BANK FOR INTERNATIONAL SETTLEMENTS

Tackling the financial cycle: the missing monetary policy link

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Workshop on financial cycles and policy response in Latin America
Buenos Aires, 22 November 2016

Theme and takeaways

- Key question for central banking in times of change:
  - Should monetary policy (MP) take financial stability into account?
  - If so, what would such a policy look like?

- Takeaways
  - A financial stability-oriented MP (FSOMP) can yield net benefits
  - But it would need to respond systematically…
    - …during both booms and busts (whole financial cycle (FC))
    - Need to avoid being too far away from financial equilibrium (FE)
    - Occasional leaning against the wind (LAW) could backfire

Structure of the remarks

- Outline basic analytical approaches
  - Similarities and differences
- Summarise main results of ongoing BIS research
  - Two studies
- Draw some broader implications
  - Caveats, reflections and conjectures

I – Basic analytical approaches

- Standard approach (Graph 1)
  - Standard interest rate/output/inflation model
  - Crisis module: add financial variables as leading indicators of crises
    - Credit growth is the chosen indicator
  - Adjust interest rate policy
  - Estimate cost/benefit
- A number of assumptions reduce the benefits of a FSOMP (Table)
  - Crises do not cause permanent output losses
  - In some cases, MP can “clean” at no cost
  - Leaning affects the crisis probability but not its cost
  - No possible benefits unless crises occur
  - Critically, risks do not grow over time

Costs and benefits of LAW: standard approach

(Graph 1)

Do benefits exceed costs?

↓ Crises tomorrow → ↑ output

↓ output today

Standard model
policy rate/output/inflation

+

Crisis module
policy rate → financial variable → crisis → output

+

Evaluation

one-off deviation from standard rule

optimal policy

LAW = leaning against the wind

Costs and benefits of LAW: assumptions

	Standard
Permanent output losses	NO
Cleaning is costly	NO/YES
LAW reduces crisis costs	NO
Benefits possible without crises	NO
Risks build up	NO

LAW = leaning against the wind

I - Basic analytical approaches (cont)

- Assumption that risks do not grow over time has big implications
  - There is little or no cost to waiting
  - Encourages narrow view of FSOMP
    - Follow a traditional policy most of the time
    - Deviate only when large financial imbalances emerge
    - Obvious risk of doing too little too late

- BIS work relaxes these assumptions: common features (Table)
  - Risks build up over time during boom phase of FC
  - MP has larger impact on probability and cost of financial busts
    - Crises are not necessary for benefits to arise

Costs and benefits of LAW: assumptions

	Standard	**BIS**
Permanent output losses	NO	NO/YES
Cleaning is costly	NO/YES	YES
LAW reduces crisis costs	NO	YES
Benefits possible without crises	NO	YES
Risks build up	NO	YES

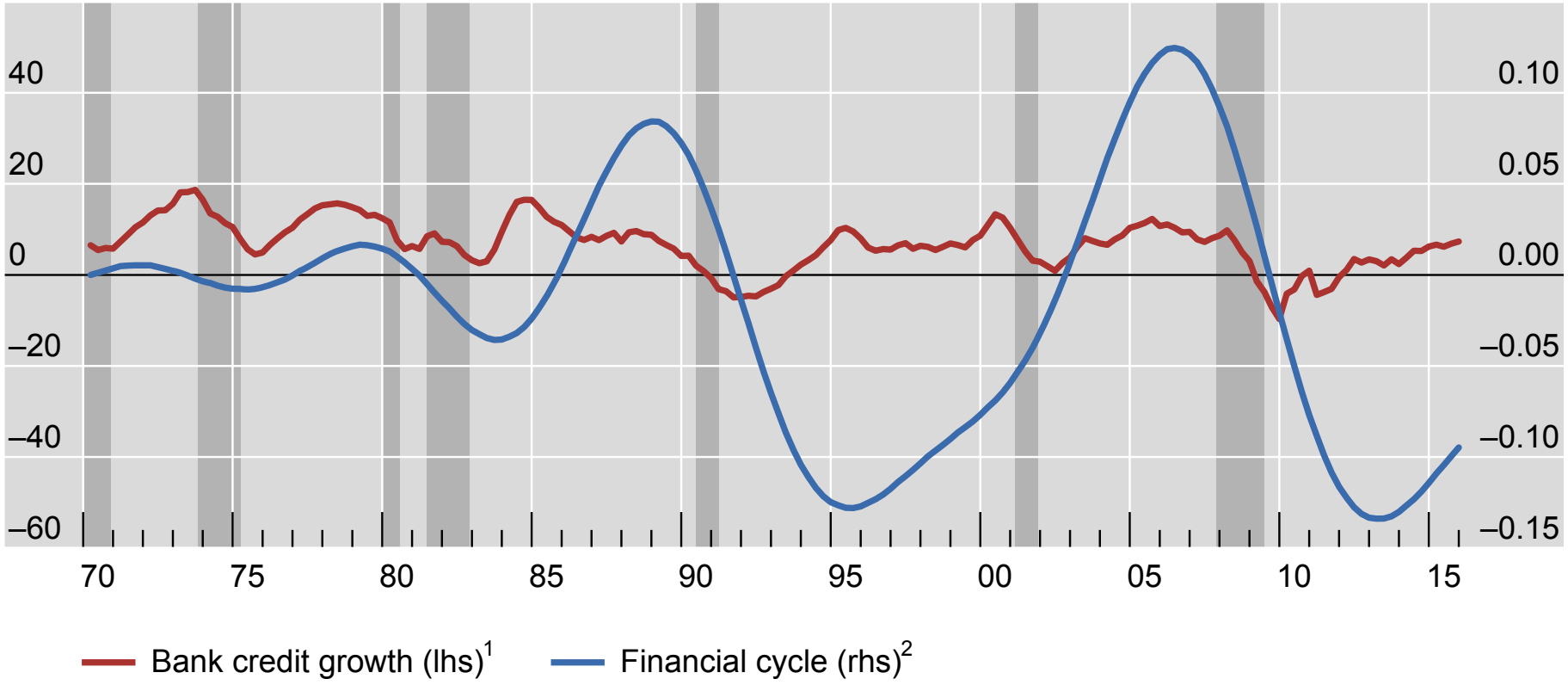
LAW = leaning against the wind

II – BIS research: first study

- Main features
  - Standard stylised economy…
  - …but with recurrent FCs in the crisis module
    - Based on credit/property prices/credit-to-GDP ratio (Graph 2)
  - Estimated on US data
- Key results
  - Generally desirable to lean against financial booms
  - It pays to lean early: otherwise costs grow
    - Risks build over time if no action is taken...
    - …in contrast to credit growth (variable in other studies) (Graph 2)
      - This returns quickly to the mean: no/little cost
    - Result would also hold with credit gap (Basel III): stock vs flow
  - The larger the imbalance, the greater the benefit
    - Because the bust is larger

