Endogenous housing risk in an estimated DSGE model of the Euro Area

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This paper provides an extension to first generation DSGE models with a financial sector – for which QUEST III would be a typical example – by explicitly modelling (mortgage) loan demand and supply decisions. First generation DSGE models with a financial sector essentially only provide a framework for analysing the consequences of loan demand and supply shocks, since they treat the loan to value (LTV) ratio and the external finance premium (the difference between the loan rate and the risk free rate) as exogenous variables. This makes these models still useful for analysing the macroeconomic consequences of for example a tightening of loans (credit squeeze), but they provide little information on the factors determining changes in loan supply. Also in projection scenarios they do not provide economic rationale for determining a new equilibrium loan to value ratio.

This paper follows the recent literature which tries to integrate financial contracts (with limited information of lenders about solvency of heterogeneous borrowers) into macro models. The financial contract typically determines a LTV and an external finance premium which depends on default thresholds of borrowers and the distribution of loan risks (linked to heterogeneous and uncertain value of collateral) across borrowers. Time varying lending risk (defined as the variance of the value of the collateral over the cross section of borrowers) plays a crucial role for the determination of loan supply and demand and this variable constitutes an important new macroeconomic shock.

The paper provides three distinct contributions:

First, it fits a model with these loan market features to Euro area aggregate data over the period 1995Q1 to 2011Q3; second, it explores the factors driving the LTV and the EFP; and third, it measures the importance of the risk shock for explaining fluctuations of the main macroeconomic variables.

Concerning estimation, it is found that allowing for risk and endogenous loan supply generally improves the empirical fit of DSGE models, compared to first generation DSGE models.
An important question tackled in the paper is the explanation of the behaviour of residential investment, house prices and LTV in the EA. The paper distinguishes between macro fundamental drivers (such as productivity and wage developments), policy shocks (monetary policy), housing market specific shocks and risk shocks. Shock decompositions show that fundamental factors and monetary policy do not explain the housing boom starting in the early 2000s in the EA. The housing boom over that period is largely explained by shocks to housing investment itself (either housing bubble or persistent shift in demand towards housing). The house price inflation is partially dampening the increase in housing investment. Similar to housing investment, house price inflation cannot be explained by fundamental factors. House price inflation is partly explained by housing demand and most importantly by persistent shocks (bubbles) to house prices itself. Demand for housing and house prices are also important drivers of loan growth in the mortgage market. In addition, risk perceptions of lenders play a crucial role for explaining loan growth, as they affect the tightness of the collateral constraints faced by households. Even though loan growth exceeds GDP growth in this period, the LTV does not show a persistent increase because of the strong increase in the value of the housing stock.

For the period since 2009 the paper suggests that the decline in credit growth is largely driven by risk perceptions of borrowers, more than by a fall in house prices and residential investment.

Apart from its importance for explaining LTV and EFP, the risk shock also turns out to be an important driver for residential investment and private consumption and therefore constitutes an important new shock besides the standard policy technology and demand shocks we usually identify in macro models.