Monetary Policy and Financial Stability

Course on Monetary and Exchange Rate Policy
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Outline

1. New Monetary Policy Framework

2. Financial Stability

3. Systemic Risk and the Macro-Prudential Perspective

4. Prudential Regulation and Supervision

5. Case Studies of Macro-Prudential Policies

6. Conclusion

New Monetary Policy Framework

Price Stability and Financial Stability

- Price stability does not guarantee financial stability;
- Policy rate is too broad to be cost effective;
- More-targeted policy tool is needed - macroprudential policy;
- Both need to take account of each other's objective;
- Policy coordination can improve outcomes;

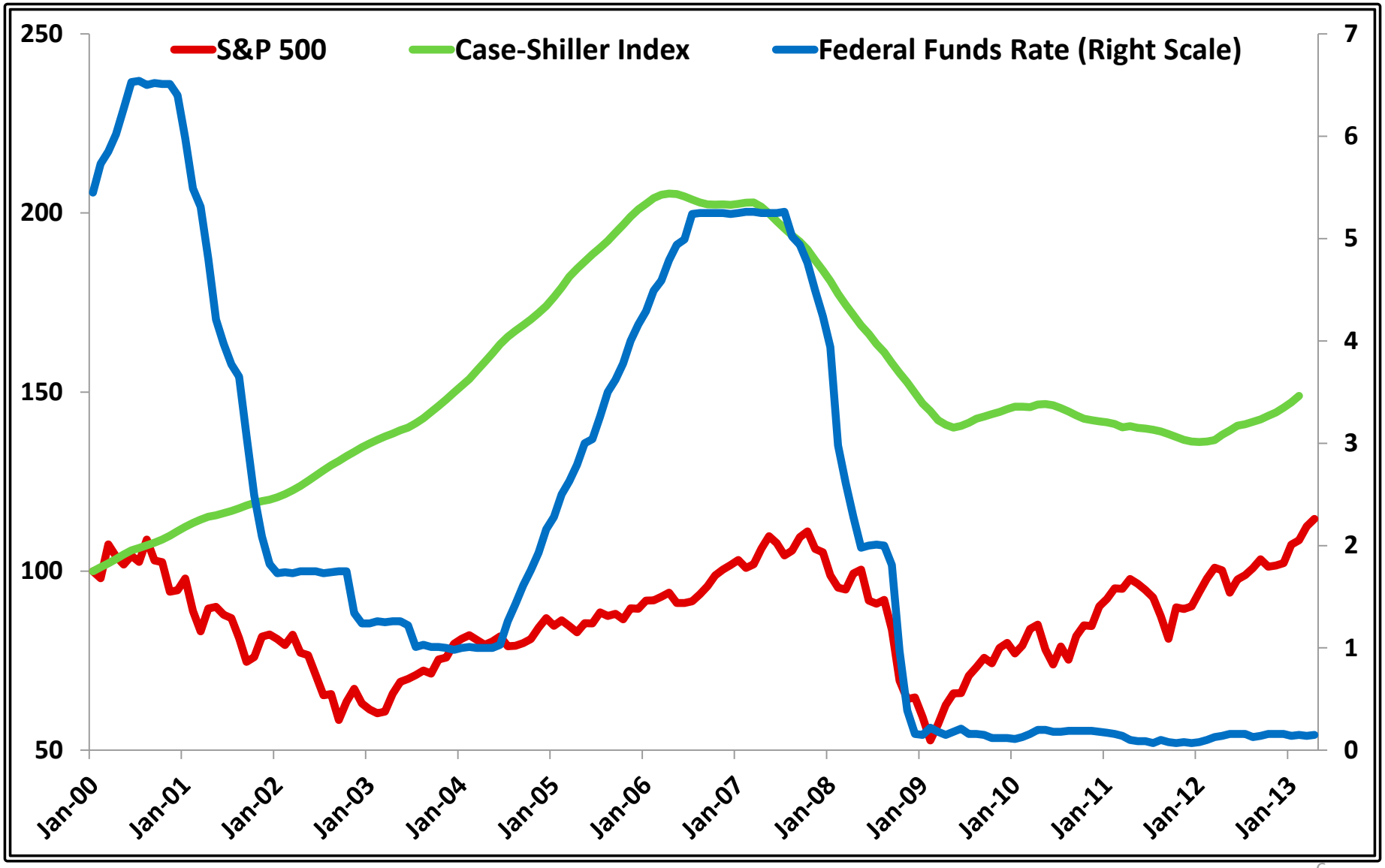
Asset Prices

- Argument: If the Central Banks had tightened monetary policy in the wake of sharply rising asset prices and credit growth between 2003–07, the bubble on equity and real estate markets would not arise and we would not be where we are today.

  – Should monetary policy respond to asset price booms?
  – If yes, than how?

Fed Funds Rate and Asset Prices

(Fed Funds in percent, S&P500 & Case-Shiller (2000 = 100))



Source: Federal Reserve Economic Data

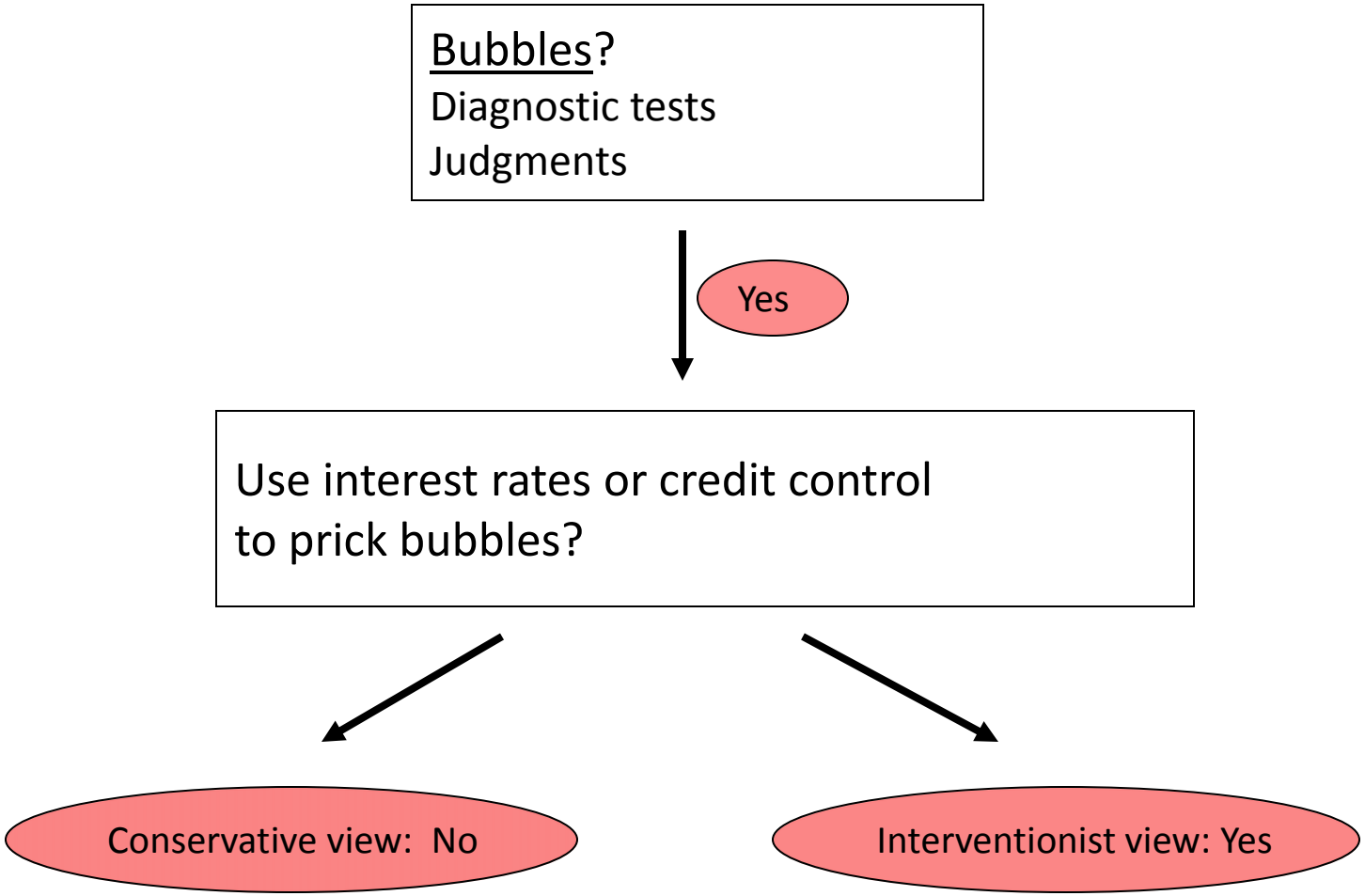
Interest Rate and Asset Price

- Globalization has made advanced and EM economies more susceptible to external shocks;
- As capital sloshes around, it can create its own burden on monetary policy;
- Too much focus on price stability and less on financial stability (e.g. asset market bubbles);
- Central banks cannot ignore asset bubbles;
- Financial stability mandate does exactly that;
- Was the proximate cause of the housing boom and bust in the US a result of loose monetary policy or weak regulation?

Interest Rate and Asset Price

- Lower interest rates increase the present value of future income flows (or the cost of finance for assets), and therefore asset prices;
- This may have no direct impact on inflation if asset prices are excluded from the CPI basket – but it will raise wealth which will affect aggregate demand;
- But there may be tensions: low interest rate may help keep banks profitable, but they may be inflationary;

Asset Price Bubbles and Monetary Policy



‘Leaning against the wind’(1)

- It may be difficult to measure whether asset prices are misaligned but that does not mean we completely ignore them:
  - Central banks consider output gap and CPI inflation – there are many problems in measuring output gap and forecasting future CPI inflation too;
  - Need to devise better ways of measuring misalignment;

‘Leaning against the wind’ (2)

- Some have called for including asset prices in CPI:
  - what weight should we give to asset prices;
  - equity prices are too volatile;

- It may still be beneficial to include housing prices – tend to be less volatile than equity and may have some information;

‘Cleaning up Afterwards’

- Difficult to identify bubble;
- Too blunt a weapon:
  - May require a very large size move in policy rate that may be detrimental to overall economy;
  - Counterview – maybe small changes in policy rate accompanied by successful communication may be beneficial;
- Impact of bubble bursting may not be too large;

EM Policy Issues

- Low cost of financing may be sowing the seeds of financial stability risks;
- Corporate and household leverage buildup needs to be monitored carefully including in FX;
- Potential deterioration of bank asset quality needs to be watched;
- Macroprudential measures including capital flow measures may need to be deployed if conventional monetary management does not prove to be sufficient to address financial imbalances;
- Implementation of macroprudential polcies will have to be carefully calibrated to the shifting stance of monetary and exchange rate polices;

Financial Stability

Transformation of Finance

Financial markets have undergone rapid transformations and expansions in recent years driven by:

- **Deregulation**
- **Innovation**
- **Globalization**

Frequent Financial Disruptions

- Currency crisis in Mexico (1994)
- Asian financial crisis (1997)
- LTCM collapse (1998)
- Argentina crisis (2000)
- The financial crisis (2007-11)

➢ **Importance of making financial stability an explicit economic policy objective.**

Functions of Financial Systems

- Payment system (some tend to see this function as uniquely important for banks, narrow banking)
- Credit intermediation (channeling savings into investments)
- Liquidity creation for non-financial sectors (maturity transformation)
- Deals with problems of asymmetric information ("delegated monitor", "informed risk taking)
- Providing means of hedging financial risk

What is Financial Stability?

Financial transactions are inter-temporal transactions:

- Finance embodies uncertainty and relies on trust.

  Trust is fragile and can be a source of potential financial instability:

  - doubts about trust can be transformed by the financial system into market and other financial risks.

