Indicators for shock-resilience and pro-cyclicality at the Central Bank of Hungary

Gergely Fabian

Workshop for heads of financial stability, Bank of England
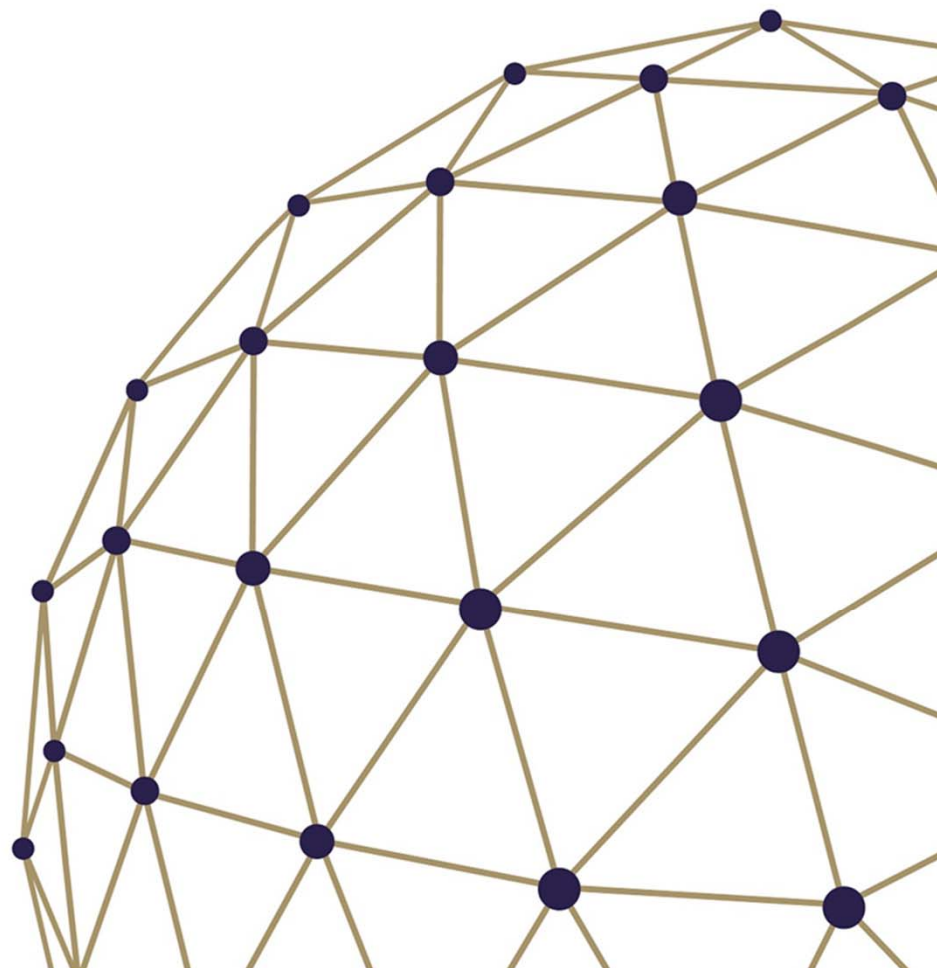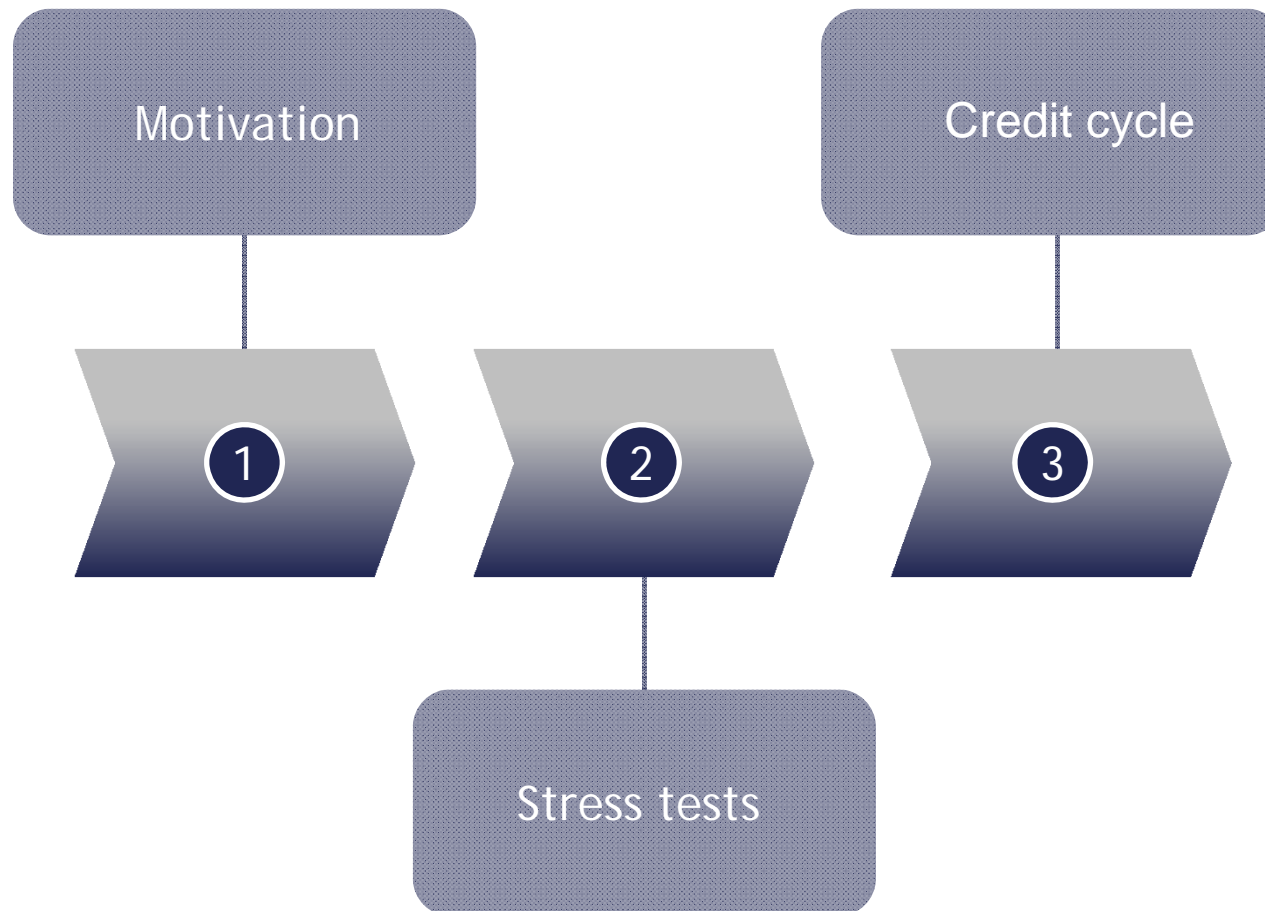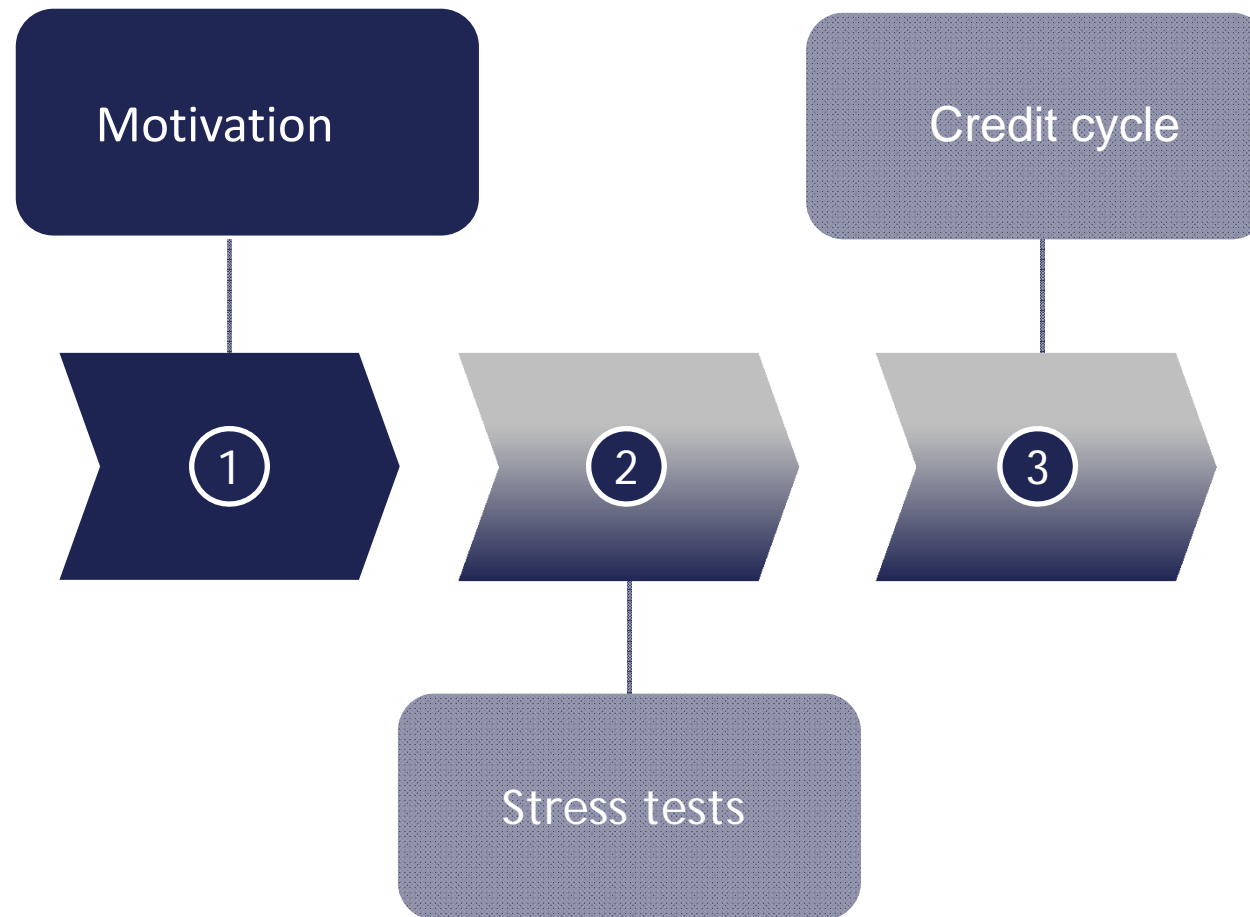
22-23 February 2016

