Macroprudential, Monetary and Capital Flows Management Policies and Their Interactions

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Federal Reserve Board

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Structure: Two Parts

- *Domestic*: macroprudential policies, usage, effects, and interactions with monetary policy
  - Evolving paradigm for macroeconomic and financial stability
  - Interactions, implications for policy and institutional design
- *International*: monetary (MOP), macroprudential (MAP), capital flow management (CFM) policies
  - Monetary policy and financial spillovers, policy coordination
  - Macroprudential policies and capital flow management tools

Domestic Dimensions

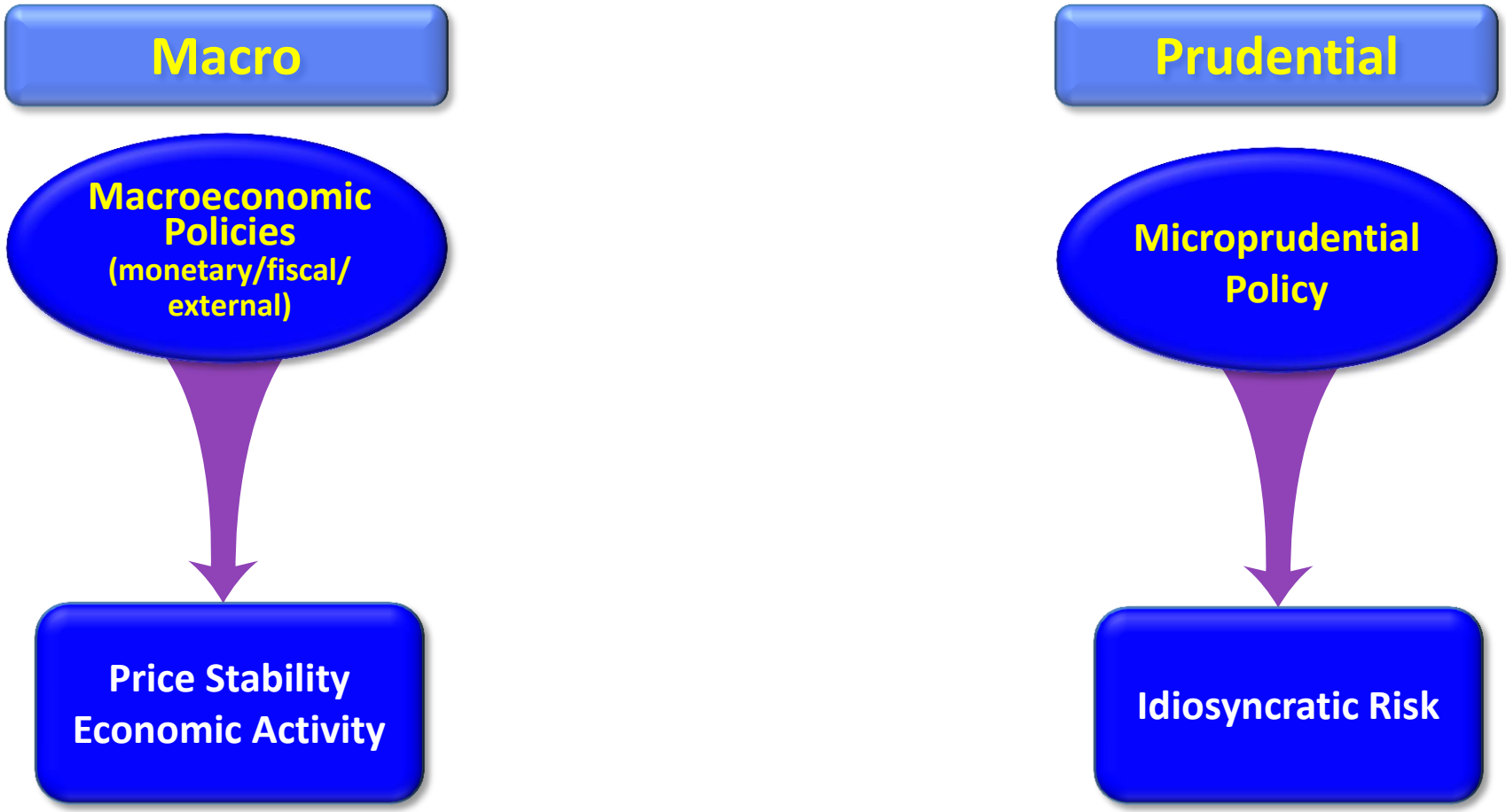
Macroprudential Policies (MAPs)

- Greater attention, but still limited knowledge
  - Questions on: analytics, effectiveness, calibration, rules vs. discretion, adaptations to countries, interactions with other policies, assignment, etc.
  - Empirics at early stage, often using aggregate data

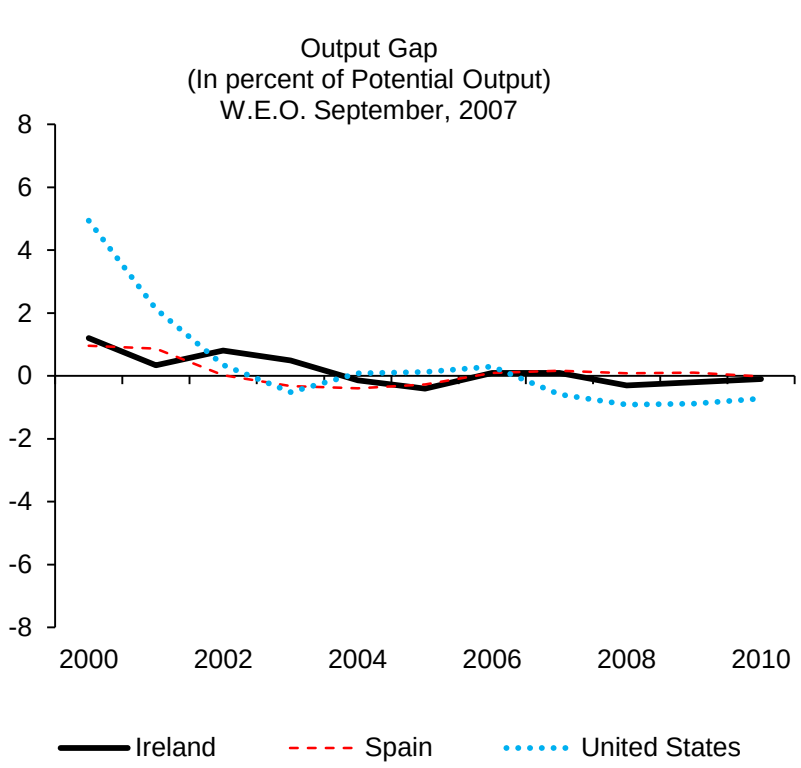
1. Review motivation for MAPs
2. Document MAPs use for large sample/period
3. Show effects of MAPs on procyclicality
   - How do MAPs affect growth of credit, house prices?
   - Differentiate by country type, instruments, etc.

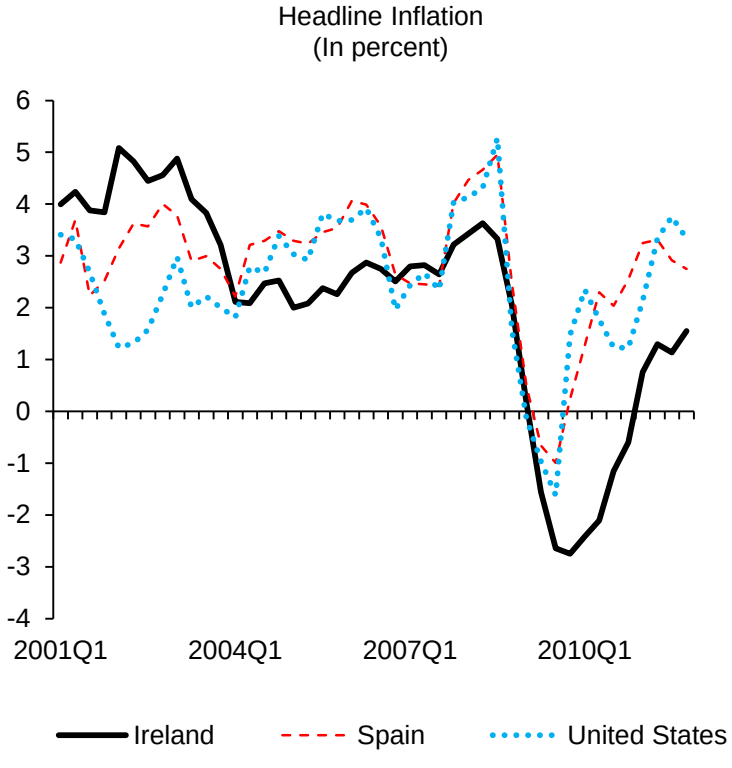
"Old" Framework of Macroeconomic and Prudential Policies

How we saw the world before the financial crisis

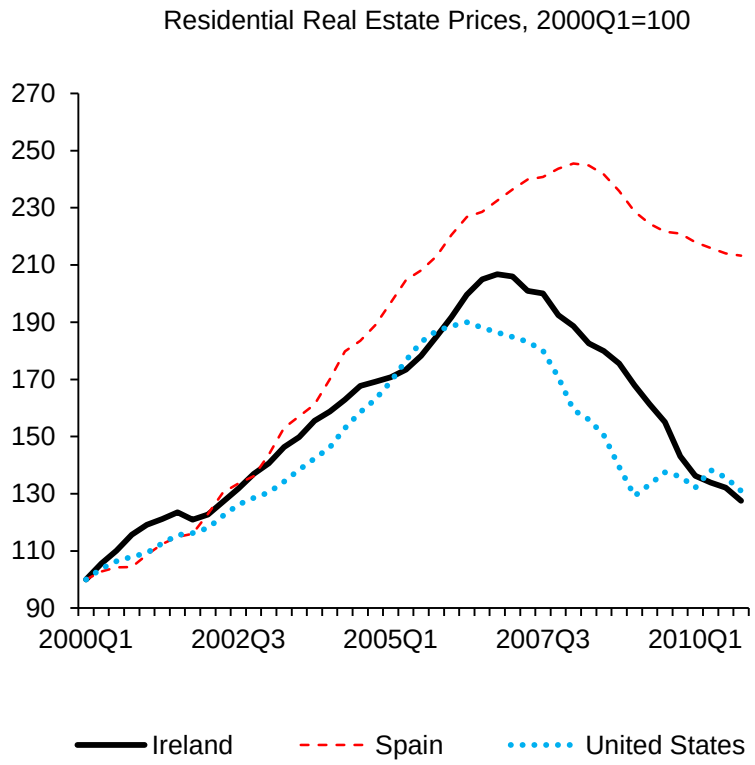


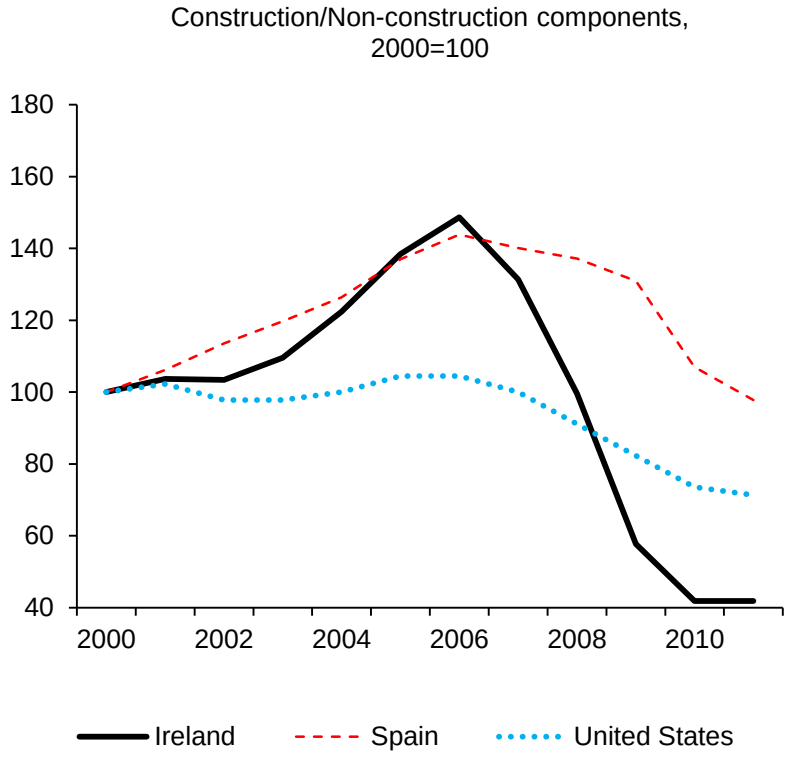
Paradigm delivered broadly stable output and low inflation





