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May 27, 2019

CNB Research Open Day

DISCUSSION OF DOMINIKA KOLCUNOVÁ AND SIMONA
MALOVANÁ: THE EFFECT OF HIGHER CAPITAL
REQUIREMENTS ON BANK LENDING: THE CAPITAL
SURPLUS MATTERS



The authors apply state-of-the-art methods, and perform very thorough investigation of the topic at macro- and microlevel as well. They use a unique supervisory panel dataset on banks in the Czech Republic.

The results are intuitive and coherent, and are in line with our findings on the same topic and similar time span on Hungarian data with some data-driven differences.

- The results show that it is important to involve in the investigation the size of the capital surplus as well. Since the authors find that it does not only serve as an intermediate channel but there is a link between capital surplus and lending even in times of stable capital regulation.
- Moreover they find that the negative effect of tighter capital requirements is more pronounced for banks with low capital surplus.



- The authors provide an analysis of a unique supervisory dataset on Czech banks.
- The macrolevel investigation studies the macro-financial linkages using a Bayesian VAR with independent Normal-Wishart prior.
- The macrolevel results show that a decrease in capital surplus eventuate in a decrease in loan growth and as a consequence a drop in GDP growth, implicit risk weights also adjust with a decrease.
- The way profitability is modelled does not have significant impact and this underpins the robustness of the results on the time span of 2004 Q1 to 2017 Q4.



- The authors first time use a unique, very detailed bank-level supervisory panel dataset. In the microlevel investigation they provide wide range of estimation results on a shorter time frame of 2014 Q1 to 2017 Q4.
- In the microlevel analysis bank heterogeneity is investigated. In the single-equation specification a least square dummy variable (LSDV) estimator and bootstrap-based bias-corrected estimator (BBBC) is applied. The authors properly handle the possible biases (Nickell bias).
- The two- or three-equation systems are estimated using three-stage least squares (3SLS) procedure, which is estimated on the longer time span.
- In the microlevel study the authors can directly investigate the effect of higher capital requirements on loan growth and GDP. Their findings are intuitive: the impact on capital surplus and loan growth is negative regardless of the estimation technique.
- The effect of raising regulatory capital is much more pronounced for low-capitalized banks: for better-capitalized banks this effects is even not significant. The authors distinguish between intentionally and unintentionally formed capital surpluses and study the transmission via these two variables.
- They test robustness at microlevel in many ways and also compare the consistency of the macro- and microlevel results on the longer time span.



1. Is it possible to approximate capital requirements with the difference of regulatory capital and capital surplus? If data allows it would be a more direct way of investigating the effect of an increase in capital requirements in the macrolevel study. (In Hungary data allows this approximation at monthly frequency.)
2. Would it be possible to investigate the behaviour of banks in terms of loans to households and loans to non-financial corporations separately in times of higher additional capital regulations? On Hungarian data we saw significant differences in this regard.
3. How did the authors choose the split of the banks into low-cap and better-cap? It seems to me a bit arbitrary the way they define this break-up.
4. In Hungary significant portion of the loan portfolio was denominated in foreign currency so REER is used as a control variable. What was the constitution of loan portfolio in this regard?
5. Within the panel investigation it may be useful to also apply the Pesaran's pooled mean group (PMG) estimator.



COMPARISON WITH RESULTS ON HUNGARIAN DATA



- Supervisory bank-level data (FINREP, COREP) with country specific discretions
- 7 largest banks, consolidated basis
- Monthly frequency data (from 2014 variables describing capital interpolated due to EBA requirements)
- Aggregated data timespan: 2005 January to 2018 June (158 observations)
- Restricted sample for panel study: 2014 January to 2018 December
- Capital requirements are calculated as a difference of regulatory capital and capital surplus on the extended sample
- Capital requirements are explicitly recorded in the restricted sample



- Bayesian VAR model, independent Normal- inverse-Wishart prior distribution with Minnesota shrinkage
- Monthly variables, after 2014 regulatory capital and capital surplus are interpolated
- IRFs, simple Cholesky decomposition
- Baseline ordering: $Y = [\text{REER}; \text{GDP proxy growth}; \text{credit growth}; \text{proxy for profit: ROA}; \text{IRW change}; \text{capital surplus}; \text{capital requirements}]$

BAYESIAN VAR: VARIABLE SELECTION

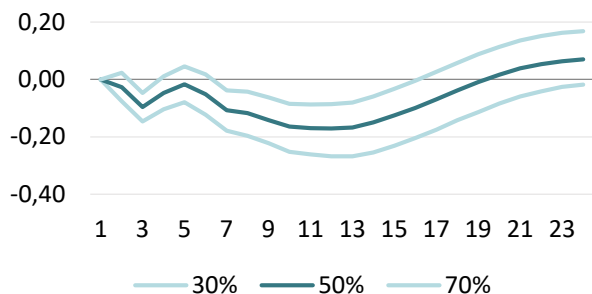


Variable	Transformation	Details
GDP Proxy	Real (deflated with CPI) YoY Standardized	Industrial production, retail sales, number of people working in construction (regression weighted average)
REER	Standardized	
Credit (Banking system)	Real (deflated with CPI) YoY Standardized	YoY real credit stock
ROA	Real (deflated with CPI) Standardized	
Implicit Risk Weights (IRW)	YoY Standardized	
Capital surplus (Banking system)	Real (deflated with CPI) YoY Standardized	Regulatory capital - (SREP additional capital requirement + capital requirement)
Capital requirements (Banking system)	Real (deflated with CPI) YoY Standardized	Regulatory capital – Capital surplus

