IU BLOOMINGTON

EMERGING AREAS OF RESEARCH

Abstract Template -- Due June 30, 2017

Title of initiative to be proposed:

Uncertainty and Strategic Interaction in Economic Networks

Name of lead PI, with title, department/school:

Dr. Emerson Melo, Department of Economics, College of Arts and Sciences

Key team member names and departments/schools (up to 10 names):

Description of area to be proposed. What constitutes this area of research or creative activity as emerging? (Word limit=500)

Network structures play a fundamental role in the modern economy. Examples vary from communication and transportation networks to supply chains and financial networks. In all of these markets, economic agents face two types of uncertainty: Strategic uncertainty and Systemic uncertainty. Strategic uncertainty refers to situations where economic agents make decisions in strategic environments. To study this class of uncertainty, the theoretical and applied literature have adapted ideas from traditional game theory to understand how strategic interaction is determined by network structures. Systemic uncertainty refers to situations where all the agents in a given network make decisions with incomplete information about the realization of some fundamental variables that affect the entire system (network). To fix ideas, consider the case of a financial system, where the interrelation amongst banks is captured by a financial network. In this environment all banks face uncertainty about the realization of some financial shock or about the realization of some relevant economic variable. Because the realization of these exogenous shocks affect all the banks in the network, this uncertainty is refereed as systemic uncertainty. A real world example that fits into this description is the 2008 sub-prime crises: All the economic agents faced uncertainty about the situation of the real state market. Most of the theoretical (and empirical) literature in Economics has been focused on strategic uncertainty, omitting the role of systemic uncertainty. In this project we study the role of systemic uncertainty in economic networks. In doing so, we built upon the literature of network games, including explicitly the role of risk measures, which allow us to capture the relevance of systematic uncertainty in agents' decisions.

We make three main contributions:

1. We develop a model of strategic interaction in networks, in which agents are risk-averse. This in sharp contrast with all previous literature on network games which has assume that agents are risk-neutral. As a consequence we are able to characterize agents behavior not only in terms of network structures but also in terms of the role of systemic uncertainty.
2. Based on point 1, we develop numerical methods to compute and simulate large network problems. A direct application of these methods is the counter factual analysis of different economic policies.
3. Finally, we characterize the type of networks that are robust to systemic uncertainty.

Please submit to earprogram@indiana.edu