But dangerous imbalances built up despite

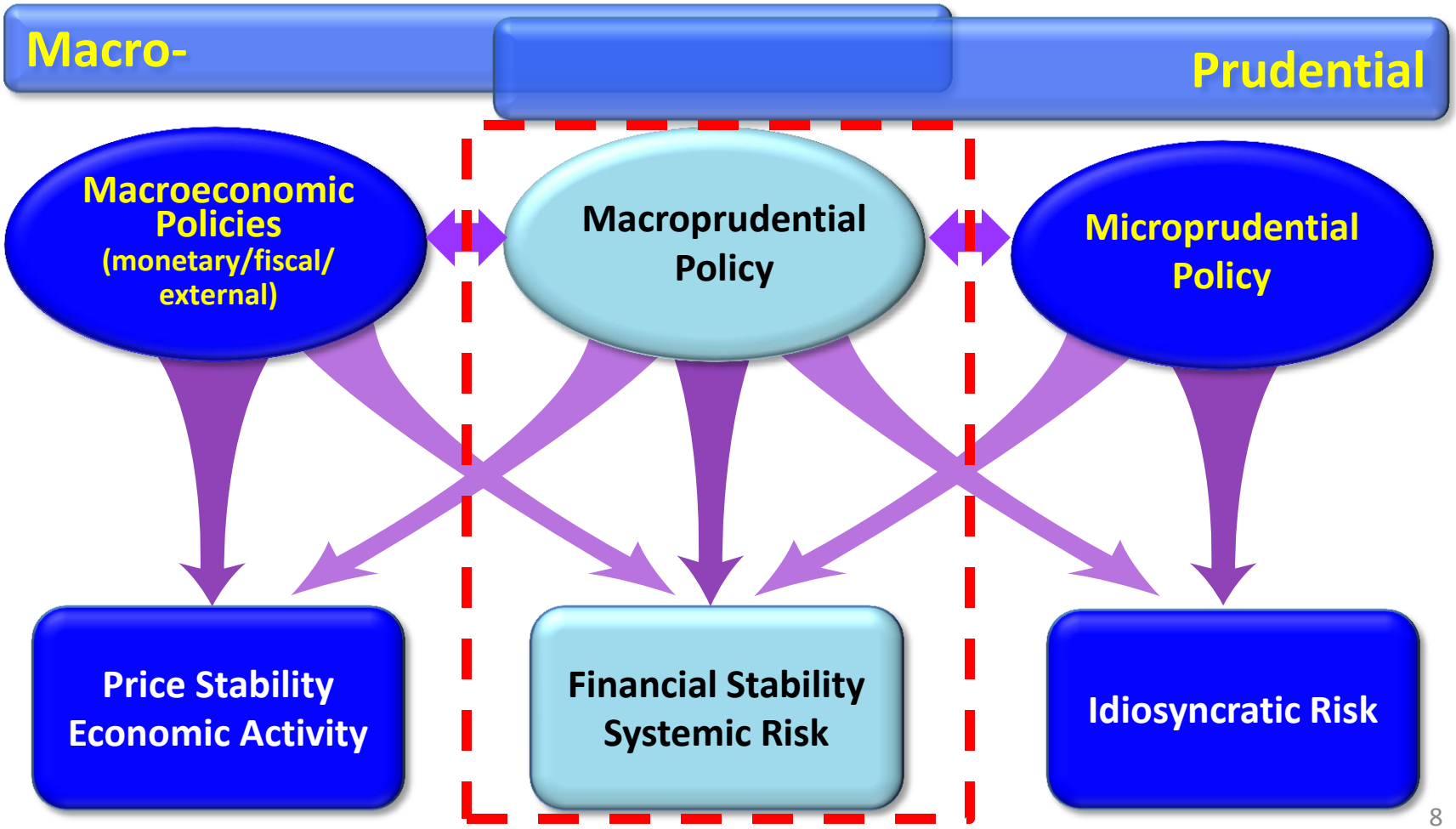




- The crisis made evident that to ensure macroeconomic stability, policy needs financial stability as a goal
- But a new goal requires new tools: macroprudential policies

"New" Framework of Macroeconomic and Micro- and Macroprudential Policies

How we see the world now



Why Exactly are Macroprudential Policies (MAPs) Needed?

Finance is **Procyclical**, subject to booms/busts

- Runs often through asset values and leverage

Finance displays much **Interconnectedness**

- Contagion within financial system (e.g., TBTF)

Procyclicality interacts with **interconnectedness**

Microprudential, monetary, other do not suffice→ MAPs

But MAPs need justification: externalities or to compensate for other policy causes, e.g., microprudential, tax deduction

Microprudential Does not Address (All) Systemic and Procyclicality Issues

- Microprudential takes partial equilibrium view, looks at risks in isolation, not considering system, ignores:
  - Externalities, spillovers. Amplification/endogenous risks. Financial cycles/procyclicality. Fallacies of composition, assets (fire-sales, credit crunch) or liabilities (liquidity) related. Etc.
- Microprudential rules can also "distort," systemic risks
  - Capital adequacy requirements, margins. Deposit insurance, safety net. Diversification vs. diversity; etc.
  - Also remuneration, agency issues can lead to procyclicality
- Both: possible adverse general equilibrium outcomes
  - Excessive systemic risk, herding, creation of tail risks, etc.

And Given Costs/Limits of Monetary (and Fiscal) Policy, MAPs can be "Better"

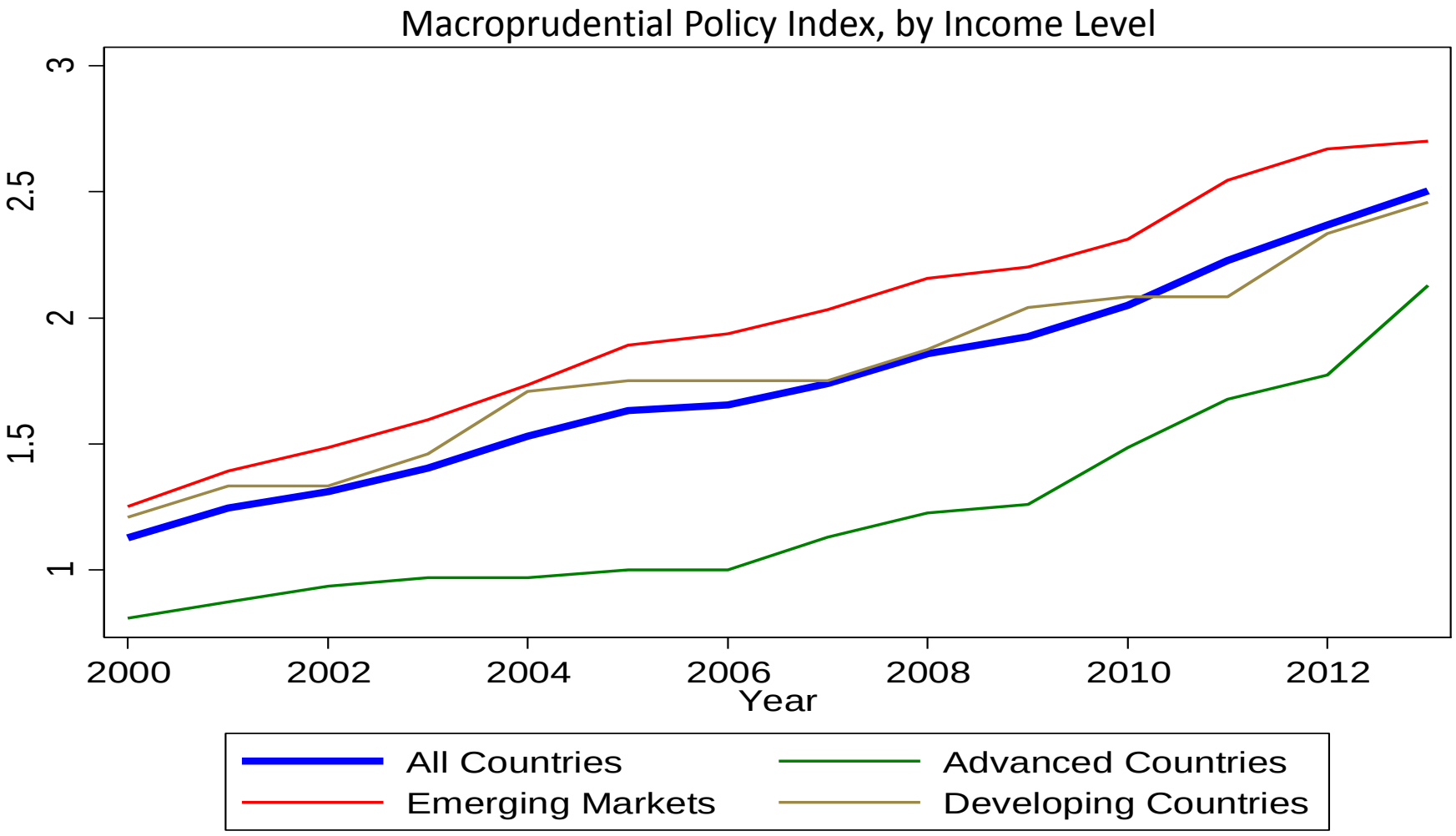
- Monetary policy: make borrowing more expensive. But:
  - Effect on speculative component is likely limited
  - Too blunt: costly for the *entire* economy
    - Example: Panel VAR suggests 100 basis points reduce house price appreciation by 1 pp. but also lead to a 0.3 pp decline in GDP growth
  - Hard for open economies, with capital flows responding to domestic interest rates (if no CFM tools)
- New consensus view:
  - Macroprudential to help microprudential (limit risk taking and leverage) and monetary (and fiscal) policy

Need for MAPs supported by Literature (Claessens, 2015 reviews)

- Early: Borio (2003), Borio & White (2003), White (2006)
  - Highlighted procyclicality of/in financial systems
- Brunnermeier, et. al. 2009; Hanson, Kayshap, Stein, 2011; De Nicolò et al, 2012; de la Torre et al, 2011; Farhi, Werning, 2015; Korinek and Simsek, 2014, etc.
  - Conceptual motivations for MAPs (and CFMs)
- Allen and Carletti (2011), Bank of England (2011), Schoenmaker and Wierts (2011), many others
  - Classify sources of systemic risks and related MaPP
- IMF, 2012; Ostry et al 2011; Sandri, Jeanne, Korinek, '15
  - Motivate and frame CFM tools
- Acharya 2011; Shin, 2011; IMF, 2014; some others
  - Adaptations of MAPs and CFMs to EMs and DCs

