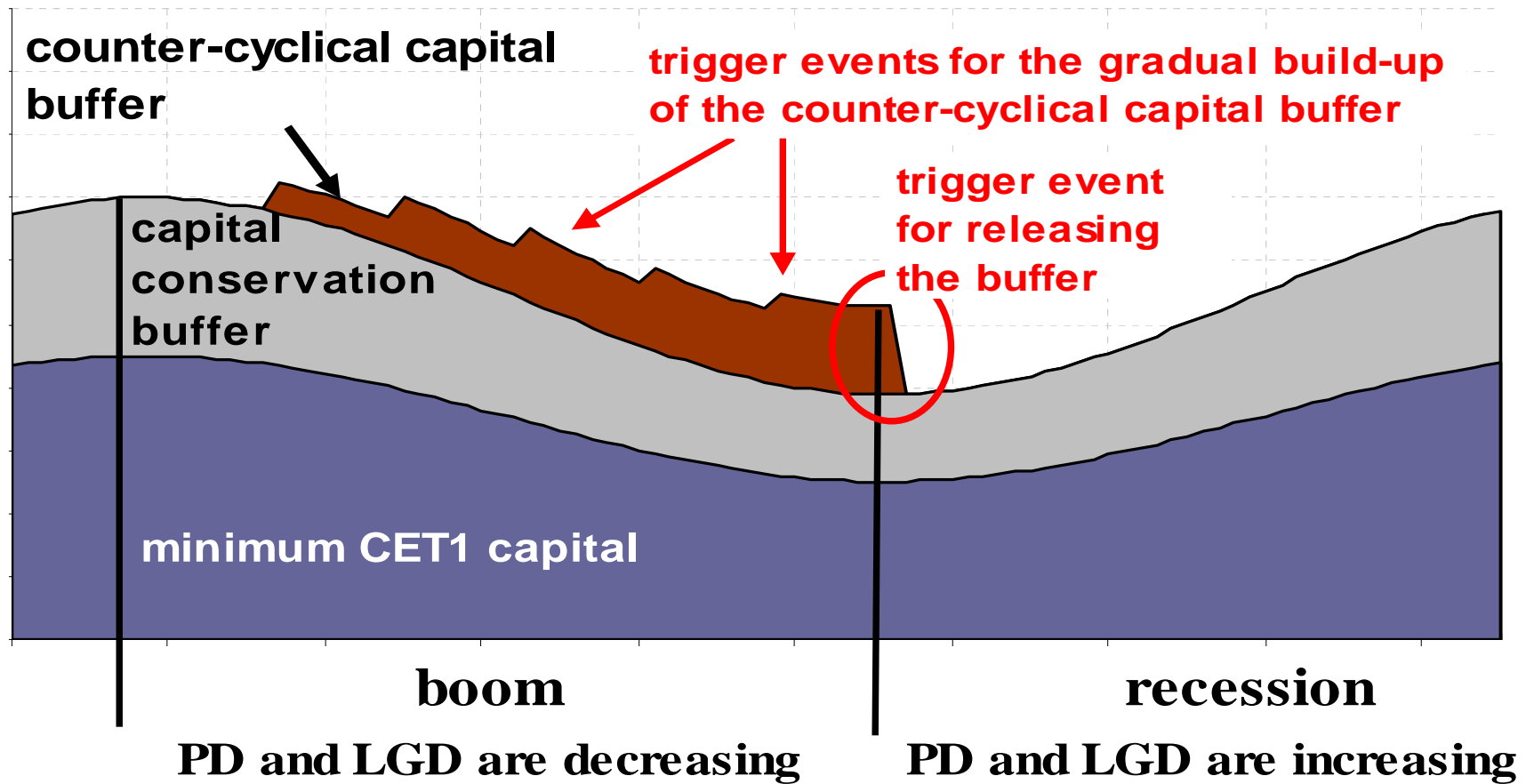
# 4. Macro-prudential regulatory instruments

## Counter-cyclical capital buffer (CCB)

- To be implemented as part of the Basel III framework
- Main idea: CCB is to be activated in periods of excessive credit growth associated with the build-up of systemic risks and released in stress situations. It can substantially improve the resilience of the banking sector, thus contributing to the smooth provision of financial services throughout the business cycle.
- The ESRB and the EBA play important roles in ensuring consistent policymaking regarding the CCB across EU Member States (policy guidelines, regulatory standards).
- The CCB is the key macro-prudential instrument that has currently been internationally agreed upon.
- If the CCB had been in place in the last decade, the buffer requirements would, in most cases, have reached their peak during the recent financial crisis.
- **On average, the CCB would have covered about half of the capital needs banks had to face in the recent crisis.**