A Definition of Financial Instability

Financial instability is a situation characterized by three basic criteria:

1) Important financial asset prices seem to have diverged sharply from fundamentals; and/or…

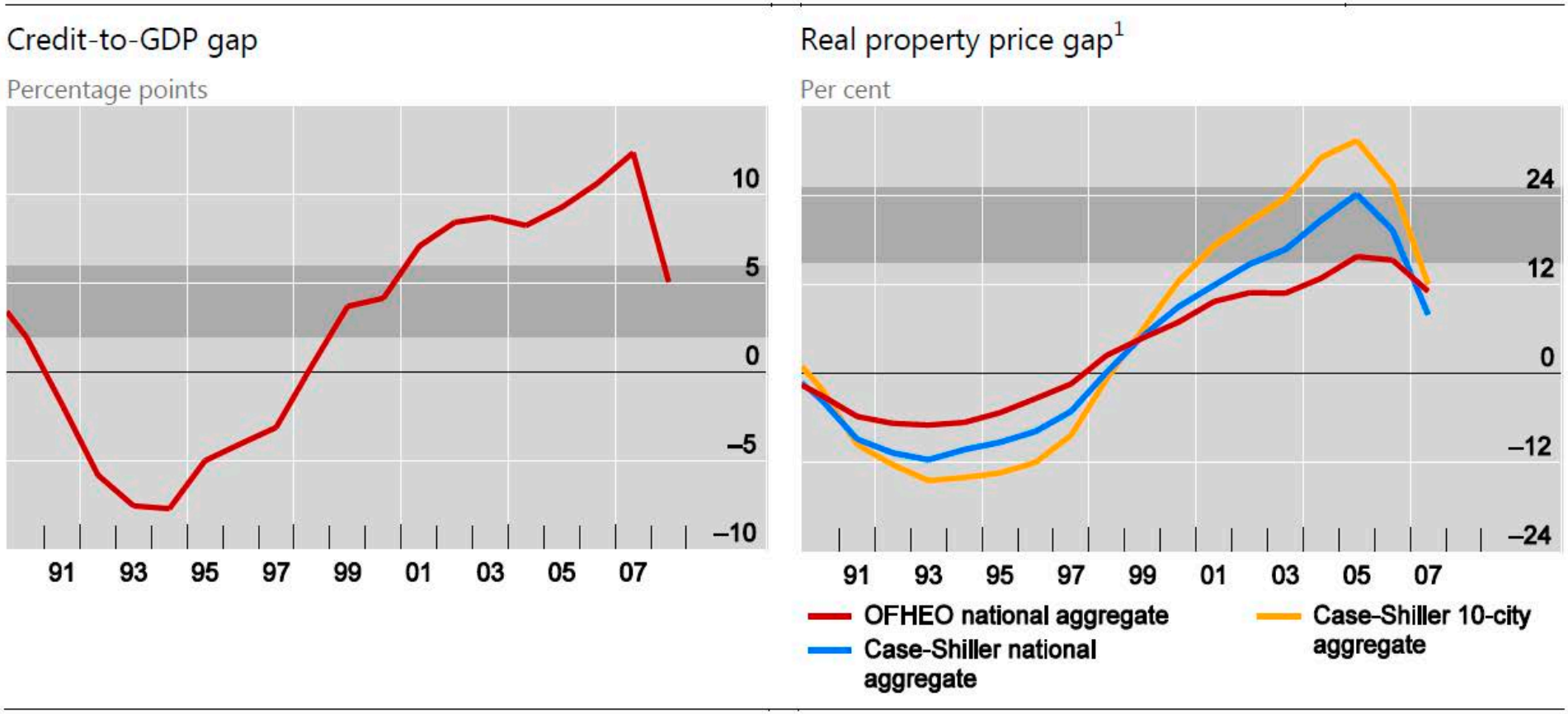
2) …Market functioning and credit availability have been significantly distorted, with the result that…

3) …Aggregate spending deviates (or is likely to deviate) significantly, either above or below, from the economy's ability to produce.

Source: Ferguson, Roger, 2002, Should Financial Stability Be an Explicit Central Bank Objective? (Washington: Federal Reserve Board)

Financial Stability Risk Indicators

Leading Indicators of Banking Crises: Credit and Property Price Gaps for U.S.



Note: The shaded areas refer to the threshold values for the indicators: 2–6 percentage points for credit-to-GDP gap; 15–25 percent for real property price gap. The estimates for 2008 are based on partial data (up to the third quarter). OFHEO stands for Office of Federal Housing Enterprise Oversight.

[1] Weighted average of residential and commercial property prices with weights corresponding to estimates of their share in overall property wealth. The legend refers to the residential property price component.

Source: Borio (2012).

Policy Challenge

1) **Maintaining**
   - the smooth functioning of the financial system and
   - its ability to facilitate and support the efficient performance of the economy;

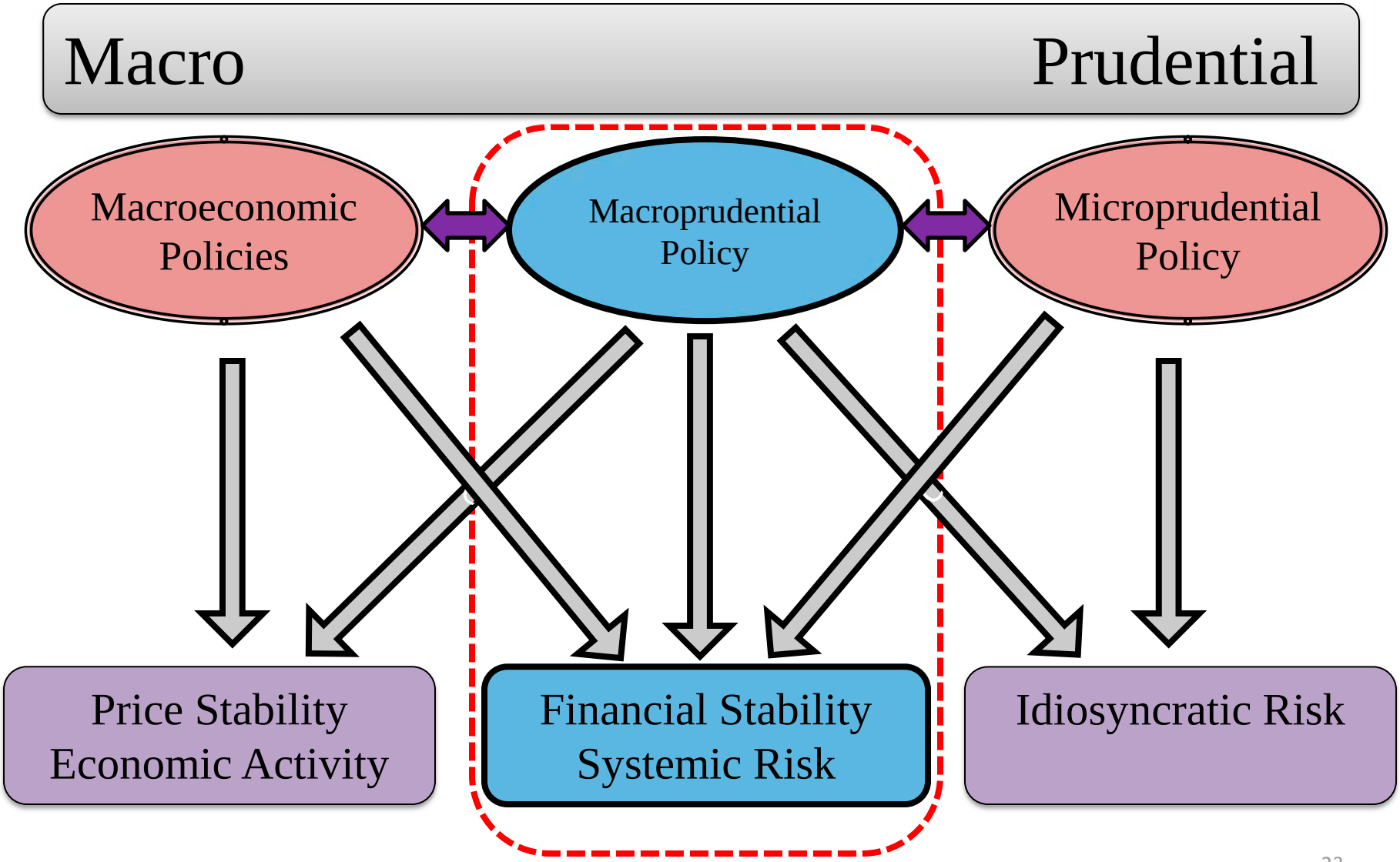
2) **Safeguarding**
   - resilience to adverse shocks and unraveling of imbalances;

3) **Preventing**
   - accumulation of large vulnerabilities and excessive risk taking;

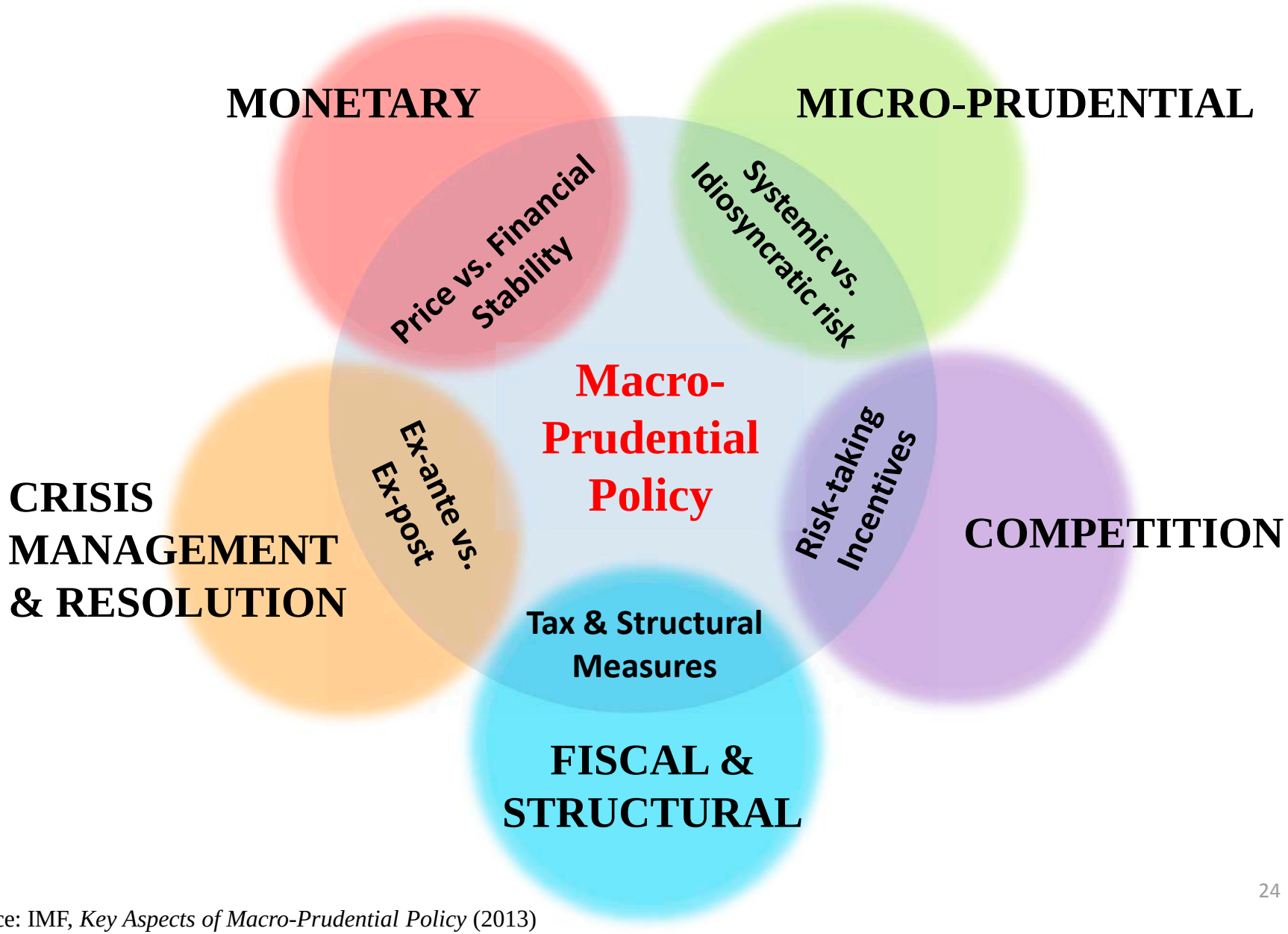
Systemic Risk and the Macro-Prudential Perspective

Policies and Objectives

How we see the world now



Financial Stability Framework and Macro-Prudential Policy



Source: IMF, *Key Aspects of Macro-Prudential Policy* (2013)

The Macro-Prudential Perspective

- **Macro-prudential**: approach in which prudential (regulatory and supervisory) arrangements are set based on a macroeconomic (system-wide) perspective, with the objective of limiting the risk of financial distress episodes and their costs

- **Two features**:
  - *Top-Down*: it first defines the desirable risk for the system as a whole, and then derives implications for individual institutions
  - *Systemic Risk is Endogenous*: it accounts for the fact that aggregate risk depends on the collective actions of individual institutions (concern about joint failure of institutions)
    - Collectively institutions can affect the prices of financial assets, leading to feedback effects

Table 1*

The macro- and microprudential perspectives compared

	Macroprudential	**Microprudential**
Proximate objective	Limit financial system-wide distress	Limit distress of individual institutions
Ultimate objective	Avoid output (GDP) costs linked to financial instability	Consumer (investor/depositor) protection
Characterisation of risk	Endogenous	Exogenous
Correlations and common exposures across institutions	Important	Irrelevant
Calibration of prudential controls	Contribution to system-wide risk; top-down	Risks of individual institution; bottom-up
Likelihood of failure of individual institutions	Maybe different	Same

* Based on Borio (2009). The two perspectives are intentionally stylised. They are intended to highlight two orientations that inevitably *coexist* in current prudential frameworks.