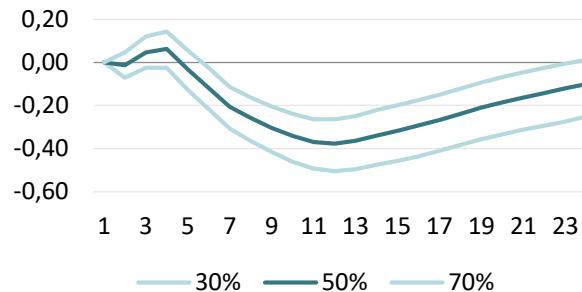
BVAR RESULTS



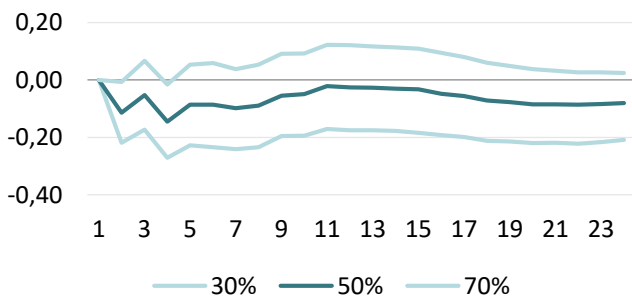
GDP Proxy



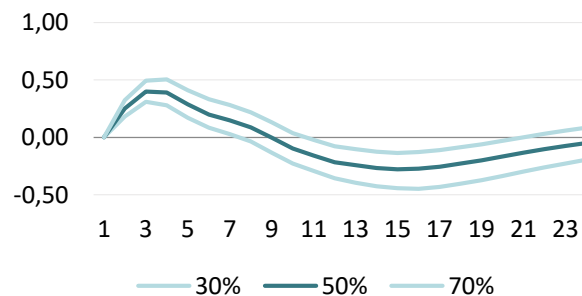
Credit



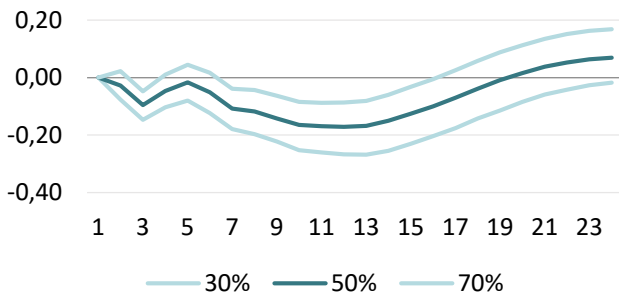
ROA



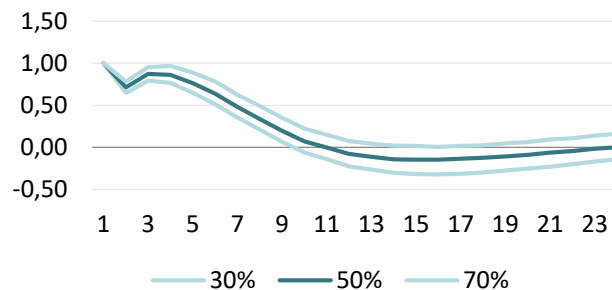
Implicit Risk Weights



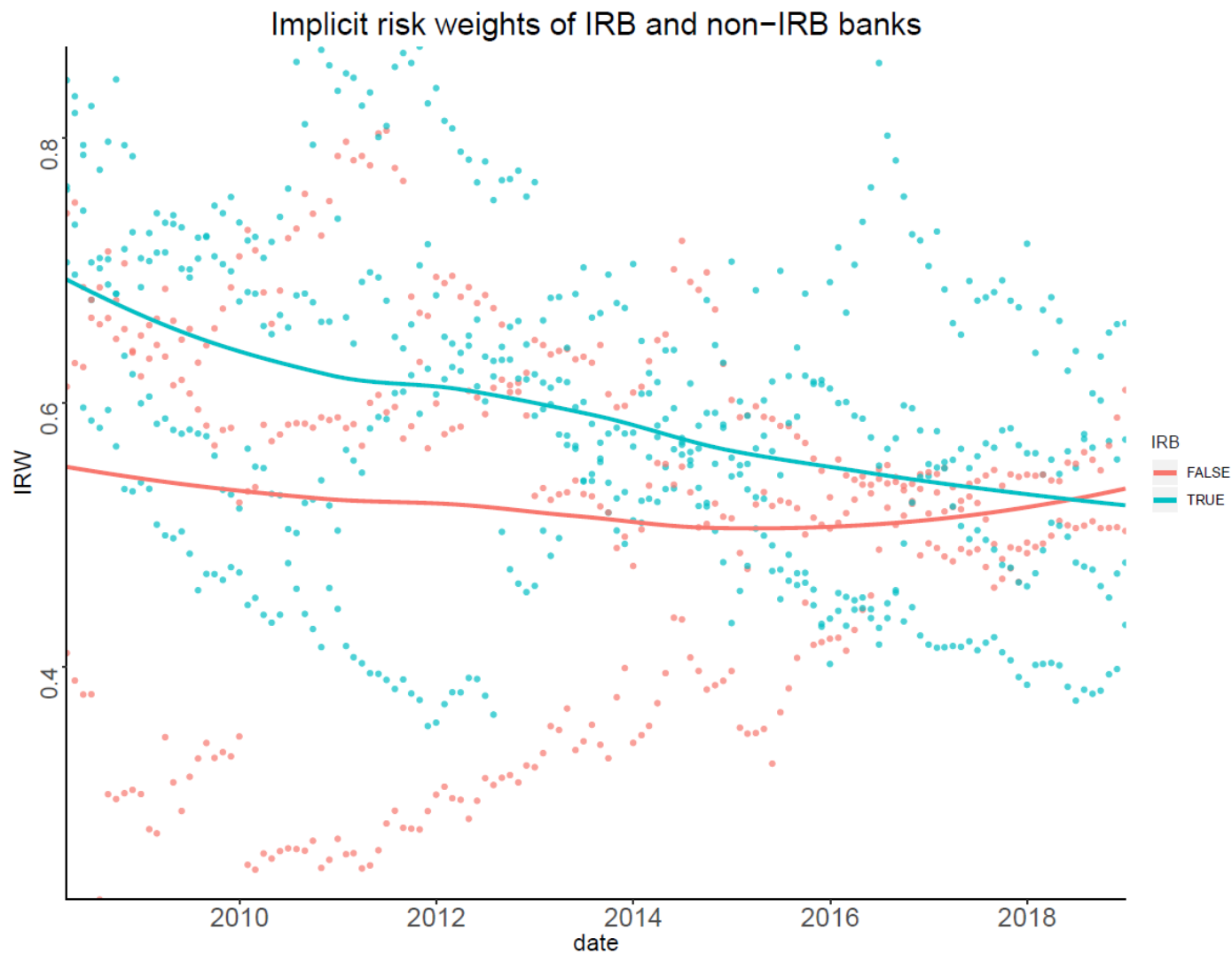
Capital Surplus



Capital Requirement



IMPLICIT RISK WEIGHTS OF HUNGARIAN IRB AND STA BANKS



The study of the impact of macroprudential instruments must take into account the effect of non-linear nature of the economy: the policy instruments have different effects in the