# 4. Macro-prudential regulatory instruments

## Counter-cyclical capital buffer (CCB)



## 4. Macro-prudential regulatory instruments

### **Dynamic provisioning (DP): The Spanish Experience (began in 2000)**

- **Main aim**: build up provisions for potential expected losses (statistically estimated) over the cycle rather than on the basis of incurred losses. DP provides for an earlier recognition of inherent credit losses
- **Motivation**:
  - Increase bank resilience: reduce the need for a sharp rise in provisions during a period of rising defaults
  - Contributes to smoothing the credit cycle: provisions are built up in good times to be used in bad times
- **Impact** : improved bank resilience to downturn but insufficient to prevent the build up of imbalances
  - By end-2007: increased bank reserves by 1.3% of total assets
  - Some success in smoothing credit supply fluctuations but overall lending impact small (Jimenez and Saurina (2006), Jimenez et al (2012)):
  - Spain house prices and household leverage still increased substantially

# 4. Macro-prudential regulatory instruments

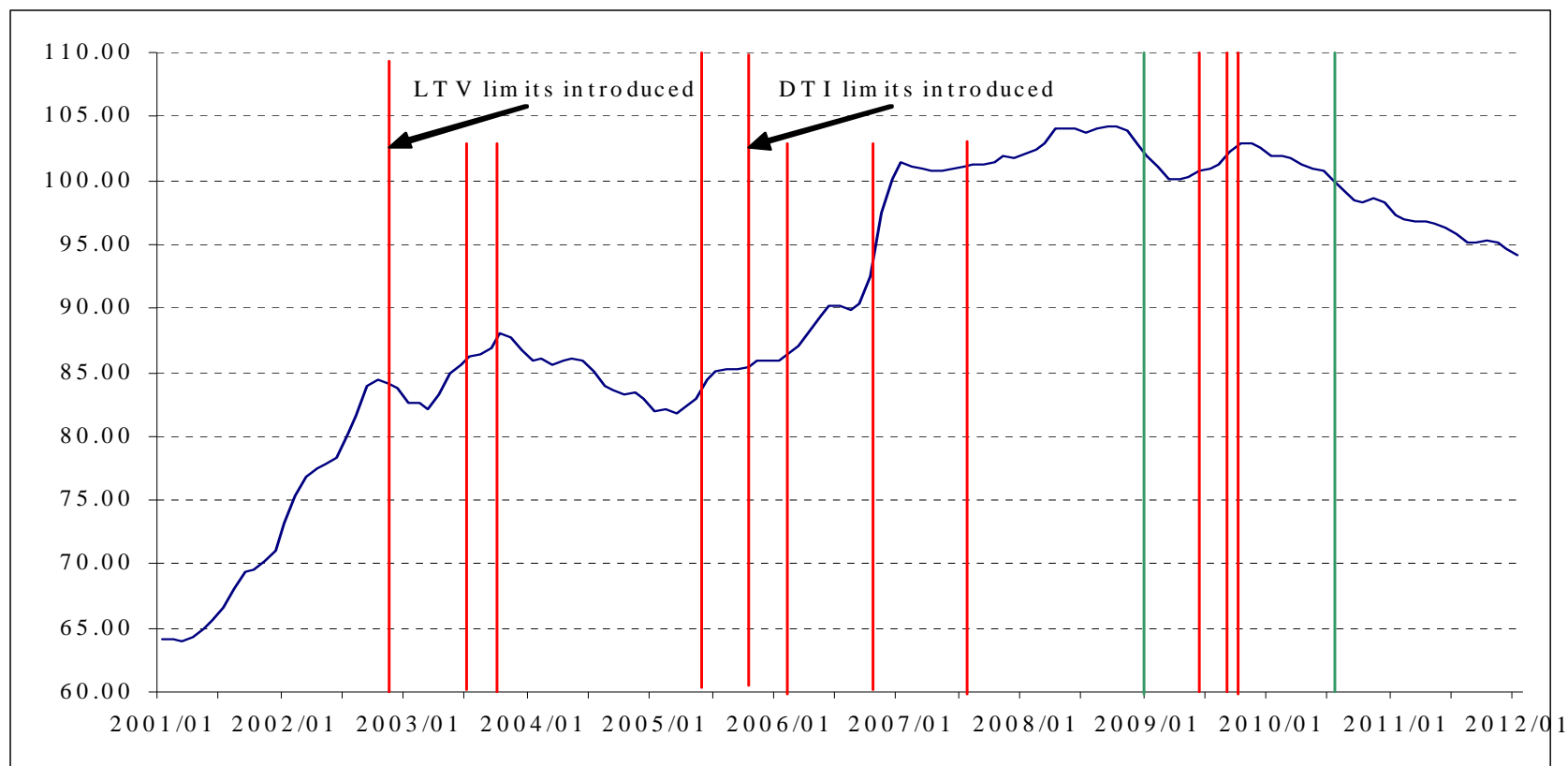
## Maximum loan-to-value (LTV) and debt-to-income (DTI) ratios