What is Systemic Risk?

- **Systemic risk:** the risk of financial disruptions that can destabilize the macro economy
- To limit systemic risk, we first need to identify it
- **What financial disruptions can destabilize the macroeconomy?**

  Difficult to define … but we know them when we see them
  - large number of financial institution failures;
  - failures of large institutions
  - breakdown in financial markets (such as money or interbank markets)

Dimensions of Systemic Risk

- **A) Time dimension**:
  (how aggregate risk evolves over time)
  - Pro-cyclicality and macro-financial linkages
  - Policy question: how to dampen the pro-cyclicality
- **B) Cross-section dimension**:
  (how risk is distributed in the system at a given point in time)
  - Common exposures across institutions
    - direct exposures to similar asset classes
    - indirect exposures through counter-party relationships
      Policy question: how to limit joint failures of institutions that represent a significant portion of the system

A) Time Dimension: Pro-Cyclicality and Its Sources

Pro-cyclicality: phenomenon of amplifying feedbacks within the financial system and between the financial system and the macro economy (macro-financial linkages)

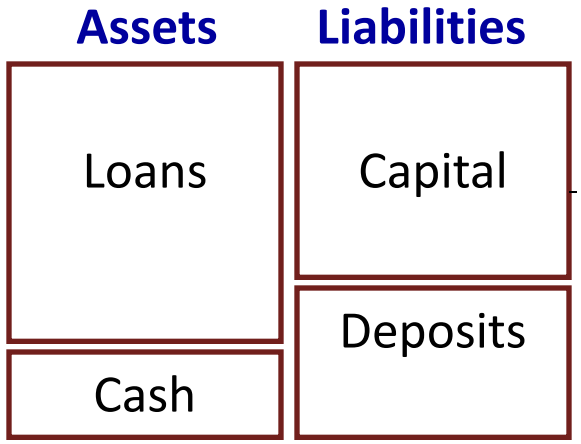
Sources:

- Asymmetric Information and Financial Acceleration
- Risk misperception due to agents' behavioral biases
- Risk mismanagement (e.g. flaws with VaR techniques)
- Asset bubbles
- Regulatory
- Accounting

Macro-prudential policies could limit pro-cyclicality but they cannot eliminate *all* the *sources* of pro-cyclicality (e.g. behavioral biases)

Regulatory Sources of Pro-cyclicality: Loan Write-offs and Binding Capital Requirements

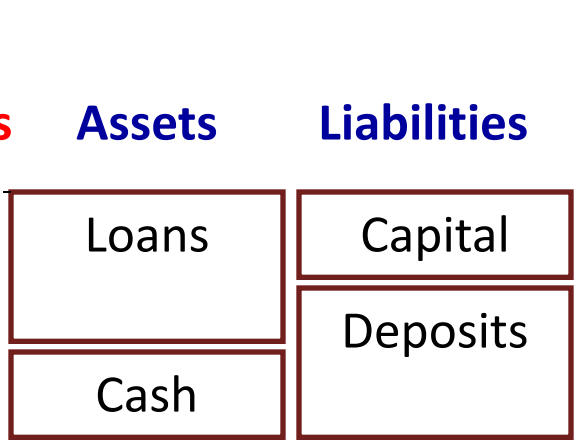
- **Bank's initial balance sheet:**



CAR > 0.08

- **Effects of recession:**

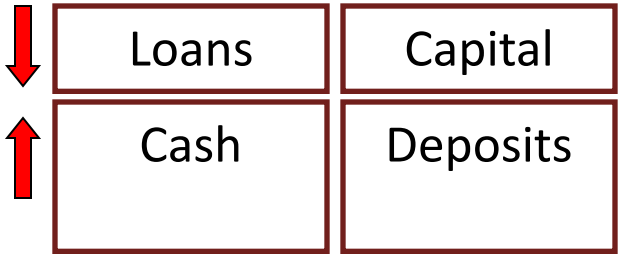
Loan write-offs



CAR < 0.08

- **To satisfy the capital requirement ... further loan reductions**

$$\uparrow \text{CAR} = \frac{\text{Capital}}{\text{Risk-weighted assets}} \downarrow$$



CAR = 0.08

- **Amplification of the credit crunch and the recession**

Prudential Regulation and Supervision

From Basel I to Basel III

Basel I

- **Capital adequacy framework :**
  - Credit risk
    - Fixed risk weights
  - Market risk
  - Definition of capital

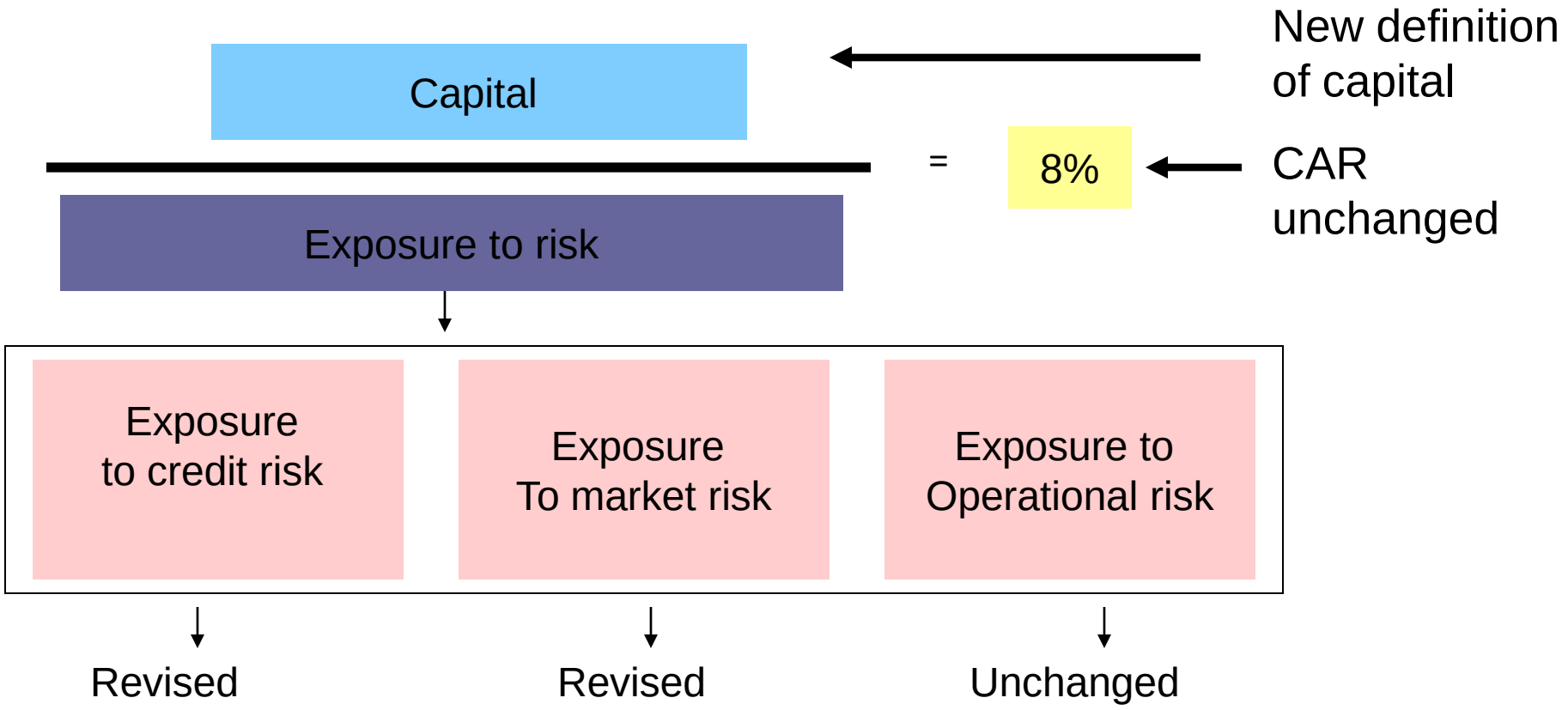
Basel II

- **Capital adequacy framework:**
  - Credit risk
  - Market risk
  - Operational risk
- Menu of more risk-sensitive approaches
- Supervisory review process
- Disclosure requirements

Basel III

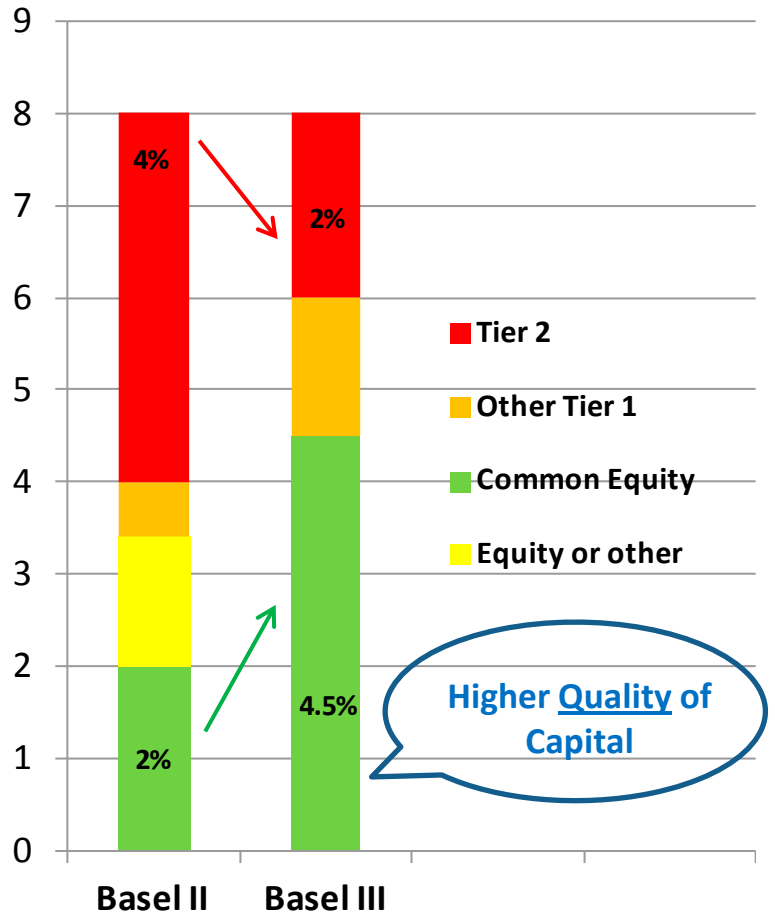
- **Capital adequacy framework:**
  - Better capital base
  - Improved risk coverage (market risk, counterparty credit risk, credit rating agencies)
  - Leverage ratio
  - Reducing pro-cyclicality
  - Dealing with SIFIs
- **New Liquidity framework:**
  - Short-term ratio (LCR)
  - Longer-term ratio (NSFR)

Basel III – Pillar 1 Changes



Raising Quality, Consistency and Transparency of Capital

- Definition of capital (numerator) strengthened
- Deductions from capital harmonized
- Quality of Tier 1 and Tier 2 enhanced
- Tier 3 eliminated
- New ratios with greater focus on higher quality capital:
  - 4.5% common equity/RWAs
  - 6 % Tier 1 capital/RWAs
- Total capital/RWA unchanged (8.0%)



