

Financial Constraints and Household Heterogeneity in the Macroeconomy

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List of Abbreviations

GFC Great Financial Crisis

HANK Heterogeneous Agent New Keynesian

Abstract

Abstract goes here.

1 Introduction

Households face limits to borrowing. This limit to borrowing is usually much harsher than the so-called natural borrowing limit, which is commonly defined as the expected net present value of an individual's income stream.

The presence of a borrowing limit has consequences not only for individual households but also for the economy as a whole. The following question arises: how does time-variation in those limits affect the economic outcomes on aggregate and household levels? To answer this question, this thesis follows and extends the work by Guerrieri and Lorenzoni (2017) and analyses shocks to the household-level borrowing limits in a heterogeneous agent New Keynesian model (HANK).

Since at least the Great Depression economists have acknowledged the importance of debt, leverage and limits to both of these. The Great Financial Crisis (GFC) was a vivid reminder of how developments in finance, including credit and limits to credit, affect households and the macroeconomy.

The model and its dynamics are solved with the Python package Econpizza by Boehl (2023) and the methods therein.

Outline

The remainder of this thesis is structured as follows. Section 2 reviews the related literature. Section 3 lays down the macroeconomic model, the numerical implementation and calibration of which is discussed in section 4. Thereafter, section 5 presents the results and section 7 concludes.

2 Related Literature

This section reviews two strands of the literature which the present thesis is most closely related to: household heterogeneity and financial constraints in the macroeconomy. Before discussing each fields in turn, I briefly highlight the findings of Guerrieri and Lorenzoni (2017), the paper that this thesis is most closely related to.

Guerrieri and Lorenzoni (2017) build a household-focused incomplete-markets model and find that a permanent tightening in the household-level borrowing constraint evokes deleveraging and increased precautionary savings. Combined, these two effects depress output and interest rates in the economy. The recession is aggravated and the economy falls into a liquidity trap when the model is augmented with nominal wage rigidities and the zero lower bound.

2.1 Household Heterogeneity in the Macroeconomy

2.2 Financial Constraints in the Macroeconomy

In the real world, it is not only households who face financial constraints. Other agents, such as firms and financial intermediaries, can be subject to limits to their borrowing capacity.

BG and BGG are among the earliest and most widely used approaches to the study of financial constraints on the firm side.

GK focus on the economy's financial intermediaries. In their framework, banks are limited in the amount of leverage they can hold because of the possibility of banks' owners to liquidate the business.

3 Model

3.1 Households

Households are subject to idiosyncratic, i.e. household-level, income risk. They can self-insure by saving and borrowing in a one-period, risk-free and perfectly liquid bond. This bond is the only asset in the economy.

A note on the asset structure is in order. The one-asset framework seems to be in contradiction to what we find in reality, where households can choose from a variety of assets to self-insure. What is more, there is government insurance and insurance from employers, see Heathcote et al.

3.2 Firms

3.3 Fiscal Policy

3.4 Monetary Policy

4 Implementation and Calibration

5 Results

5.1 Comparison of Steady States

5.2 Transitional Dynamics

6 Sensitivity Analyses

7 Conclusion

References

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Guerrieri, V. & Lorenzoni, G. (2017). Credit Crises, Precautionary Savings, and the Liquidity Trap. *The Quarterly Journal of Economics*, 132(3), 1427–1467. <https://doi.org/https://doi.org/10.1093/qje/qjx005>.

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Appendices

A Description of Computer Codes

Statement of Authorship

I hereby confirm that the work presented has been performed and interpreted solely by myself except for where I explicitly identified the contrary. I assure that this work has not been presented in any other form for the fulfillment of any other degree or qualification. Ideas taken from other works in letter and in spirit are identified in every single case.

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Bonn, the 25th August 2023