



Seðlabanki Íslands

# Financial cycles, capital flows, and policy responses in Iceland

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Capital Flows, Systemic Risk, and Policy Responses  
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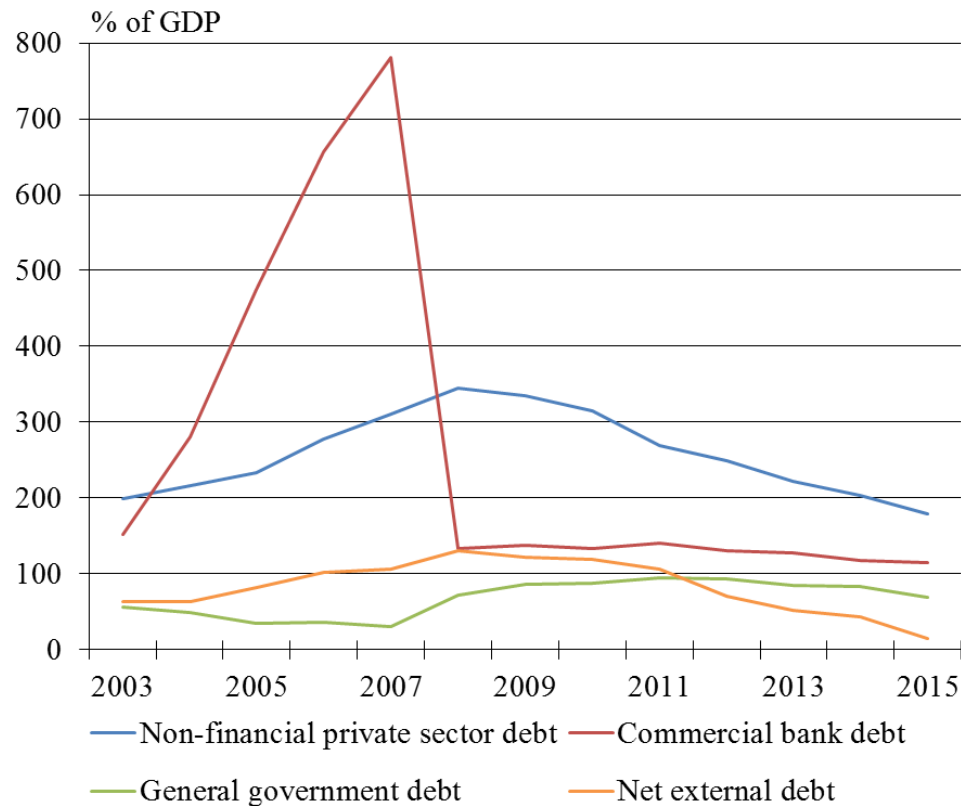
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# Capital flows, systemic risk, and policy responses



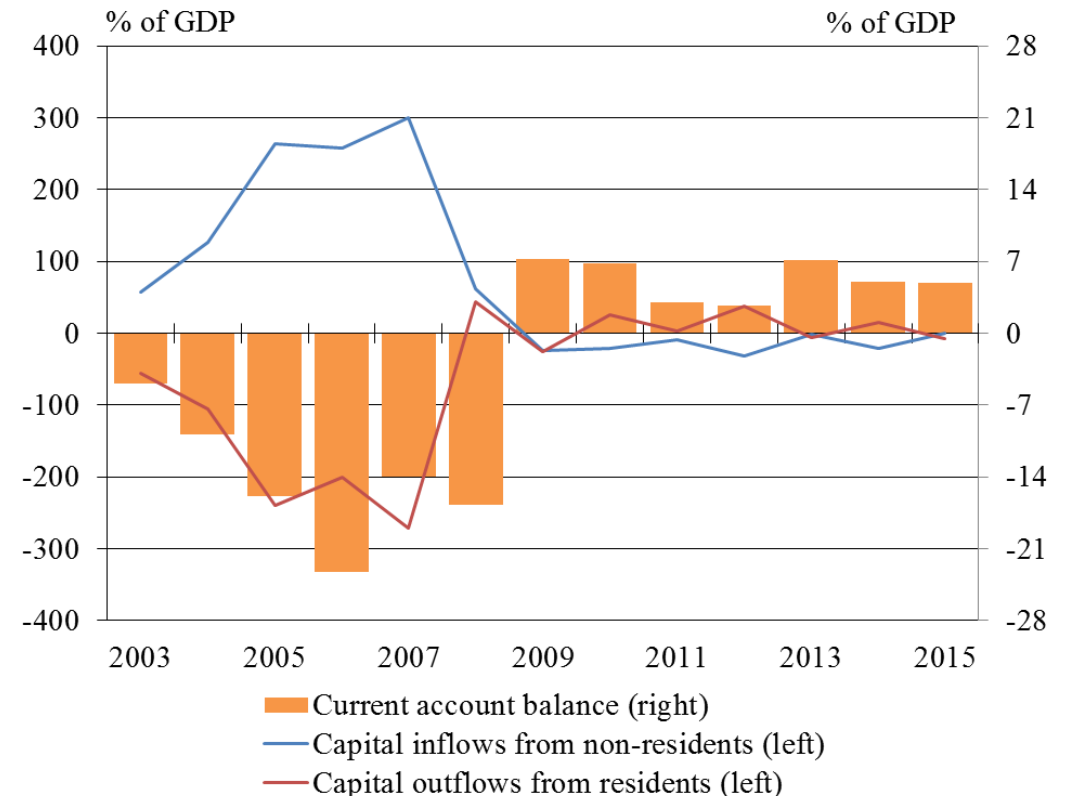
- Iceland in the 2000s represents a vivid example of a hefty build-up of leverage, excessive capital flows, and unsuccessful policy responses, resulting in a systemic financial crisis of extraordinary proportions ...
- ... however, balance sheets have now been repaired and the capital account is being re-liberalised within a reformed policy framework, designed to be more successful in safeguarding economic and financial stability

