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# The response of term rates to monetary policy uncertainty

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## Abstract

This paper shows that greater uncertainty about monetary policy can lead to a decline in nominal interest rates. In the context of a limited participation model, monetary policy uncertainty is modeled as a mean preserving spread in the distribution for the money growth process. This increase in uncertainty lowers the yield on short-term maturity bonds because the household sector responds by increasing liquidity in the banking sector. Long-term maturity bonds also have lower yields but this decrease is a result of the effect that greater uncertainty has on the nominal intertemporal rate of substitution—which is a convex function of money growth. We examine the nature of these relations empirically by introducing the GARCH-SVAR model—a multivariate generalization of the GARCH-M model. The predictions of the model are broadly supported by the data: higher uncertainty in the federal funds rate can lower the yields of the three- and six-month treasury bill rates.

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## 1. Introduction

The current generation of quantitative macroeconomic models, such as those based on the real business cycle paradigm, invariably cast the analysis within a stochastic environment in which the first moments of policy variables constitute the almost exclusive object of interest. In this literature, beginning with the Lucas tradition that emphasized

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the distinction between unanticipated and anticipated monetary policy and continuing with modern extensions that introduce various real and nominal rigidities (sticky prices, sticky wages, and limited participation models, for example), there are few examples that study the impact that the second (and higher) moments of policy variables have on economic activity and welfare. This paper broadens the analysis of macroeconomic policy by investigating how monetary policy uncertainty affects one important aspect of the macroeconomy: nominal yields on risk-free bonds.

We are not the first to point out the paucity of research that examines the consequences of policy uncertainty. Obstfeld and Rogoff (2000) highlight the scant attention that policy uncertainty receives in open economy, macroeconomic policy analysis. While concerns about uncertainty of monetary policy are reflected in popular discussions of *policy transparency* and *policy risk*, the theoretical neglect of these issues is primarily driven by a key technical consideration: the solution of stochastic general equilibrium macroeconomic models typically involves a linear approximation that implies certainty equivalence in equilibrium. Obstfeld and Rogoff (2000) depart from certainty equivalence by assuming that the exogenous variables in the model have lognormal distributions. This particular distributional assumption allows them to obtain closed form solutions. Our analysis also requires that we make distributional assumptions to find exact solutions to the economy but these take the form of a discrete-state Markov process for monetary policy. Moreover, the transition probability matrix of this Markov process is appropriately parameterized to study the effects of *time-varying* uncertainty.<sup>1</sup>

Few papers outside the finance literature have successfully explained the variation in the term structure of interest rates with a modern equilibrium macroeconomic model. For example, den Haan's (1995) analysis predicts a yield curve that is essentially flat. A notable exception is that of Evans and Marshall (1998) who find that a limited participation model of monetary non-neutrality is broadly consistent with empirical regularities in the term structure. A limited participation model is an attractive environment for an investigation of policy uncertainty on term-structure relations because of three important properties:<sup>2</sup>

- (1) the channel of monetary policy transmission is captured through the traditional mechanism of liquidity affecting interest rates which, in turn, affect real activity;
- (2) agent's savings decisions, which in part determine the supply of funds in the loan market, are made before the state of the world is known. Consequently, time-varying uncertainty in monetary policy may create an endogenous response in the loan market which will be reflected in interest rates; and
- (3) nominal interest rates are affected by both Fisherian and liquidity factors.

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<sup>1</sup> That is, Obstfeld and Rogoff (2000) focus on the unconditional variance of money growth so that their analysis is one of comparative dynamics. In contrast, the analysis presented here studies the effects of changes in uncertainty within a particular economy.

<sup>2</sup> This monetary model is also a departure from the Obstfeld and Rogoff (2000) analysis which generates a demand for money by placing real balances in the utility function. Since their focus is on price setting behavior and nominal rigidities, a money-in-the-utility function approach is reasonable. However, since our emphasis is on the term structure, a richer model of interest rates is required.

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