Two different processes: the financial cycle and credit growth

(Graph 2)



[1] Bank credit to the private non-financial sector; year-on-year changes, in per cent. [2] Measured by frequency-based (bandpass) filters capturing medium-term cycles in real credit, credit-to-GDP ratio and real house prices.

Sources: BIS calculations; based on US data.

II – BIS research: second study

- Main feature: more granular estimated description of economy (US example)
- Three steps (Graph 3)
  - 1. Decompose FC into two key variables
    - debt service burden and leverage proxies (Graph 4)
    - their deviations from long-run (gaps) drive economy and generate FC
      - Gaps measure deviations from FE
    - Can generate permanent output losses
      - Help trace the Great Recession out of sample
    - No separate crisis module
      - FC fully integrated in economy's dynamics
  - 2. Use financial gaps to estimate the natural interest rate and output gap
    - Natural rate is intercept in reaction function (Taylor rule)...
    - ...but now needs to be consistent also with FE
  - 3. Carry out a counterfactual experiment (2003 onwards)
    - Based on augmented Taylor rule: includes FC proxy

Costs and benefits: an alternative approach (Graph 3)

Model: basic structure

Decompose the financial cycle

debt service burden leverage

+

Model: policy rule

Estimate financial cycle-adjusted inputs

output gap natural interest rate

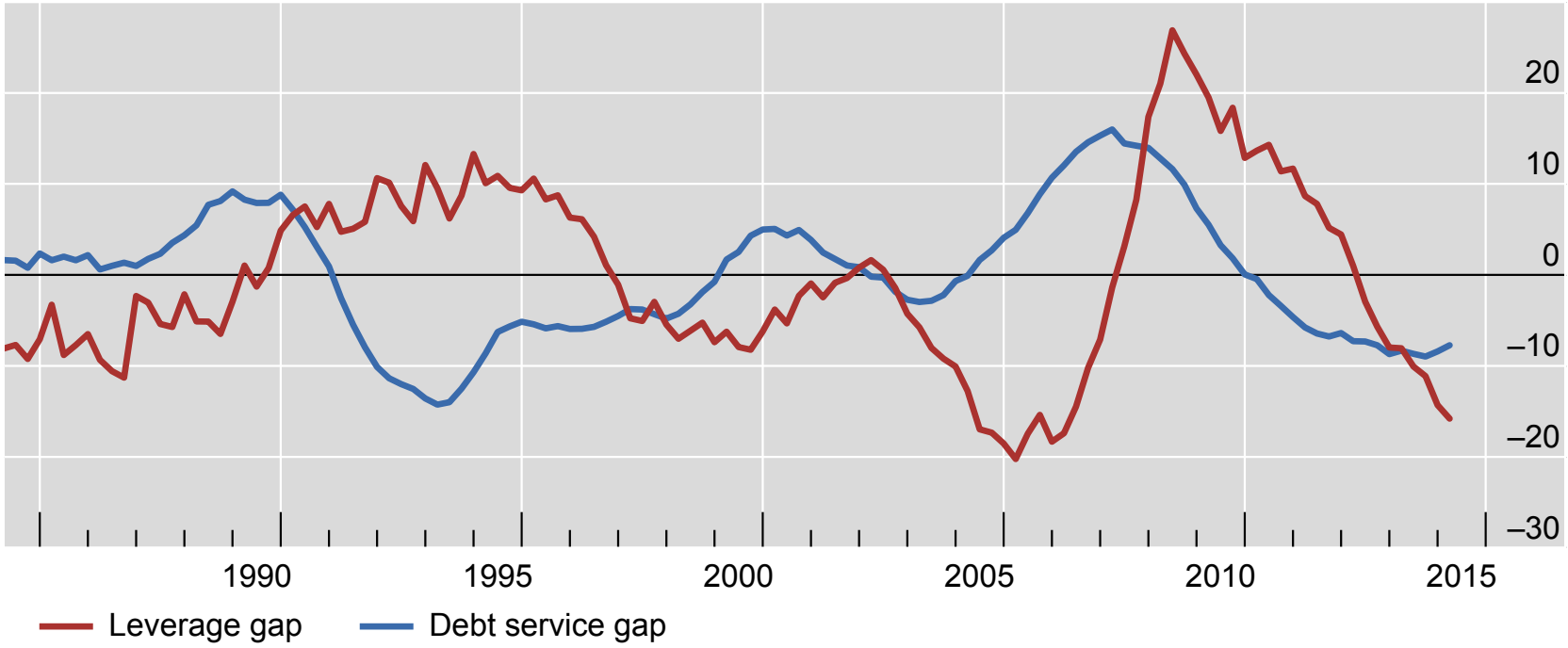
+

Counterfactual experiment

New policy rule:

output gap, inflation and **financial cycle proxy**

Graph 4: Evolution of the leverage and debt service gaps

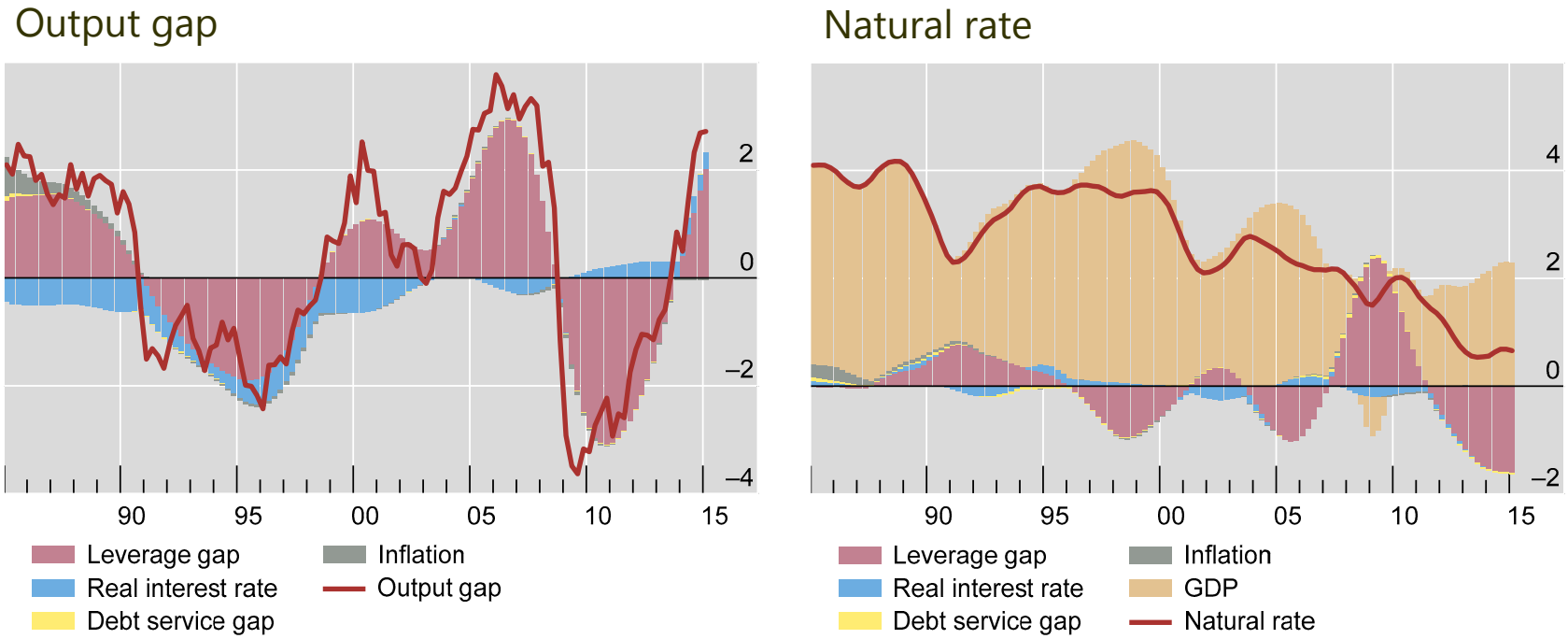


Source: M Juselius, Borio C, Disyatat P and Drehmann M, 'Monetary policy, the financial cycle and ultra low interest rates'.

II – BIS research: second study (cont)

- Key results
  - Gaps are key in estimates of output gaps and natural interest rate (Graph 5)
  - New reaction function leads to output gains at no inflation cost (Graph 6)
  - Important to lean early and respond systematically to the FC (Graph 7)
    - Allows faster normalisation of policy
  - Gains arise because the policy smooths the FC (Graph 8)
  - The earlier the counterfactual begins, the larger the gains
  - The natural interest rate (Graph 9)...
    - ...is higher than commonly estimated
    - ...falls by less when the central bank responds to the FC
  - Sizeable deviations of policy rate from natural rate may be needed
    - Larger than in standard Taylor rule

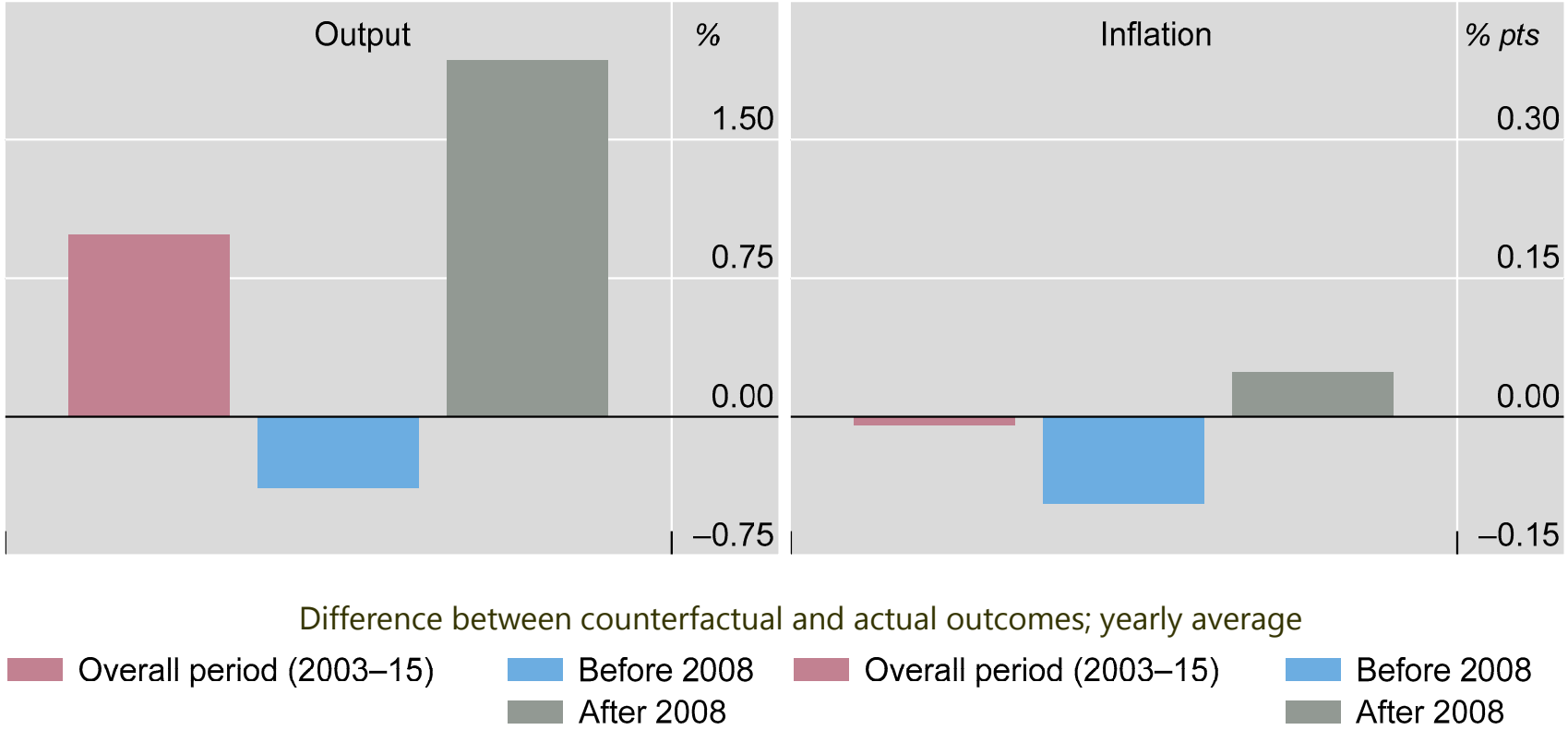
Graph 5: The financial cycle helps explain the variation in the output gap and the natural rate