Iceland's leverage cycle 2003-2015<sup>1</sup>



1. Sectoral debt is gross debt and regardless of whether the creditors are residents or non-residents, while external debt is net debt and is based on the Central Bank's estimate of the underlying debt position. Commercial bank debt is total debt of the three largest commercial banks at each time.  
Sources: Statistics Iceland, Central Bank of Iceland, Commercial banks' annual reports.

Iceland's sudden floods and stops in capital flows 2003-2015<sup>1</sup>



1. Gross capital inflows from non-residents represents their net purchases of domestic assets, while gross capital outflows from residents represents their net purchases of foreign assets.  
Sources: Statistics Iceland, Central Bank of Iceland.

# The focus of my presentation



## Systemic risk and spillovers

- Need to understand the endogenous self-reinforcing feedback dynamics operating within the financial system, between the real and financial sectors, domestically and across borders

## Financial cycle analysis

- The financial cycle is a promising analytical tool to capture such dynamics and I will present an analysis into the financial cycle in Iceland\*

## Post-crisis policy reforms

- Monetary and macro-prudential policy, as well as the ongoing work on capital flow management measures

\*Einarsson, B. G., K. Gunnlaugsson, T. T. Ólafsson, and T. Pétursson (2016). The long history of financial boom-bust cycles in Iceland – Part II: Financial cycles. Central Bank of Iceland *Working Papers*, forthcoming.

# The financial cycle in Iceland



## Definition of the financial cycle

- The term generally refers to the co-movement of a set of financial variables, including both quantities and prices – with its most parsimonious representation relying on house prices and credit
- We measure the financial cycle as the low-frequency cyclical co-movement of a broader set of financial variables to attain additional insight and expose potentially important small open economy features – including the role of global spillovers