different regimes. The different regimes must be taken into account from an application perspective: see CCyB build up and release.

The Threshold Bayesian VAR (TBVAR) model:

$$Y_t = \left[c_1 + \sum_{j=1}^M B_{1,j} Y_{t-j} + \Sigma_1^{1/2} \varepsilon_{1,t} \right] S_t + \left[c_2 + \sum_{j=1}^M B_{2,j} Y_{t-j} + \Sigma_2^{1/2} \varepsilon_{2,t} \right] (1 - S_t)$$

Where Z^* is a non-observable threshold value:

$$S_t = 1 \Leftrightarrow Z_{t-d} \leq Z^*$$

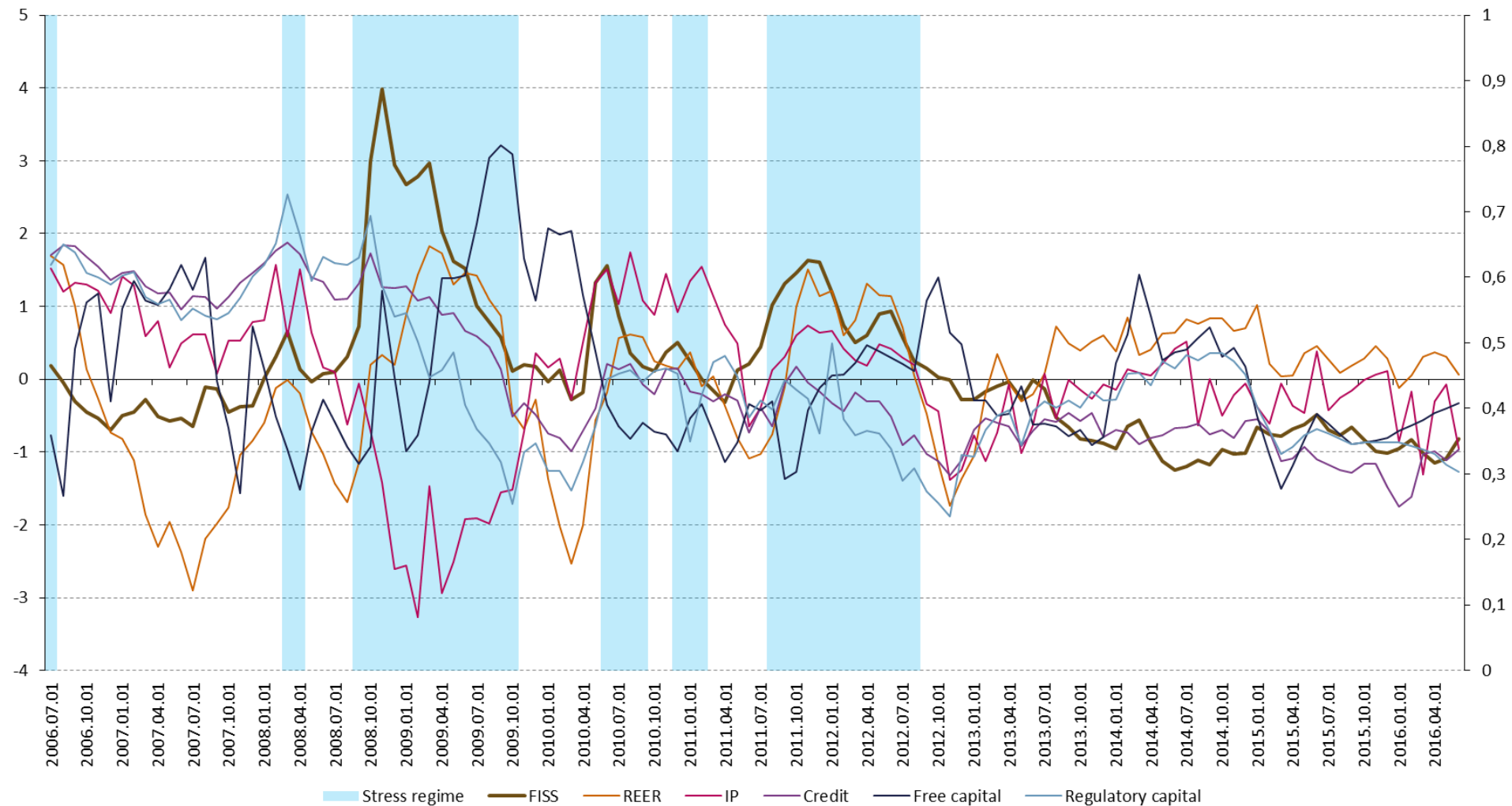
The matrix of endogenous variables: Y_t , the financial regime indicator (FISS): Z_t

