COUNTERCYCLICAL PRUDENTIAL TOOLS IN AN ESTIMATED DSGE MODEL

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DISCUSSION

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BRIEF SUMMARY OF THE PAPER

Objectives of the paper: To test the efficacy and quantitative impacts of 2 macroprudential tolos: 1) countercyclical buffers (CCB), 2) dynamic loan-loss provisions

Research questions:

- What are the quantitative impacts of the two macroprudential tolos, in particular on credit, leverage, bank capital, and the macroeconomy?
- Which tool is more effective in generating buffers that may cover future losses, in reducing the procyclicality of real activity, and smoothing the cycles?

Method: Extend the Uruguay DSGE model to include firm borrowing and bank lending á la BGG (1999). The model is a medium-scale SOE model with mainly *domestic* (but **dollarized**) banking system. The (finance part of the) model is mainly driven by shocks related to *international financial factors*. It is a (linearized?) RE-model with a non-stochastic and unique SS.

Strategy: Model (reduced system of 11 parameters) is estimated on 2005Q1-2015:Q4 data. Perform comparative impulse response analysis of economy with and without macroprudential tools.

Novelty: Limited. Mainly an applied piece but *very useful* for CB evaluation of policies.

Combination of previous work by Basal et al (2016) + BGG (1999) + Lindquist (2004) + Bouvatier and Lepetit (2012)

BRIEFLY ON THE RESULTS

- **Both** macroprudential tolos are effective in generating loan-loss buffers that may materialize in the future.

- However, **dynamic provisions** are more effective in **smoothing** the cycle and, in general have a **countercyclical** impact on macroeconomi activity.

- While both tolos have very limited real effects, those of **CCB** are **weaker** than those of dynamic provisioning.

- Finally, **both** prudential tolos should be made available to macroprudential authorities since their relative effectiveness depends (*to some extent*) on the source of the shock for:

1. Selection of the 'best-performing' policy tool
2. Selection of the indicator variable to which the CCB should respond to.
3. Calibration of the size of the dynamic provisioning

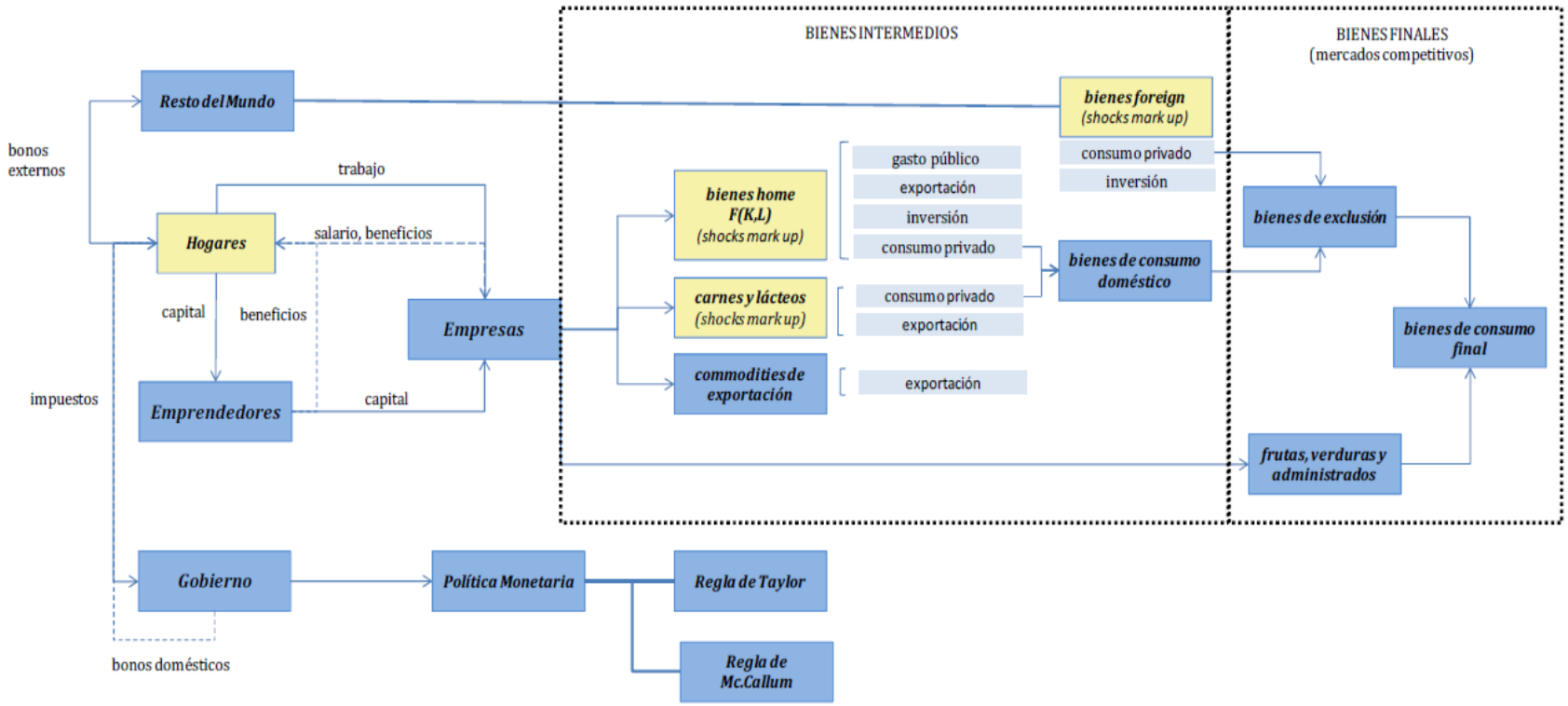
A STOCHASTIC GE MODEL FOR THE URUGUAYAN ECONOMY: BASAL ET AL (2016)

