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Determinants of credit to households: An approach using the life-cycle model



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ABSTRACT

This paper applies a life-cycle model with individual income uncertainty in order to investigate the determinants of credit to households. We show that the household credit to GDP ratio depends on the lending-deposit interest rate spread, individual income uncertainty, and individual income persistence. We subsequently provide empirical evidence for the prediction of a theoretical model on the basis of data from OECD and EU countries.

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1. Introduction

Economic policy makers, financial supervisors and investors alike need reliable empirical estimates of the steady-state level of credit within their economies. This necessity is due to the fact that upward deviations of credit from the steady state often lead to an increase in macroeconomic imbalance (e.g., rising inflation, asset bubbles or instability within the financial system). Commercial banks are also interested in the relationship between their credit policies and the state of the economy, as

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macroeconomic instability usually hits in the form of deteriorating their assets. This in turn may even have the potential to cause a banking crisis. Knowing the steady-state value of credit helps to assess credit dynamics. When the level of credit is low, its rapid growth might reflect an adjustment to the steady state and can be related to, for instance, a financial deepening in emerging economies. When the level of credit is high, even a one-digit growth rate of credit may be considered excessive.

International macroprudential authorities have also noticed the problem of credit booms leading to financial instability. As such, these authorities have proposed some tools to deal with rapid credit growth (e.g., the new regulatory framework known as Basel III or the Macroeconomic Imbalance Procedure introduced by the European Commission). Typically, studies devoted to the matter of financial stability simplify their modeling of long-run trends for loans to households by applying statistical filters (e.g., the Hodrick–Prescott filter) to the time series of loans. Such statistical filters have clear limitations: they are unable to differentiate between periods of credit booms and periods of catching up in the credit market, especially in emerging economies (e.g., [Coudert and Pouvelle, 2010](#); [Egert et al., 2007](#)). Moreover, time series of loans to households are often too short to obtain precise estimates, and application of these filtering techniques involves an arbitrary ‘smoothness’ parameter that clearly impacts the estimate of the equilibrium level of credit (e.g., [BCBS, 2010](#); [Gersl and Seidler, 2011](#), p. 115). Given that simple mechanical methods used to estimate the long-run level of credit have clear disadvantages, more sophisticated methods and models are required to determine a sustainable level of credit (see, e.g. [BCBS, 2010](#); [Repullo and Saurina, 2011](#); [Serwa, 2013](#)).

The issue of the steady-state level of credit in the economy is addressed from two different perspectives in the literature. The first employs theoretical general equilibrium models to assess how various economic and institutional factors affect the level of credit present within the economy. Given that representative agent models are not well suited to address issues such as the redistribution of wealth among households and empirical findings indicating that household savings are to a large extent explained by individual income and age (e.g., [Attanasio and Browning, 1995](#)), the dominant framework with which to analyze this specific question usually builds upon the seminal paper by [Huggett \(1996\)](#). This paper introduced a general equilibrium life-cycle model with individual income uncertainty to the economic literature. According to Huggett’s simulations, the share of indebted households depends on the characteristics of individual income such as its variance, to name just one factor. The main extensions of this baseline framework are twofold. First, [Livshits et al. \(2007\)](#) extended the model for unsecured debt by allowing households to declare bankruptcy. The implication of this setup is that each household is subject to a person-specific borrowing interest rate that is equal to the risk-free interest rate augmented for the probability of default. In turn, age, income and the level of indebtedness determine the probability of a default.¹ This framework was subsequently applied to analyze the effect of different bankruptcy regulations on the economy, including the ratio of credit to GDP. [Fernandez-Villaverde and Krueger \(2011\)](#) proposed the second extension by introducing durables, hence secured debt, to the benchmark life-cycle model. This kind of framework has been applied by [Rubaszek \(2012a\)](#) to analyze the effects of macroprudential policy on the level of the debt-to-GDP ratio. It is also worth mentioning the paper by [Hintermaier and Koeniger \(2009\)](#), which proposes a life-cycle model with both durables and unsecured debt in an effort to analyze consumer debt portfolios in the US economy.

The second perspective in the literature is empirical and tests whether there is a stable relationship between the value of credit and a set of economic, demographic, or financial factors. Most studies either focus on the determinants of the long-run level of aggregate credit in the economy without separating loans to households, or use explanatory variables typical of the models of aggregate credit (or even ad hoc variables) to explain the level of loans to households. The usual determinants of loans in macroeconomic panel data models include the level of GDP (per capita), the real interest rate, inflation and housing prices (see, e.g., [Hofmann, 2004](#); [Cottarelli et al., 2005](#); [Kiss et al., 2006](#); [Buncic and Melecky, 2013](#)). A valuable example of a study analyzing credit to households is that by [Chrystal and Mizen \(2005\)](#), who built a macro vector error correction model for the UK economy and found that, in the long run, consumer loans are driven by the net labor income, the net wealth of households, the interest rate spread on loans, and inflation. [Iacoviello \(2008\)](#) fits his theoretical model to US

¹ [Chatterjee et al. \(2007\)](#) also proposed a similar extension of [Aiyagari’s \(1994\)](#) infinite horizon model.

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