THRESHOLD BAYESIAN VAR: VARIABLE SELECTION



Variable	Transformation	Details
FISS	Monthly average Standardized	See: Szendrei & Varga (2017)
IP	Real (deflated with CPI) YoY Standardized	
REER	Standardized	
Credit (Banking system)	Real (deflated with CPI) YoY Standardized	YoY real credit stock
Capital surplus (Banking system)	Real (deflated with CPI) YoY Standardized	Regulatory capital - (SREP additional capital requirement + capital requirement)
Capital requirements (Banking system)	Real (deflated with CPI) YoY Standardized	Regulatory capital – Capital surplus

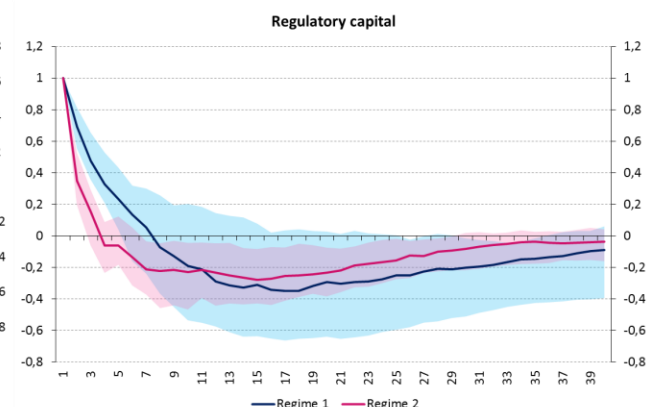
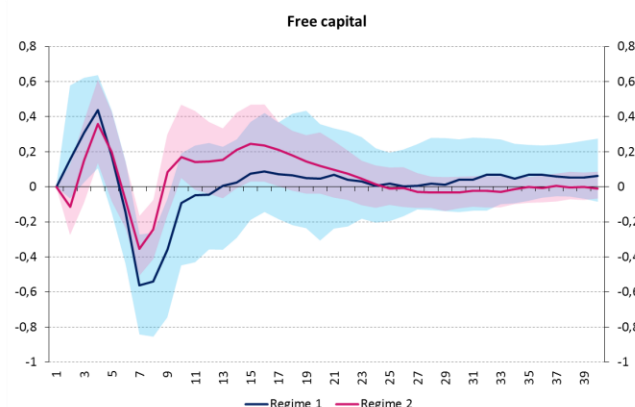
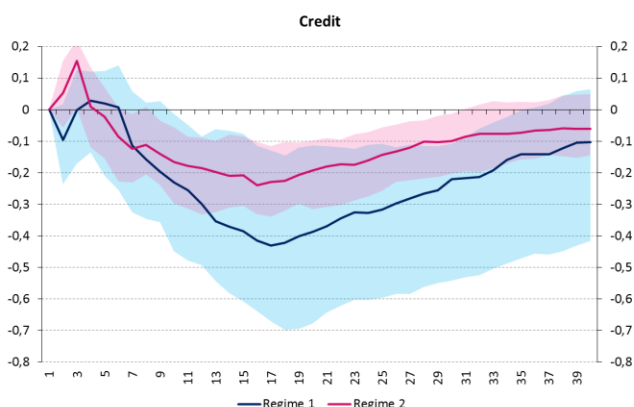
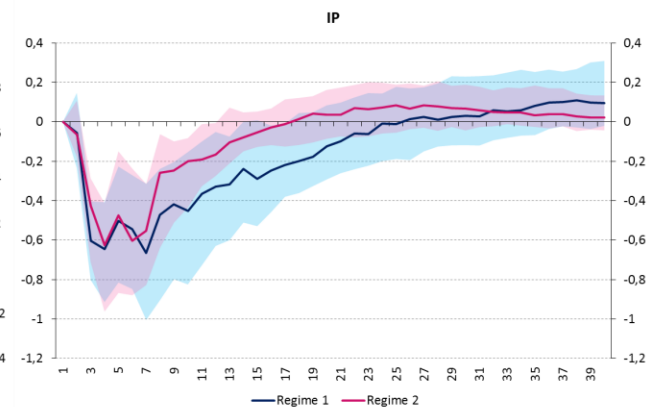
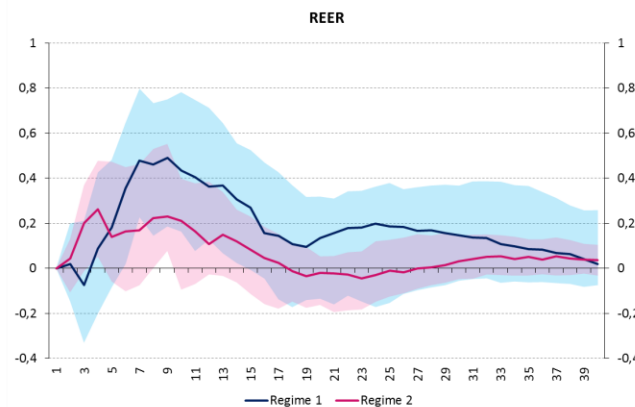
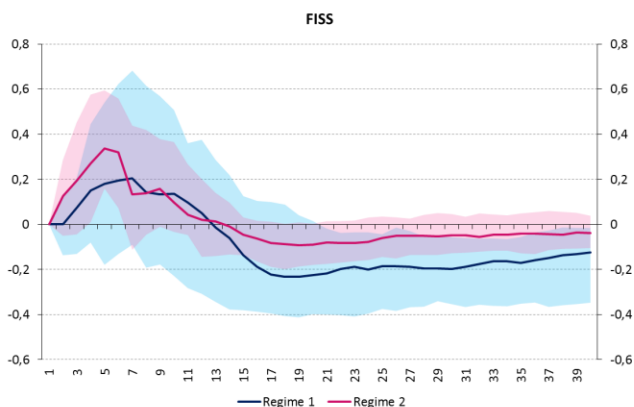
STRESS AND NORMAL REGIMES