## Annual data for the period 1875-2013

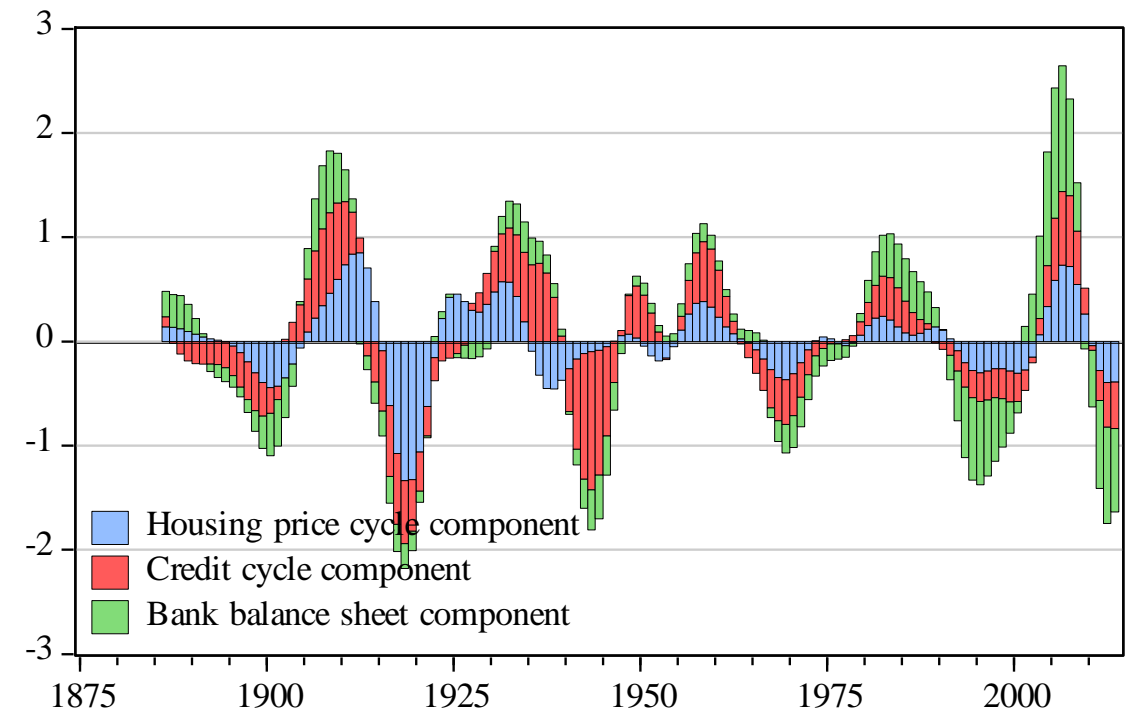
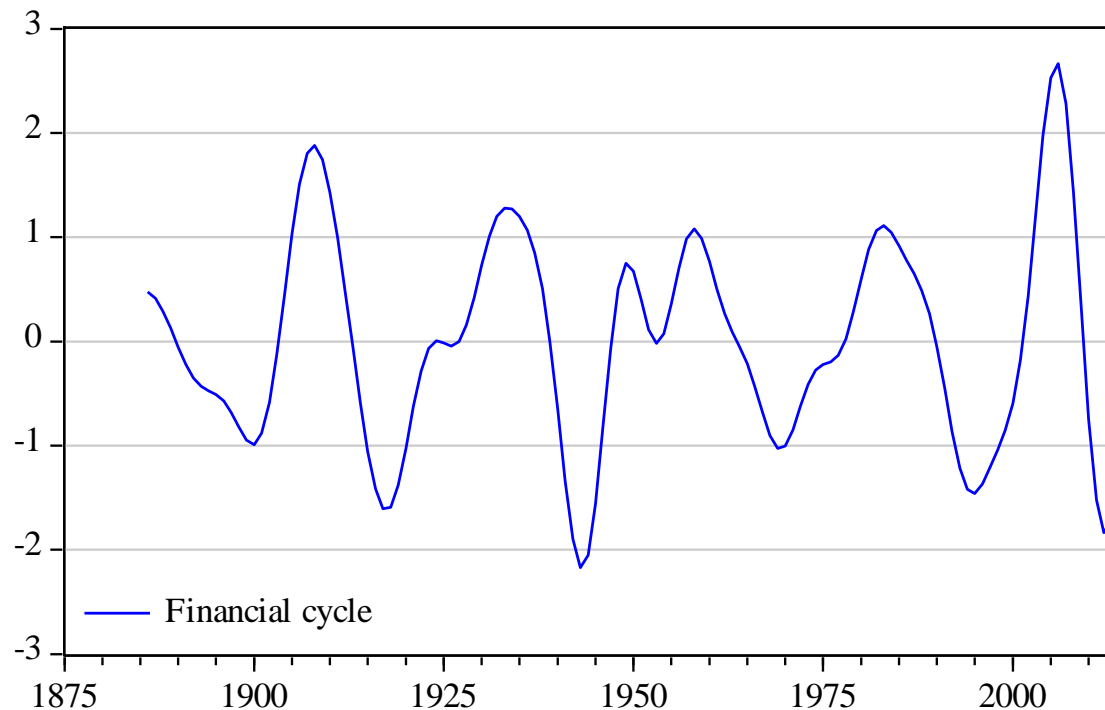
- Domestic financial variables
  - Real house prices, credit, and money
  - Banking system assets, leverage, and liability composition
- International financial variables
  - US data as a proxy for global financial cycle
  - Danish, Norwegian and UK financial variables to capture potential regional spillovers

