



Chapter 21

Credit–Market Imperfection and Monetary Policy Within DSGE Models

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ABSTRACT

This survey presented the various ways that are utilized in the literature to include financial market frictions in dynamic stochastic general equilibrium (DSGE) models. It focuses on the fundamental issue: to what extent the Taylor rules are optimal when the central bank introduces the goal of financial stability. Indeed, the latest financial crisis shows that the vulnerability of the credit cycle is considered the main source for the amplification of a small transitory shock. This conclusion changed the instrument that drives the transmission of monetary policy through the economy and pushed the policymakers to include financial stability as a second objective of the central bank.

INTRODUCTION

The great recession reminds us cruelly that credit frictions are a key driver of business cycle variation. Imbalances can construct up during apparently tranquil periods until a trigger leads to great and persistent wealth destructions potentially spilling over to the real economy. While in normal times, the banking (financial) sector can mitigate credit (financial) frictions, in crisis periods the banking (financial) sector's

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vulnerability aggravates the instability. Adverse feedback loops and liquidity spirals lead to non-linear impacts that can lead to a credit crunch. There has been a large body of empirical literature target to analyze the properties of how to go about modeling the financial crisis in a DSGE framework.

In this chapter, we examine the hypothesis adopted by the DSGE models before the financial crisis and how modelers reacted to the crisis and its aftermath. Inevitably, models must distract from some characteristics of the real economy, raising the issue: which characteristics should we introduce and which characteristics should we eliminate to better model the individuals' behavior? Starting from this question, we survey what the key characteristics of pre-financial crisis models were and why the introduction of these characteristics was justified. We then study how DSGE models extended in reaction to the subprime crisis and how central banks improved the monetary policy rule to better respond to financial instability.

Models discussed in this survey suppose diverse financing restrictions. Depending on the underlying economic friction, financing constraints can arise in different forms. For instance, the financial accelerator model of Bernanke et al (1999) assumes that the returns on capital may be impacted by idiosyncratic shocks and that the posterior performance of this return is private information, which the lenders can observe if they pay a monitoring cost. This cost increases the lending interest rate and decreases the investment project. In contrast, the collateral constraint model of Kiyotaki and Moore (1997) assumes that the borrower cannot borrow as soon as its assets, which uses as collateral, covers at least the entire loan requested. Besides, this model assumes that the entrepreneur never goes bankrupt because the debt is a fraction of its wealth value. Contrary, in the context of the financial accelerator the entrepreneur is faced with the default of the payment since their credit can exceed its net value. However, until here, the payment default of the financial firms was not treated since in both models the bank finances only by the deposit of the households. Also, the impact of bank capital deterioration and the holding effect of toxic assets are excluded in these two models.

After being criticized following the subprime crisis, the DSGE models stand as incomplete models for anticipating the vulnerability of the real economy. The emerging literature on DSGE modeling with financial frictions since the start of the crisis either spells out a banking system or adds financial frictions and/or shocks to establish the intermediation process between entrepreneurs and deposits. As proposed by (Brazdik et al. (2012), Gertler et al. (2016), Karmelavicius and Ramanauskas (2019)) the introduction of a banking system could help to better understand the transmission mechanism of different shocks and analyze if this mechanism is altered by the presence of a banking system. Moreover, including a banking sector permits DSGE models to put in evidence the different interest rates applied by the banks.

This paper focuses on two objectives: First, we aim to review the most important ways of including financial frictions in a DSGE model and to show the effect of these frictions on monetary policy conduct. Second, we target to study the different ways of introducing financial variables into the monetary policy to mitigate the aftermath of the financial crisis.

The rest of the paper is structured as follows: firstly, we will present the famous Pre-crisis DSGE models, which deal with credit frictions on the demand side framework. In the second section, we focus on the weak points of these models especially following the subprime crisis, and in the third section, we look at what has changed in these models. Section four aims to present the transmission mechanism of monetary policy and the different manner of modeling this policy in the DSGE models. Finally, we conclude with a discussion of new instructions for DSGE modeling.

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