BASELINE MODEL: AGGREGATE CREDIT



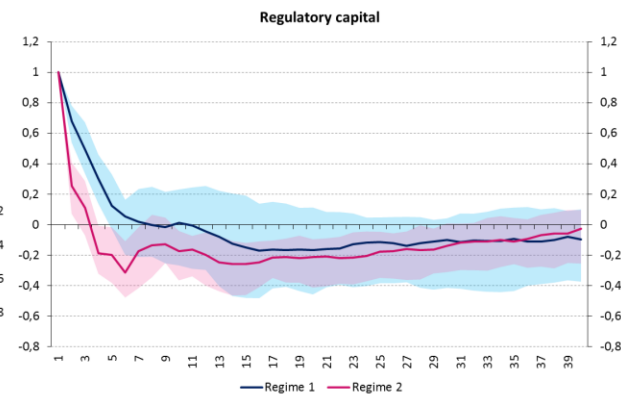
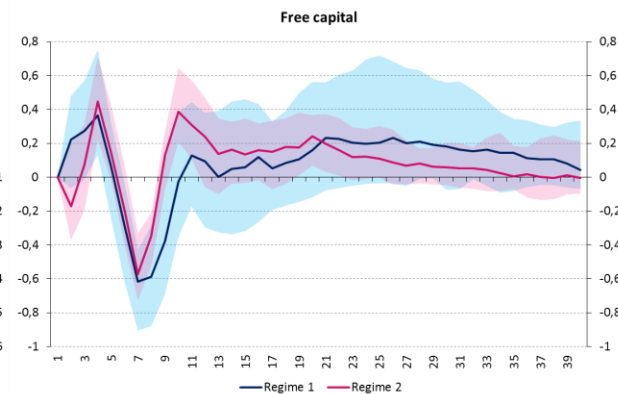
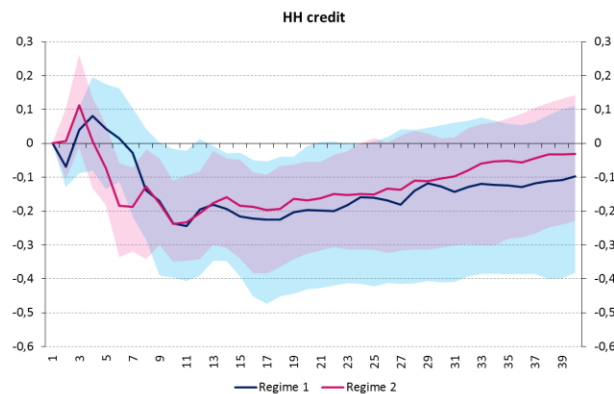
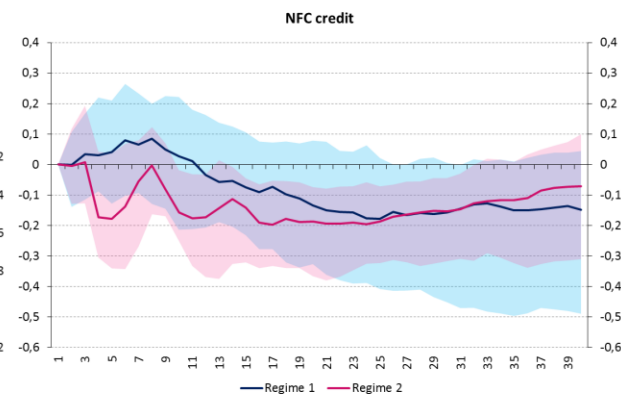
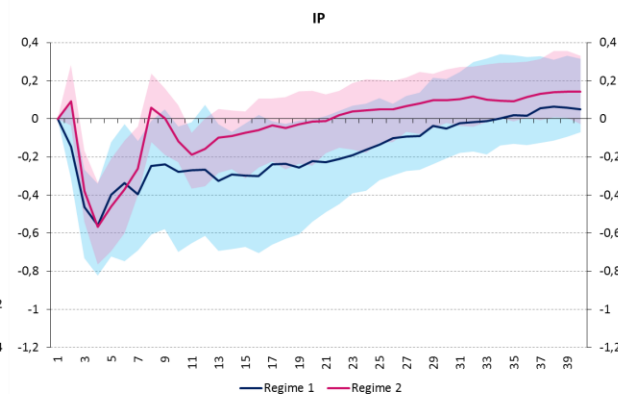
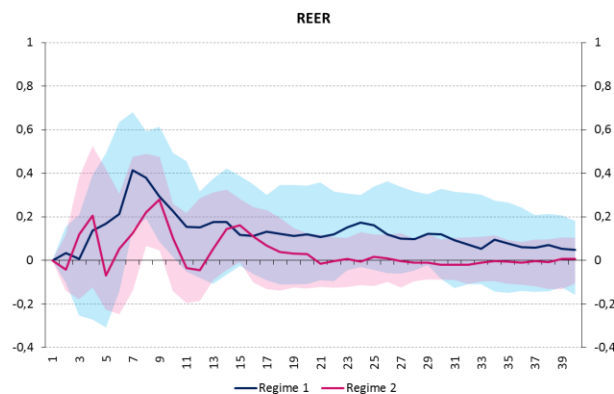
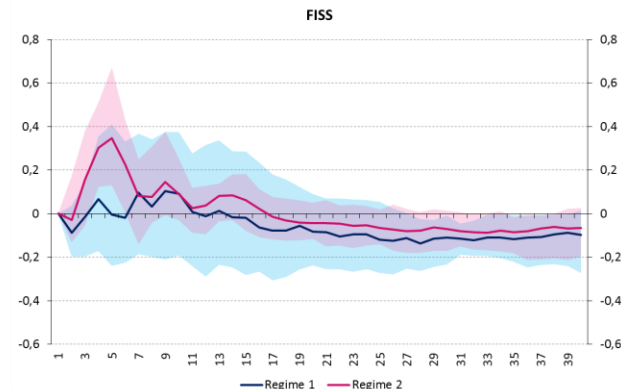
Capital requirement → Capital surplus → Credit → IP → REER → FISS