# The financial cycle and its composition

- We apply the Christiano and Fitzgerald frequency filter to extract the medium-term cyclical component of each series and use a principal component analysis to estimate the aggregate financial cycle
- We find that there exists a well-defined financial cycle with seven identified cyclical expansions - the latest one standing out in size and duration – with bank balance sheets often playing an important role

## The financial cycle and contribution of individual cyclical components

Financial cycle (left) and contribution of medium-term components (right)



Financial cycle and contribution of individual cyclical components, weighted with their normalised factor loadings. *House price cycle component* refers to the contribution of the medium-term cycle in real house prices to the financial cycle, *Credit cycle component* refers to the weighted average contribution of medium-term cycles in real credit, credit-to-GDP and credit-to-M3 to the financial cycle, *Bank balance sheet cycle component* refers to the weighted average contribution of medium-term cycles in bank assets-to-GDP, foreign non-core bank liabilities ratio and total non-core liabilities ratio to the financial cycle. The individual components are normalised so that their sum has the same mean and standard deviation as the aggregate cycle.

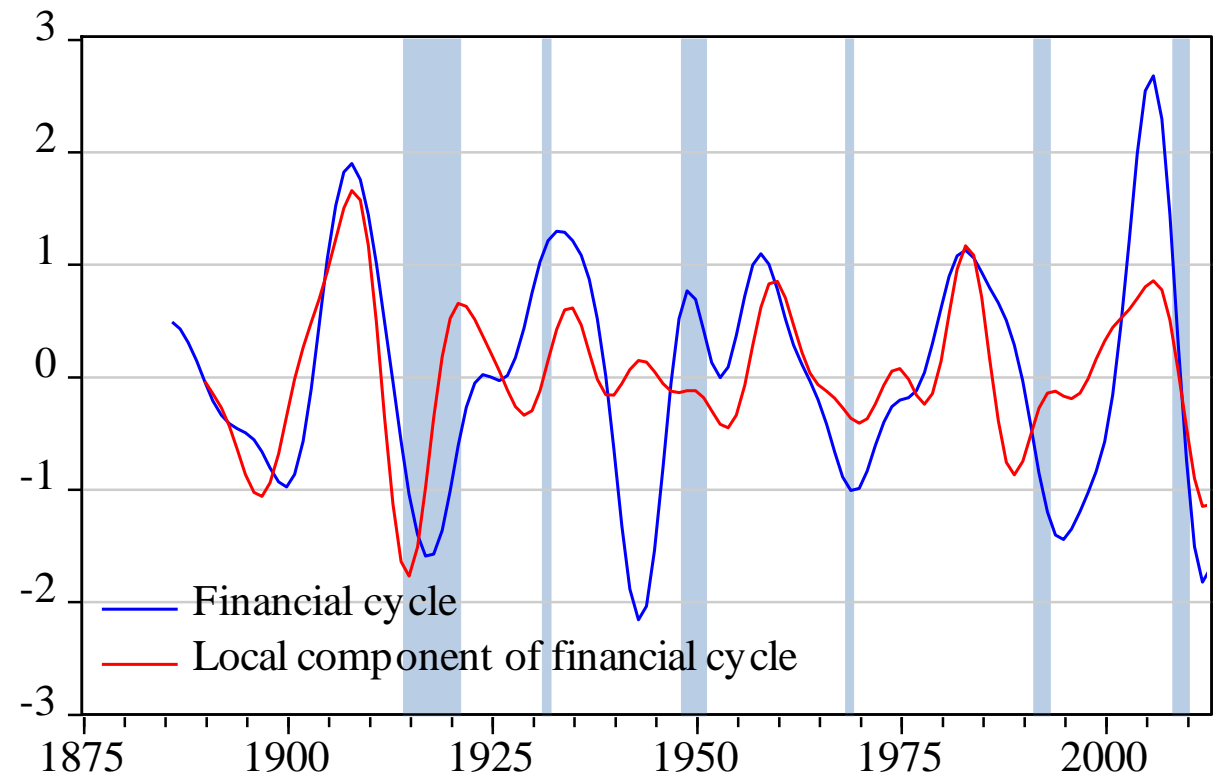
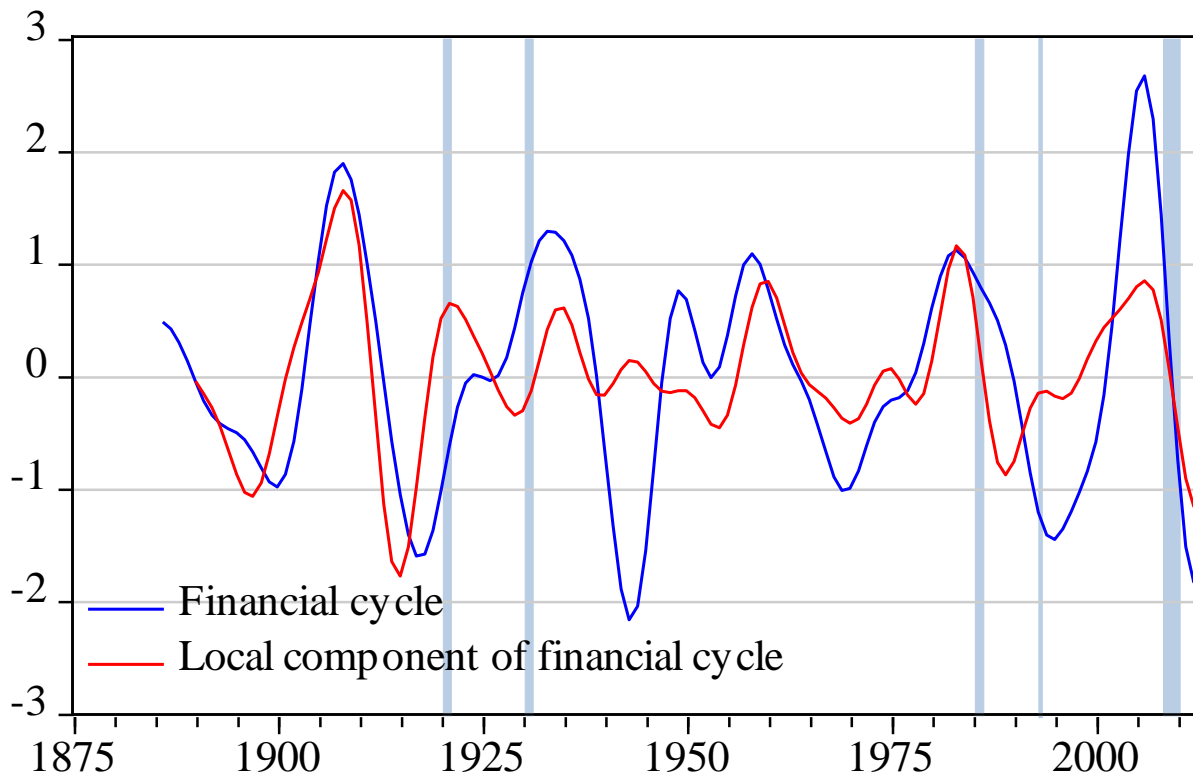
# Close relation between the financial cycle and crises



