Abstract

Part 1
The recent global financial crisis has clearly shown the need to develop policies to both prevent such events from occurring as well as more effectively dealing with such events when they do occur. On the positive side, the economics profession has progressed significantly in developing the economic theory needed to understand financial crises. Progress on empirical implementation of these theories has been much more limited. The research in this grant develops a new approach for empirical analysis of macroeconomic models of financial crises. This new approach will first provide a way to measure which economic shocks are driving an economy towards a crisis. Second, it will provide a framework for analyzing the effectiveness of policies to avoid and mitigate the impact of crises. The model developed is based on the idea that financial crises are rare but large events, implying that any reasonable model for analyzing crises must be non-linear. The research writes models of financial crises as a two-regime model. By viewing a financial crisis as a discrete regime the proposed research captures the large and significant change in an economy in crisis. A key innovative feature of the new model is that the probability of moving to the crisis regime is a function of the current state of the economy — for example when debt rises relative to GDP the probability of a debt crisis increases.

Part 2
The research in the grant develops an endogenous regime switching approach to modeling financial crises. In the model there are two regimes, one a crisis regime, the second a regime for normal economic times. The switch between regimes is based on a probability determined by economic variables in the economy. Agents in the economy know how economic fundamentals affect the probability of moving in or out of the crisis state. That is, it is a rational expectations solution of the model. The solution then ensures that decisions made in the normal state fully incorporate how those decisions affect the probability of moving into the crisis state as well as how the economy will operate in a crisis. The model developed captures all of the salient features one would want in an empirical model of financial crises. First, it captures the non-linear nature of a crisis. Second, the regime switching model is solved using perturbation methods and a second order solution. This allows the solution to capture the impact of risk on decision rules due both in an out of the crisis. Third, since the solution method is perturbation based it can handle a number of state variables and many shocks. That is, we are less constrained than current non-linear methods in terms of the size of the model. Fourth, the speed of the solution method means that non-linear filters (e.g. particle filter) can be used to calculate the likelihood function of the model for a full Bayesian estimation of the relevant shocks and frictions that are fundamental to models of financial crises. Fifth, the fully rational expectations nature of the solution allows one to ask key counterfactual policy questions. For example, what policies, if any, would have mitigated or eliminated the Great Recession?