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Estimating Macroeconomic Models of Financial Crises: An Endogenous Regime Switching Approach

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Abstract

We develop a novel approach to specifying, solving and estimating Dynamic Structural General Equilibrium (DSGE) models of financial crises. We first propose a new specification of the standard Kiyotaki-Moore type collateral constraint where the movement from the unconstrained state of the world to constrained state is a stochastic function of the endogenous leverage ratio in the model. This specification results in an endogenous regime switching model. Next, we develop perturbation methods to solve this model. Using the second order solution of the model, we then design an algorithm to estimate the parameters of the model with full-information Bayesian methods. Applying the framework to quarterly Mexican data since 1981, we find that the model's estimated crisis regime probabilities correspond closely with narrative dates for Sudden Stops in Mexico. Our results also shows that fluctuations in the non-crisis regime of the model are driven primarily by real shocks, while leverage shocks are the prime driver of the crisis regime. The paper provides the first set of structural estimates of financial shocks stressed in the normative literature and consistent with available reduced form evidence finding that financial/credit shocks only matter in crisis periods.