Source: M Juselius, Borio C, Disyatat P and Drehmann M, 'Monetary policy, the financial cycle and ultra low interest rates'.

An illustrative experiment: higher output and similar inflation

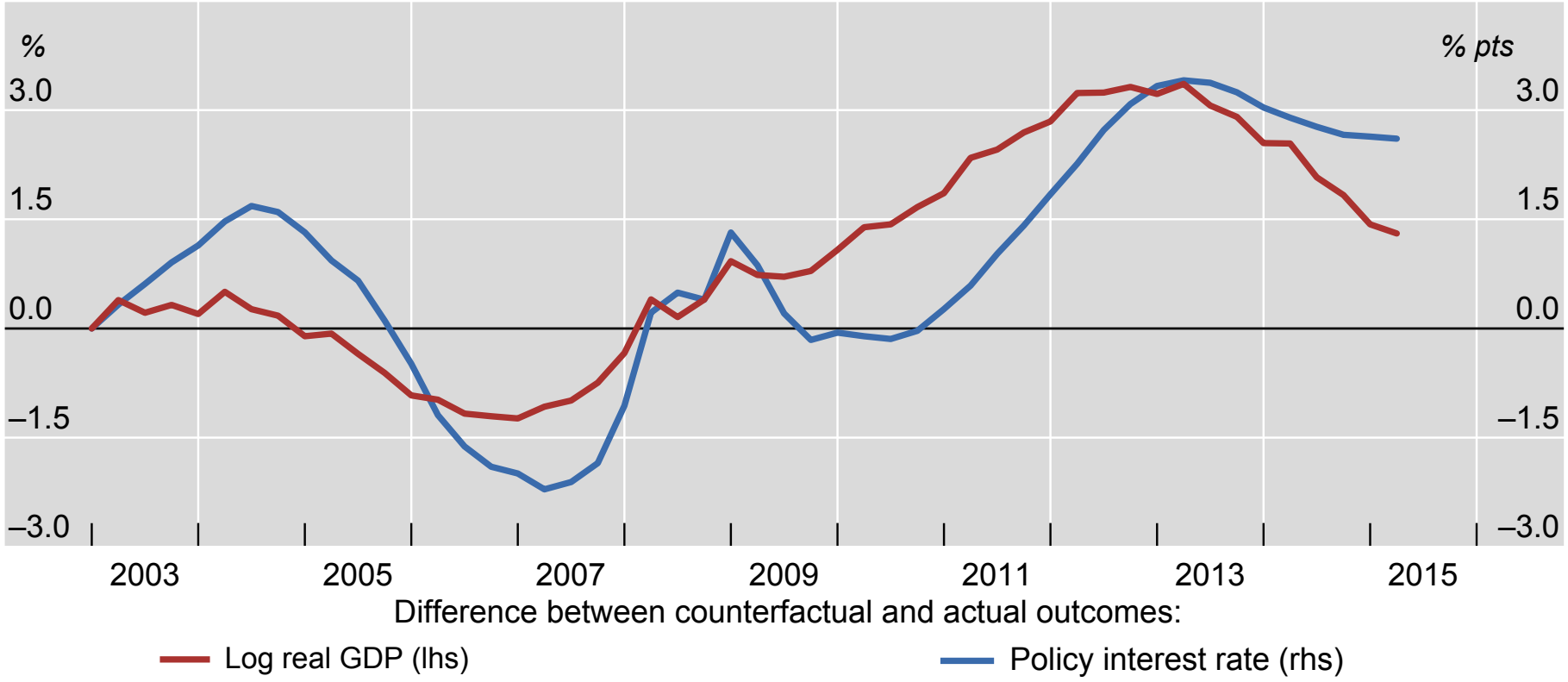
(Graph 6)



Sources: M Juselius, C Borio, P Disyatat and M Drehmann, "Monetary policy, the financial cycle and ultra-low interest rates", BIS, mimeo, 2016; based on US data.