CREDIT DIFFERENTIATION



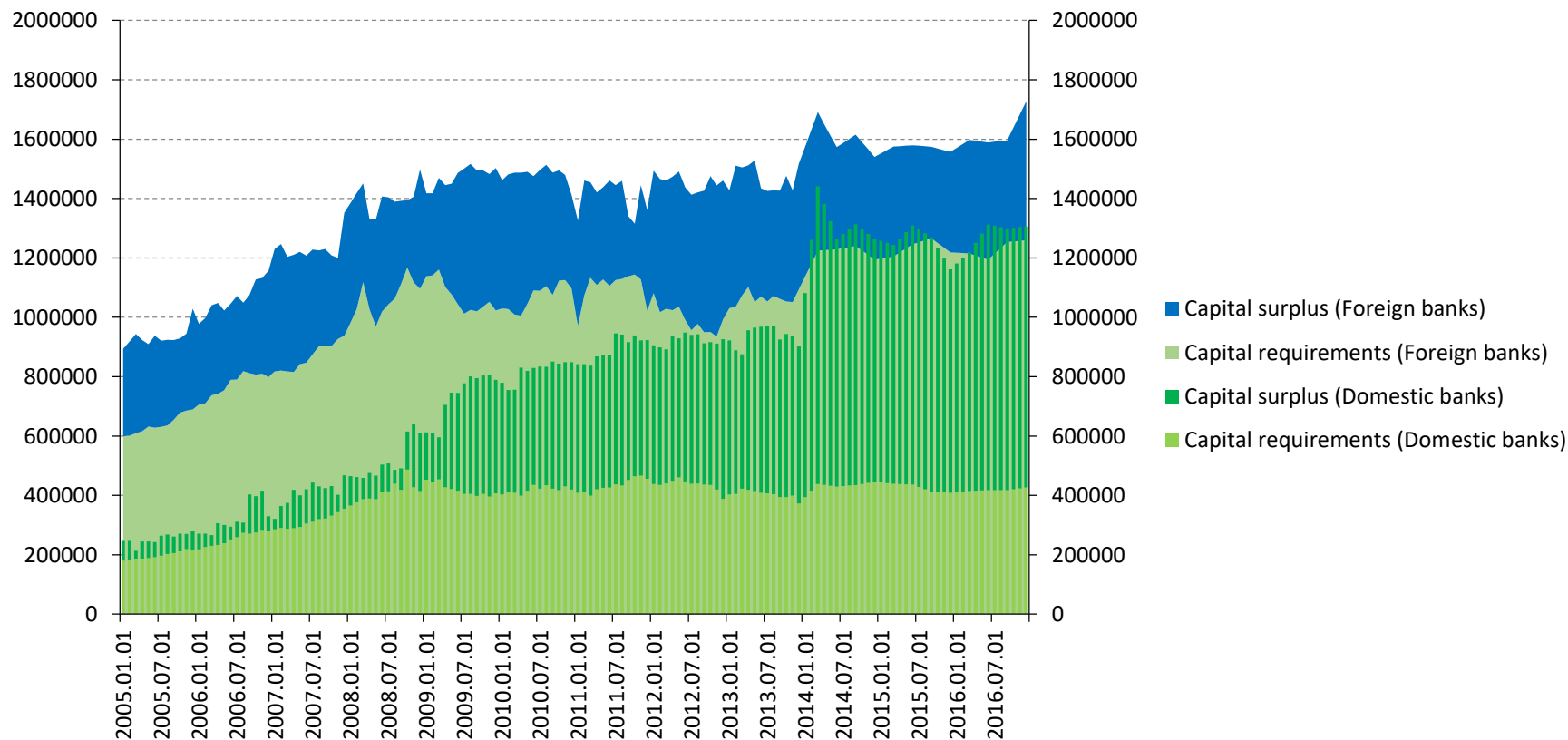
Capital requirement → Capital Surplus → Credit to household → Credit to non-financial corporations → IP → REER → FISS