Basel III: Macro Prudential View

Reducing procyclicality and promoting countercyclical buffers

Forward-looking provisioning	• BCBS presented proposal on expected loss (EL) provisioning to the IASB (June 2010) • Deduct excess of EL over provisioning from Tier 1 • Stronger disclosure
Mitigating cyclicality of the minimum	• Need to adjust for the compression of PD estimates in good times (e.g., using PD estimates in downturn conditions) • BCBS will issue supervisory guidance to assess adequacy of capital buffers
Capital conservation buffer	• Target buffer of 2.5% of RWA above the minimum by 1/1/2019 • Profit retention requirements increase at capital levels close to the minimum (e.g., in cycle trough) and decrease at higher levels (e.g., at cycle peaks) • Can have a countercyclical effect
Countercyclical capital buffer	• Would act by expanding the conservation buffer based on an indicator of excessive credit growth • Calibration: 0%-2.5% of RWA

Macro-Prudential Indicators

Capturing the financial cycle: some useful indicators

Macroeconomic indicators	Broad credit aggregates Measures of debt sustainability (debt to income, debt service ratio)
Banking sector indicators	Stress tests, bank risk metrics Leverage ratios Maturity and currency mismatch Indicators of funding vulnerabilities Profits and losses
Market-based indicators	Asset valuations in equity and property markets Corporate bond and CDS spreads and risk premia Margins and haircuts Lending spreads
Qualitative information	Underwriting standards Asset quality Credit conditions

Macro-Prudential Indicators

Potential indicators to signal systemic crises

Market-based indicators	Liquidity conditions in money markets Credit and CDS spreads Market risk premia and systemic risk measures Margins and haircuts
Banking sector indicators	Stress tests, risk metrics Profitability Losses Lending standards

Macro-Prudential Policy Instruments

Policy instrument	Potential indicators
Capital-based instruments	
Countercyclical capital buffers[1]	Measures of the aggregate credit cycle
Dynamic provisions[1]	Bank-specific credit growth and specific provisions (current and historical average)
Sectoral capital requirements	Measures of the price and quantity of different credit aggregates (stock and new loans) on a sectoral basis: interbank credit, OFIs, non-financial corporate sector and households Measures of sectoral concentrations Distribution of borrowing within and across sectors Real estate prices (commercial and residential, old and newly developed properties) Price-to-rent ratios

Macro-Prudential Policy Instruments

Liquidity-based instruments	
Countercyclical liquidity requirements	LCR and NSFR Liquid assets to total assets or short-term liabilities Loans and other long-term assets to long-term funding Loan-to-deposit ratios Libor-OIS spreads Lending spreads
Margins and haircuts in markets	Margins and haircuts Bid-ask spreads Liquidity premia Shadow banking leverage and valuation Market depth measures
Asset-side instruments	
LTVs and DTIs	Real estate prices (commercial and residential, old and newly developed properties) Price-to-rent ratios Mortgage credit growth Underwriting standards Indicators related to household vulnerabilities Indicators of cash-out refinancing

Macro-Prudential Indicators

Potential indicators to measure risks in the household sector

Credit variables
Credit-to-GDP gap: deviation from a long-term trend (Basel III reference indicator)
Household credit-to-GDP: deviation from a long-term trend[1]
Annual growth rate in real household credit: deviation from a 15-year rolling average
Aggregate debt service ratio: deviation from a 15-year rolling average
Residential property market indicators
Annual growth rate in real residential property prices: deviation from a 15-year rolling average
Residential property prices over rents: deviation from a long-term trend[1]

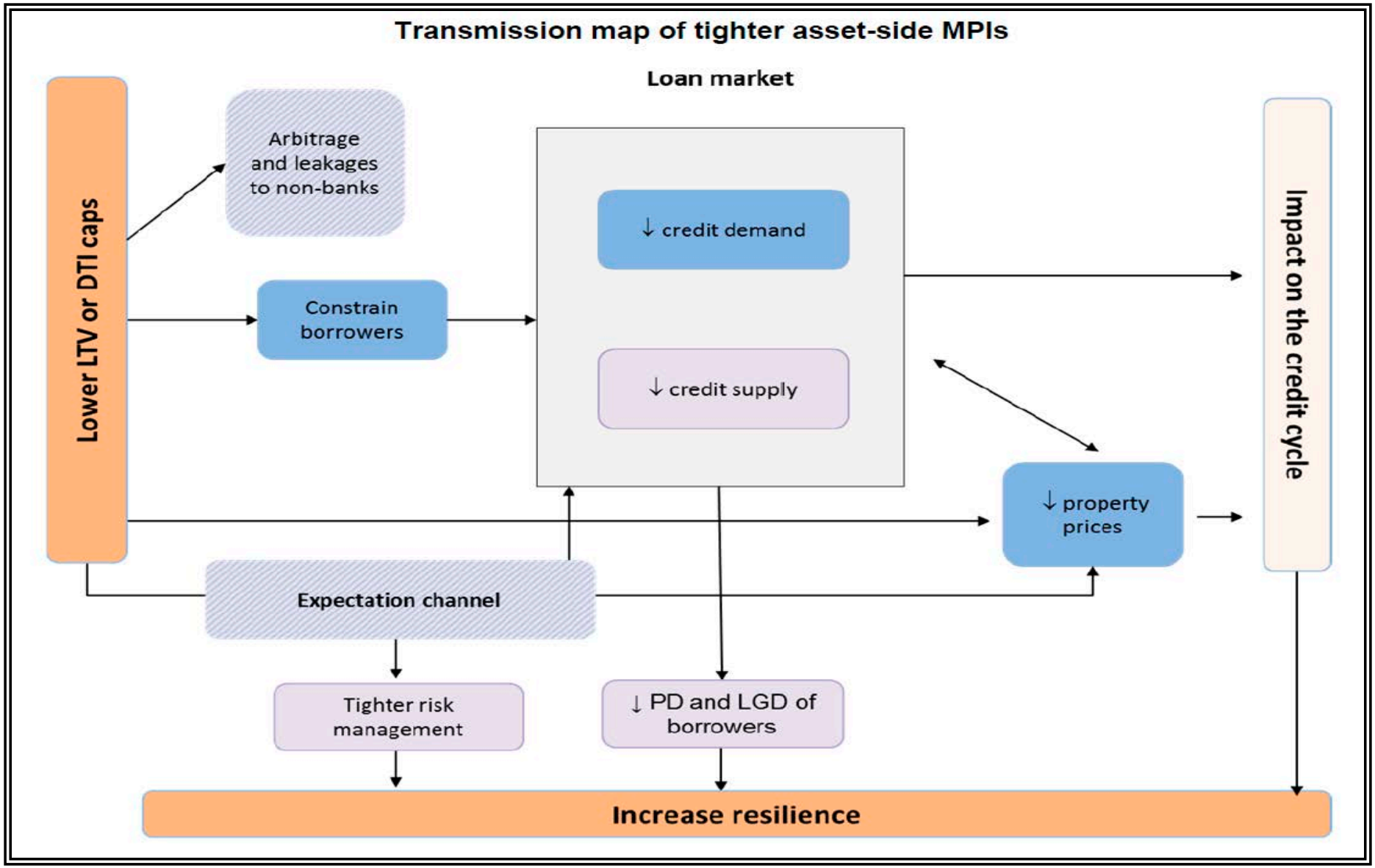
[1] Long-term trends are calculated as for the credit-to-GDP gap under Basel III (Basel Committee (2010b)).

Macro-Prudential Indicators

Potential questions to provide qualitative information about the build-up of vulnerabilities

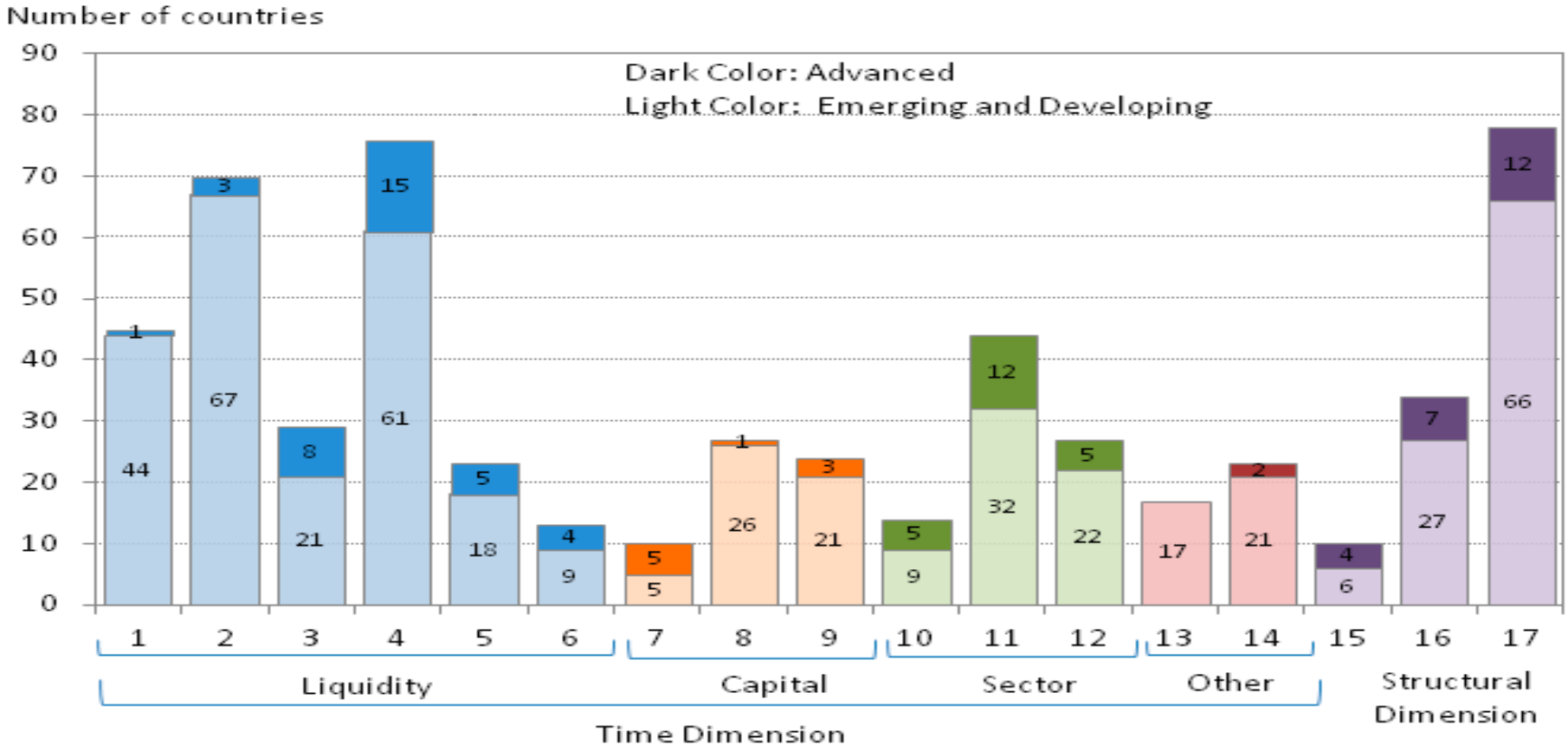
Are there signs of speculative behaviour?
Are particular asset classes heavily advertised or discussed in the media?
Are banks taking large positions where profits continuously exceed measured risks?
Are there relatively new products with large market shares, and have they been increasing rapidly?
Are lending standards falling?
Are profit margins decreasing?
Is competition increasing from the shadow banking sector?

Transmission of MPP Measures on the Asset Side



Source: CGFS, December 2012.