An illustrative experiment: output and interest rate paths

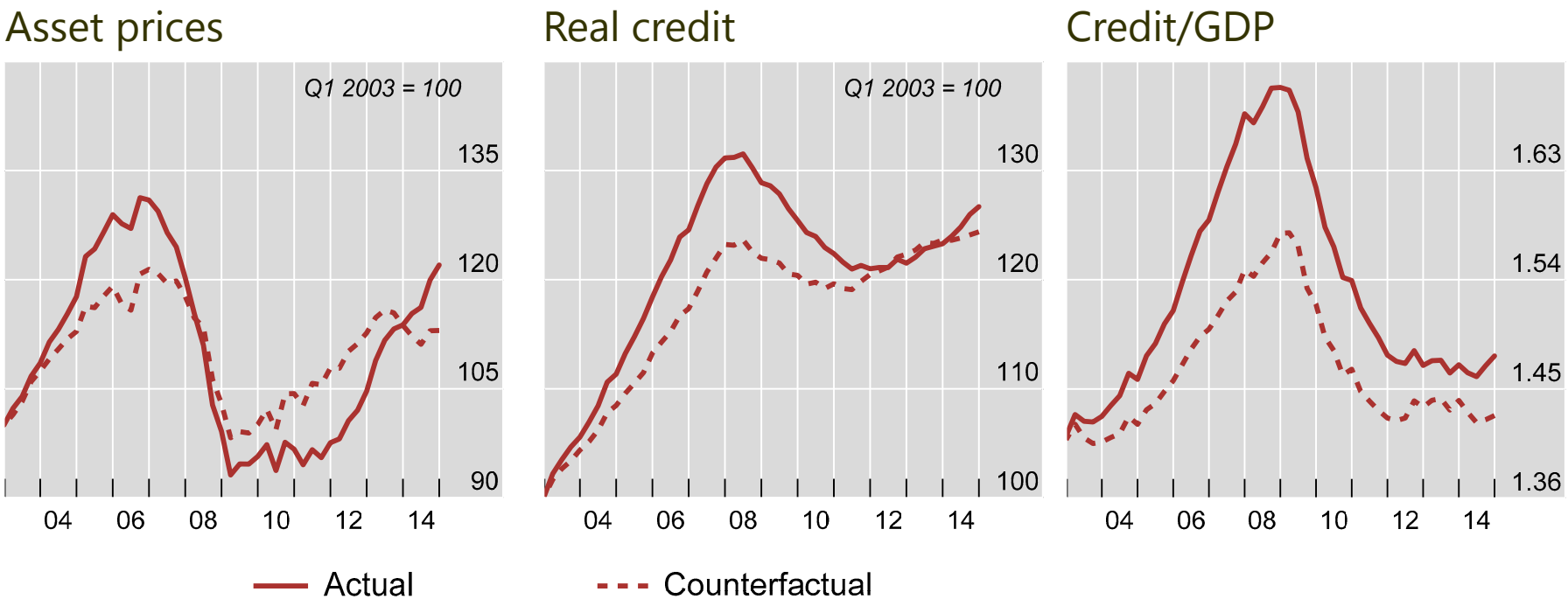
(Graph 7)



Sources: M Juselius, C Borio, P Disyatat and M Drehmann, "Monetary policy, the financial cycle and ultra-low interest rates", BIS, mimeo, 2016; based on US data.

An illustrative experiment: smoothing the financial cycle

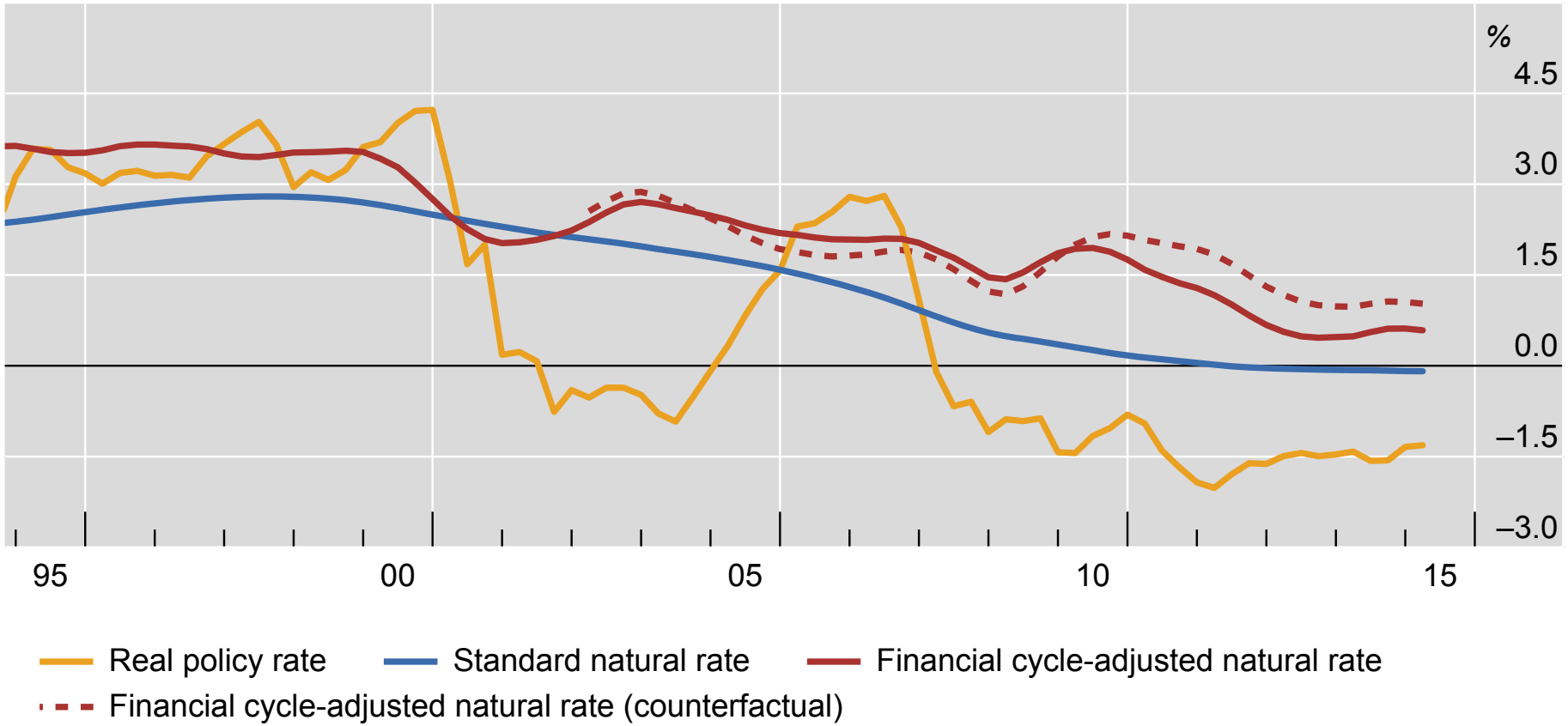
(Graph 8)



Sources: M Juselius, C Borio, P Disyatat and M Drehmann, "Monetary policy, the financial cycle and ultra-low interest rates", BIS, mimeo, 2016; based on US data.

Comparing interest rates: standard and financial cycle-adjusted

(Graph 9)



Sources: M Juselius, C Borio, P Disyatat and M Drehmann, "Monetary policy, the financial cycle and ultra-low interest rates", BIS, mimeo, 2016; based on US data.