- There is evidence that banks try to reduce their household loan activity before shrinking their corporate loan portfolio.
- The impact of an increase of capital requirements on household credit is more pronounced and lasts longer in the stress regime than in the normal regime.
- In the normal regime there is no significant reaction of the corporate loan segment to an increase of capital requirements .
- The effect of a shock in capital requirements on the variable describing the real economy has the same direction across the two regimes with the extent of the impacted shrinkage being different.

HETEROGENEOUS BANKS



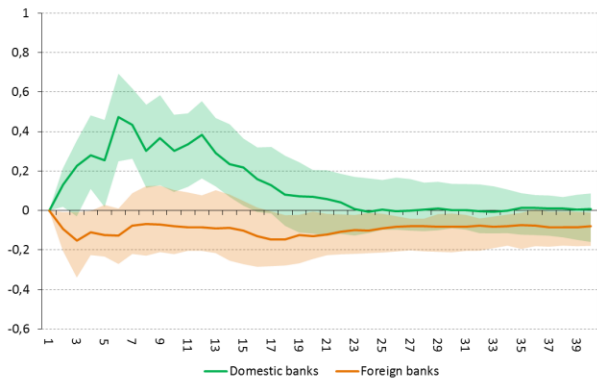
- Domestic banks increasing capital surplus at a stronger pace than foreign banks after the crisis.
- Foreign banks, subsidiaries are mostly maintaining the level of capital surplus.
- Difficult to distinguish prudent behavior from expansionary plans.

