Taming Macroeconomic Instability: Monetary and Macroprudential Policy Interactions in an Agent-based Model

Lilit Popoyan[1] , Andrea Roventini[1,2] and Mauro Napoletano[2,1]
1.SantAnna School of Advanced Studies(Pisa, Italy)
2.OFCE, Sophia-Antipolis (Nice,France)

The recent financial crisis has demonstrated numerous weaknesses in the global regulatory framework. As a consequence, a growing consensus has arised to re-orientate banking supervision to place stronger emphasis on mitigating instability in the financial system, i.e. the invocation for macroprudential regulatory tools. The new Basel III regulatory accord emerged, that aims to increase the stability of financial markets and to protect the banking sector from periods of excess aggregate credit growth. The policy debate is focusing in particular on the usage, implementation and effectiveness of prudential tools.

The paper develops an agent-based model with a detailed bank regulation system and a monetary sector. We contribute to the existing literature by providing 1)an impact analysis of Basel III main components(both, jointly and in isolation) on financial stability and macrodynamics, 2)an analysis of interactions between the monetary and macroprudential policies and 3)a comparison of the two regulatory frameworks: pro-crisis regulatory (Basel II) and post-crisis regulation(Basel III).

The model is calibrated on U.S. data and is empirically validated. We use a set of prudential tools approved as a global regulatory framework of Basel III. Particularly the new capital requirement in terms of capital adequacy ratio(CAR) and countercyclical capital buffer(CCB) mechanism, liquidity coverage ratio and leverage ratio.

To analyze the interactions of monetary-macroprudential policy we look at 4 different types of monetary rules. In the baseline scenario the Central Bank(CB) follows a Taylor rule indexed upon inflation and output gap. In alternative Taylor rules CB follows 1)"one-mandate" policy targeting inflation only, 2)"dual-mandate" Taylor rules including an adjustment to unemployment gap-inflation on the one side and 3)a "three-mandate" Taylor rule indexed upon inflation, output gap and nominal credit .

Simulation reveals the following results:

1.In "leaning against the wind" monetary strategy where CB indexes Taylor rule also upon credit growth, we have a lower unemployment, output Gap and volatility of economy.

2. Basel III has a stabilizing effect on the financial side of economy since the bank failure rate and the likelihood of economic crisis is the lowest under Basel III regulation. At the same time macroprudential tools have limited effect on inflation.

3.The static capital requirement together with CCB mechanism under Basel III accord shows the second-best result after the combined instruments of Basel III. It arises a question about the tradeoff between the complex vs. a simple policy driven rules.

4.The effects of leverage and liquidity requirements in isolation as well as the combination of both is marginal or negative, i.e. both of them increase the unemployment, output gap volatility, the likelihood of economic crisis and the bank failure rate. The latter at the end of the day transmits to increase the output gap.

5.The joint impact of microprudential tools is considerably larger to the financial stability issue than the sum of the individual ones, i.e. the standalone impacts are not additive.