More MAPs in Place Over Time
Still, ACs less than EMs & DCs

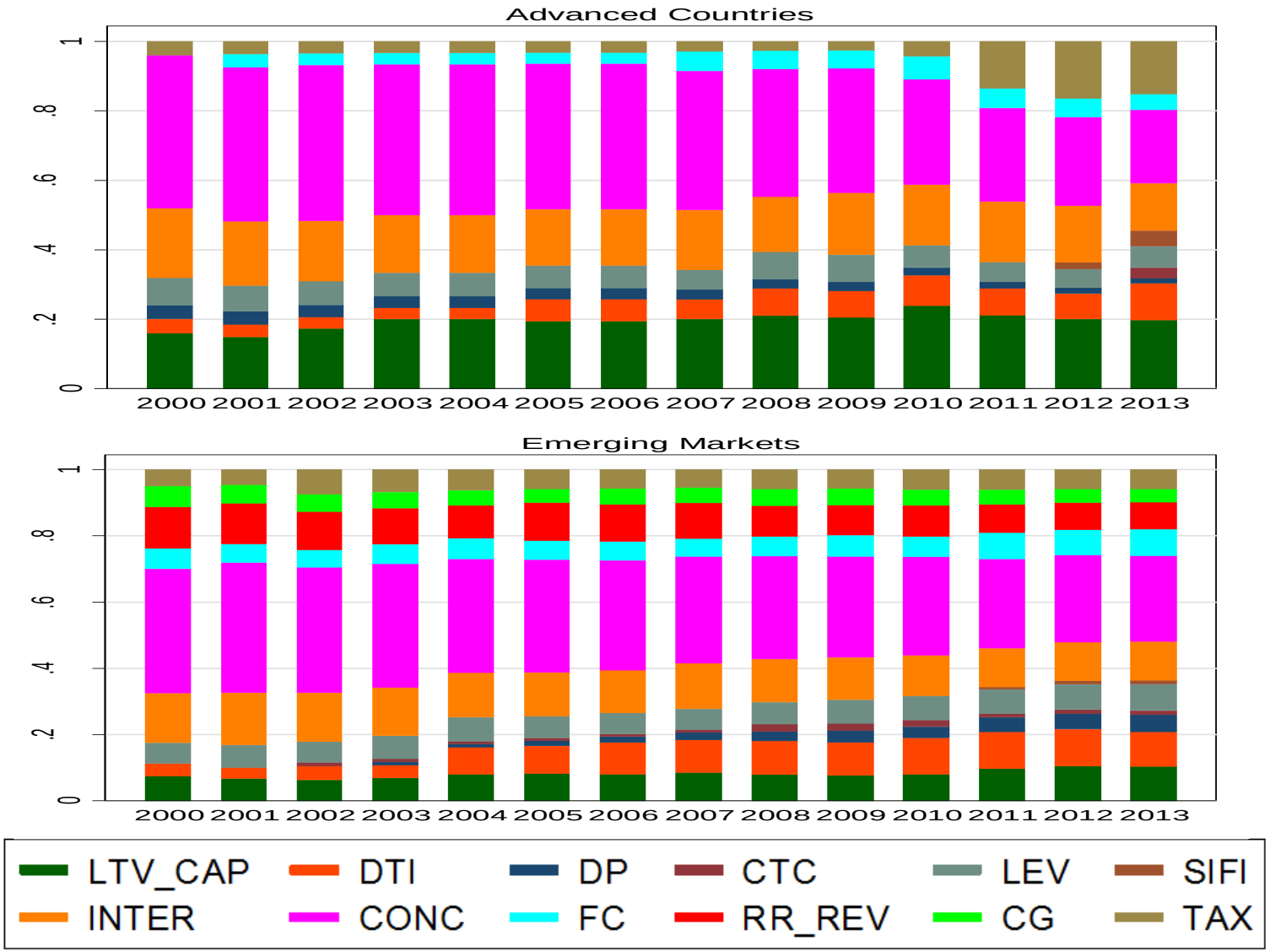
(% of country-year observations using any instrument)



What MAPs Exist, Are Being Used?

1. **Borrower- or activity-based**
   - i. Loan-to-Value Cap (LTV)
   - ii. Debt-to-Income Ratio (DTI)
   - iii. Margin/Haircuts (minimum, cyclical)
   - iv. Taxes/fees on turnover ("Tobin" taxes)
2. **Financial institutions-based**
   - i. Time-Varying/Dynamic Loan-Loss Provisioning
   - ii. Counter-Cyclical Capital Requirements, Leverage Ratio
   - iii. Capital Surcharges on SIFIs
   - iv. Limits on Exposures, Concentration
   - v. Limits on Foreign Lending
   - vi. Reserve Requirements
   - vii. Credit Growth Caps
   - viii. Levy/Tax on Financial institutions

ACs Use More Borrower-based EMs Use A Broad Set of MAPs



Analysis of MAPs: Data, Regression

- Sample: 119 countries (31 ACs, 64 EMs, 24 DCs) over 2000-2013 period. IMF MCM GMPI survey
- Panel investigation of effects of MAPs. Model:

$$Y_{i,t} = \alpha Y_{i,t-1} + \beta * MAPs_{i,t-1} + \theta * X_{i,t-1} + \mu_i + \varepsilon_{i,t}$$

  - Lagged dependent variable
- MAPs = Overall Index, Individual (12), Groups (Borrower or Financial Institutions-based)
- Country-level (X): Time-varying controls (lagged GDP growth+ crisis+interest rate), fixed effects

Economic Effects of MAPs are Large, but Vary in Importance by Country

- *Effects on total credit.* For ACs, a one standard deviation (STD) in Index reduces credit growth by 2.2 pp, ¼ of STD (9.04). For EMs, one STD reduces by 8.3 p.p., 2/3 of STD. And one-half STD for DEV
- *Borrower-based* important, more so in EMs, closed. *Financial institutions-based* matter, again less in ACs
- *Household credit* responsive to borrower based, in EMs especially. *House prices* and *corporate sector credit* not to borrower based. LTV affects overall credit, HH credit in EMs, corp. in ACs. *Foreign exchange related* in EMs for all credits, but not HPs

MAPs Less Effective in Open Economies, Suggesting "Evasion"

- Higher use $\rightarrow$ increases cross-border claims
  - One STD increase in Index increases cross-border ratio in open countries by 6 pp, about 1/3th its STD

  $\Rightarrow$ Consider MAPs together with CFM tools (next..)
- Country characteristics, besides type, matter
  - MAP not more effective with higher GDP/Capita or institutional development. Less impact with more developed finance, more flexible exchange rate

  $\Rightarrow$ More developed, tap alternatives, circumvent MAPs

Asymmetric Impacts of MAPs

- MAPs should and will vary in booms vs. in busts
- *Higher* Credit Growth $\rightarrow$ extra decrease
  - MAPs more effective in dampening when credit growth is high, especially in ACs and EMs
- *Lower* Credit Growth $\rightarrow$ impact increases
  - MAPs can be effective in maintaining credit growth in ACs and open economies

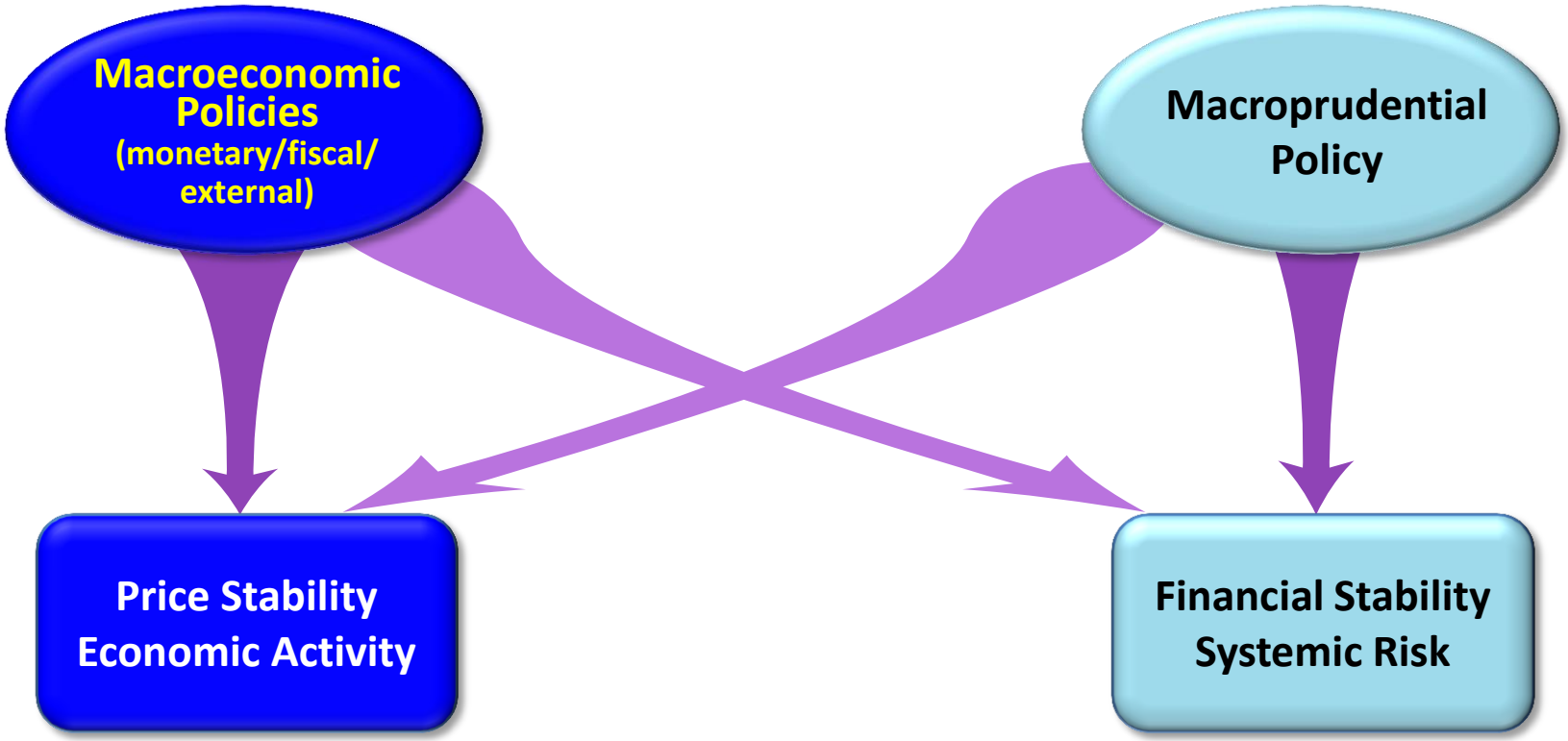
$\Rightarrow$ Impact of MAPs asymmetric: less credit in upswing, more in downswing

$\Rightarrow$ Need to consider phase of financial cycle

Empirical Evidence: Still Early Days

- Borrower-based ("LTVs"): Work for real estate, harder to circumvent. But politically "costly"
- Financial-institutions: Better known. But easier to evade, costly for intermediation
- All: Temporary cooling effect, but not always sustained, buffers seldom sufficient for bust
- Know too little on costs, side effects of MAPs
  - Rarely explicitly at externalities/market failures
  - Financial, economic, political costs and risks
- Partly due to limited data and research