Standard **SOE-DSGE** model with:

- Habits in utility
- Investment adjustment costs
- Price rigidities
- Wage rigidities
- Highly dollarized economy
- Imperfect pass-through of X-rates to local prices
- Local production
- Rest of production is modeled as commodity endowments: either 1) fully exportable, or 2) partially exported + locally consumed
- Demand for imported godos standard
- Ricardian fiscal policy
- Taylor-type MP rule

A STOCHASTIC GE MODEL FOR THE URUGUAYAN ECONOMY: BASAL ET AL (2016)

CUADRO 1: ESTRUCTURA DE LA ECONOMÍA



REFERENCIAS

Indica precios à la Calvo e indexación, en Hogares corresponde a los salarios

DISCUSSION AND SUGGESTIONS

Structure the discussion in **two** parts:

A. Positive aspects

B. Drawbacks, gaps and suggestions on:

- Model construction
- Estimation results
- Quantitative results
- Alternative measurement approaches for policy-making institutions (CB)
- Minor remarks

But as authors themselves acknowledge, the work is still *very preliminary* and *incomplete*. Hence please take this my criticisms as suggestions for alternative extensions and improvements.

POSITIVE ASPECTS

- Fairly rich and complex model, allowing for a number of interactions and transmissions.

- Relevant experiences from Emerging Market Economies (EME): These economies have longer experience from applying macroprudential policy measures and are thus in better position to structurally evaluate their effectiveness.

- Interesting exercise using two time-varying rules that **conceptually** are **very similar** (if not identical) but **in practice** are applied **differently**.

- Consistent workhorse model with the central bank-wide DSGE which allows for comparisons and consistency checks across the institution.

DRAWBACKS, GAPS AND SUGGESTIONS: *MODEL CONSTRUCTION*

Currently the international finance aspect is entirely absent. Currency exposures are also modeled in a very 'minimalistic' manner. However for Latinamerican SOE these are big concerns.

- All firm borrowing is domestic. There is a large literature from Calvo, Mendoza and others showing the importance of international borrowing in all Latin American economies, and their effects on the boom-bust cycles. One example is the chain of sudden stops-models (Mendoza, 2010). This aspect needs to be brought in if the evaluation of macroprudential tolos is going to be credible.
- Households in the model demand both domestic and foreign assets. They already have a non-standard set-up, but are then reduced to be simple BGG-lenders. Why don't you explore their involvement in international asset markets further? They could either hold international portfolia, engage in intertemporal risk diversification, or currency hedging (see Rabitsch and Stepanchuk (2014), Rabitsch et al (2015), Rabitsch and Punzi (2015)).
- Commodity production is highly volatile and for many countries, it represents a **major** source of fluctuations. It affects the intertemporal C/I-decisions, but can also determine the amount of market liquidity in the economy. You should consider endogenizing the commodity-production sector for financial stability purposes.

A micro-founded (or microprudential) rationale for capital requirements/provisions is also missing except for reducing credit supply. Maybe include bank deafult (non-linear).