- Motivation:
  - Enhance the resilience of households (as well as the banks lending to them) to negative shocks
  - Lean against building imbalances (especially in the housing market)
- Cross country evidence (Duca et al (2010), Crowe et al (2011)):
  - LTV ratios affect house prices
  - 10pp increase in maximum LTVs increases house prices by 5-15%
- The Korean experience (Crowe et al (2011), Igan and Kang (2011)):
  - LTV limits introduced in September 2002, DTI limits in August 2005)
- LTV and DTI limits helped restrain the housing price boom (evidence from Igan and Kang (2011) and Crowe et al (2011))
  - Led to a slowdown in housing price inflation
  - LTV limits somewhat more effective than DTI limits
  - Some evidence that the policy worked by dampening expectations of future house price appreciation

# 4. Macro-prudential regulatory instruments

## Korean real house prices (All Dwellings, Seoul)

Source: Bank of Korea

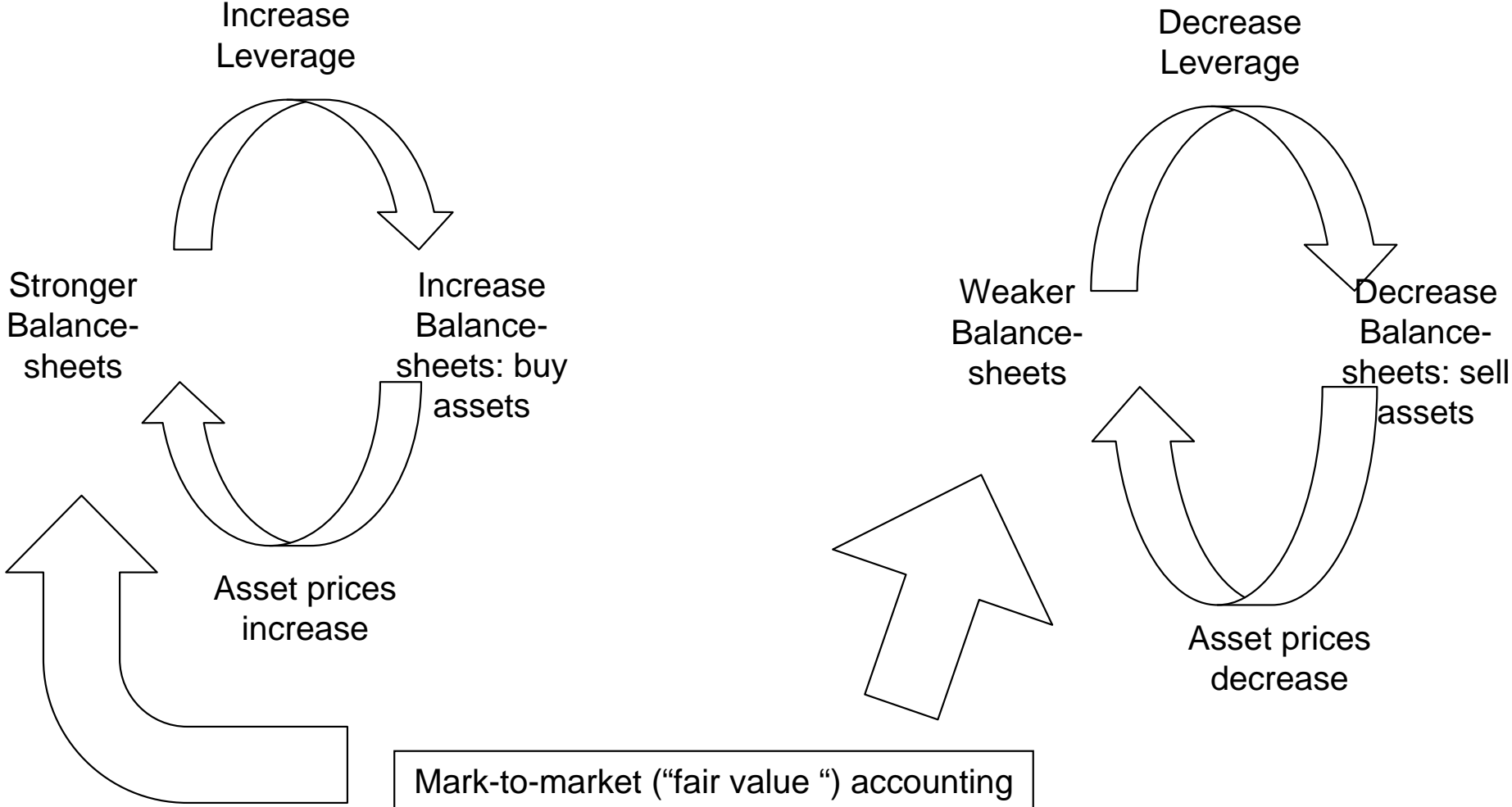


- Policy had to be adjusted several times in order to stop the boom
- 2 main reasons for the adjustments
  - Continued house price growth
  - Exploitation of policy loopholes by financial institutions



# 4. Macro-prudential regulatory instruments

## Macro-prudential regulation: The potential role of accounting and the leverage cycles



Source: Inspired by Adrian, T and H Song Shin (2007) "Liquidity and Leverage" NY FED Staff Reports n. 238 (revised in Dec 2010)

## 4. Macro-prudential regulatory instruments

### Macro-prudential regulation: The potential role of accounting

- **Lesson from the crisis**: Pro-cyclical bias of present accounting standards, providing misleading signals to market participants
  - **2 main channels**: 1) Pervasive use of fair value accounting and 2) delayed recognition of credit losses in the banking book
- **Possible remedies**: Forward-looking provisioning (FLP), Economic cycle reserve (ECR) and prudential adjustments (PA)

Instrument	ECR	PA	FLP
Aim	Fair value volatility	Fair value volatility	Delayed provisioning
Scope	Banking and trading books	Typically banking book only	Banking book only