Macroprudential and Monetary Policy Need to Consider Side Effects



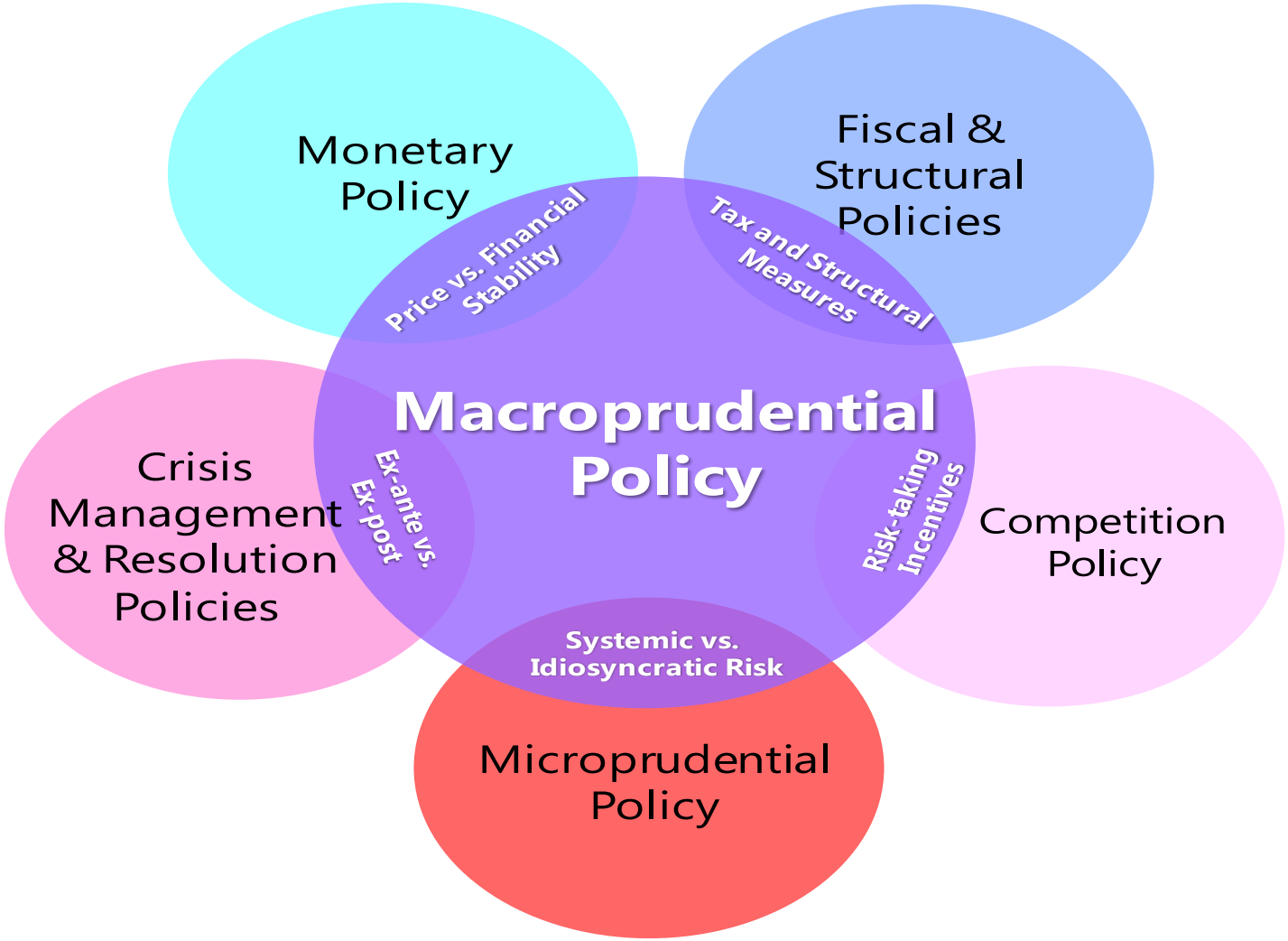
What Is "Best" Conduct Of Monetary Policy (MOP) and MAPs given Interactions?

- Benchmark: MOP and MAPs work optimally
  - MOP: With only nominal rigidities as a distortion, stabilizing inflation = maximizing welfare
  - MAP: With financial distortions, financial stability additional (intermediate) policy goal, but more fuzzy as distortions vary over time, by country
- Three departures from ideal world:
  1. If MAPs work imperfectly, implies what for MOP?
  2. If MOP is constrained, what is the role for MAPs?
  3. If institutional and political economy constraints, how can both MAPs and MOP best be adjusted?

Interactions between MAP and MOP

- When policies operate perfect, no major challenges
  - Can complement each other, e.g., when business-financial cycles overlap
- But: constraints on one imply the other has to do more
  - With imperfect MAPs, MOP has to do some ("getting into the cracks")
  - With constraints on MOP (fixed exch.rate, ZLB), MAPs have to do more
- Both: clear mandate, decision-making, accountability
- MAP in central bank can improve coordination, but then safeguards against risks of dual objectives needed
- More work needed for clear-cut policy advice
  - Effectiveness, interactions among MAP tools, intermediate targets
  - Costs, side-effects of MAPs and potential new distortions
  - Coordination issues, also with other policies (i.e., MIP, fiscal, crisis)

P.S. MAPs also interact with other policies, raising more coordination questions



Domestic Part: Conclusions

MAPs: Usage, Effects, Issues

- Empirically: some evidence of impact of MAPs
  - On credit, overall and corp./HH, and house prices
  - But differentiate by country and individual MAPs
- Suggests some scope for MAPs
  - But need to be pragmatic, a times discretionary within frameworks, targeted at specific markets/objectives
  - Ensuring resilience can reinforce avoiding booms/busts
- But overall, MAPs still at early stage
  - Interactions with other policies. Adaptations. Costs. Political economy concerns. Rules vs. discretion.

$\Rightarrow$ More data, research on effects, risks, calibrations, etc.

International Dimensions

International Dimensions

- Monetary and exchange rate policies in small open economies (SOE) not always follow standard model
- Monetary and financial spillovers on SOEs arise from MOPs in ACs and "Global Financial Cycle"
- MOPs and MAPs hard to coordinate internationally (gains small/uncertain, cooperation difficult, with limited forums, or ex-post, when in financial crises)

➢ Some countries may need to resort to capital flows management (CFM) policies

- *How to balance and interface MAPs and CFM tools?*

Monetary and Exchange Rate Policy in Small Open Economies (SOEs)

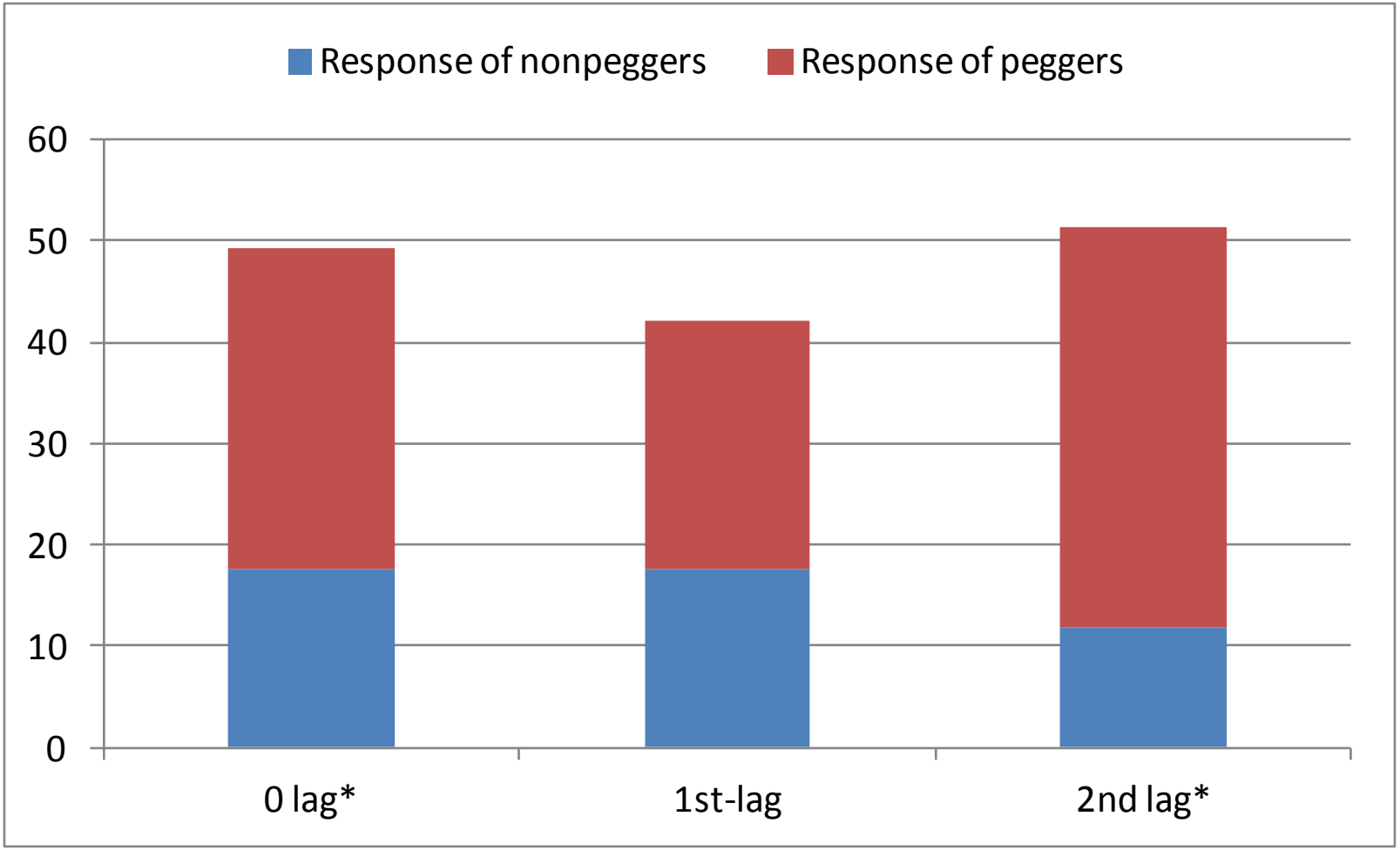
- De-facto, many small open economies seem to have:
  - Two targets: inflation and exchange rate
  - And two instruments: monetary policy and reserves
- Reflects in part concerns for international conditions on exchange rate, capital flows, financial stability
  - Given balance sheet mismatches, booms, other effects
- While theory poor, this SOE model can operate well
  - Provided interventions limited, exchange rate kept close to fundamentals.
  - Could still be second best, as it relies on the "distortions," limits to international arbitrage, financial frictions

International Monetary Spillovers

- MOPs in ACs and global financial cycle spill over
  - Occurs through asset prices and quantity (capital flows) channels, more than basic models "predict"
  - Behavior of internationally active banks important, as they drive (gross) credit flows, leading to booms/busts
- Exchange rate regime does not fully insulate
  - MOP cannot be fully independent, e.g., even with floating exchange rate, still see local impacts
- Risks can arise to economic and financial stability
  - Can increase asset prices, credit booms (and busts)
  - (Unconventional) monetary policy (exit) increase risks