Table of content

Motivation

Credit cycle

1

2

3

Stress tests

Table of content

Motivation

Credit cycle

1

2

3

Stress tests

Motivation

- Need for visualization
- Need for comparability
    - Create time-series from stress test results
- Understanding the cyclical position of credit and the banking sector behaviour itself
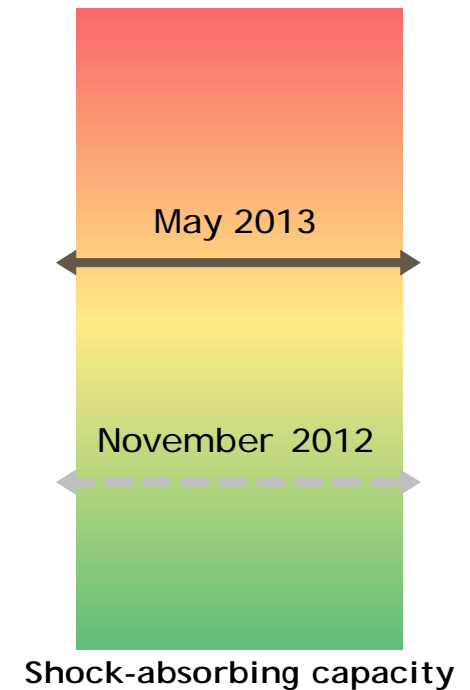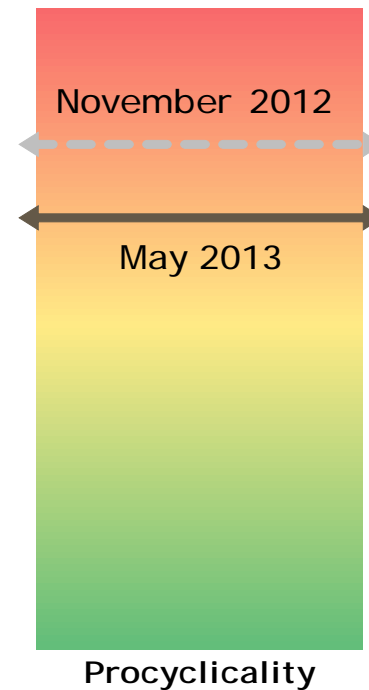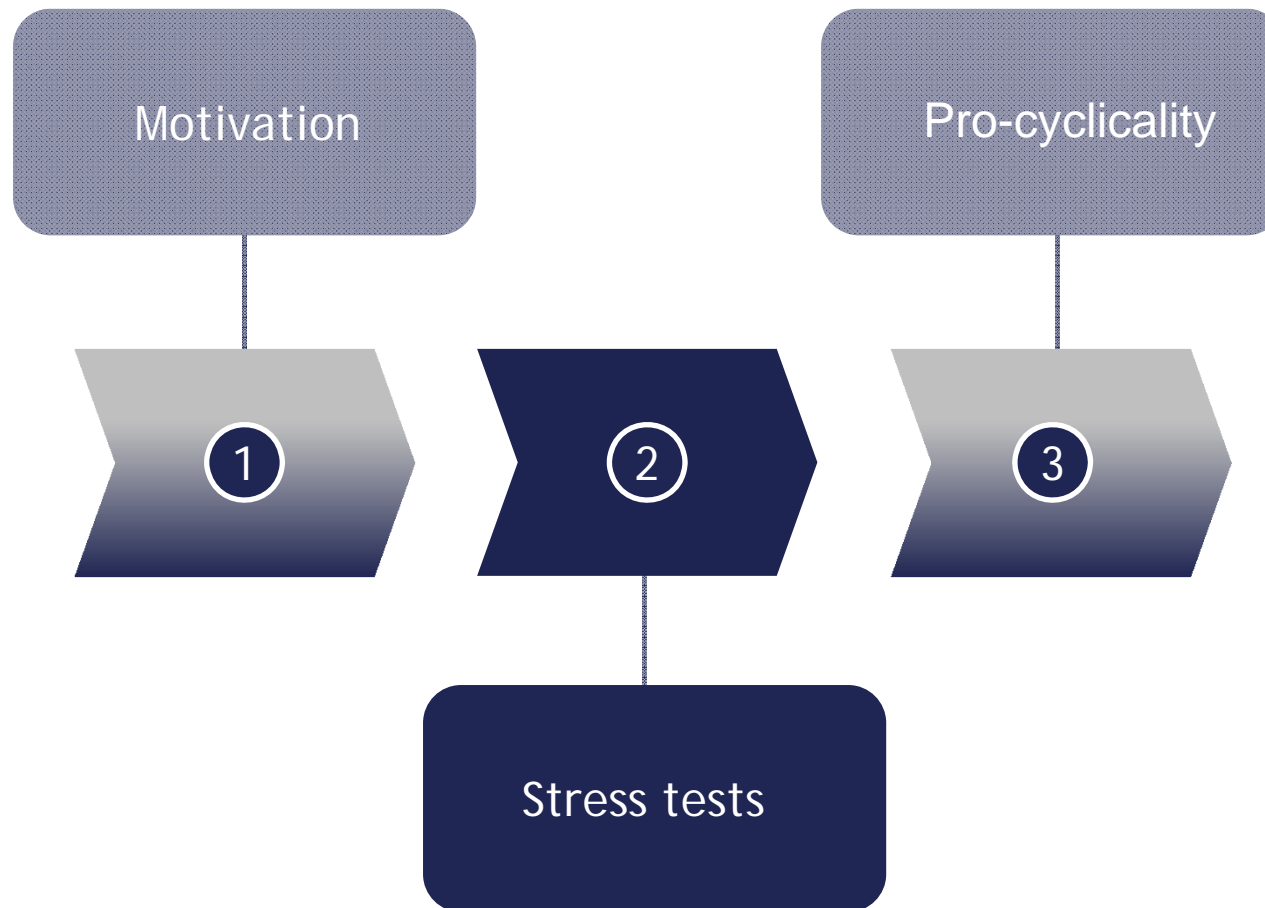   - Taking into account the specialties of the local credit market

November 2012

May 2013

Procyclicality

May 2013

November 2012

Shock-absorbing capacity

Table of content

Motivation

Pro-cyclicality

1

2

3

Stress tests

Stress tests

Liquidity stress

- 30-day forward looking test of liquidity position for simultaneous occurrence of severe but plausible liquidity shocks
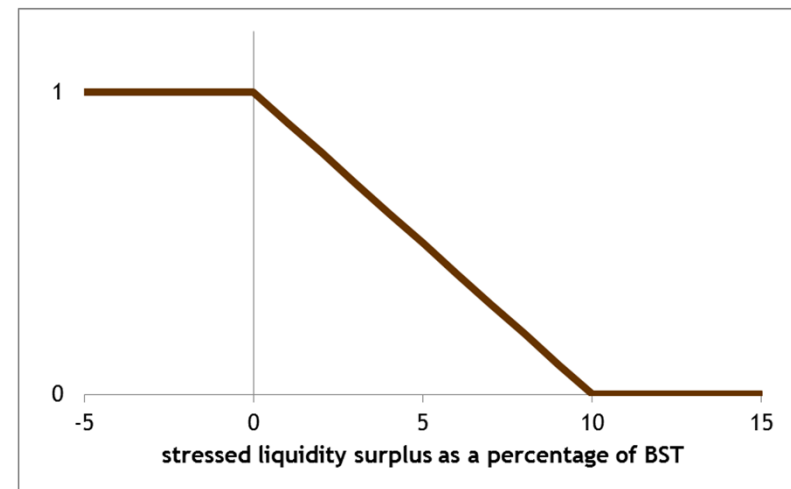
Solvency stress

- 2-year forward looking test of capital position for severe but plausible macroeconomic shock

# Transforming the individual liquidity needs to an index

- Calculate the stressed liquidity surplus as a percentage of balance sheet total, then transform:
  - surplus under 0 percent: illiquidity (value 1)
  - surplus above 10 percent: enough liquidity (value 0)
  - surplus between 0-10 percent: linear interpolation

- Weighted aggregates
- „Red alert": the index is above 0.3
  - 30 percent of the banking sector is illiquid
 - each bank is below the regulatory minimum by 3 percentage points