DRAWBACKS, GAPS AND SUGGESTIONS: *ESTIMATION RESULTS*

Many results and discussions are currently missing in the paper:

- For the estimated parameters, no information on the prior and posterior distributions is provided.
- What are the parametric assumptions for the estimated parameters?
- Table 1: Are the values reported medians, means, or something else?
- You evaluate the success of your estimation procedure by an incomplete momento-matching exercise (data volatilities vs (implied) model volatilities using the estimated parameters). However, *6* out of *11* of the reported variables had volatilities that were 2-3 times higher in the **model** compared to the **data**. Does that mean that the fit was not good? In addition, you report volatilities of *11* variables out of the *63* (p.13) that the model includes. What about the rest? Maybe a better way to evaluate your estimation is to:

a) measure the distance between priors and posteriors,

b) use some criterion (or policy) function,

c) evaluate the contours of the likelihood functions,

d) perform second moment analysis conditional on different shock process specifications,

e) Bayesian Model Averaging (if multiple estimation models are used)

f) or the sketchiest way is just to provide the **full** list of moment matchings incl. correlations (maybe also including the fully calibrated version)

DRAWBACKS, GAPS AND SUGGESTIONS: *QUANTITATIVE RESULTS*

The results provide insights more on the qualitative rather than quantitative end.

- IRFs for some key macroeconomic variables seem to be statistically non-significant, either in all or some of the scenarios.
- There is hardly any transmission to the macroeconomy from your macroprudential experiments. The difference in real variables between the scenario **with** and **without** regulation is either very small or negligible.
- Since it is very difficult to appreciate any difference in IRFs from the different scenarios, posible alternatives could be:

a) To present the results in terms of reduction in volatility of model variables in the different scenarios compared to the benchmark case (in line with Bernanke and Gertler, 2001).

b) To explicitly measure and compare (either compute the absolute difference in IRFs or using a loss function) when the CCB reacts to credit-growth compared to GDP-growth, and when the authority uses static vs. dynamic provisioning.

c) Since shocks matter a lot in this model, you should compare the baseline scenarios (with no reaction to macroprudential rules) between the different shocks. So before you even start the analysis on the impact of rules, you should compare the baseline economy's reaction to shocks in one and the same graph in order to give the reader a feeling on how different the two propagations are. Currently you make a strong claim that shocks matter a lot but don't provide this basic analysis.

- I can asume the shocks to be uncorrelated? Currently this is not stated.

DRAWBACKS, GAPS AND SUGGESTIONS: *ALTERNATIVE APPROACHES*

There are alternative ways to provide robust quantifications of policy impacts.

- Loss-function based (given) approach
- Welfare criterion based (micro-founded) optimal policy rule selections
- Inverse counterfactual exercises. How sensitive does the reaction of a rule to the indicator variable have to be in order to avoid a recession following some negative shock or a full-blown recession (multiple shocks)?
- Interaction of these *domestically-oriented* tools with more *externally-oriented* measures, which are very important and frequently used by SOE.
- Since build-up of buffers is important in good periods, can we quantify how big these should be in order to avoid a future recession? Stated differently, what is the **optimal size of buffers** such that the costs of building too much of those (and risk supressing credit supply and growth excessively in good times) is balanced with benefits (of preventing future downturns)?
- In your current version of CCB, the voluntary capital-to-asset ratio above the mínimum requirement is **time-fixed**. We know that it is very much expectations driven and time-varying. How do your results change when you also make this component of CCB **time-varying**?
- Also in your CCB rule, is there any situation/scenario where the first two and last two components (equation 22) go in **opposite directions** and thus make the rule inconsistent? Does it depend on where (at which point) in the cycle we are? Your current version of the CCB rule is quiet complex so it is important to investigate ‘corner cases’.

DRAWBACKS, GAPS AND SUGGESTIONS: *MINOR REMARKS*

- A quantitative comparison with Basal et al (2016) would be in place. By how much do results change when one introduces the financial accelerator mechanism compared to the benchmark SOE-DSGE? '*Is this modification quantitatively worth it?'*
- Full list of all parameters and values needs to be provided
- I am sure that you calibrated more than 7 parameters in the (estimated) model (p.13-14). What about the other parameters?
- On page 12 you only list domestic and foreign macroeconomic shocks. Are pure financial shocks (net worth, default rate, external finance premium) absent in this model? If so, why?
- Description of the solution/simulation method and some more details on the estimation procedure would be helpful.
- A more complete variance decomposition is required (including all shocks). Also, is it a simulated variance decomposition, forecast error variance decomposition (conditional on estimated parameters), or something else? State it clearly.
- Impulse response analysis for at least few more standard shocks (even if moved to the appendix) would be nice. 2 shocks is just too little to get a feeling on the behaviour of the model.

BEST OF LUCK IN YOUR PROGRESS WITH THE MODEL!

THANK YOU FOR YOUR ATTENTION!