Impact of US monetary policy shocks: nonpeggers' interest rate affected too

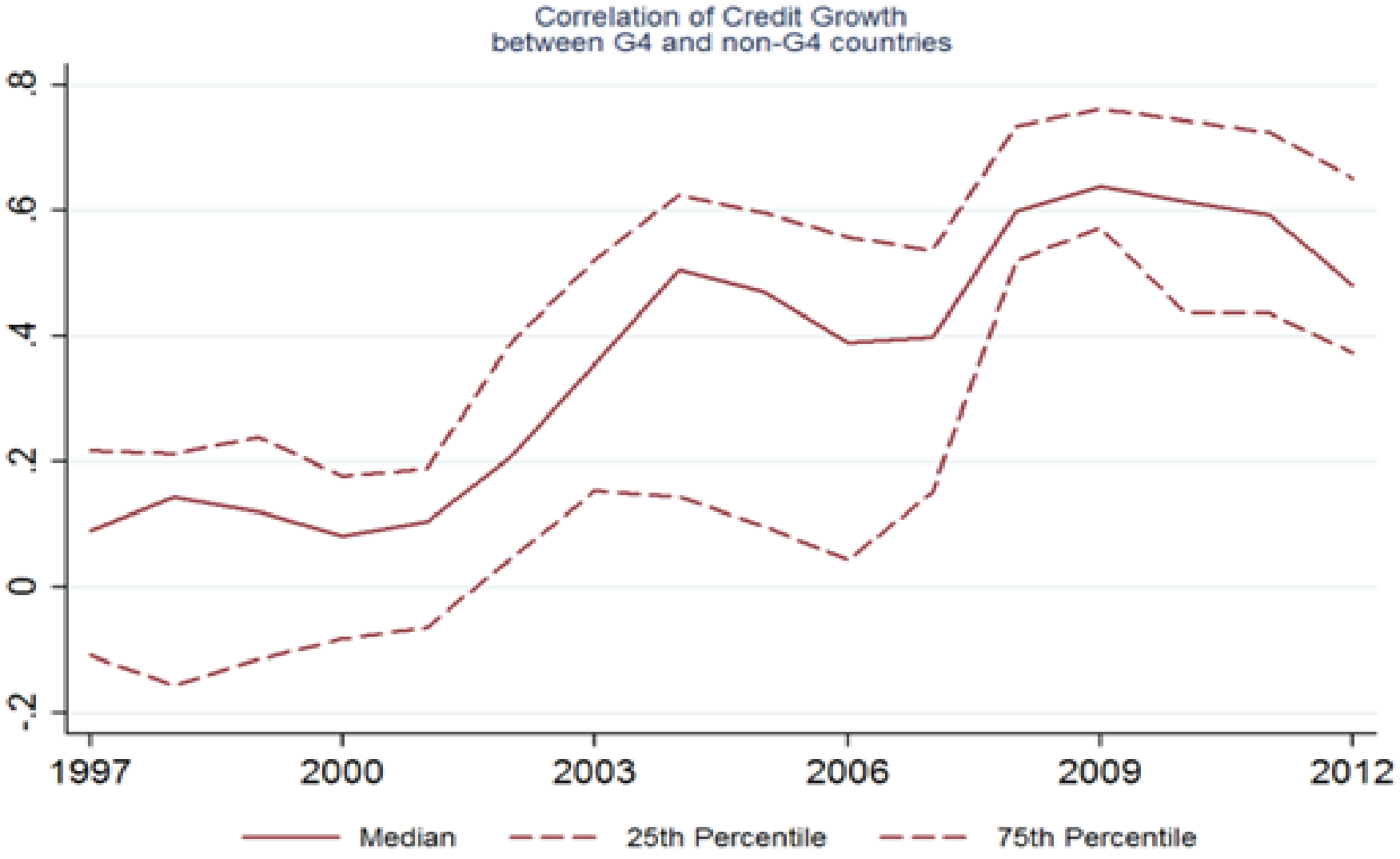
(reaction to 100 bp US shock)



International Financial Spillovers

- *Global Financial Cycle* has repercussions for SOEs' macroeconomic and financial stability
- Spillovers, at least partly, to push factors. Main:
  - ACs' MOP, supply of global liquidity (especially US$), international banks' funding conditions (US and EU), global risk aversion – although importance varies
- Impacts of these push factors seem to vary across countries, but research conflicts on how and why
  - Some say better macro fundamentals reduce sensitivity. Others saying do not

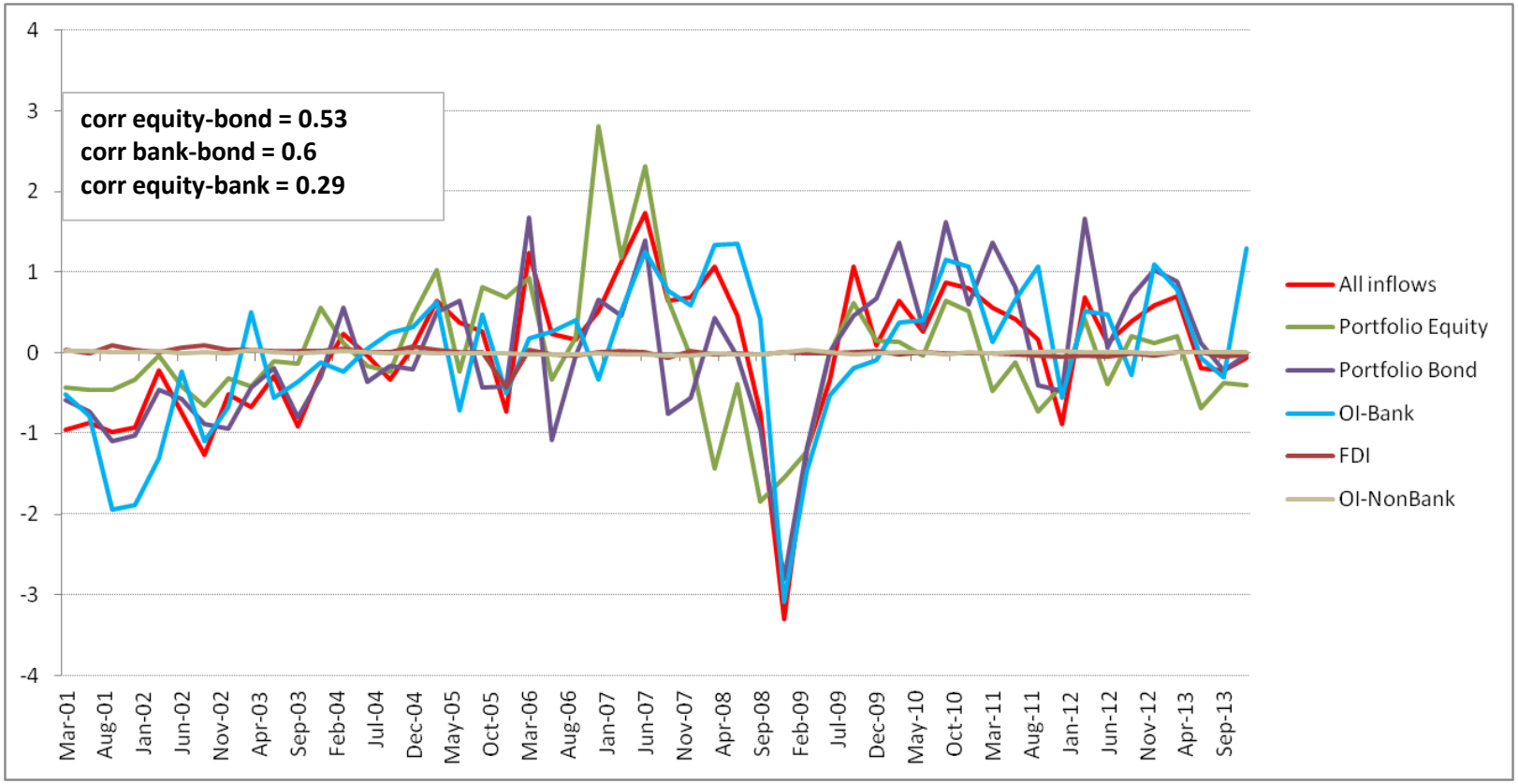
Financial cycle increasingly global, in part driven by ACs (G4), but varies..



One, comovement varies by flow

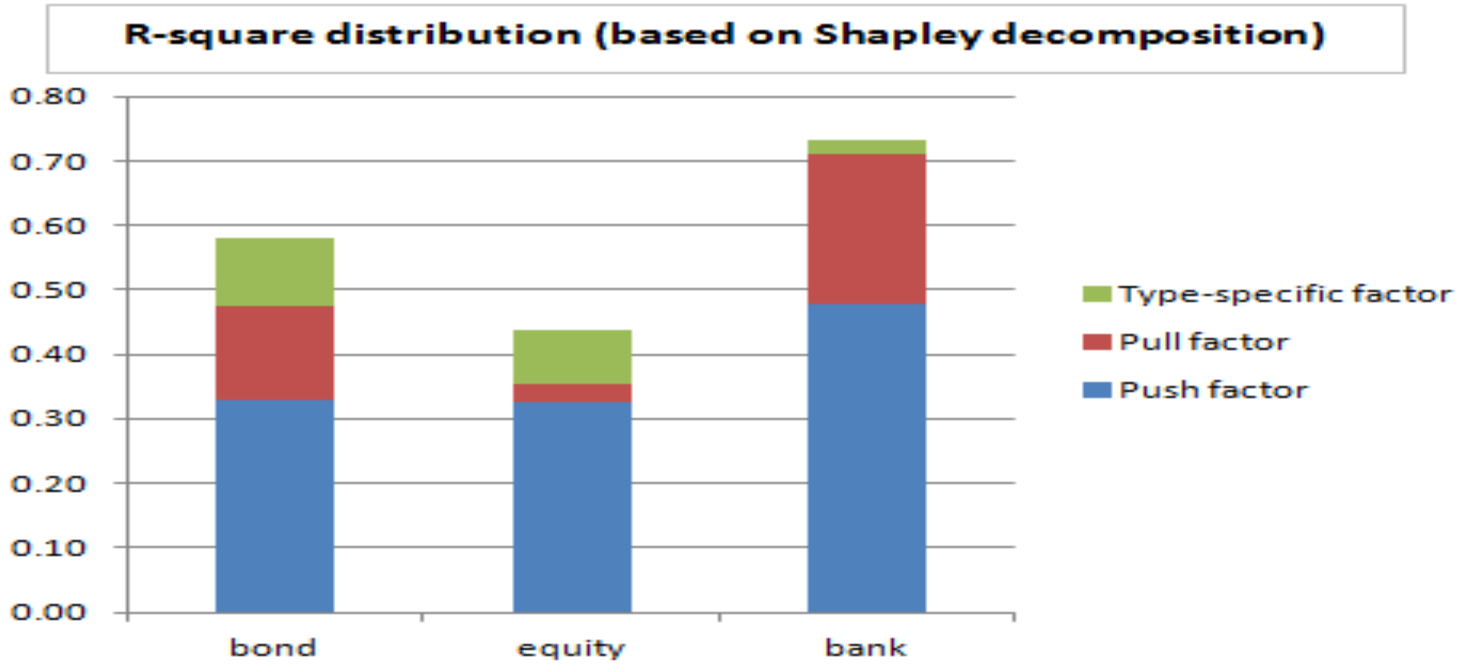
- Commonalities in Equity, Bond, Bank flows but not in FDI, OI-Non Bank
- Commonality captures key events (Lehman, Euro, Taper Tantrum)

Estimated Common Factors – All inflows and Sub-components (for EMs)