The Liquidity Stress Index
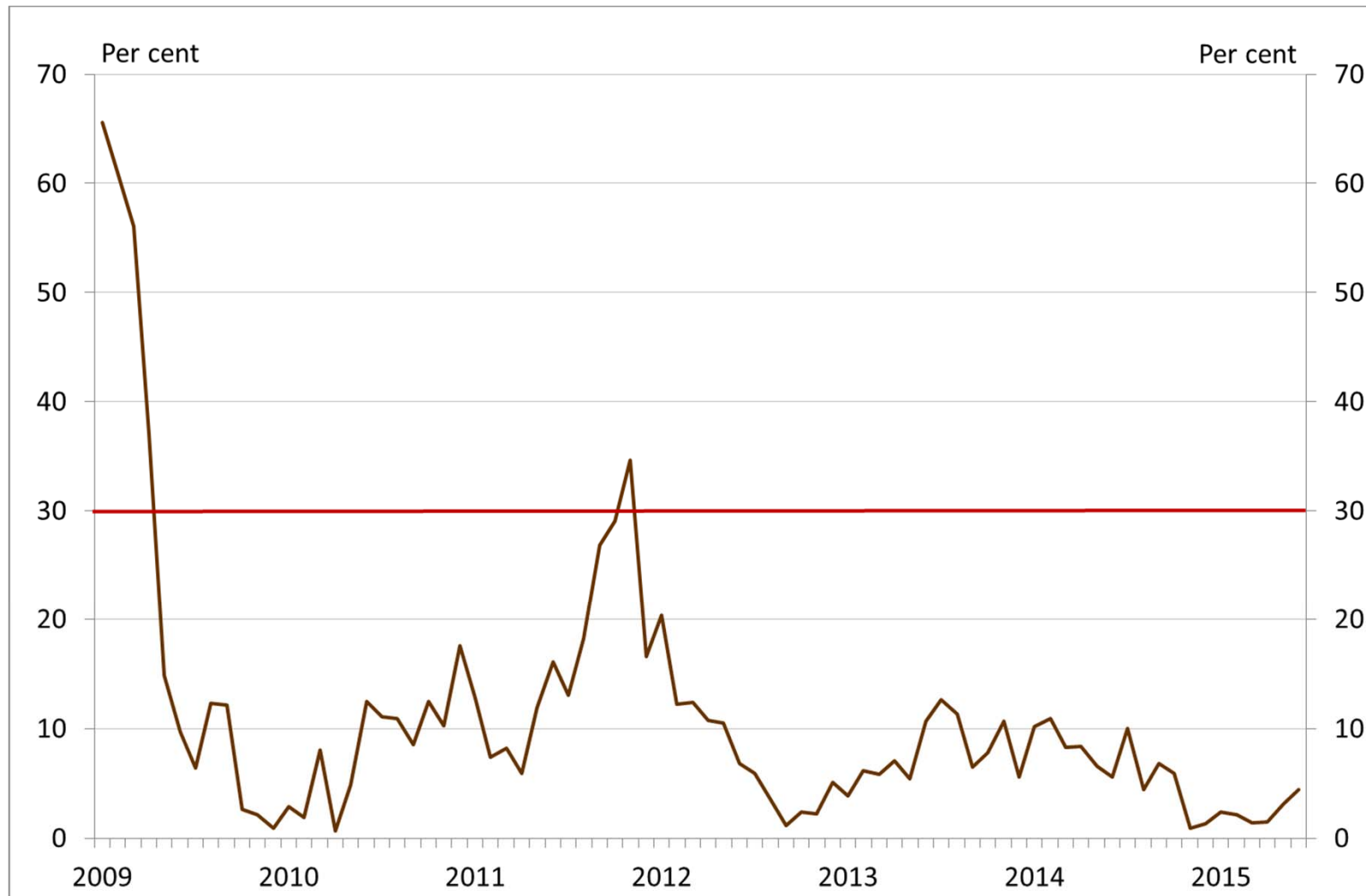
Transformation of solvency stresses

- We use the structure and methodology of last stress test

- We estimate the parameters based on knowledge of today and not the reference time

  - This approach implies full revision of the time series in case of major change in methodology

- In a normal stress test we report many variables: capital needs and buffers in billion HUF to 8% and 9%, mean and distribution of CAR