DOMESTIC VERSUS FOREIGN BANKS: NORMAL REGIME

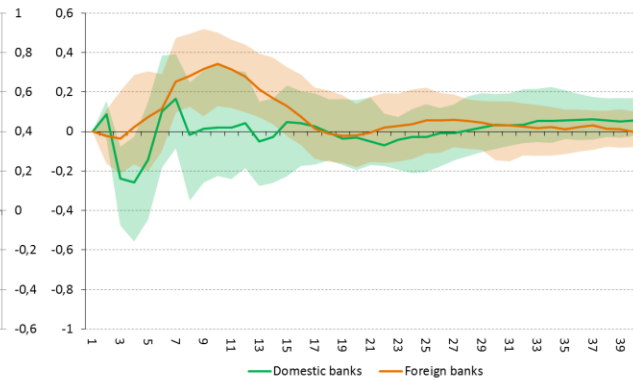


Capital requirement → Capital surplus → Credit → IP → REER → FISS

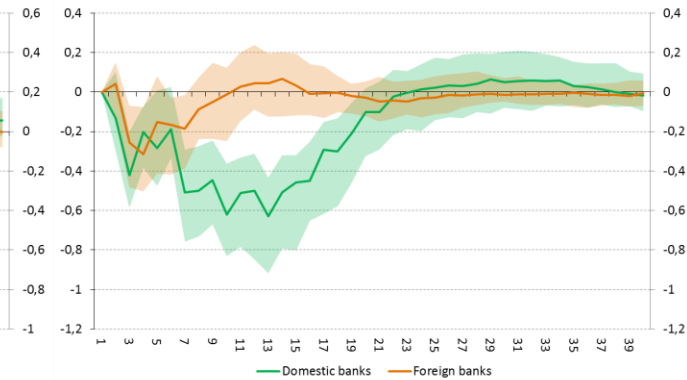
FISS; Regime 1



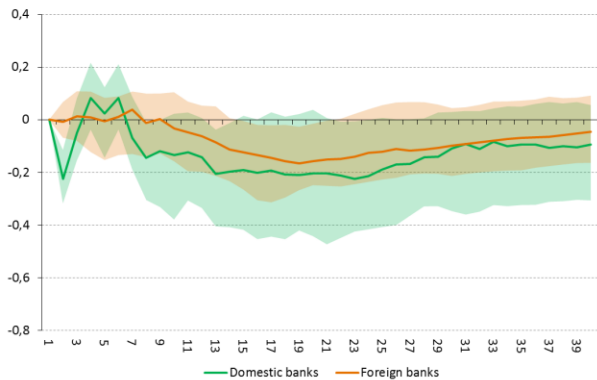
REER; Regime 1



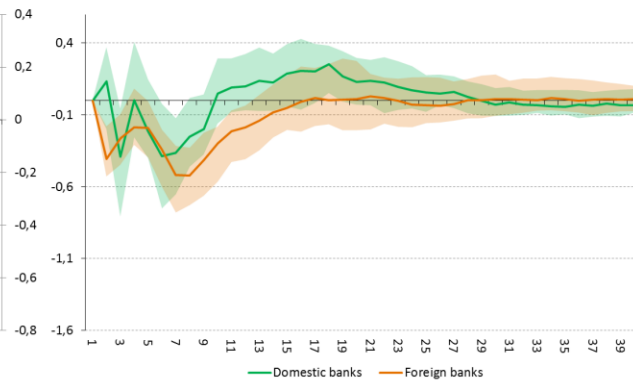
IP; Regime 1



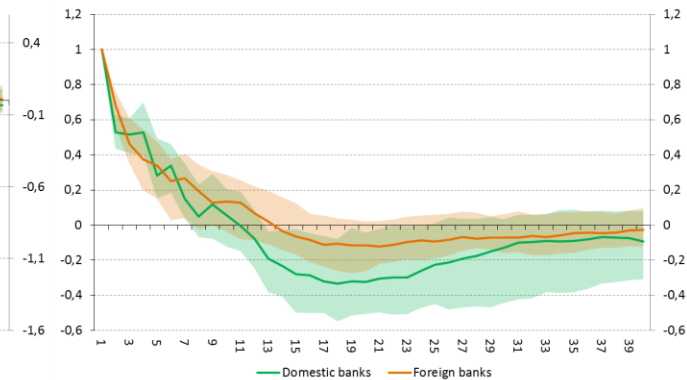
Credit; Regime 1



Free capital; Regime 1



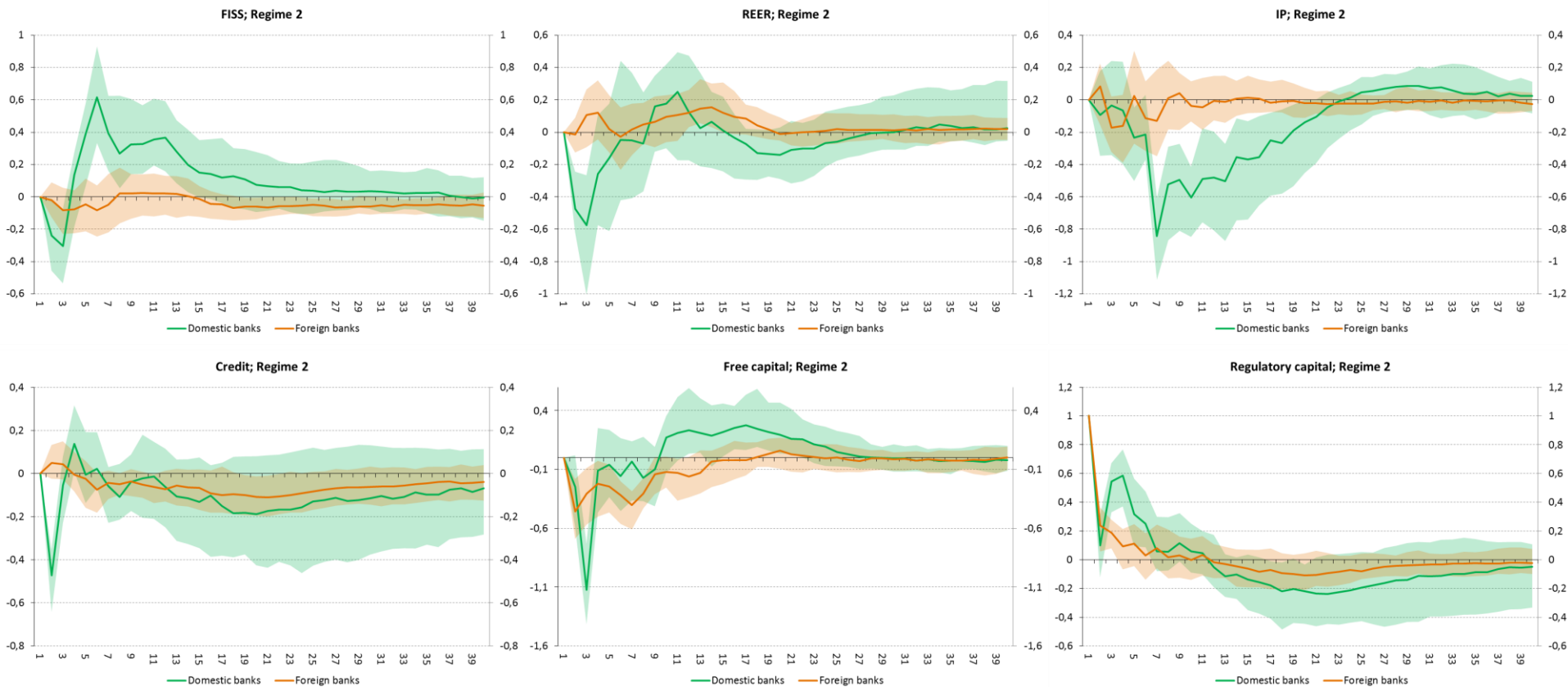
Regulatory capital; Regime 1



DOMESTIC VERSUS FOREIGN BANKS: STRESS REGIME



Capital requirement → Capital surplus → Credit → IP → REER → FISS





- There are significant differences between the responses of domestic and foreign banks.
- The impact of a capital requirement shock on credit in case of domestic banks is more pronounced than in the case of foreign banks.
- The impact in the case of foreign banks is not significant. This may be a sign that foreign banks are subsidiaries, and their parent bank may optimize its allocation globally.
- The impact of a capital requirement shock on real economy in case of domestic banks is much more pronounced than in the case of foreign banks in both regimes.

Thank you for your attention