- Financial crises are closely aligned with financial cycle peaks: almost all peaks have some kind of a financial crisis within a three year window
- The financial cycle outperforms the early warning capacity of individual financial and macroeconomic series: an expansion is followed by a banking crisis within three years in 60% of all expansionary phases

## The financial cycle and financial crises

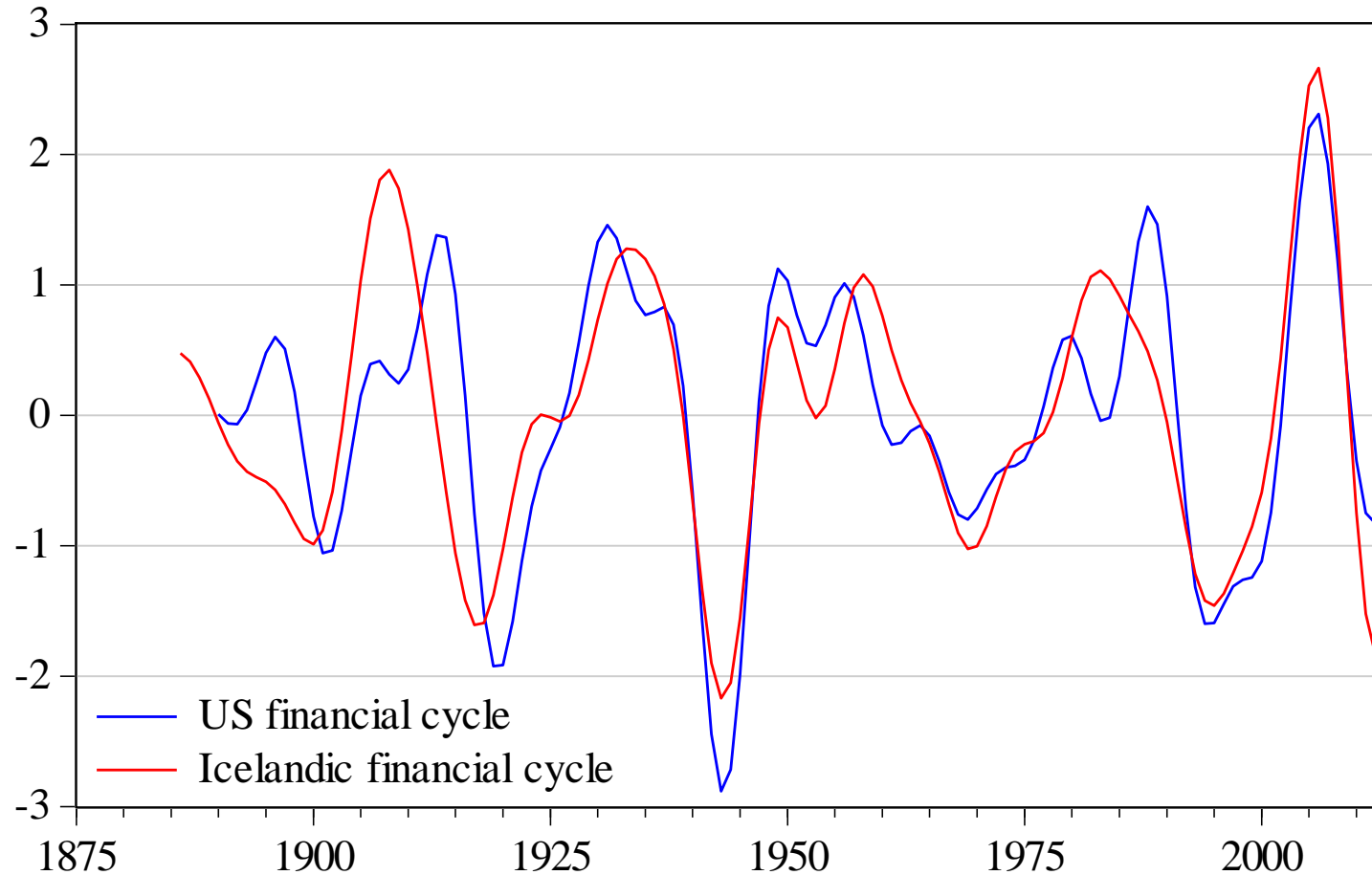
Banking crises (left) and multiple financial crises (right) shown as shaded areas



# Strong spillover effects from global financial cycle

- We find strikingly strong ties between the Icelandic financial cycle and its global counterpart
- Nearly all Icelandic peaks occur close to global peaks and the cycles are roughly 75% of the period in the same phase notwithstanding different policy and openness regimes

The US and Icelandic financial cycles



Concordance index of US and Icelandic financial cycles

US financial variable	Total sample	1875-1944	1945-2013	1980-2013
House prices	0.57	0.45	0.67	0.74
Real credit	0.65	0.59	0.70	0.71
Credit-to-GDP	0.72	0.67	0.75	0.74
Real M3	0.39	0.34	0.42	0.56
M3-to-GDP	0.60	0.66	0.55	0.53
Credit-to-M3	0.67	0.62	0.72	0.62
Assets-to-GDP	0.73	0.78	0.70	0.76
Real interest rate	0.59	0.64	0.55	0.56
Real stock prices	0.46	0.59	0.36	0.38
US financial cycle	0.74	0.67	0.80	0.74

■ indicates numbers between 0.6 and 0.7, ■ numbers between 0.7 and 0.8, and ■ numbers higher than 0.8.

# Policy challenges



## Powerful, pro-cyclical forces ...

- The financial cycle entails powerful, pro-cyclical, and long-lasting forces, which to a significant degree originate outside the domestic domain, ...
- ... and these forces have shaped economic developments and financial crises in this small open economy

## ... giving rise to challenging policy issues

- How can the design of domestic policy frameworks in small open economies take the financial cycle and global spillovers into account to try to attenuate to a larger degree the boom-bust dynamics they give rise to?