  - We need to compress so much information as we can in one index

- We examine stressed CAR between 6% and 8% and transform to [0,1] for each bank

- We take the weighted average, by the regulatory capital requirements
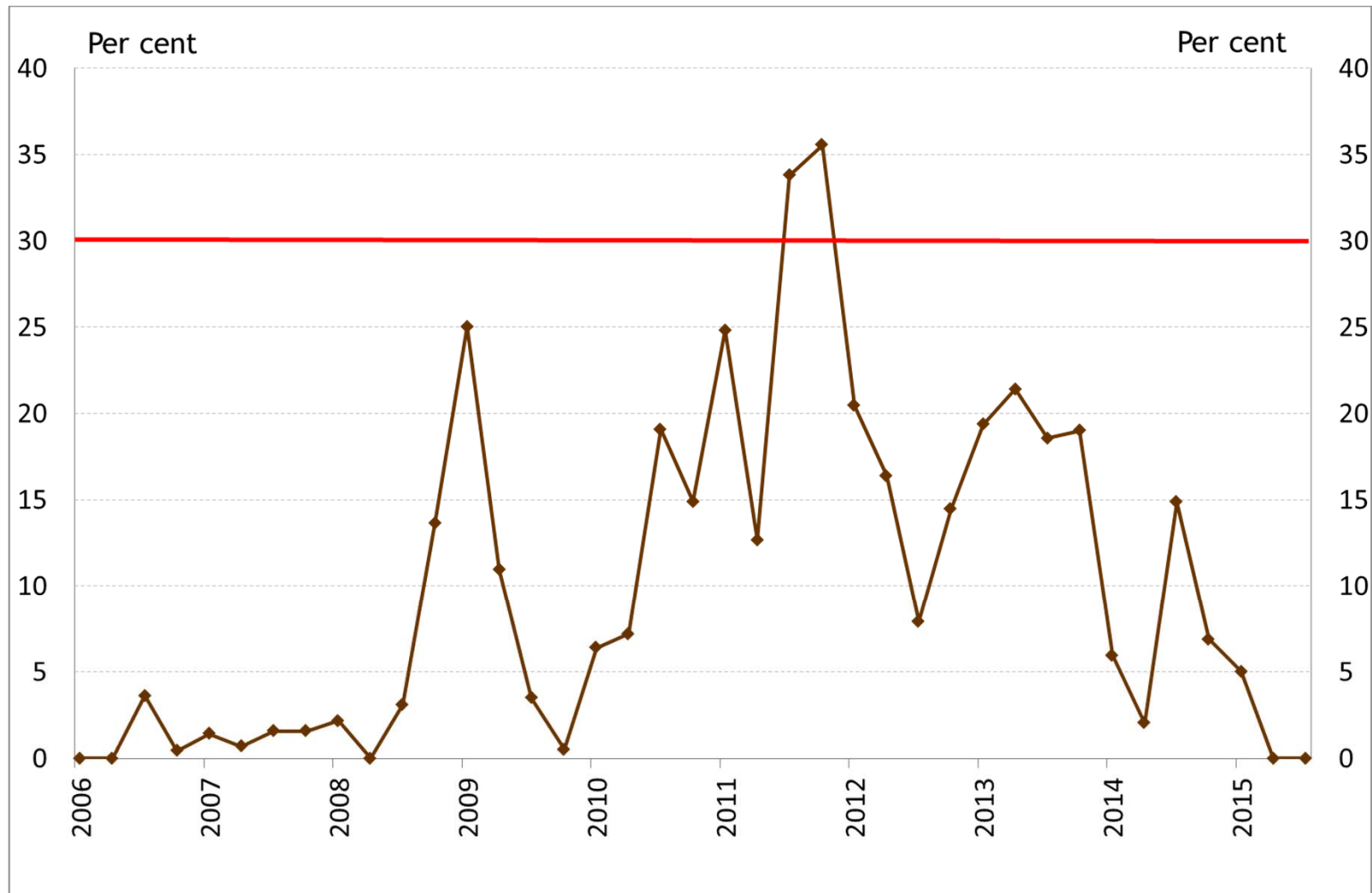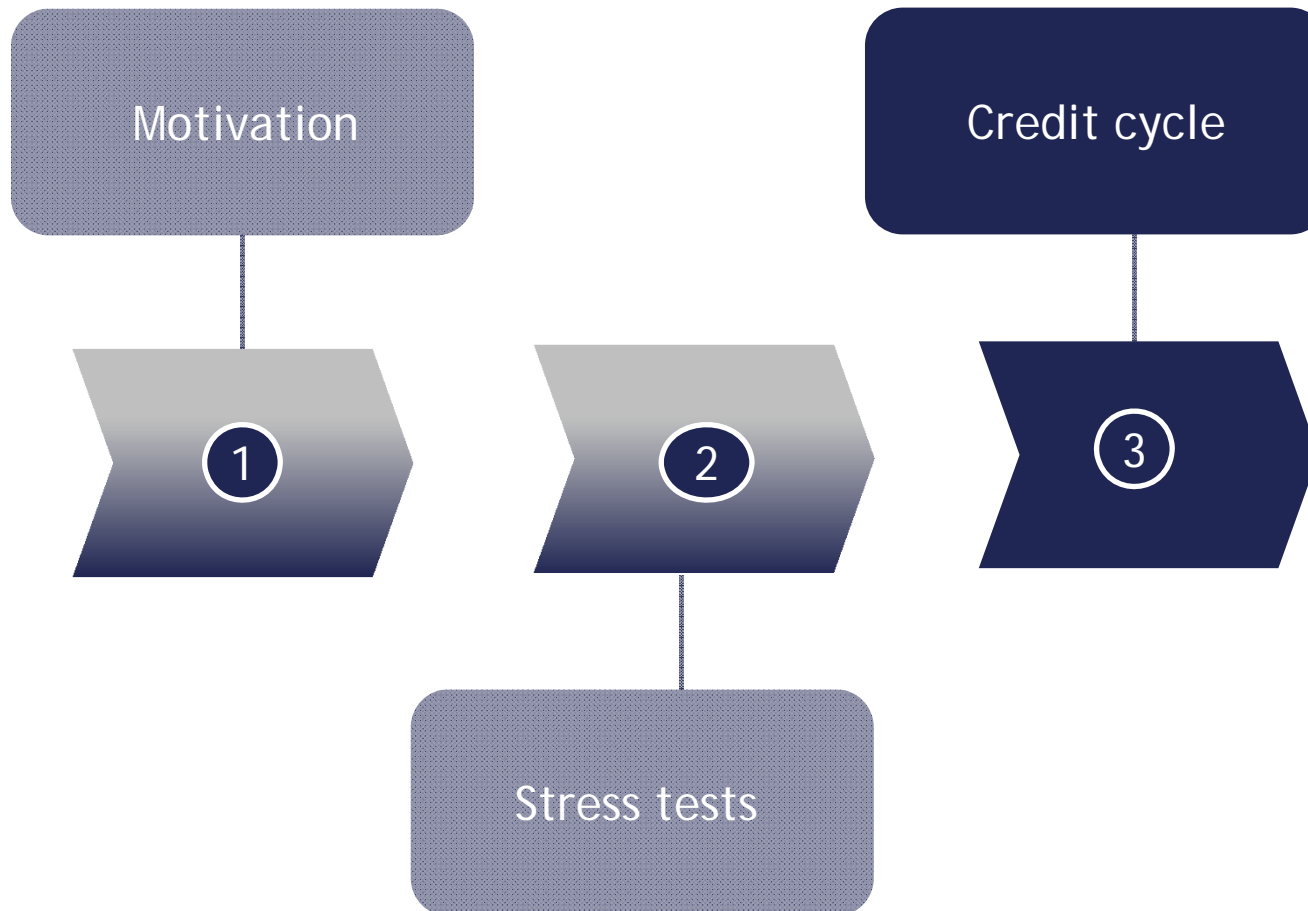
- „Red alert": 0.3 again
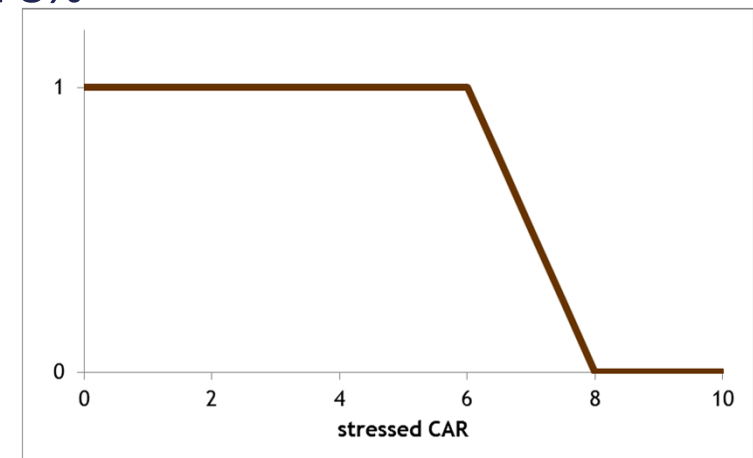
The Solvency Stress Index