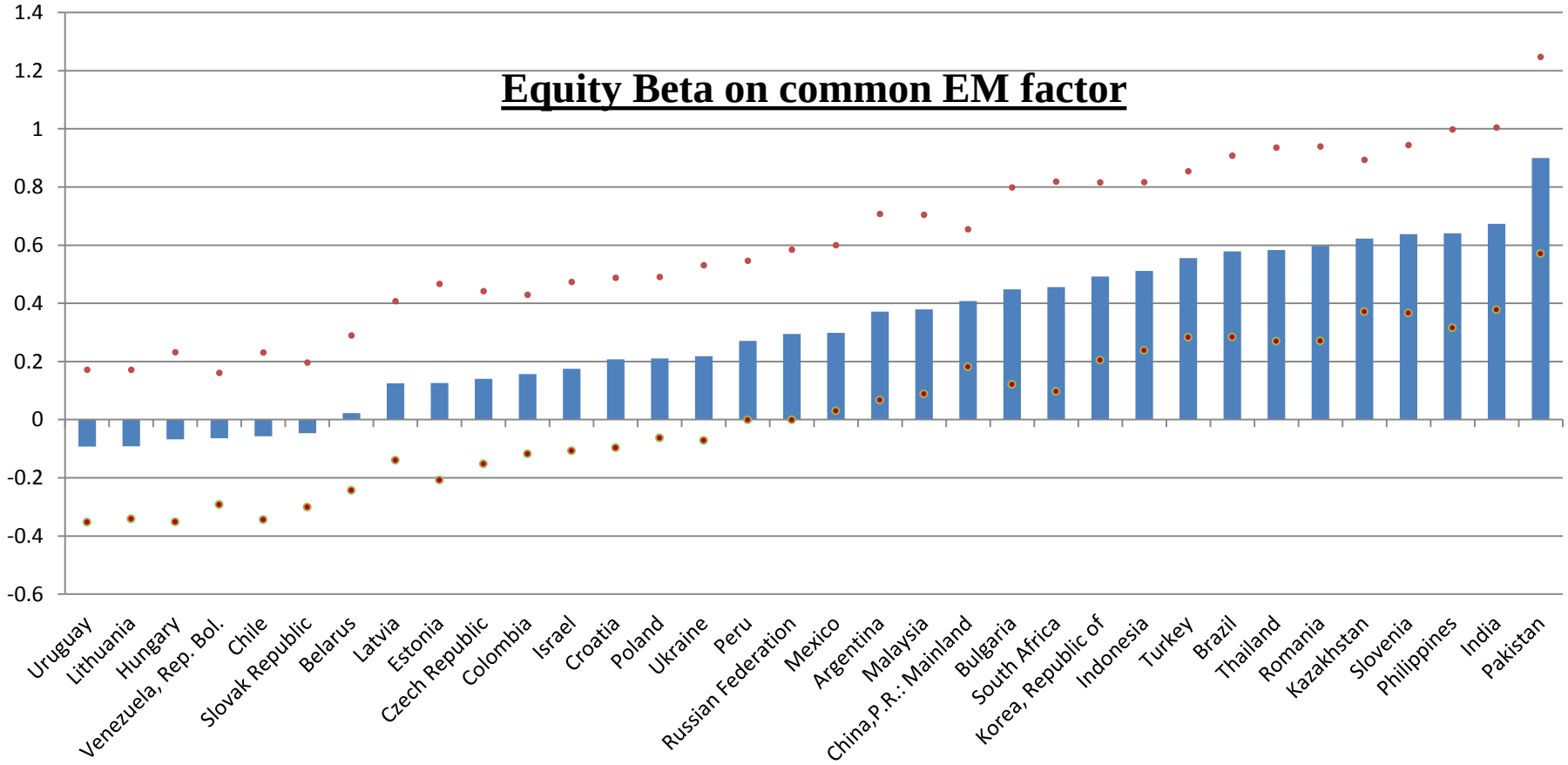
Two, what drives dynamics varies

- EM common dynamic explained mostly by push factors in core countries
- But relative importance of push factors varies across type of flows
- Pull variables somewhat more important for bond and bank flows
- Some other type-specific factors play minor roles for specific flows



Some countries are more sensitive

E.g., equity betas vary a great deal…



Three, who is more sensitive varies

	Equity	Bond	Bank
Turkey	0.56	0.42	0.42
South Africa	0.46	0.58	0.50
Israel	0.17	0.36	-0.03
Argentina	0.37	0.14	0.32
Brazil	0.58	0.52	0.46
Chile	-0.06	0.15	0.19
Colombia	0.16	0.02	0.23
Mexico	0.30	0.38	0.27
Peru	0.27	0.33	0.45
Uruguay	-0.09	0.44	0.02
Venezuela, Rep. Bol.	-0.06	0.29	-0.18
India	0.67	0.16	0.23
China,P.R.: Mainland	0.41	-0.08	0.57
Indonesia	0.51	0.69	0.43
Korea, Republic of	0.49	0.27	0.43
Malaysia	0.38	0.29	0.45
Pakistan	0.90	0.40	0.12
Philippines	0.64	0.36	0.19
Thailand	0.58	0.36	0.40

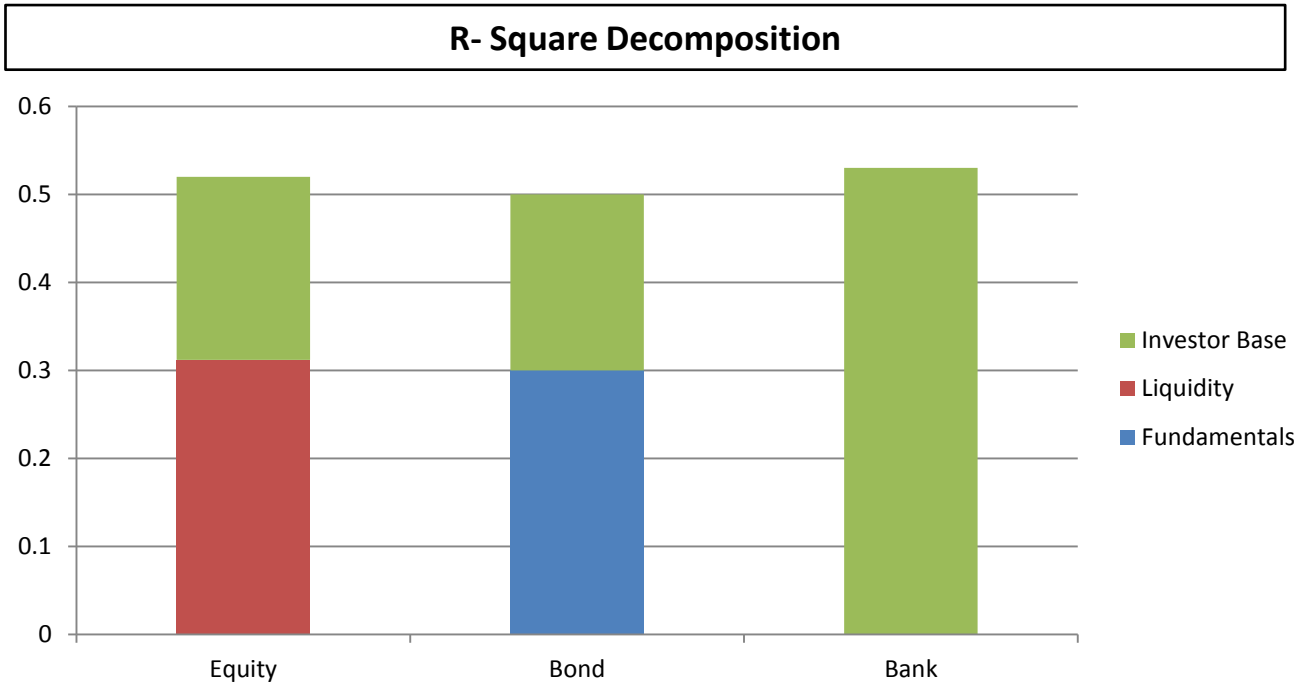
	Equity	Bond	Bank
Belarus	0.02	0.22	0.20
Kazakhstan	0.62	0.43	-0.09
Bulgaria	0.45	0.04	0.18
Russian Federation	0.29	0.36	0.39
Ukraine	0.22	0.31	0.20
Czech Republic	0.14	0.41	0.43
Slovak Republic	-0.05	0.44	0.20
Estonia	0.13	-0.22	-0.05
Latvia	0.12	0.25	0.10
Hungary	-0.07	0.43	-0.14
Lithuania	-0.09	0.35	-0.12
Croatia	0.21	0.12	-0.40
Slovenia	0.64	0.22	0.13
Poland	0.21	0.49	-0.12
Romania	0.60	0.34	-0.02

Three Groups of EMs:

- High sensitivity (Turkey, Brazil..)
- Varying by flows (China, Mexico…)
- Low Sensitivity (Chile, Estonia…)

Four, why more sensitive less about fundamentals, more markets

- Macro Fundamentals have little explaining power (except for bond flows) – No role for institutional quality
- **Liquidity** and **Investor Base proxy** account for most of the cross country variation and have quantitatively most impacts



As sensitivities vary by market, watching your lender crucial

- Sensitivity of flows more about market characteristics, conditions than (institutional) fundamentals. Consistent with recent literature on procyclical international investors
  - Micro-based evidence on mutual funds (Raddatz and Schmukler)
  - Banking flows evidence (Bruno and Shin)
- Qualifies the role of fundamentals in EMs' exposure to ACs'. Some countries more sensitive through some flows
- *Implications*: need to monitor and know lenders/investors as their mandates, incentives, constraints matter greatly
- P.S. sensitivity does not necessarily mean macro risks
  - Level vs. variance: high sensitivity problematic if flows macro-relevant
  - Other factors might amplify (or dampen) effects of a high sensitivity

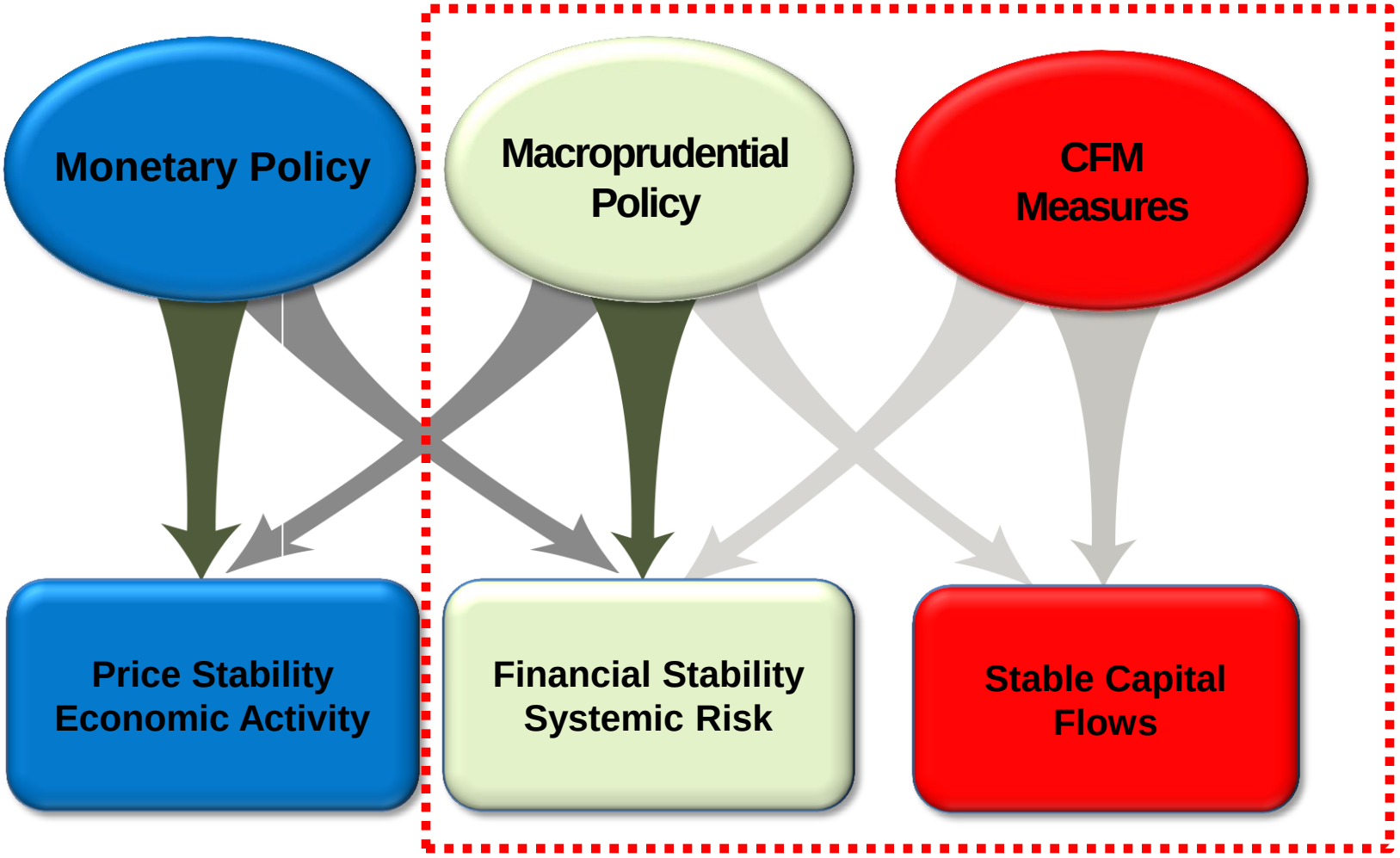
Policy responses handicapped as MOPs and MAPs hard to coordinate

