A Game Theoretic Model of Financial Crises

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Global financial crises have revealed the systemic risk posed by economic contagion. We formulate a game between countries, central banks, banks, customers, and financial inter-governmental organizations to model the dynamics of borrowers and lenders. We model strategic choices, determine equilibrium solutions, and simulate the impacts of random shocks. Our conclusions enhance the understanding of global economic risk. It is increasingly rare for financial crises to be isolated to a single country or economic entity. The growth of the global financial market coupled with increased financial innovation and economic trade has led to financial crises that are now global in nature. The 2007-08 global financial crisis provides a strong example of the possibilities produced by global economic risks. The game theoretic model of the global financial system we introduce seeks to increase the understanding of these global economic risks. In order to model the interactions between countries, central banks, banking institutions, customers, and financial inter-governmental organizations that result in global economic risks, we formulate, find Nash equilibrium conditions for, and simulate examples of a game involving these five players. The model adds to the understanding of global economic risks. Through simulations, we show how economic shocks are able to propagate across players. Common cause economic failings are demonstrated as economic shocks such as interest rate shocks adversely impact two players simultaneously. Contagion is exemplified as an adverse economic shock not only impact not only adversely impacts one player, but leads to a change in their strategy that adversely impacts another. The game, therefore, demonstrates that isolated economic shocks can develop in global economic crises through rational behavior. Furthermore, the game provides not only insight into adversities, but also to how crises can my mitigated. Players such as, financial inter-governmental organizations, countries, and central banks will suffer losses in utility as other players are negatively impacted. Consequently, they may find it a best response to lend to other players negatively impacted by economic shocks. Increased lending in response to shocks can be an optimal response to these players as a result. The model we introduce is the beginning of an increased understanding of the dynamics between players that creates the global economic risks resulting in the peril of financial crises. The implications are intended to improve global economic stability.