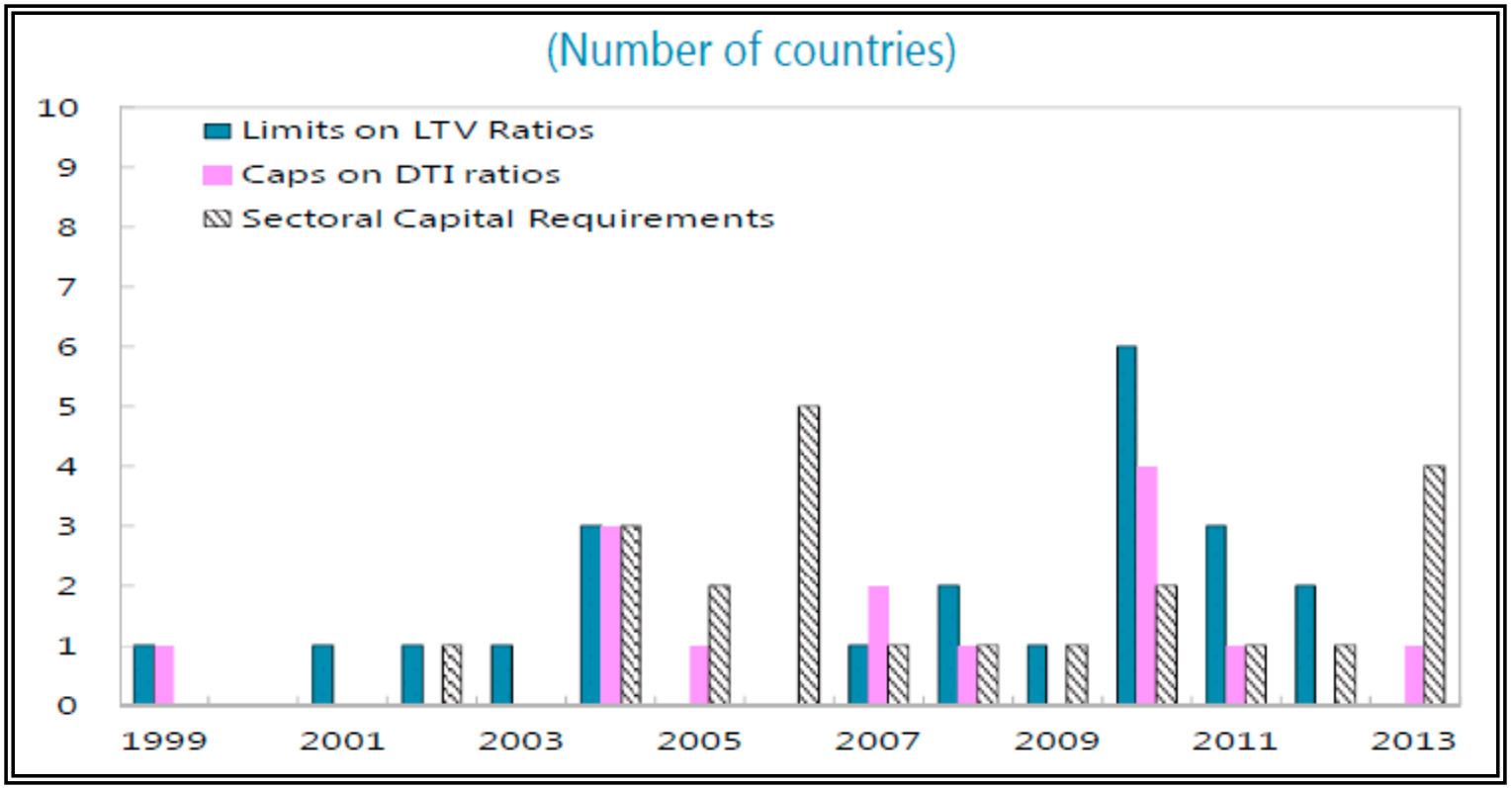
Overview of Current Use of Instruments Globally



Instruments: 1) Reserve Requirement Ratios, 2) Limits on Open FX Positions or Currency Mismatches, 3) Levy/Tax on Financial Institutions, 4) Liquidity Requirements/Buffers, 5) Loan-to-Deposit (LTD) ratio, 6) Margins/Haircuts on Collateralized Financial Market Transactions, 7) General Countercyclical Capital Buffer/Requirement, 8) Time-Varying/Dynamic Loan-Loss Provisioning, 9) Leverage Ratio, 10) Sector Specific Capital Buffer/Requirement, 11) Loan-to-Value (LTV) Ratio, 12) Debt-to-Income (DTI) Ratio, 13) Limits on Domestic Currency Loans, 14) Limits on Foreign Currency Loans, 15)Capital Surcharge on SIFI, 16) Limits on Interbank Exposures ,and 17) Concentration Limits.

Implementation of MPP (1)

	Limits on LTV Ratio	Caps on DTI Ratio	Limits on LTV and DTI ratios	Sectoral Capital Requirements	One tool	Any two tools	All three tools
Number of Countries (Total = 46)	24 (52 percent)	14 (30 percent)	14 (30 percent)	23 (50 percent)	36 (78 percent)	18 (39 percent)	7 (15 percent)



Asian Experience with Macro-Prudential Tools

Objective	Tools	Examples
Manage Pro-cyclicality	Countercyclical provisioning	China; India
	Loan-to-value ratios	China; Hong Kong SAR; Indonesia; Japan; **Korea**; **Malaysia**; Philippines; Singapore; Thailand
	Debt-service-to-income ratios	China; Hong Kong SAR; **Korea**
	Tighter lending criteria	China; Hong Kong SAR; **Korea**; **Malaysia**; Philippines; Singapore; Thailand
	Credit limits	China; Hong Kong SAR; India
	Tighter supervision	China; Hong Kong SAR; India; **Korea**; **Malaysia**; Singapore
	Capital requirements	India; **Malaysia**
	Exposure limits on lending to specific sectors	**Korea**; **Malaysia**; Philippines; Singapore

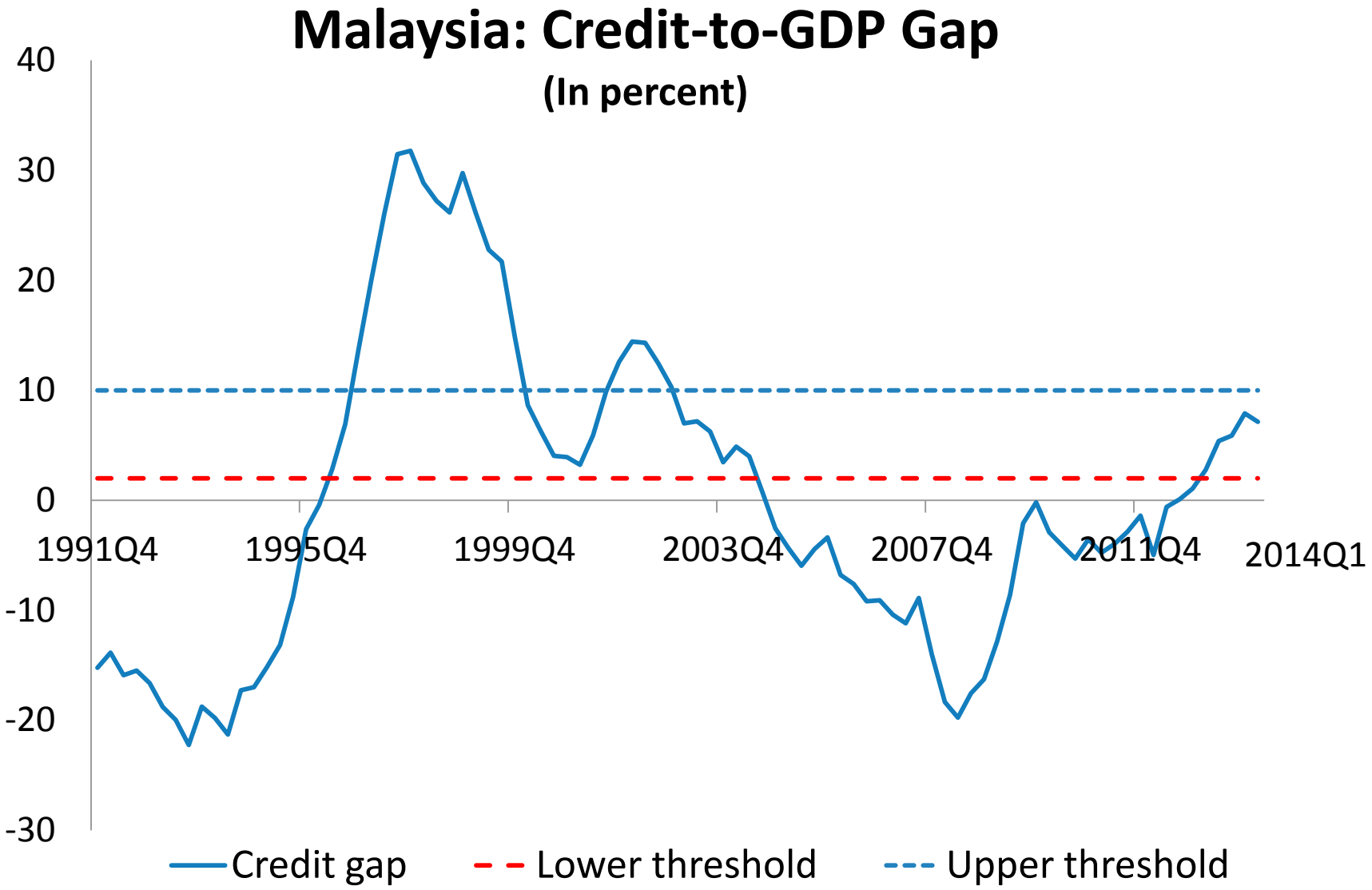
Source*: Morgan (2013)*

Asian Experience with Macro-Prudential Tools

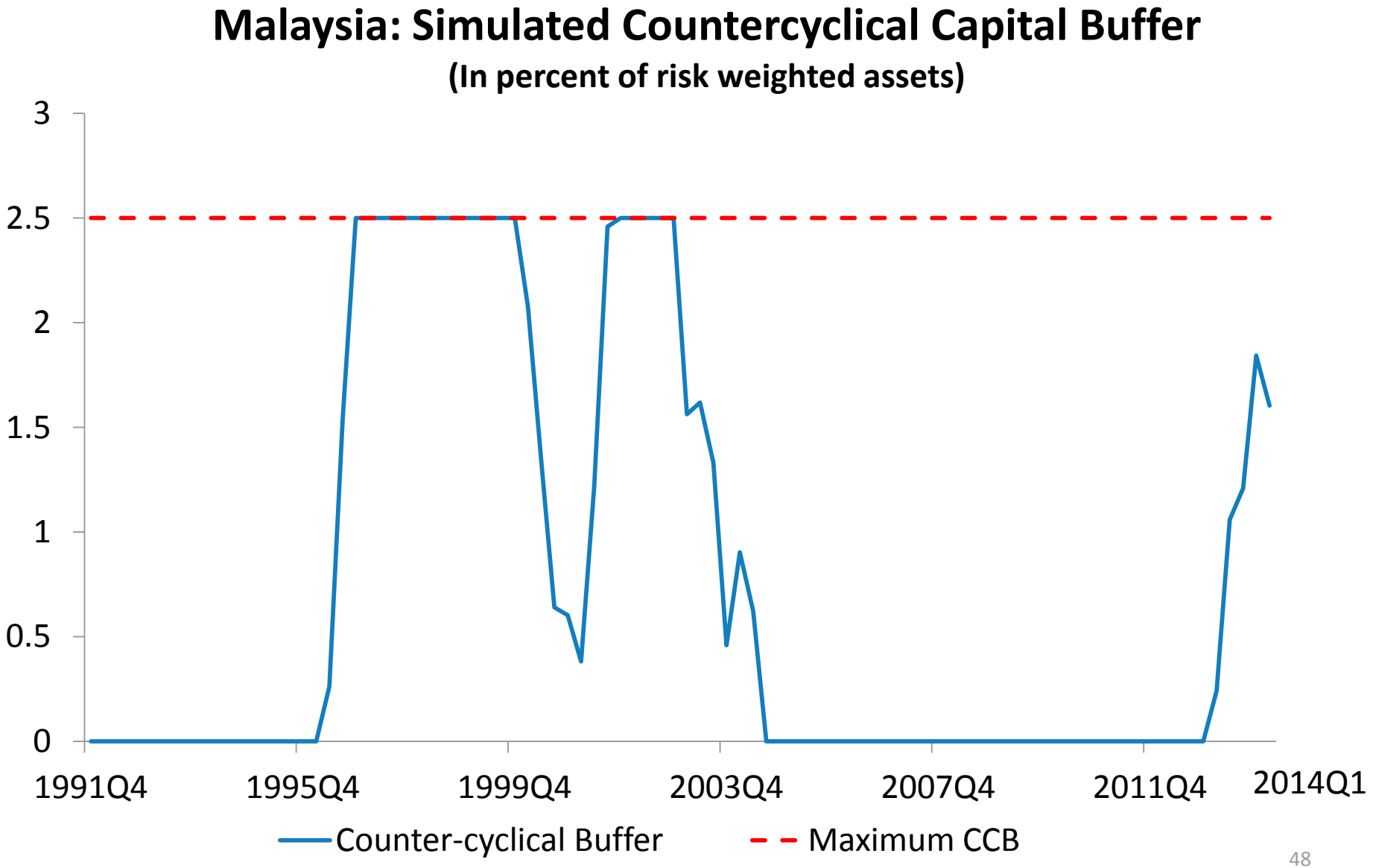
Objective	Tools	Examples
Manage Systemic Risk	Capital surcharges for systemically important banks	China; India; Philippines; Singapore
	Liquidity and funding requirements	China; India; **Korea**; **Malaysia**; Philippines; Singapore; Thailand
	Loan-to-deposit requirements	China; **Korea**
	FX exposure limits	**Korea**; Philippines
	Limits on currency mismatches	India; **Malaysia**; Philippines