Table of content

Motivation

1

Credit cycle

3

Stress tests

2

Credit cycle

Financial condition index (FCI)

- The impact of the financial factors on GDP growth

Multivariate Hodrick Prescott filter

- Based on Hosszú, Zs. - Körmendi, Gy. – Mérő, B. (2015): Univariate and multivariate filters to measure the credit gap, MNB Ocassional Papers.

- They regress the cyclical component and the trend component of the time series and add the sum of errors of these regressions as two additional terms to the original objective function of the HP filter.

Explanatory variables used for the household sector

- Regression of the cyclical component
  - weighted interest rate of outstanding loans (-)
  - BUBOR (-)
  - nominal house price index (+)
  - leverage ratio of the banking sector (+)
  - loan-deposit ratio (+)

- Regression of the trend component
  - log of real GDP (+)
 - log of real GDP's trend using Kalman filter (+)

Explanatory variables used for the corporate sector

- Regression of the cyclical component
  - interest rate of new loan disbursements(-)
  - BUBOR (-)
  - leverage ratio of the banking sector (+)
  - loan-deposit ratio (+)

- Regression of the trend component
  - log of real GDP (+)
  - log of real GDP's trend using Kalman filter (+)
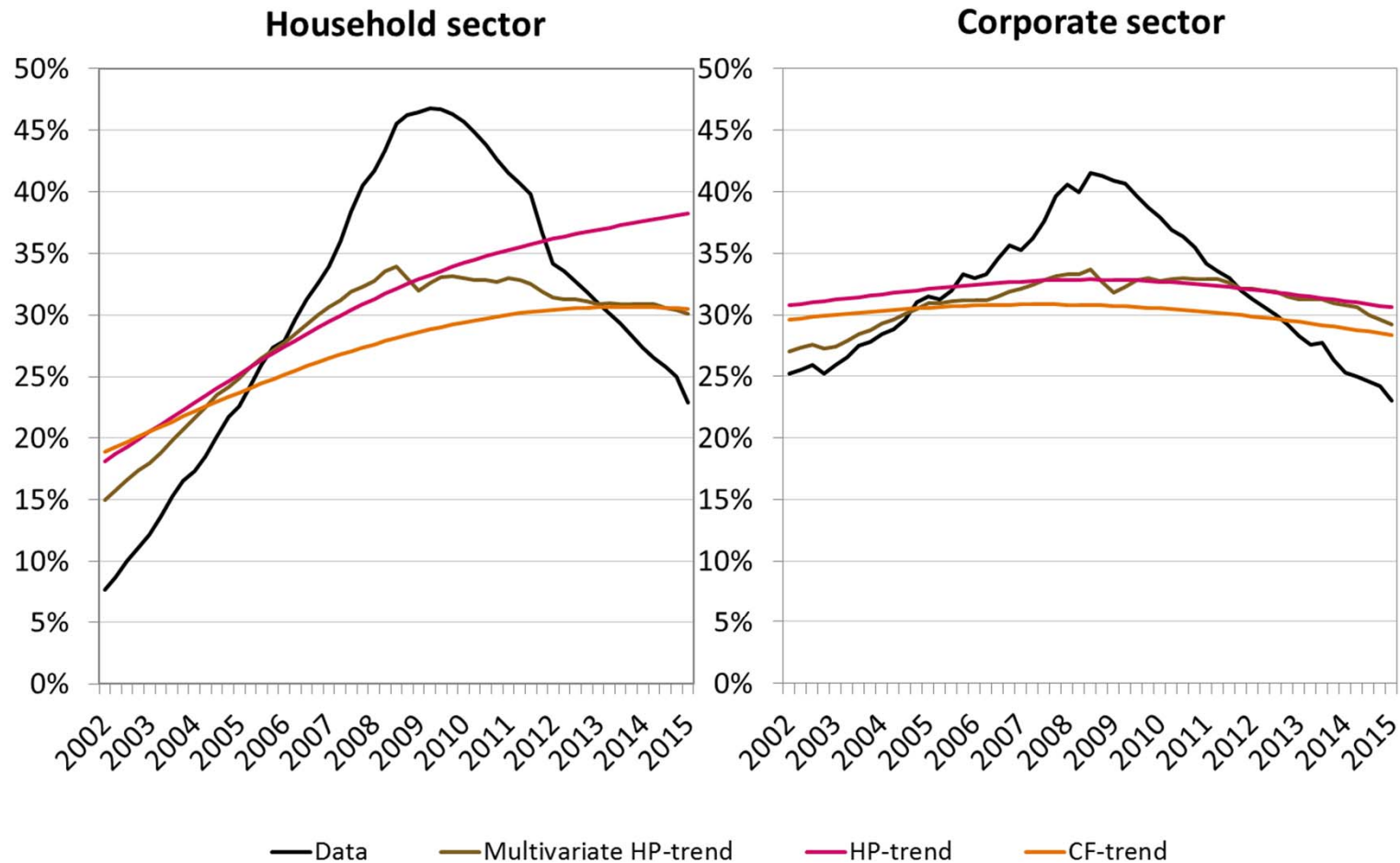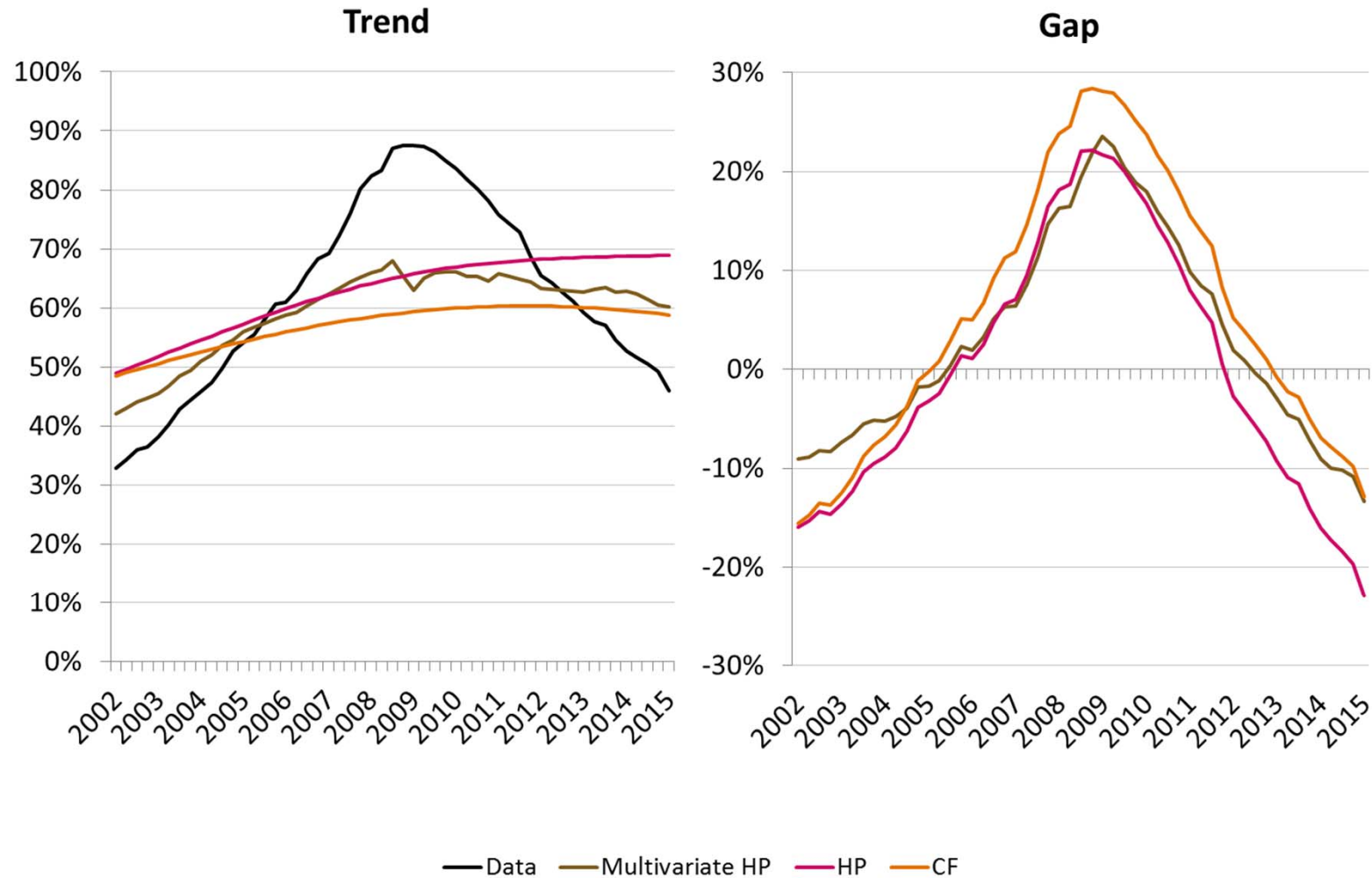
Multivariate HP filter - robustness

