The effectiveness of borrower-based macroprudential measures: a quantitative analysis for Slovakia

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The approach

- Adapting the integrated dynamic household balance sheet model of Gross and Poblacion (2017) to assess (ex ante) the change in resilience of households in Slovakia as a result of borrower-based measures (BBMs) under an adverse macroeconomic scenario.
  - GP approach focussed on quantifying impact of BBMs on risk parameters and second round effects of policy-induced reduction in demand for mortgages (incorporated both costs and benefits of BBMs).
- Uses an empirical integrated “micro-macro” model:
  - An empirical macro module to generate adverse macroeconomic scenarios
  - A micro module which uses micro data to simulate the employment status of household members and the dynamic probability of default (PDs) at the household level.
- Produces household resilience measures such as LGDs and loss rates, as well as the impact on new lending flows.
The approach

**HOUSEHOLD BALANCE SHEET**

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
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<td>house, liquid financial assets</td>
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**Default detection**

Mortgage service > net income + financial assets

**HOUSEHOLD RESILIENCE AND BANK LOSSES**

(no policy vs. macroprudential policy)
The approach

Logit model to determine prob of staying employed integrated with aggregate unemp paths from macro module

- **MICRO MODULES**
  - (employment status, new lending)

- **MACRO MODULE**
  - (VECM for macro scenarios)

- **HOUSEHOLD BALANCE SHEET**

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- **HOUSEHOLD RESILIENCE AND BANK LOSSES**

  - (no policy vs. macroprudential policy)

Generates multiple macroeconomic adverse scenarios, esp for unemployment

Household balance sheet simulator combines micro and macro inputs to determine HH ability to service mortgage debt and detect defaults
Key findings of the paper – in line with the literature

- **BBMs can improve household and bank resilience to macroeconomic shocks**, in particular when multiple measures are applied;

- **BBMs tend to complement each other** as the impact of individual instruments is transmitted via different channels (PD vs. LGD);

- The resilience benefits of borrower-based measures are significant if the measures effectively limit the accumulation of risks before an economic downturn occurs, suggesting that an **early implementation of borrower-based measures is warranted.**
Strengths of this paper

Applied example of how original modular framework can be adapted for different countries and different policy needs

- Approach to assessing resilience under an adverse scenario is aligned with **objective of BBMs in many countries**: objective tends to be focussed on building resilience / reducing losses in a crisis rather than on taming the cycle.
- Approach allows for **assessment of a combination of BBMs** – LTV, DTI, DSTI, and the different transmission channels of these.
- **Flexible approach that accommodates country characteristics** through the use of national macro models and micro estimates for employment.
- **Use of micro data** allows for examination of the distribution of risks across the borrower population.
Other nice features of the paper

- Looks at behaviour over an “exuberant period” before the adverse scenario (but assumes no loosening of lending standards during this exuberant period?)
- Implications for calibration – loans with LTV below 80% experience only a small decline in expected losses?

But how should policymakers in other countries interpret the results?

- At a high level, findings are clear and in line with the literature.
- Results are based on calibration for Slovakia.
- But are they generalizable?
Policy scenario under consideration is quite tight

Share of new mortgages granted in 2015-2017 exceeding regulatory limits or their combinations.

At the start of 2018:
- LTV is tightened to 80% (with a 20% exemption up to the maximum allowed LTV of 90%,
- DSTI is limited at 80%
- DTI at 8 times annual income

Constrained borrowers are not excluded from the market but instead reduce their borrowing proportionately to comply jointly with all the limits.

Is this a big assumption to make? What about borrowers who chose to delay purchase to increase savings?
Model assumes no second round effects of implementation

- Is it realistic that calibration like this would only reduce mortgage credit by 10pp?
- What would happen to house prices? No link from shock to credit demand to prices / broader housing market dynamics.
- GP framework would imply these effects are not negligible…

Impact of borrower-based measures on new lending

![Diagram showing impact of measures on new lending with changes ranging from 0% to -14%.]
Differential effects of different limits driven by calibration

Relative impact of borrower-based measures on resilience over the adverse period

Highest impact is through the LGD channel because:

- A larger proportion of borrowers in the sample are constrained by the LTV limit
- The tightening of the LTV limit was the most significant
Are the data representative enough?

Distributions of lending standards 2015 - 2017

- No. of borrowing households in HCFS sample of 2015 – 2017: 92 (0.005% of HHs in whole population)
- No. of household members in borrowing HCFS sample of 2015 – 2017: 155
Returning to the key findings of the paper – could these be linked more tightly with the results?

- **BBMs can improve household and bank resilience to macroeconomic shocks**, in particular when multiple measures are applied;  
  
  *Paper finds most of the effect through the LTV channel because of the nature of the calibration?*

- **BBMs tend to complement each other** as the impact of individual instruments is transmitted via different channels (PD vs. LGD);

- The resilience benefits of borrower-based measures are significant if the measures effectively limit the accumulation of risks before an economic downturn occurs, suggesting that an **early implementation of borrower-based measures is warranted**.  
  
  *Is this a strong conclusion when only 2 years of exuberant period is considered?*
Useful extensions?

- **Use ‘credit available’ approach** of Kelly et al (2015) to refine impact of introduction of measures on borrowers.
- No policy scenario could include **financial accelerator effects**: loosening of lending standards driving house prices and economic activity during upturn
  - Would increase resilience benefits of the measures relative to the counterfactual?
- Approach focuses solely on **benefits of BBMs**, could also incorporate **costs of these measures** so their activation can be considered in a net benefit framework:
  - Second round effects module from GP (2017)
  - Effect of measures on mortgage market entry – borrowers excluded from the mortgage market by these measures?
- Extend to assess **combinations of BBMs and capital based measures**: should the calibration of the CCyB be lower after implementation of BBMs?