# Ongoing post-crisis policy reforms in Iceland



## Institutional

Monetary policy committee

Financial stability council with a systemic risk council

Governance within and across policy spheres

## Intermediary objectives

Safeguard monetary policy transmission, avoid being overburdened

Limit systemic risk (across the time and cross-sectional dimensions)

Strengthen the financial system's resilience to busts

## Toolbox

FX interventions

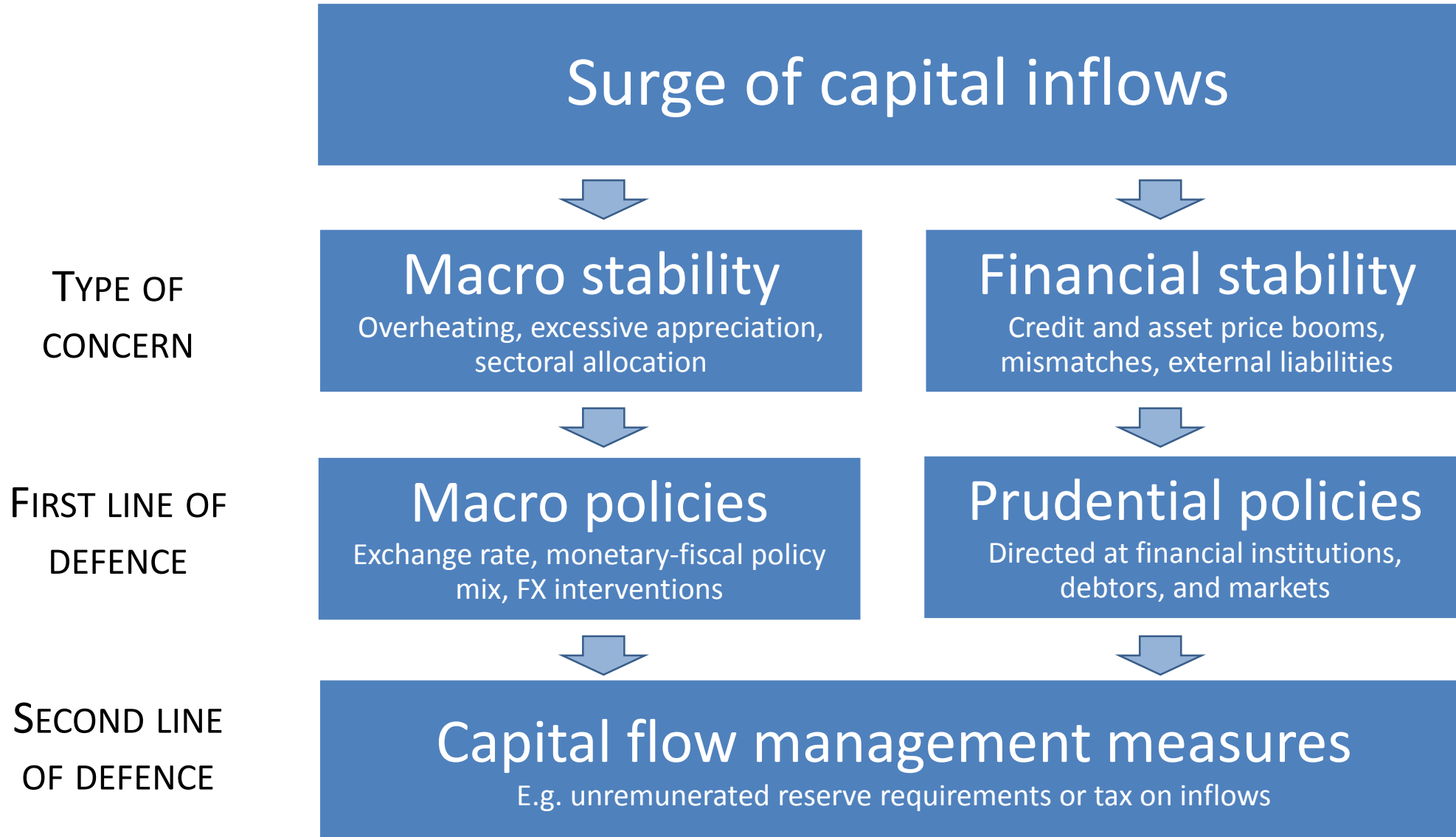
Capital flow management measures (CFMs)