Comparison of the three filters - trend

Household sector — Corporate sector
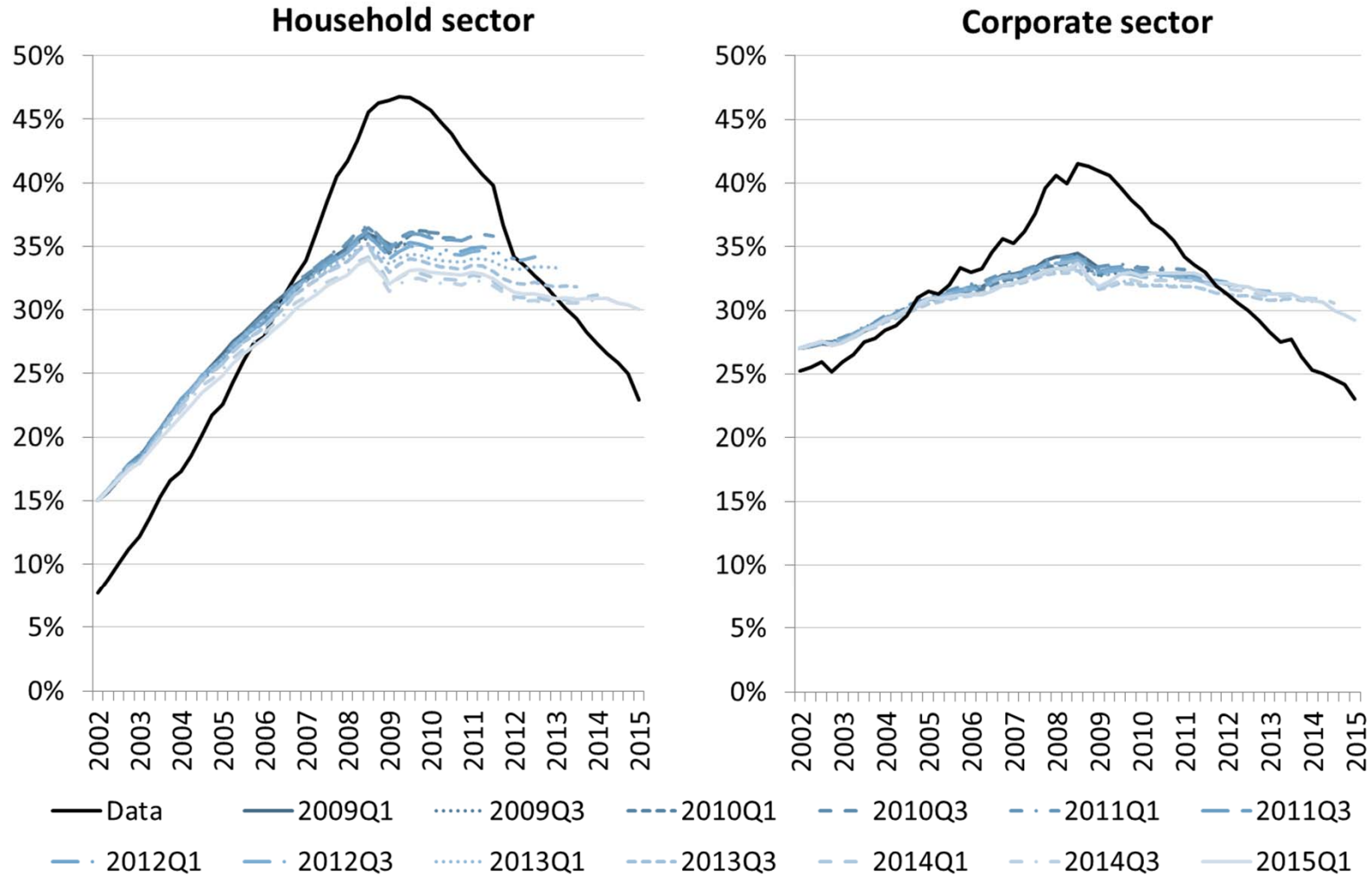
Data — Multivariate HP-trend — HP-trend — CF-trend