- MOPs
  - Gains from cooperation are small in many models
    - Even when larger, uncertainty can preclude cooperation
  - Central banks are independent, accountable local
- MAPs
  - Supply side: inward leakages, outward spillovers
  - Demand side: incomplete coverage, arbitrage
  - Very few methods (to date) to coordinate policies
    - So far only countercyclical buffers, CCyB, and w/i EU
    - In times of stress, even harder (e.g., ring-fencing)

Capital Flow Management (CFM) tools may therefore be needed

- Given continued scope for spillovers and limits to coordination, CFM tools may be needed
- Some distinctions between MAPs and CFMs
  - Operational: type of capital flows (bank intermediated, gross vs. net flows); FX vs. LC
  - Legal: resident vs. non-resident
- But also much overlap & both may be needed
  - Regardless, use of MAPs and CFM to be guided

How to use and balance MAP and CFM tools?



A three-way classification

1. MAPs
   - Reduce systemic risk without discriminating based on residency or currency
2. FX-related prudential measures
   - Discriminate according to currency, not residency, of flow
   - Applied to regulated financial institutions, primarily banks
3. CFM
   - Discriminate between residents and non-residents in cross-border capital movements (OECD Code, 2009)
   - Economy-wide or sector/industry (usually finance) specific
   - Cover all flows or specific (debt, equity, FDI; short, long)

Source: Ostry et al

Examples of MAP, FX-other MAP, CFM

1. MAPs
   - LTV ratios; Limits on credit growth and sectoral lending; Dynamic loan-loss provisions, and counter-cyclical capital requirements; Reserve requirements for local currency deposits; Levy on interest from consumer loans; Capital requirements for specific sectors and loans.
2. FX-related MAP or MIP measures
   - Limits on banks' open FX (derivative) position (as a proportion of their capital), on FX lending by domestic banks, on ratio of banks FX loans and securities to FX borrowing; Reserve requirements on foreign currency deposits, special capital requirements for FX loans.
3. CFMs
   - Unremunerated reserve requirements on non-resident deposits; Tax on capital gains for NR investments, on equity and bond inflows, on settlement of derivative contracts with NRs, fees on NR purchases of central bank paper; Licensing requirements; Outright limits or bans.

Source: Ostry et al

Comparing classifications Functional vs. legal …

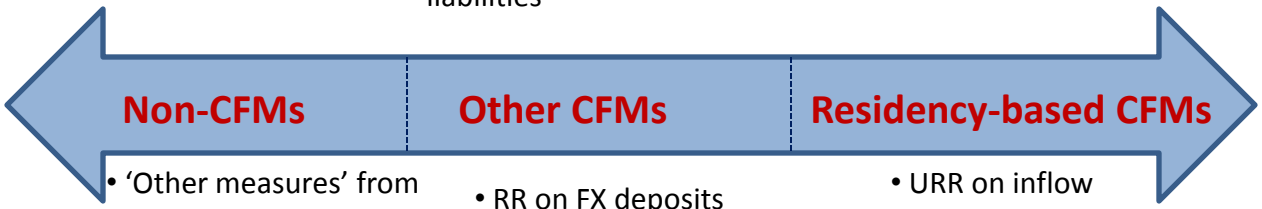
Less likely to have an impact on capital inflow

- LTV ratios
- RR for LC deposits
- Credit growth limit
- Counter-cyclical capital requirements
- Sectoral limits on loan concentration

- Limit on net open FX position
- Limit on FX loans
- Capital requirements for FX loans
- Limit on FX derivative position
- RR on FX deposits
- Levy on non-deposit foreign liabilities

- URR on inflow
- Taxes on inflow
- Administrative restrictions on inflow

More likely to have an impact on capital inflow



- 'Other measures' from above
- Limit on net open FX position
- Limit on FX loans
- Capital requirements for FX loans

- RR on FX deposits
- Levy on non-deposit foreign liabilities

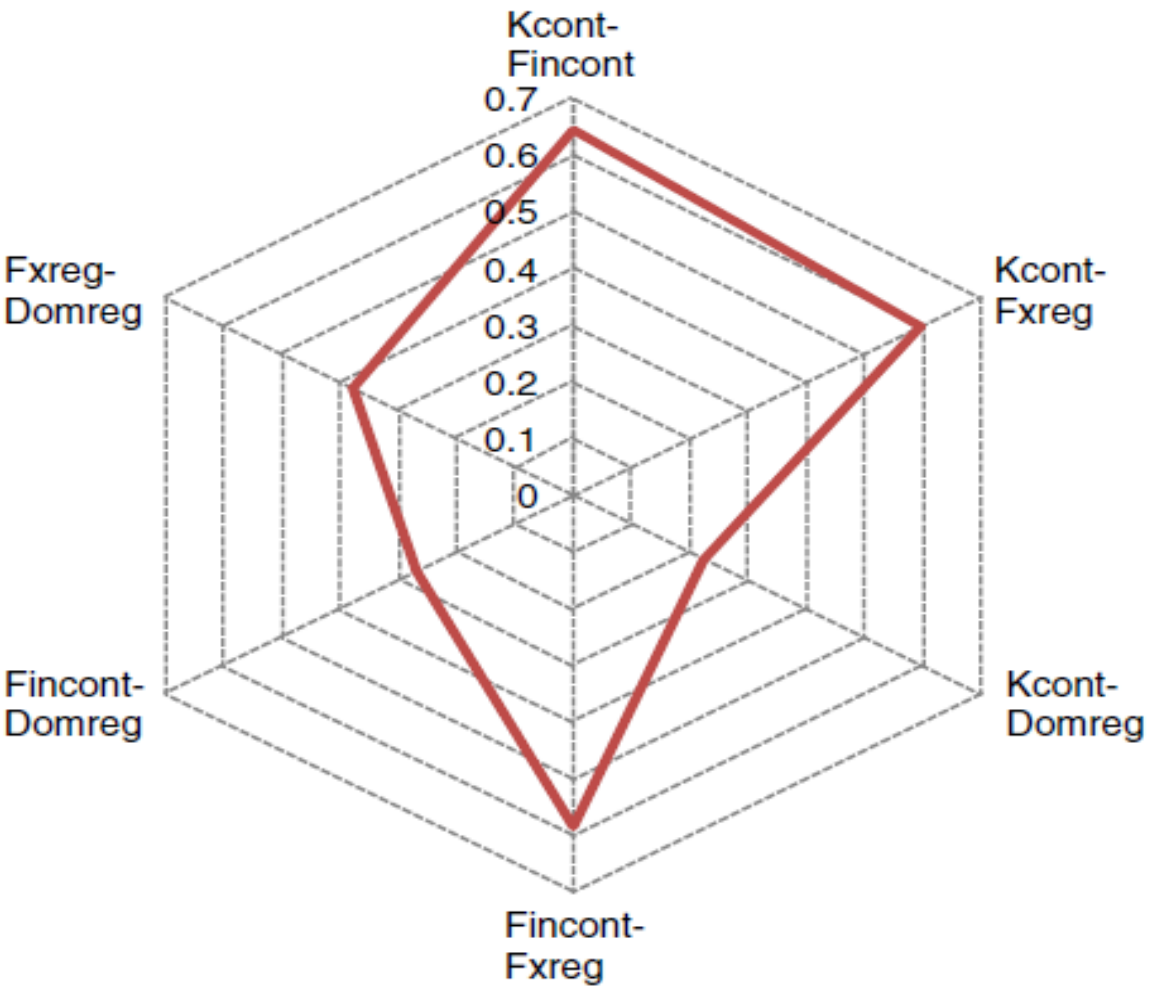
- URR on inflow
- Taxes on inflow
- Administrative restrictions on inflow

- Limit on FX derivative position
- RR on short dollar position
- Withholding tax on non-residents' bond purchases

Source: Ostry et al

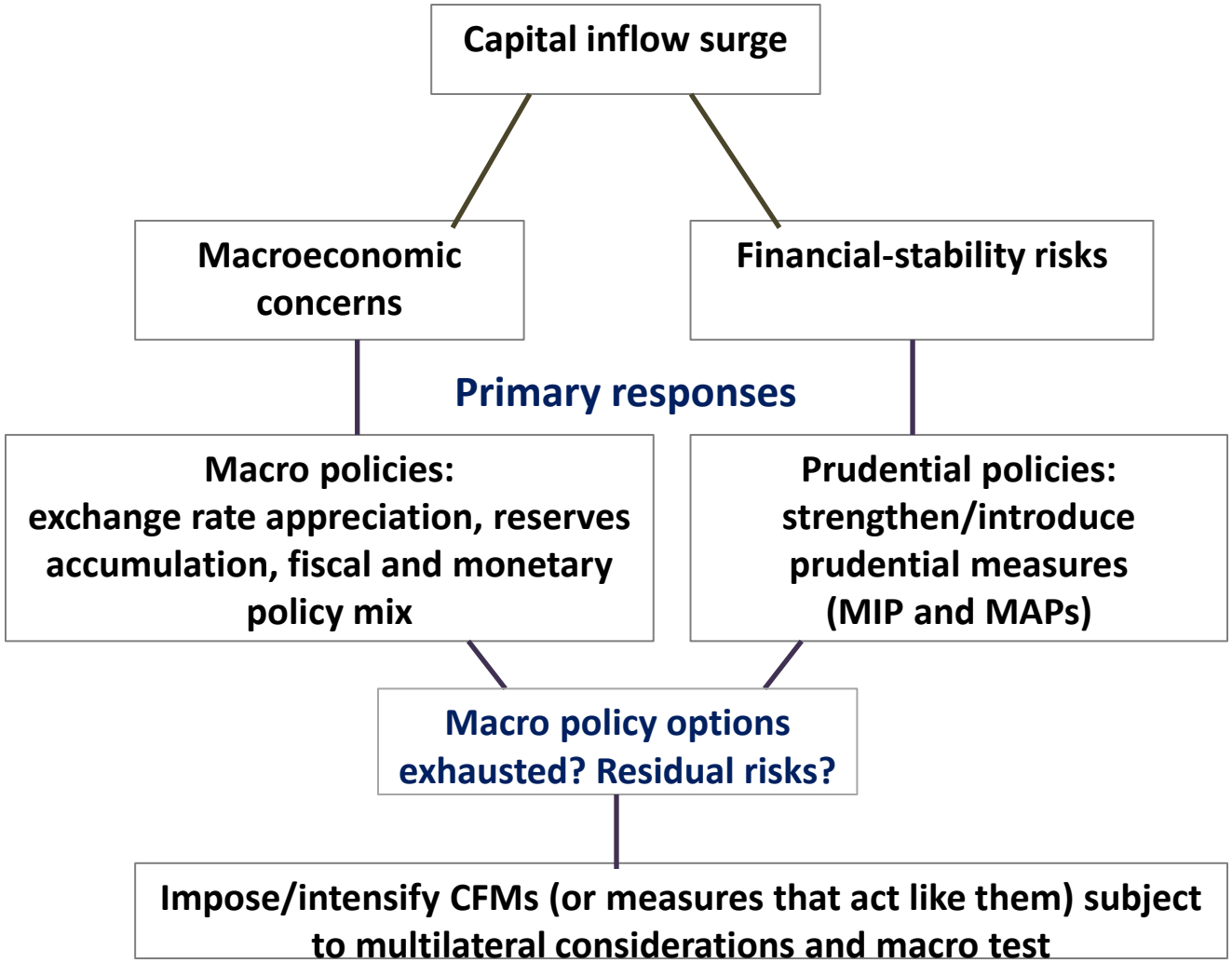
In practice, many countries use both FX-MAPs and CFM measures

