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Rare Shocks vs. Non-linearities: What Drives Extreme Events in the Economy? Some Empirical Evidence[☆]

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Abstract

A small-scale vector autoregression (VAR) is used to shed some light on the roles of extreme shocks and non-linearities during stress events observed in the economy. The model focuses on the link between credit/financial markets and the real economy and is estimated on US quarterly data for the period 1984–2013. Extreme shocks are accounted for by assuming *t*-distributed reduced-form shocks. Non-linearity is allowed by the possibility of regime switch in the shock propagation mechanism. Strong evidence for fat tails in error distributions is found. Moreover, the results suggest that accounting for extreme shocks rather than explicit modeling of non-linearity contributes to the explanatory power of the model. Finally, it is shown that the accuracy of density forecasts improves if non-linearities and shock distributions with fat tails are considered.

JEL Codes

C11, E44, C32

Keywords

Non-linearity, Fat tails, Bayesian VAR, Density forecasting

1. Introduction

One of the responses of economic research to the Great Recession has consisted in a thorough examination of the shock distributions assumed in macroeconomic models. Attention has shifted towards non-Gaussian error structures, especially those exhibiting fat tails. For example, the Student's *t*-distribution is often considered because it ascribes higher probability to extreme events. Within the family of DSGE models, such investigation includes the studies by Chib and Ramamurthy (2014) and Cúrdia et al. (2014). Chiu et al. (2014) examine *t*-distributed shocks in

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