Modeling of credit interconnections and mortgage markets dynamics[1]

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Abstract

Over the past 25 years, the market for housing finance in industrial countries has changed and developed greatly and the literature concentrates primarily on two countries: the US and UK. As regards the euro area, the analysis and comparison of statistics on EU mortgage and housing markets are particularly interesting as well as data and information from several third countries such as the United States (see, e.g., the report of the European Mortgage Market Federation (EMF), the Working Papers of European Central Bank). The reactions of these markets to macroeconomic impulse as changes in monetary policy, in terms of both prices and quantities (i.e. interest rates level and numbers of new contracts), could have a large impact on the balance sheets of banks, families as well as construction industrial sectors (see EMF, 2012).

In the context of Italian market, the Italian anti-usury law provides that a maximum threshold is calculated for interest rates to apply for funding. This threshold varies with the technical form of financing: mortgages, leasing, employee loans and more. Moreover, the threshold varies each quarter and it is obtained for each technical form, increasing the average rate charged in the previous quarter. Due to recent developments in credit markets, the mortgage one is considered since it represents one of the most important financial market, at least in Italy, where banks were more oriented toward a traditional business and families plan to buy a house as a primary investment option. The residential mortgages market presents several characteristics that make it attractive to employ microeconomics analytical tools to study its dynamics. A large number of producers (banks) supply highly standardized goods. Customers can easily obtain all the relevant information useful to compare different offers and banks have at their disposal a rich set of information to evaluate the credit worthiness of the counterparties.

In this market two broad kinds of mortgages contracts are offered: fixed-rate mortgages (FRMs) and adjustable-rate mortgages (ARMs) and a meaningful and complete database of Banca d'Italia (BI) collects the relative information on Financial Institutions (FIs) in Italy (1997:q1–2011:q4) distinguishing between these two operations. This database shows that the relative importance of these markets recently displayed significant fluctuations since in 2005 fixed interest rate mortgage loans were about 10% while in 2009 they raised up to 70% and, moreover, interesting dynamics were observed in the market share for these contracts and in the difference of their prices.

Therefore in this paper, the interdependencies among FRMs and ARMs markets are analysed in the study of the interconnections within credit markets since it appears very suitable and promising. The specular dynamics of FRM vs ARM suggests that the structure of an aggregate cobweb model type is suitable when based on demand and supply of these two kinds of financial contracts.

In this framework, a dynamic credit market model is set up by Casellina et al. (2011) to analyse the interconnections among two types of credit markets considered from the aggregate demand side view point starting from a model of interconnected markets recently developed by Dieci and Westerhoff (2009, 2010) where they enrich the classic cobweb framework based on Brock and Hommes findings (1997, 1998) and the economy is modelled from supply side. The proposed model is an aggregate demand driven model for unobserved FIs which are assumed to supply credit on competitive markets and competition is due to the interest rates (i.e. prices) with respect to the corresponding contracts' demand. Moreover these FIs can put contracts on the credit market switching over time on different types of contracts depending on expected profit differentials. Among the main characteristics of this model, it is important taking into account that the total number of transactions involved in the two credit markets is assumed changing over time, which is not usual in this family of models. With reference to some model calibrations, the dynamic behaviours and the reactions of the model are investigated. The proposed model is found to be realistic besides its simple formulation: the dynamics and the performances of the model are found to be regular before and after different kinds of stochastic shocks.

Furthermore, the model of Casellina et al. (2011) is applied in Uberti et al. (2013) to test its capacity to capture the dynamics of the observed and available data. It is worth stressing that the involved real data of BI (volume of contracts and average interest rate in the FRMs and ARMs markets) are not sample information but they are evaluated on the entire population, it is meaningful and complete for both the extension and the accuracy of the available data, and it covers a period of 60 quarters.. The obtained findings point out the good level to fit the interest rates dynamics. Moreover, the model captures the switching mechanism and it catches the structural breaks when they occurs. Finally, in Landini et al. (2013) some very preliminary results are showed in a fairly new research stream which aims to understand how the effects of the European Central Bank control on the EURIBOR transmit to different technical form interest rates contracts in the Italian mortgage market, as well as to the behavior of interest rates term structure.

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