III – Broader policy considerations: caveats

- Studies not sufficient to form a judgment on these issues
  - All such exercises face serious analytical/econometric challenges
  - Many considerations excluded from the analysis
    - Use of alternative policies (eg prudential)
    - Richer characterisation of the economy and uncertainty
      - Eg no explicit treatment of the exchange rate
  - Work is just one contribution to the bigger debate

- But argued elsewhere that
  - (Macro-) prudential policy cannot address the FC on its own
  - Typical objections to complementary role of MP are not fully convincing

III – Broader policy considerations: role of inflation

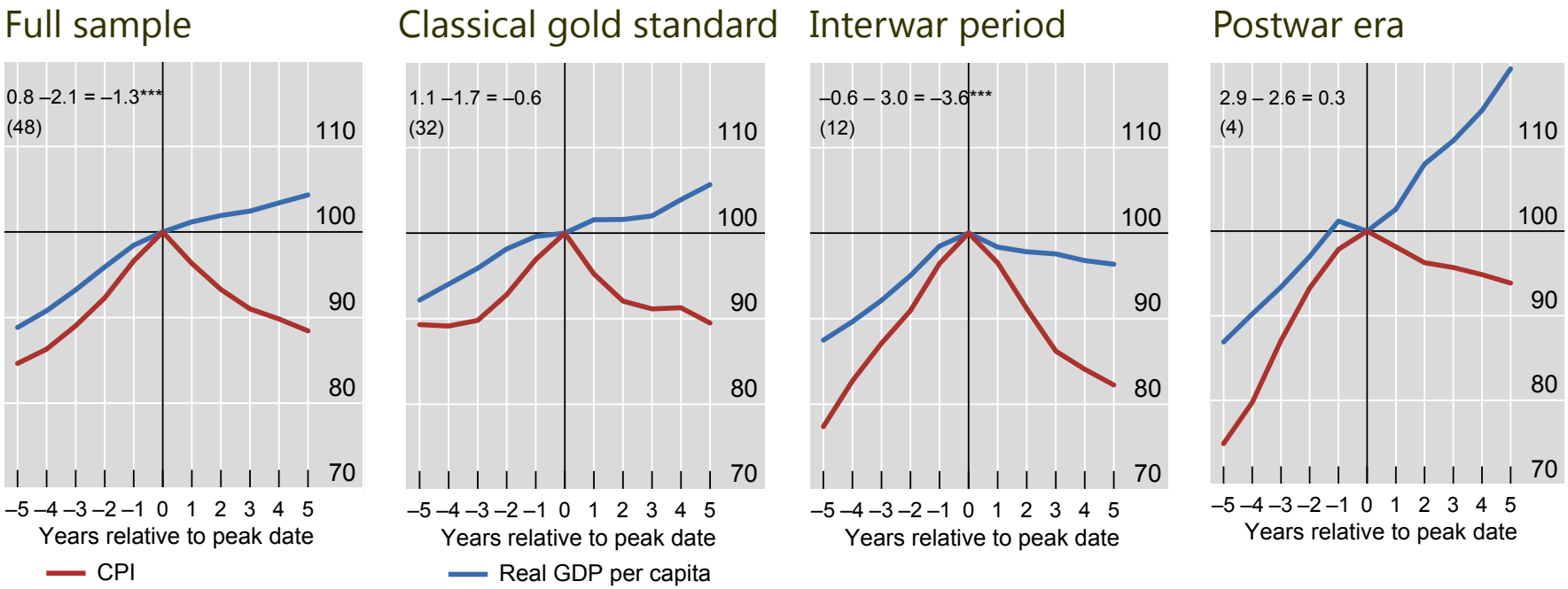
- Need for greater tolerance for persistent deviations from target
  - Paradox: risk of turning benign into malign disinflation
    - Failure to fight build-up of FIs changes its nature

- Understanding disinflation/deflation drivers and costs is essential
  - Historical record suggests that deflation is often benign (Graphs 10, 11)
    - Probably reflection of positive supply-side factors
      - Eg, globalisation and technology (Graph 12)
  - *What if* impact of MP on inflation is more temporary as a result?
    - Risk of driving real policy rates ever lower

- Implications for adjustments to MP frameworks
  - Exploit available flexibility to the full
  - If necessary, revise mandates as last resort (and with care)

Graph 10: Output costs of persistent deflations?[1]