Correlations between MPP and CFM measures



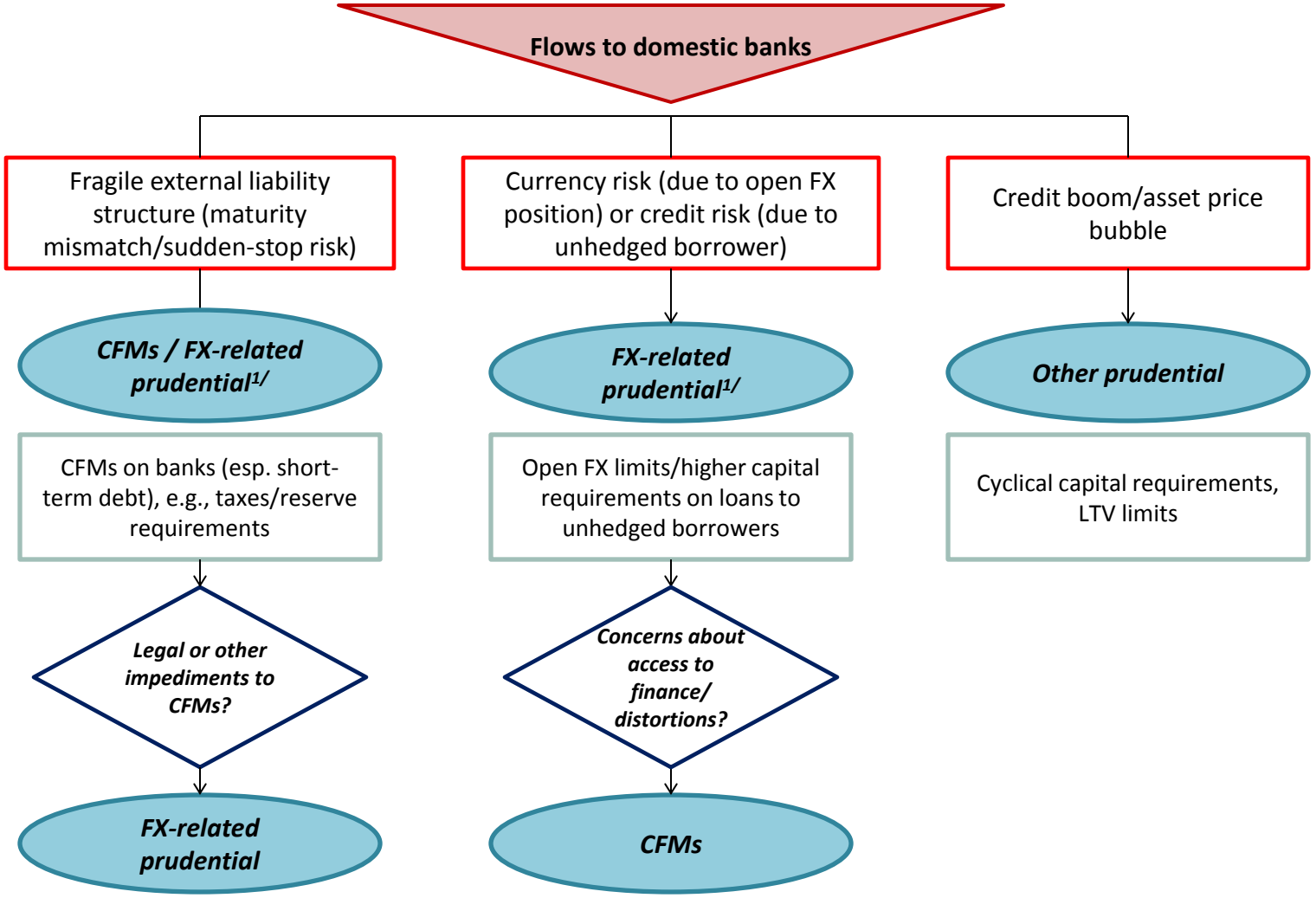
Source: Ostry et al

How do macroeconomic and financial stability concerns and policies fit together?



Source: Ostry et al

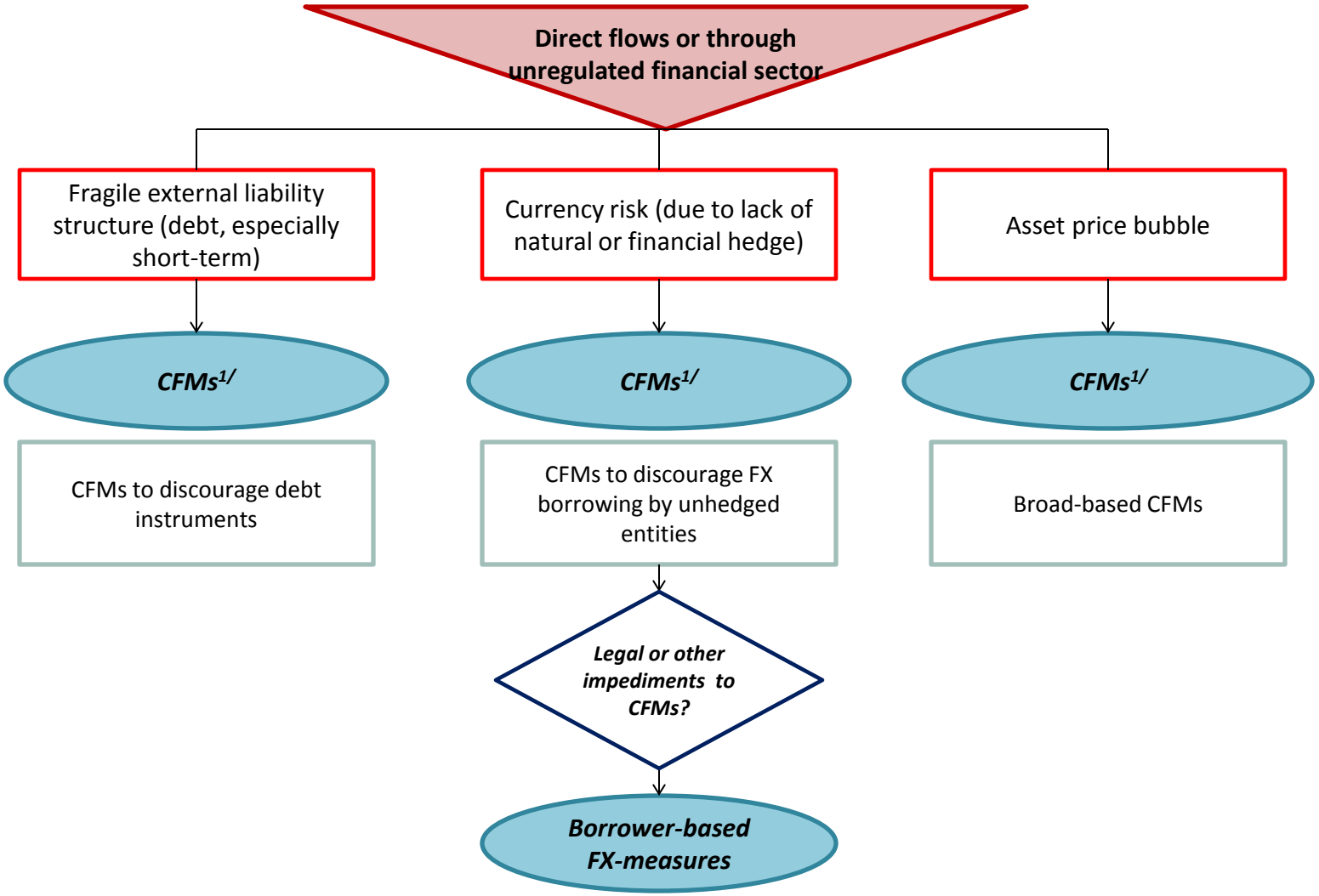
Choice of instruments: flows intermediated through domestic banks



1/ Once macro policy space exhausted, and taking due account of multilateral considerations.

Source: Ostry et al

Choice of instruments: flows not intermediated through financial sector



1/ Once macro policy space exhausted, and taking due account of multilateral considerations

Source: Ostry et al

Qualification and exceptions to decision chart

- Know your lenders' mandates, incentives, constraints
  - Can matter more than fundamentals
- Playing field for access of large firms vs. SMEs
  - Could make CFM preferable over MAPs
- MAPs may cause disintermediation to unregulated
  - Extending the perimeter not easy, in short run (or ever)
  - Regulatory arbitrage possible with weak supervision or with sophisticated institutions, deep capital markets
- Speed of adjustment of MAPs vs. CFM (vs. other)
  - CFM tend to be acyclical; MAPs may be easier to adjust
- International obligations may prohibit, constrain CFMs
  - E.g., EU treaty, GATS, OECD code, bilateral treaties

International Dimensions: Conclusions

Interactions MAPs and CFMs

- Macroeconomic policy and MAPs can go a long way to deal with global effects, including from UMP
  - Use and strengthen orthodox policies, toolkit before CFMs
  - Assure macro policy space exhausted, multilateral effects considered
- May need MAPs and CFMs to target specific risks
  - MAPs main instruments when flows intermediated through banks
  - CFMs main instruments when flows by-pass banks
- In designing CFMs, have to consider
  - Macro concerns imply broad, price-based controls for surges
  - Prudential concerns imply targeted on specific risks and possibly administrative CFMs, even in case of persistent inflows
  - All designs to reflect administrative ability, financial sophistication. And, regardless, try to know your lenders and investors

Based on, among others:

1. Cerutti, Claessens, and Laeven, 2016. "The Use and Effectiveness of Macroprudential Policies: New Evidence," *Journal of Financial Stability.*
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4. Claessens, 2013, “Interactions between Monetary and Macroprudential Policies in an Interconnected World,” mimeo, IMF.
5. Claessens, 2015, "An Overview of Macroprudential Policy Tools," *Annual Review of Financial Economics.*
6. Claessens, 2016, “Global Banking: Recent Developments and Insights from Research,” mimeo, Federal Reserve Board.
7. Engel, Charles, 2016, ”Macroprudential Policy under High Capital Mobility: Policy Implications from an Academic Perspective,” mimeo, University of Wisconsin
8. IMF, 2013, “The Interaction of Macroprudential and Monetary Policies,” Policy Paper.
9. IMF, 2013, “Unconventional Monetary Policies—Recent Experience and Prospects”.
10. IMF, 2015, “Measures which are Both Macroprudential and Capital Flow Management Measures: IMF Approach”
11. Ostry, Ghosh, Habermeier, Laeven, Chamon, Qureshi, and Kokenyne, 2011, “Managing Capital Inflows: What Tools to Use?” IMF Staff Discussion Note 11/06.
12. Ostry, Ghosh, Chamon, and Qureshi, 2012, “Tools for managing financial-stability risks from capital inflows,” *Journal of International Economics*.