Accounting impact	P/L impact (possibly)	Affects regulatory capital (“below the line”)	P/L impact

# 5. Conclusions I

- Financial instability is enormously disruptive to the real economy
- A new framework is in the making that adds a macroprudential layer to improved microprudential policies
- Two main objectives
  - Contain excessive risk and imbalances
  - Improve the resilience of the financial system to crisis
- Much progress on the macroprudential front:
  - A better analytical toolkit for systemic risk assessments
  - Regulatory progress under the Financial Stability Board/G20 agenda (including Basel III)
- Central bank at the centre of a successful macro-prudential policy
  - Analytical competence and understanding of systemic risk
  - Independence
  - Synergies with other tasks (e.g. payments system oversight, experience in crisis management)
  - Inter-dependence of monetary policy and financial stability

## 5. Conclusions II

- The understanding of the actual working of macro-prudential policy instruments needs to be much enhanced before more decisive steps can be done in introducing policy instruments that address and contain systemic risks directly. Better macro models including financial sector feedback and the relevant financial frictions ( banks and bond market, credit supply friction, leverage cycle, liquidity risks- see H.S.Shin (2012))
- There is more confidence in policy makers ability to increase resilience through buffers than in addressing and containing systemic risks upfront (e.g. lean against bubbles).
- The present specific instruments of macro-prudential policy seem weak to really justify a promise to significantly smooth the financial cycle. Stronger instruments and/or collaboration with other macro policies is needed, particularly monetary policy.
- Learning the lessons of the crisis: asymmetry creates moral hazard and price stability does not per se guarantee financial stability. Necessary courage to avoid refuge in neat Tinbergen instruments assignments.

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