The external finance premium in the Euro area: A dynamic stochastic general equilibrium analysis

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A R T I C L E   I N F O

A B S T R A C T

In this paper I estimate a New Keynesian Dynamic Stochastic General Equilibrium model à la Smets and Wouters (2003, 2005, 2007) featured with financial frictions à la Bernanke, Gertler, and Gilchrist (1999) for the Euro Area. The main aim is to obtain a time series for the unobserved risk premium of entrepreneurs loans, with the further aim of providing a dynamic analysis of it (IRFs analysis and variance decomposition analysis). Results confirm in general what recently found for the US by De Graeve (2008), namely that the model with financial frictions can generate a series for the premium, without using any financial macroeconomic aggregates, highly correlated with available proxies for the premium (about 65% with the A graded corporate bonds spread). The advantage of using a structural model to obtain the premium lies in the fact that it allows for the dynamic analysis above mentioned, whose main achievement is to highlight that the estimated premium is not necessarily: (1) counter-cyclical (this depends on the shock considered) and (2) pro-cyclical during a recession.

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1. Introduction

The main goal of the paper is to provide a time series for a relevant economic variable which is unobserved. This is the external finance premium, i.e. the premium that risky entrepreneurs (because of the uncertainty of the projects they undertake) have to pay when they borrow funds from the banks, because there is a problem of asymmetric information and costly state verification between the two types of agents. In other words agents operate in a world of credit frictions. The analysis concerns the Euro Area and covers the period from 1980 to 2008.

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The motivation behind the paper is surely related to the recent financial crises. It is very important during this time of heavy disruption of the financial markets to know about the dynamic properties of the variables pertaining those markets, among which the external finance premium is one of the most relevant. In addition to that financial markets play a relevant role also during "normal" times, so I think it is worth having a better understanding of their functioning.

In order to achieve my aim I base my analysis on a New Keynesian Dynamic Stochastic General Equilibrium model (NK DSGE henceforth) which closely follows the structure of the model developed by Smets and Wouters (2003, 2005, 2007) but with the addition of the so called financial accelerator mechanism developed in Bernanke and Gertler (1989), and already included in a basic DSGE model (Bernanke et al., 1999, BGG henceforth). The main advantage in using such a model is that, contrary to the last quoted theoretical contribution, several sources of nominal and real rigidities (which help in many ways in an estimated model[1]) and a large set of structural shocks are considered.

It is the use of a structural model and the presence of those numerous shocks which justifies the importance of this paper. In fact, many proxies for the financial premium are available, more often represented by the difference of some risky interest rates or yields (e.g. corporate bonds yields) and a measure of the risk free interest rate. Nevertheless, the use of a structural model to estimate such a series allows for a dynamic analysis of the premium. It is possible to highlight the stochastic forces explaining its behaviour through the variance decomposition and evaluate the impact that those forces have on its cyclical movements thanks to the impulse response functions analysis. Another advantage is that the proxies for the premium available for the Euro Area are short (they start in the first quarter of 2000). My approach gives an estimated series as long as the sample used, namely a series dating back to the 1980s.

The main result of the paper is that the estimated premium is not necessarily counter-cyclical as theoretically prescribed (BGG) and empirically found for the Euro Area by previous contributions (Queijo, 2005, 2008). That feature depends in a crucial way on both the nature of the shock considered and on the assumption on investments adjustment costs. This characteristic is at the basis of the explanation of the evidence that the estimated premium in the Euro Area does not display any relevant regularity either during a period of recession or immediately before it (it has been found to be always increasing before a recession and always pro-cyclical during it – with the exception of the two early eighties' recessions – in De Grove, 2008 for the US[2]). The variance decomposition suggests that many shocks are relevant for the explanation of the variability of the premium. Given that those shocks have different implications in terms of pro/countercyclicality of the premium and that at any point in time they are acting contemporaneously, it is not surprising that the premium behaves accordingly, being pro/countercyclical on the basis of the shocks which dominate the others in a particular period.

Further investigations are due in order to validate the estimated premium to guarantee its reliability before proceeding with its dynamic analysis. The same type of validation has been done by De Graeve (2008) who estimates the same model I am estimating in this paper using US data from 1954 to 2004. He finds that "the estimate – based solely on non financial macroeconomic data – picks up over the 70% of the dynamics of lower grade corporate bond spreads. . ..[in addition there is] A gain in fitting key macroeconomic aggregates by including financial frictions in the model". I confirm those main results for the Euro Area, finding that the correlation between the series for the premium and the A graded corporate bonds spread is about 0.65.

With respect to the confirmation of the empirical relevance of the financial frictions, a model for the Euro Area with such features has been already estimated by Queijo (2005, 2008). Her estimation ends at the fourth quarter of 2002, so in a sense my estimation is an up-date. But the important difference is that her paper is silent in terms of the analysis of the fitted risk premium series described in the text, because her focus is on the comparison of the relevance of the financial frictions in the US and the Euro

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[1] See Christiano, Eichenbaum, and Evans (2005), CEE henceforth, and Smets and Wouters (2003, 2005, 2007) for a detailed discussion about their importance in an estimated model.

[2] See footnote 21 for a more detailed explanation of those findings.