

A Dissertation Defense has been scheduled for Tina Wakolbinger, Ph.D. Candidate in Management Science, for Monday, April 30, 2007 at 3:30pm in SOM 112. All are invited to attend.

Chair: Anna Nagurney

Title: A Dynamic Theory for the Integration of Social and Economic Networks with Applications to Supply Chain and Financial Networks

Abstract:

Uzzi (1996, p. 674) highlighted that there is a "growing need to understand how social structure assists or impedes economic performance." In this dissertation, I contribute to this understanding by constructing dynamic supernetwork models that explicitly integrate social networks with economic network models and that rigorously capture the role that relationship levels play.

The research in this dissertation is motivated by the growing literature that empirically and theoretically highlights the importance of relationships in supply chains (cf. Cannon and Perreault (1999), Bernardes and Fensterseifer (2004), and Baker and Faulkner (2004)) and financial transactions (cf. Berger and Udell (1995), Anthony (1997), and Uzzi (1999)). As this literature shows, the existence of appropriate social networks can affect not only the risk associated with the transactions but also transaction costs.

By explicitly including the role that relationships play in economic transactions, I extend the previous research on supply chain network models (see, for example, Nagurney, Dong, and Zhang (2002), Nagurney, Cruz, and Matsypura (2003), and Nagurney and Matsypura (2005)). Furthermore, I extend the literature on financial network models (see, for example, Nagurney and Ke (2001, 2003) and Nagurney and Cruz (2003a,b, 2004)).

Specifically, I first develop a model consisting of an integrated supply chain and social network. I then construct a model consisting of an integrated financial and social network. Finally, I extend both these models to an international setting. The social networks consist of relationships of different strength as they have been described in the papers by Granovetter (1973), Freeman, Borgatti, and White (1991), and Golicic, Foggin, and Mentzer (2003).

The "supernetwork" models describe how the behavior of the multicriteria decision-makers and induced flows influence the co-evolution of social and economic networks. Numerical examples highlight the unique ability of this framework to analyze the interaction between the social network and the economic network. The models are based on variational inequality theory for the study of the equilibrium states (cf. Nagurney (1999)) and projected dynamical systems theory for the study of the associated dynamics (cf. Nagurney and Zhang (1996a)).