Source*: Morgan (2013)*

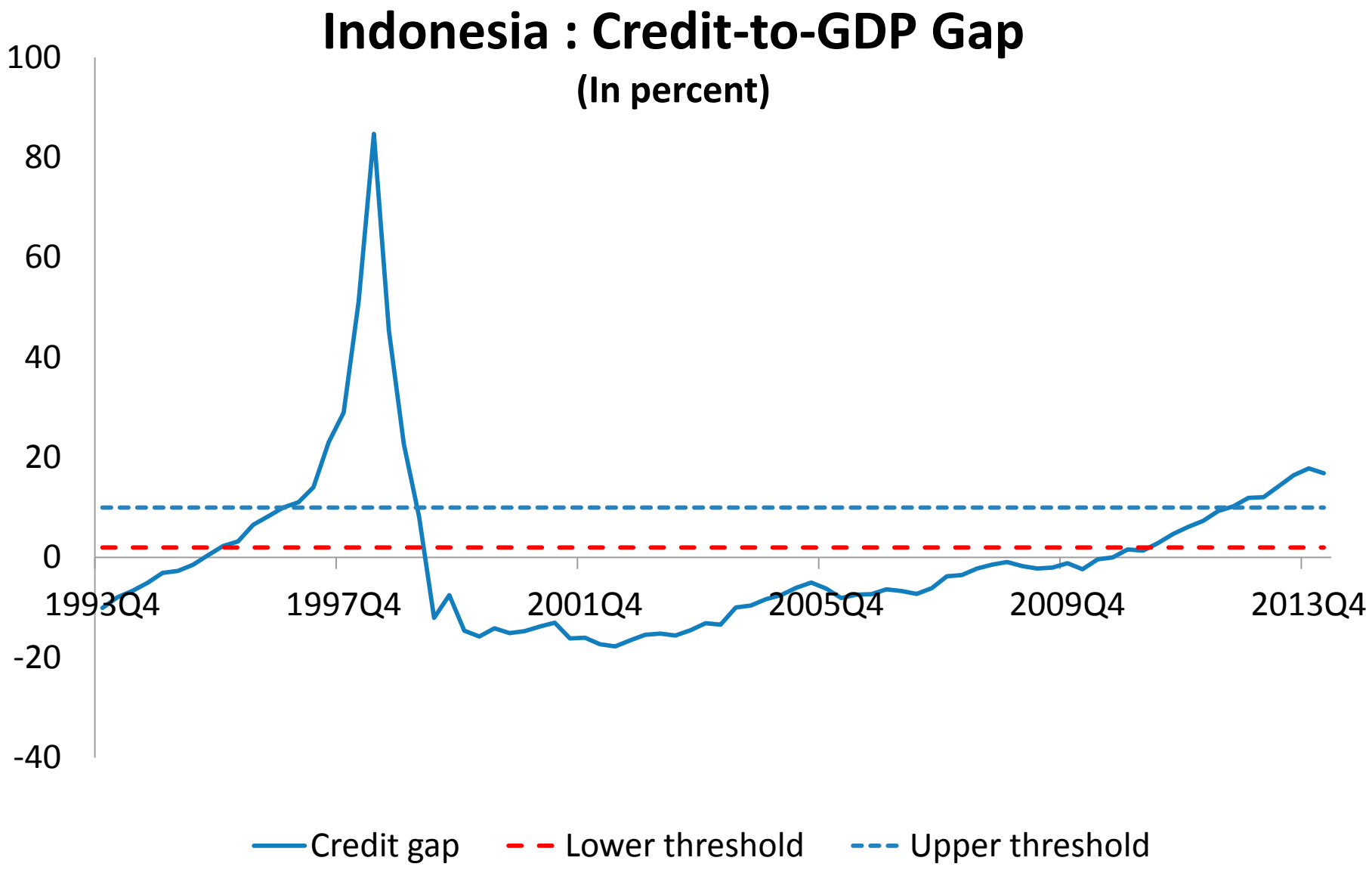
Counter-Cyclical Buffer: Case of Malaysia (1)



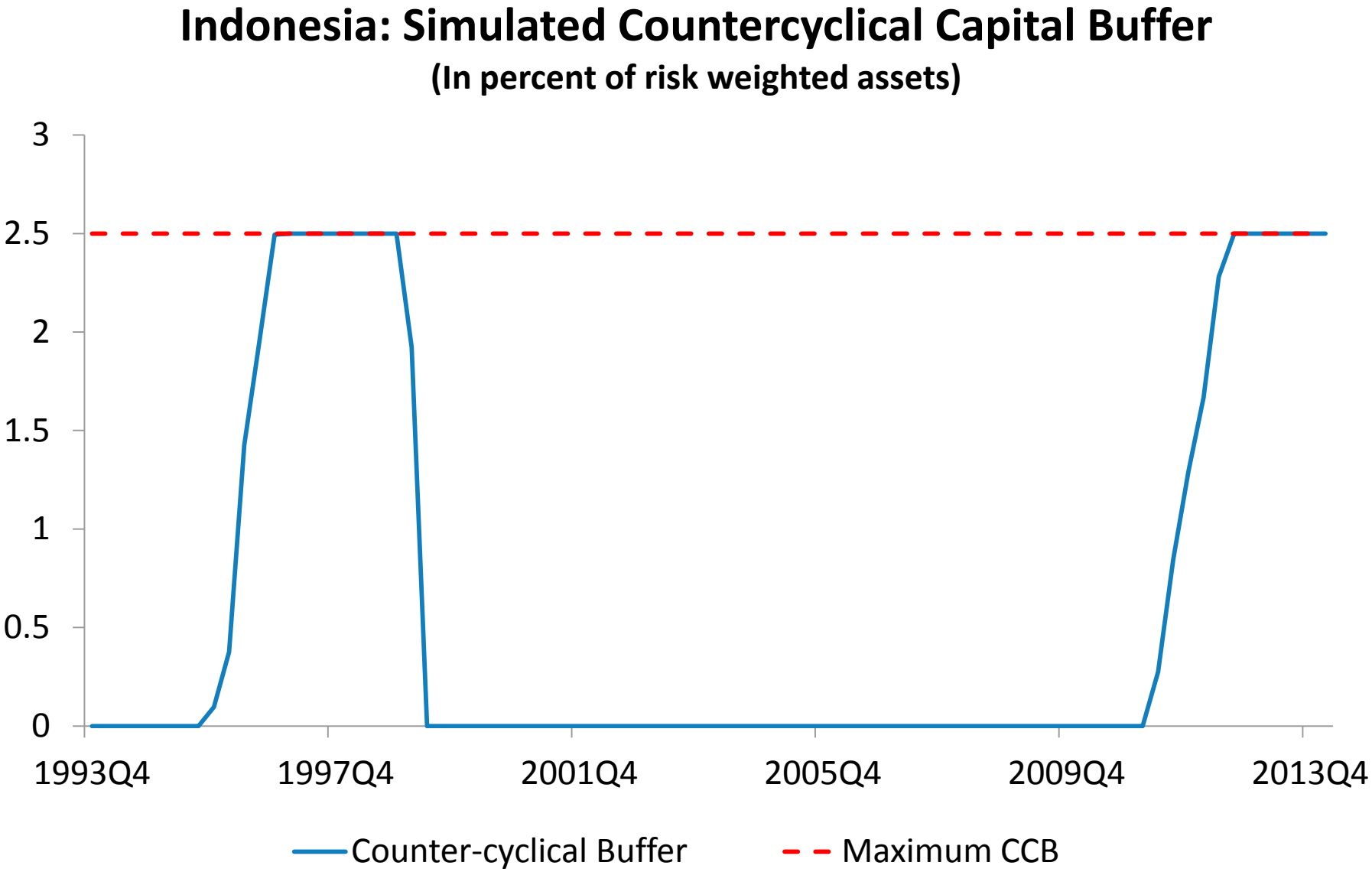
Counter-Cyclical Buffer: Case of Malaysia (2)



Counter-Cyclical Buffer: Case of Indonesia (1)



Counter-Cyclical Buffer: Case of Indonesia (2)



Leakages and Arbitrage in Implementing MPP

- Part of the tightening of a capital-based MPI may become ineffective, if banks, for example, reduce any voluntary buffers one-for-one;
- Some of the reduction in bank credit will also be taken up by non-bank intermediaries or internationally active banks that are not subject to the MPI;
- Large borrowers in developed markets, for example, may be able to substitute bank credit with the issuance of bonds and similar instruments;
- Cross-border sources of finance, in turn, can be tapped quite easily by all borrowers, including households;
- Banks may also try to dampen the impact of policy changes by gaming internal models to generate lower risk-weighted assets.

Central Bank vs. Macro-Prudential Council

	Advantages of Central Bank	Advantages of Council / Committee
Multiple tools: Monetary-Macro-Prudential interaction	Coordination of monetary and macro-prudential instruments	Preventing conflicts of interest; Joint "ownership" of policies
Communication	Coherence: one voice to the outside world	Involvement implies inter-agency conflict less likely
Information & Analysis	Flow of "soft" information, if generated in house	Diversity of views: preventing "group-think"
Speed of action	Greater decision speed	Faster implementation, if many of the tools are outside central bank

Case Studies of MPP

Vietnam: Financial Stability Risks (2010-2013)

Risk Category	Sources
Foreign currency exposure risks	Dollarization, currency mismatch
Credit risk	Dollarization, high credit growth, interest rate volatility
Excessive leverage risk	Bank-dominant financial sys., high credit growth
Liquidity risk	Maturity mismatch, Lack of confidence
Asset price risk	Real-estate loans, stocks related loans

Source: Do Quoc Tho Nguyen , State Bank of Vietnam.

Vietnam: MaPP (2010-2013)

Measures	Target
Limit open FX position	Address currency mismatch
Interest rate caps on foreign currency denominated deposit	Address currency mismatch
Limit foreign currency loans	Address currency mismatch, slow down system-wide credit growth
Limit credit growth in line with FIs' soundness	Slow down system-wide credit growth; avoid excessive leverage ratio; strengthen the resilience of financial system
Interest rate caps on VND denominated deposit	Mitigate high risk-taking mentality, reduce the interest rate volatility
Limit credit-to-fund mobilization	Slow down system-wide credit growth; avoid excessive leverage ratio; mitigate liquidity distress
Limit credit to high vulnerable sectors (mainly property credit, consumption credit, stock-related credit)	Slow down credit growth; asset bubble
Limit stock-related-loan outstanding to FIs' own capital	Reduce risk associated with stocks market bubble

Source: Do Quoc Tho Nguyen , State Bank of Vietnam.