Comparison of the three filters –
Total credit-to-GDP

Measuring procyclicality: first generation financial conditions index (FCI)

- First generation FCI: based on a bayesian SVAR estimation (Tamási-Világi [2011])

- Weighted average of various financial time series (EUR/HUF, 3-month interest rate (BUBOR), credit, credit spreads) on the basis of their impact on GDP growth

- Interpretation: if the value of the FCI is 1, the banking sector accounts for one percentage point in the annual GDP growth

- Issues:
  - High revisions
  - It contains also the effect of the monetary policy (not just the banking system)
 - Endogeneity: just little information about the credit **supply**

The new second generation FCI

- New FCI: based on a time-varying parameter FAVAR (Koop and Koroblilis [2014])

  - Financial factors estimated on a panel database: indicators related to banks' liquidity and solvency positions as well as risk appetite

  - Interpretation: if the value of the FCI is 1, the banking sector's lending activity accounts for one percentage point in the annual GDP growth

- Advantage of the new estimation:

  - Wide set of information is used

  - Factors concentrate on the supply side of the credit market

  - Time-varying parameters: the estimation is more robust for structural changes (for example: new macroprudential regulations)

FCIs and GDP growth
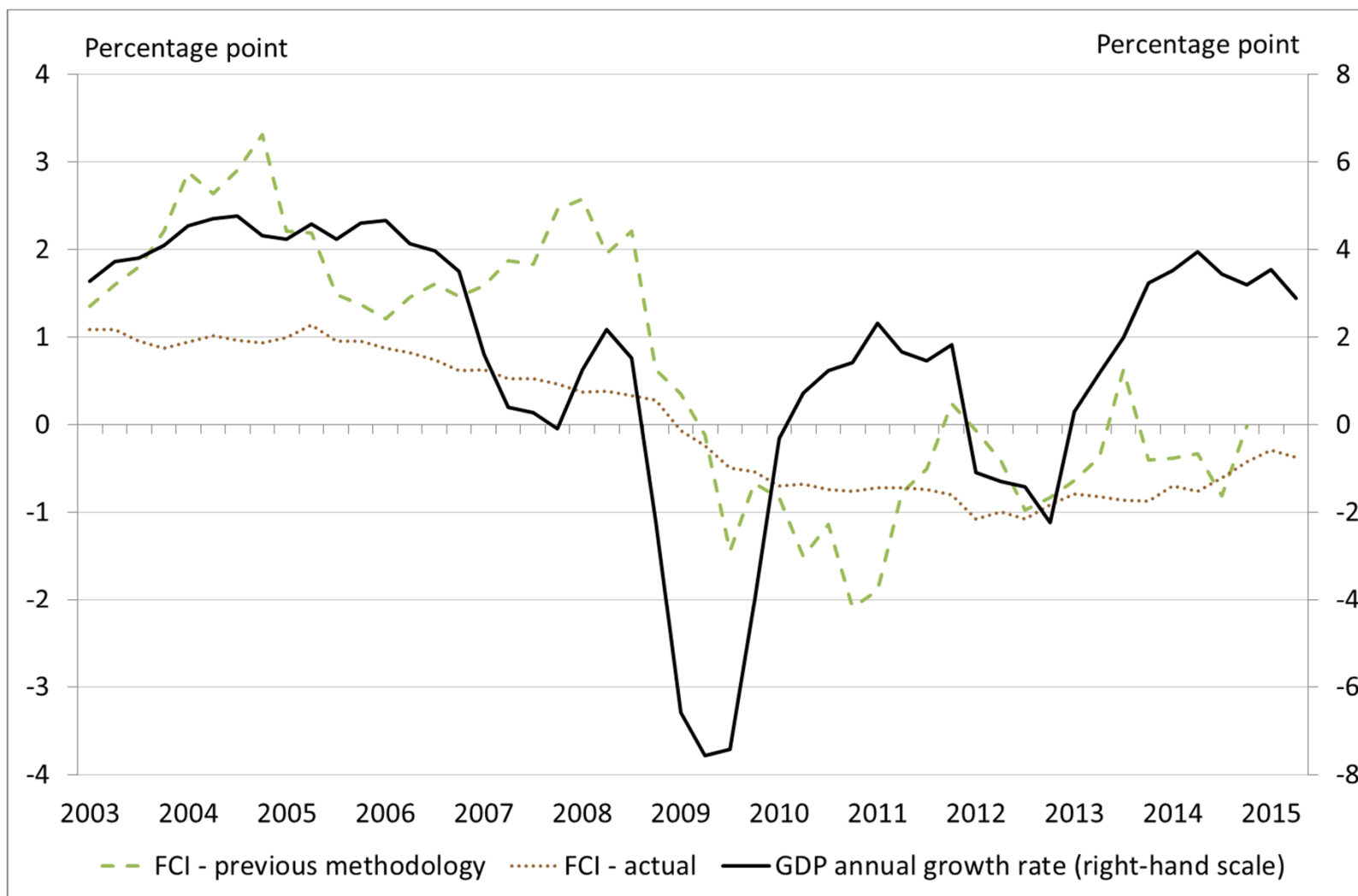
Thank you for the attention!

The Central Bank of Hungary
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