Thirty-eight economies, 1870–2013, variable peak[2] year = 100



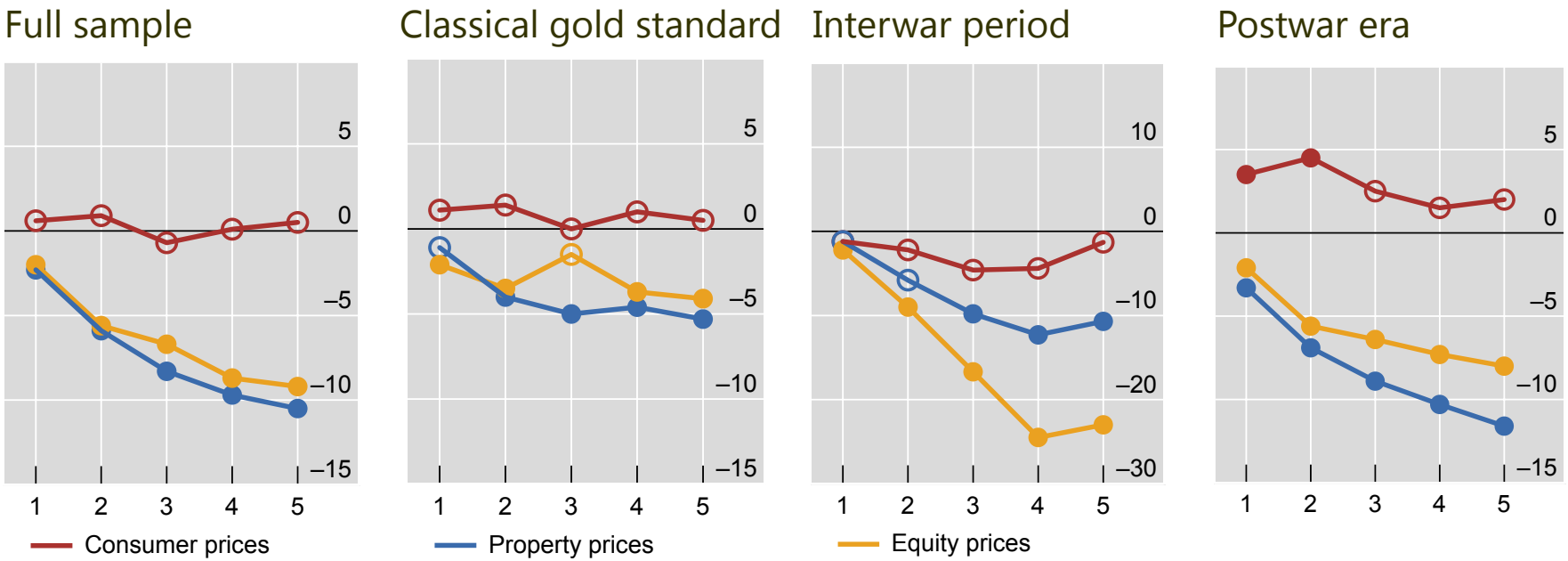
The numbers in the graph indicate five-year averages of post- and pre-price peak growth in real GDP per capita (in per cent) and the difference between the two periods (in percentage points); */**/*** denotes mean equality rejection with significance at the 10/5/1% level. In parenthesis is the number of peaks that are included in the calculations. The data included cover the peaks, with complete five-year trajectories not affected by observations from 1914–18 and 1939–45. For Spain, the Civil War observations are also excluded (1936–39).

[1] Simple average of the series of CPI and real GDP per capita readings five years before and after each peak for each economy, rebased with the peaks equal to 100 (denoted as year 0). [2] Associated with a turning point in the five-year moving average and peak levels exceeding price index levels in the preceding and subsequent five years.

Source: Borio, C, M Erdem, B Hoffman and A Filardo (2015).

Graph 11: Output costs - Deflations vs asset price declines[1]

In percentage points[2]



The estimated regressions are: $(y_{i,t+h} - y_{i,t}) - (y_{i,t} - y_{i,t-h}) = \alpha_i + \beta_1 P_{i,t}^{CPI} + \beta_2 P_{i,t}^{PP} + \beta_3 P_{i,t}^{EP} + \varepsilon_{i,t}, h = 1,2,3,4,5$
where *y* is the log level of per capita real GDP and are, P^{CPI}, P^{PP}, P^{EP} respectively, the CPI, property and equity price peaks.

A circle indicates an insignificant coefficient, and a filled circle indicates that a coefficient is significant at least at the 10% level. Estimated effects are conditional on sample means (country fixed effects) and on the effects of the respective other price peaks (eg the estimated change in h-period growth after CPI peaks is conditional on the estimated change after property and equity price peaks).

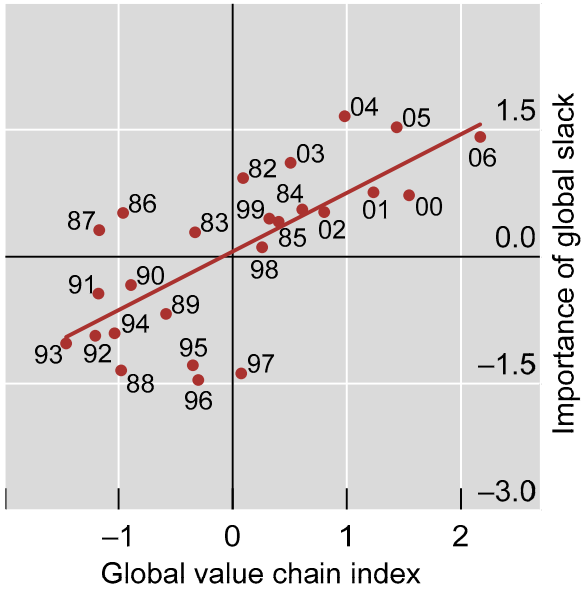
[1] The graph shows the estimated difference between h-period per capita output growth after and before price peak. [2] The estimated regression coefficients are multiplied by 100 in order to obtain the effect in percentage points.

Source: Borio, C, M Erdem, B Hoffman and A Filardo (2015).

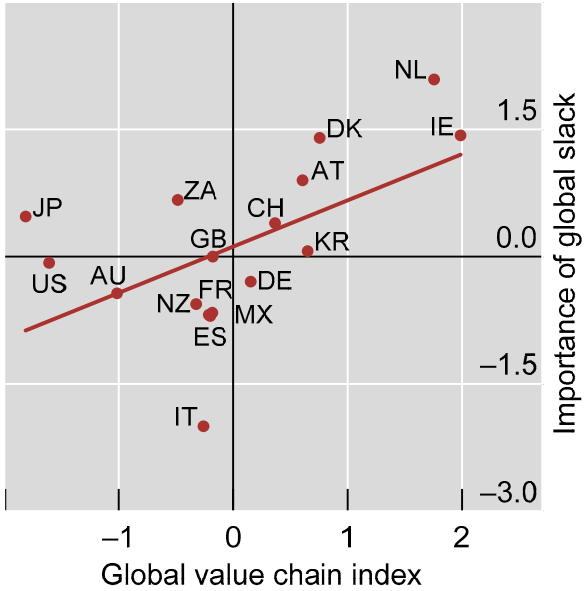
Graph 12: Expansion of GVCs drives rising importance of global slack for domestic inflation

Growth in GVCs has increased

...the relevance of global gaps over time...



...and across countries



GVCs = global value chains

Source: Auer, Borio and Filardo (2016): . "The globalisation of inflation: growing importance of international input-output linkages", BIS Working Papers, forthcoming.