Vietnam: Mapp (2010-2013)

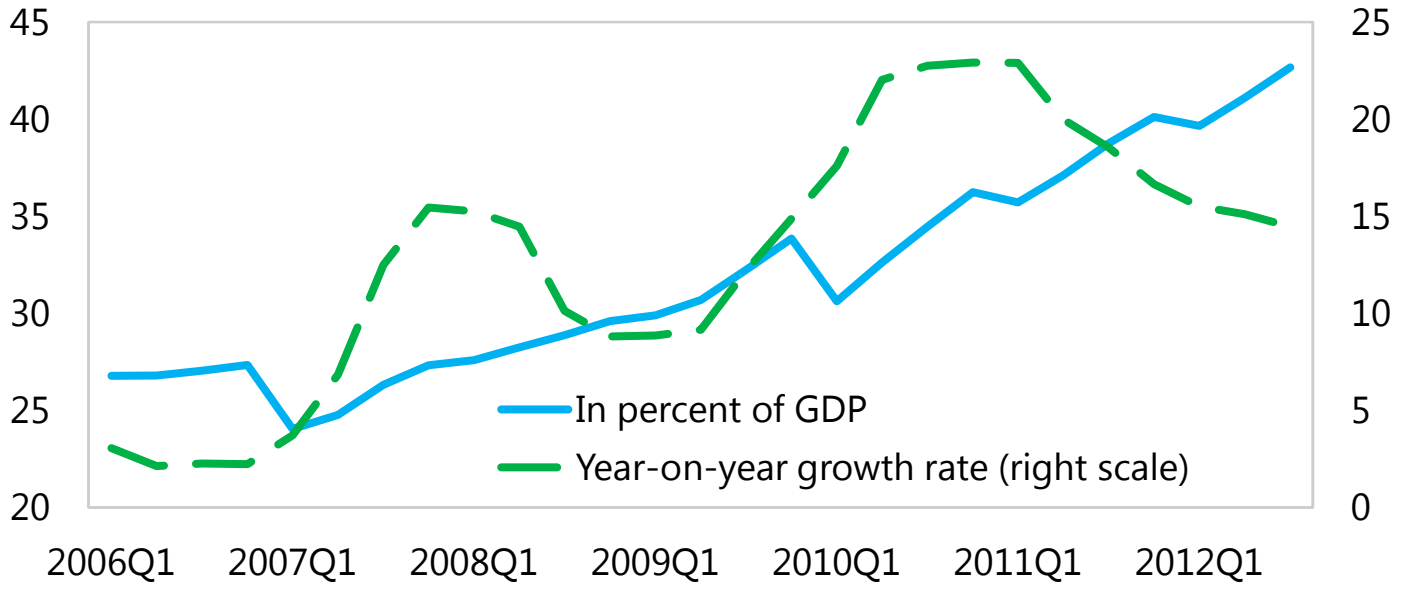
Measures	Target
Monetary policy	
Reserve requirement	Curb credit growth
Repo transactions	Liquidity management
Refinancing facilities	Liquidity management
Intervene on FX market	Stabilize exchange rate; limit currency mismatch
Capital control	Limit currency mismatch
Microprudential policy	Strengthen the soundness of individual FIs
Re(structural) policies (M&A, Bridge Bank, Open Bank Assistance, etc)	Strengthen the soundness of the system

Source: Do Quoc Tho Nguyen , State Bank of Vietnam.

Singapore: Interactions between Monetary Policy, Interest Rates and Real Asset Prices

Record-low interest rates have fueled high credit growth rates, particularly for housing.

Bank Mortgage Loans



Sources: CEIC Data Company Ltd.

Singapore: Measures to Cool the Property Market

Date	Measure
September 2009	The *interest absorption scheme* (allowing some deferment of principal payments) and interest-only housing loans for private residential projects were disallowed
February 2010	*Loan-to-value (LtV)* ceilings were lowered to 80 percent from 90 percent for all housing loans provided by banks (including for HDB flats).
	A *seller's stamp duty (SSD)* was introduced on private residential properties sold within one year of purchase at the rate of 1 percent for the first S$180,000, 2 percent for the next S$180,000, and 3 percent for the remaining balance.
August 2010	*LtV ceilings* were reduced from 80 percent to 70 percent for buyers with at least one existing mortgaged property.
	The SSD was extended to sales within three years of purchase, with rates depending on the holding period (3 percent if sold within one year of purchase, 2 percent within the 2nd year after purchase, and 1 percent within the 3rd year after purchase).
	For buyers with at least one existing mortgaged property, the minimum cash down *payment (not sourced from pension fund savings)* was increased from 5 percent to 10 percent of the purchase price.
January 2011	The *SSD* was extended to sales within four years of purchase, with the rates raised to 16 percent, 12 percent, 8 percent, and 4 percent correspondingly.
	LtV ceilings were lowered to 60 percent for individuals with at least one existing mortgaged property and to 50 percent for corporates.
December 2011	*An additional buyer's stamp duty (ABSD)* on residential property purchases was imposed (in addition to the existing duty of up to 3 percent). The rate is 10 percent for foreigners and corporate entities buying any residential property, 3 percent for permanent residents buying their second or subsequent property or for Singapore citizens buying their third or subsequent property.
October 2012	The *maximum tenure of all new residential property loans* (including refinancing loans) was capped at 35 years for both private properties and public housing flats. If loans exceed 30 years tenure or if the loan period extends beyond the retirement age of 65 years, the LtV limit was lowered to 40 percent for a borrower with one or more outstanding residential proper loans and 60 percent for a borrower with no outstanding residential property loan. LtV limits for residential property loans to non-individual borrowers were also reduced from 50 percent to 40 percent.
January 2013	*ABSD* rates were raised between 5 and 7 percentage points across the board, and imposed on permanents residents purchasing their first residential property and on Singaporeans purchasing their second residential property. LtV limits on housing loans were tightened for individuals who already have at least one outstanding loan, as well as for companies. *Minimum cash down payment* for individuals applying for a second or subsequent housing loan were raised from 10 to 25 percent. Caps on *mortgage service to gross income ratios* were tightened for public housing loans. A SSD was introduced on the sale of industrial properties
2009-present	*Supply of public housing and land* sold to private developers has been increased.

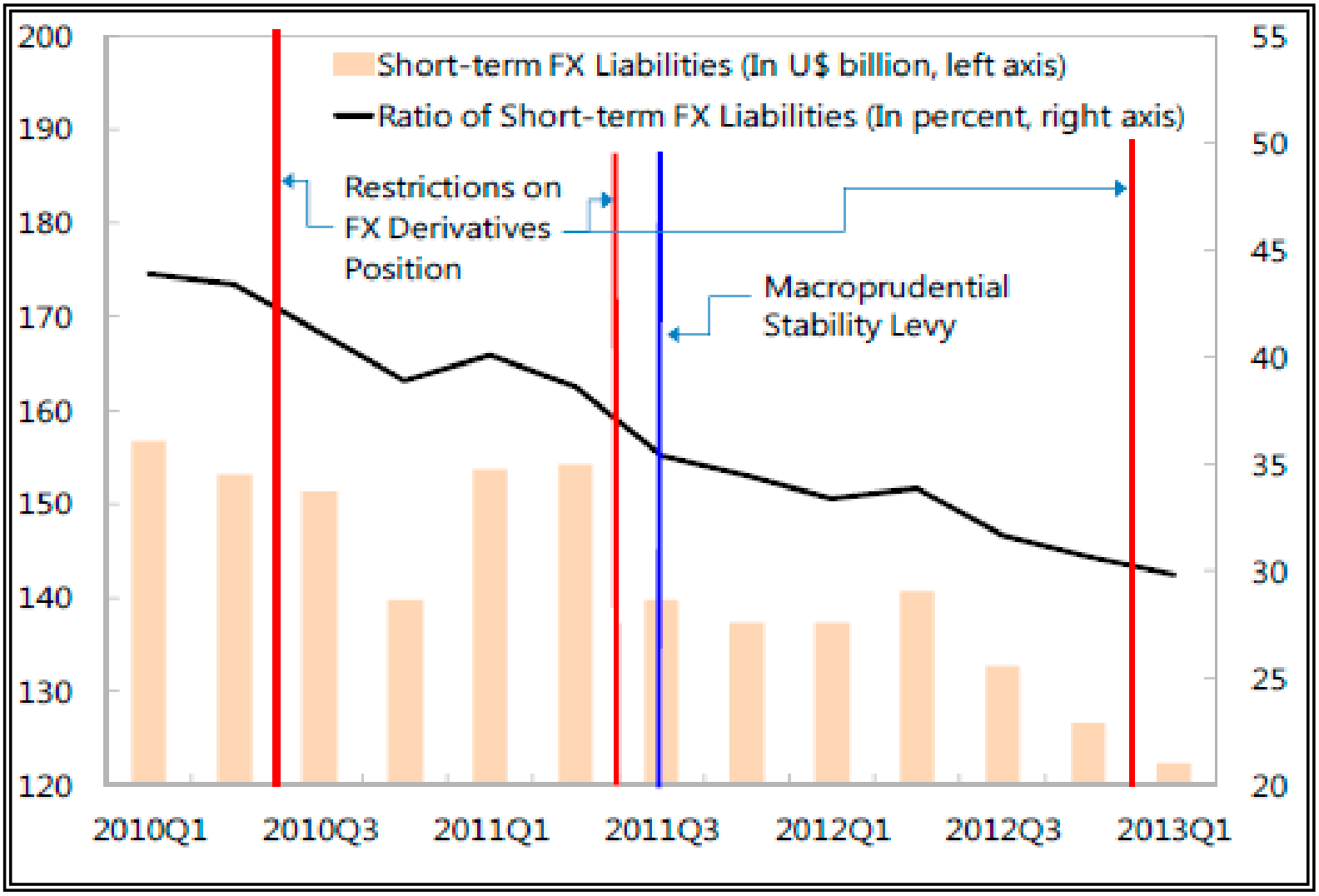
Macro-Prudential Responses

Korea

- Capped foreign exchange forward positions of banks relative to their equity capital (June 2010);

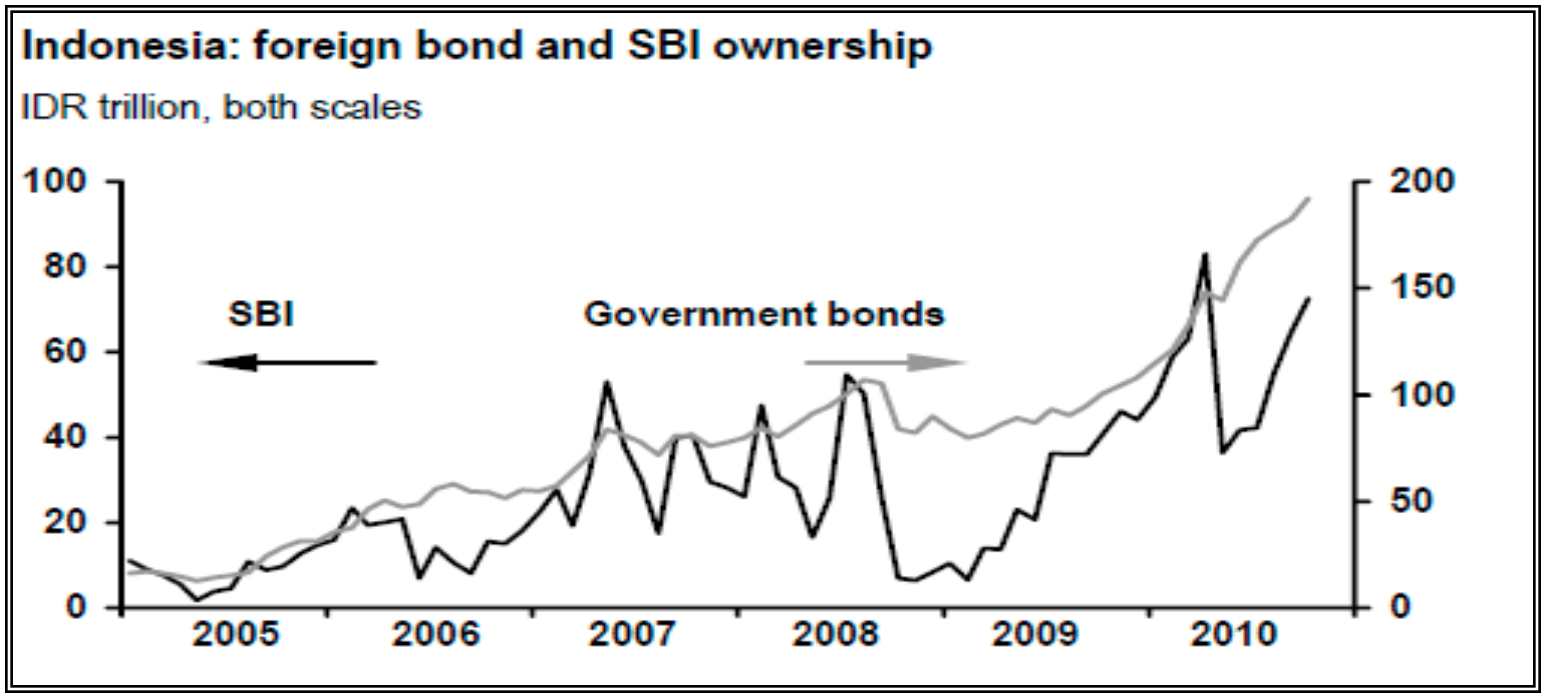
- Objective: to reduce banks' ST borrowing abroad (leverage) undertaken to hedge FX exposure in carry trades;

South Korea (cont'd)