Capital buffers

Liquidity and funding regulation

Debtor tools

# CFMs: complementary when policy is constrained

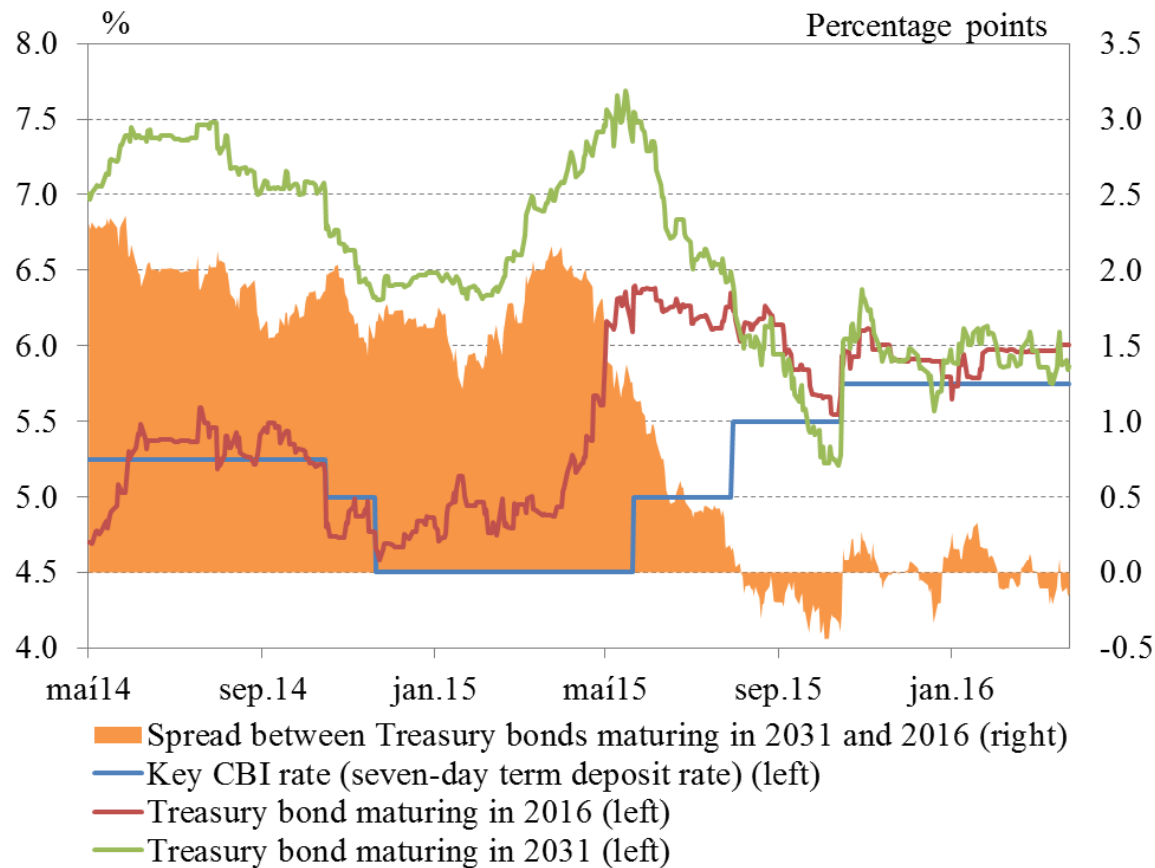


# Challenges from capital inflows at the current conjuncture



## Key Central Bank rate and nominal Treasury bond yields

Daily data 21 May 2014 - 13 April 2016



Source: Central Bank of Iceland.

## Macro challenges

Monetary policy transmission interruptions

Monetary policy becoming more constrained

## Financial stability challenges

Limited to date but could grow as experience shows

Scope to reinforce current prudential tools

# Uncertain effects from the use of CFMs



## Size of flows and exchange rate appreciation

- Little evidence of CFMs limiting extent of inflows and the size of the exchange rate appreciation

## Monetary policy independence

- Some evidence of CFMs increasing monetary policy's effectiveness and autonomy

## Systemic risk

- Evidence of changed composition of flows towards less risky flows, although credit and asset price booms have nevertheless taken place

# Conclusions



## Insight from the financial cycle approach

- The financial cycle provides insight into the multifaceted self-reinforcing feedback dynamics that operate within the financial system, ...
- ... between the real and financial sectors, both domestically and across borders, and can result in systemic risk

## Policy reforms

- A number of policy reforms have been introduced in Iceland, but further improvements are needed to strengthen our capacity to ensure overall stability, ...
- ... especially with regards to dealing with capital inflow surges and disruptive outflows – that work is currently underway and we are grateful for the insight provided at this conference