Conclusion

- Two studies presented are just one contribution to broader debate

- But two conjectures are expected to survive further scrutiny
  - There are likely to be potential gains from a more FSOMP
  - Any such policy would need to respond systematically to FC
    - In both good and bad times
    - Need to avoid being too far away for too long from FE
    - Policy of "selective attention" would fall short of the mark

- Suggest adjustments to current MP frameworks
  - Greater role in benchmark responses for financial variables
  - Stronger medium-term orientation
  - Greater tolerance for persistent deviations of inflation from targets

Graph 13: Unusually accommodative global monetary conditions

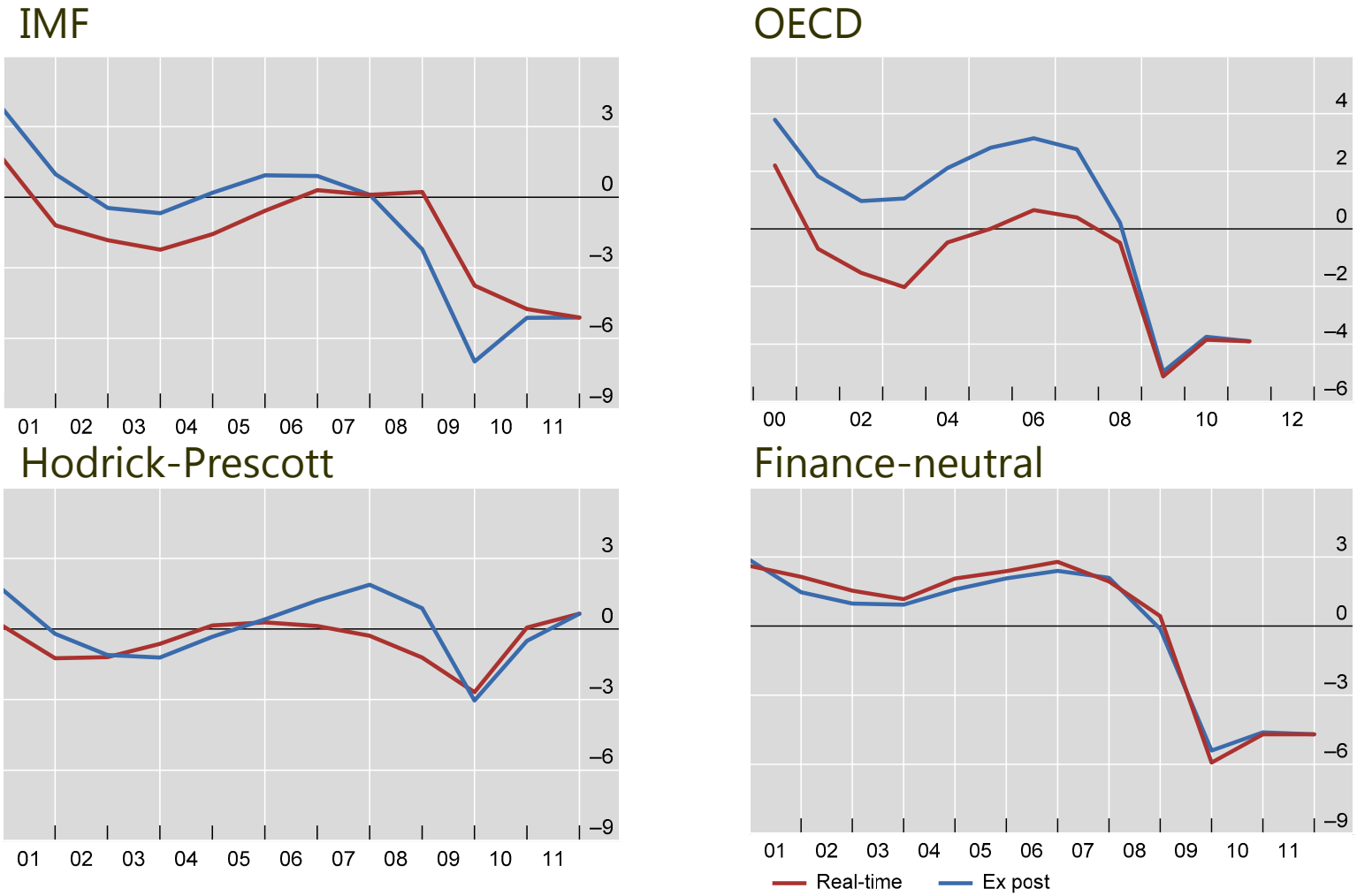
Weighted averages. For details, see BIS, *85th Annual Report*, Graph V.3.

Table 1: Early warning indicators for banking distress – risks ahead

	Credit-to-GDP gap[2]	Property price gap	Debt service ratio (DSR)	Debt service ratio if interest rates rise by 250 bp[4]
Asia	18.3	10.4	2.0	4.3
Australia	1.6	1.5	0.7	4.5
Brazil	15.7	–5.2	4.6	6.3
Canada	6.5	6.3	1.7	5.5
China	25.4	–6.3	5.8	9.1
Central and Eastern Europe	–11.2	7.1	1.2	2.7
France	5.7	–11.7	1.4	4.5
Germany	–5.9	9.7	–1.8	0.1
Greece	–7.4	4.6		
India	–3.4		2.1	3.2
Italy	–9.8	–17.2	0.8	3.0
Japan	5.2	13.3	–2.2	0.6
Korea	3.4	4.2	0.1	3.8
Mexico	6.0	–4.0	0.3	0.9
Netherlands	–14.7	–19.2	1.6	6.5
Nordic countries	1.5	2.6	1.7	5.9
Portugal	–29.7	7.6	–0.5	2.9
South Africa	–2.1	–6.2	–0.9	0.4
Spain	–39.1	–26.6	–2.2	0.8
Switzerland	9.3	11.6	0.4	3.6
Turkey	16.6		4.1	5.7
United Kingdom	–29.0	–3.1	–1.7	1.2
United States	–12.5	0.9	–1.8	0.7
Legend	*Credit/GDP gap>10*	*Property gap>10*	*DSR>6*	*DSR>6*
	2≤Credit/GDP gap≤10		*4≤DSR≤6*	*4≤DSR≤6*

Graph 14: US output gaps: ex post and real-time estimates

In per cent



For each time *t*, the "real-time" estimates are based only on the sample up to that point in time. The "ex post" estimates are based on the full sample.

Source: Borio, C, P Disyatat and M Juselius (2013).