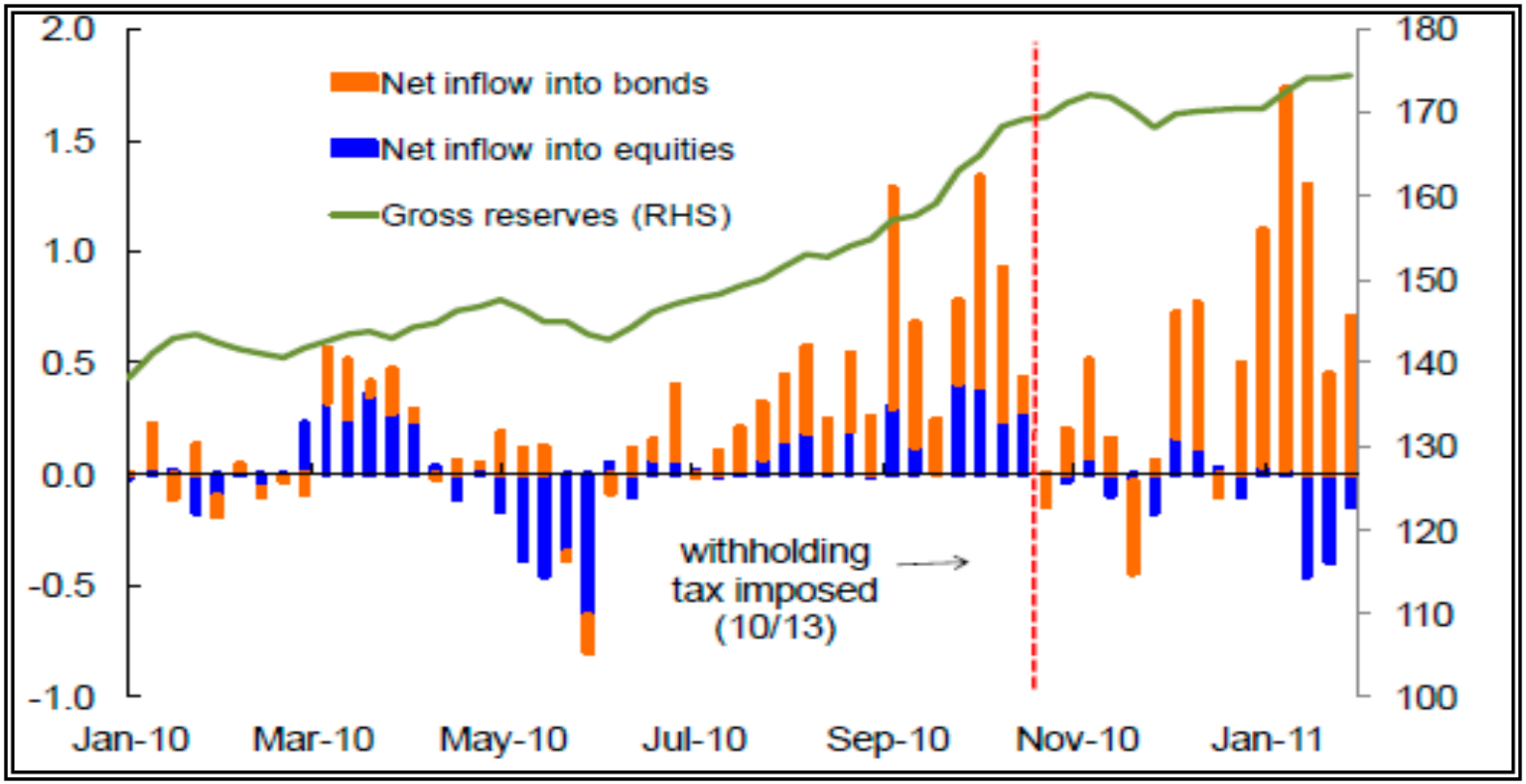
Indonesia: Short-lived effectiveness?

- Initial drop in foreign holdings of SBIs
- Interest in longer-term bonds has accelerated
- Foreigners' positions in SBIs have been rebuilt



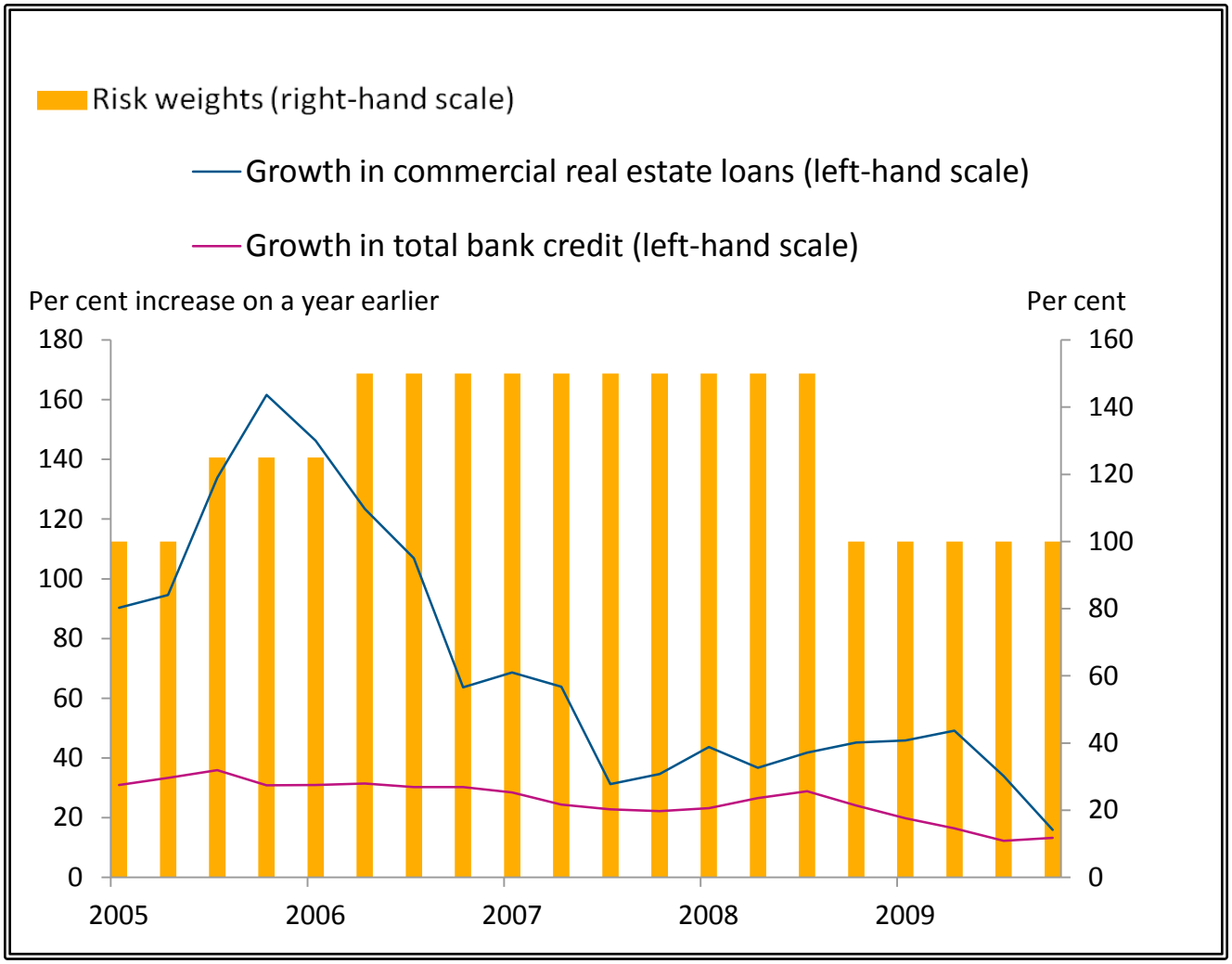
Thailand: Policies to stem capital inflows

- Exchange rate appreciation
- Liberalized capital outflows
- Removed withholding tax exemption on local bonds
- Imposed higher risk-weights on higher LTV real estate loans



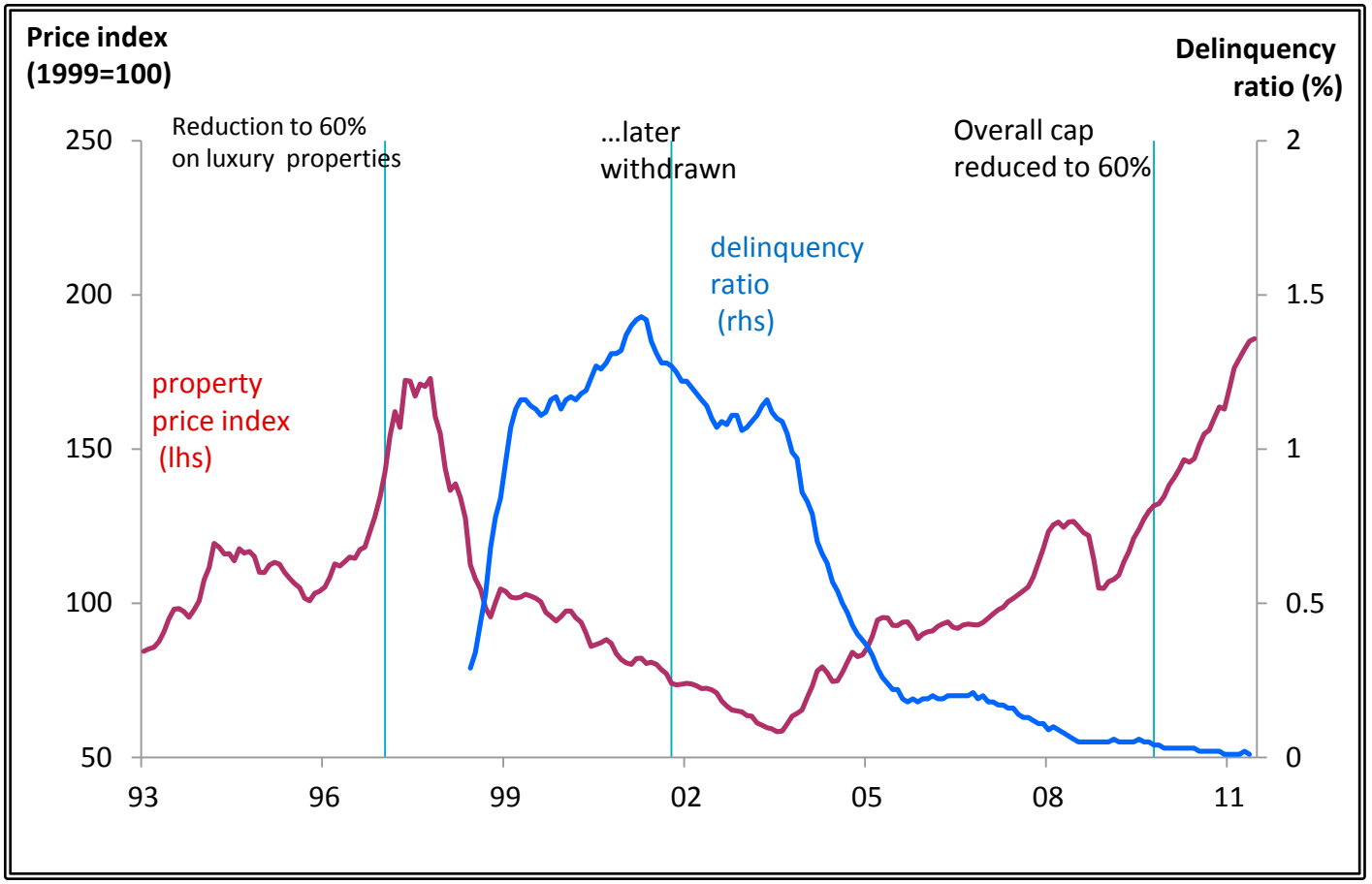
Example Tools: Risk Weights and Leverage

Risk weights against loans to commercial real estate in India



Example Tools: LTVs and Margins

Loan-to-value restrictions and delinquencies in Hong Kong



Conclusion (1)

What kind of economic policies would be desirable to bolster financial stability?

1) Regulatory and supervisory policies (micro- and macro-prudential);

2) Monetary policy;

3) Exchange rate policy;

4) Other types of policies (fiscal policy, capital controls, etc.).

Conclusion (2)

- Macro-prudential regulation is still embryonic, policies supporting price and financial stability should be mutually supportive;

- Macro-financial linkages are complex, dynamic and the feedback loop is still difficult to predict;

- Ability of financial institutions to circumvent measures mean that policymakers will have to remain vigilant of new sources of risk;