Interdisciplinary Data Sciences

* IDSC Seminar Series *

Mathematics &Statistics Colloquium

April 20, 2016 1:30-2:30pm

Location: ENB 109

Presents

Dr. Donald J. Berndt

Muma College of Business, University of South Florida

Title: Agent-Based Simulation of Corporate Bond Market Liquidity

Abstract: The Granular Systemic Risk (GsRisk.org) project is a research initiative at the University of South Florida with grant support from the National Science Foundation (NSF award 1445403) and the Office of Financial Research (OFR). The project's overall goal is to research novel ways to monitor systemic risk, using distributed computing platforms to analyze fine-grained financial data. Our initial research focuses on US corporate bond markets. We are applying agent-based modeling to gain an understanding of the dynamics of liquidity under stress, one of the most widely discussed issues facing financial markets today. Following the recent financial crisis, corporate bond markets have undergone tremendous change. Market size has increased significantly along with fundamental changes in market ecology (including reduced investor heterogeneity and dealer intermediation capacity), leading to potential systemic imbalances. The analysis of market liquidity requires simulation approaches, since liquidity is typically ample in normal (steady state) operation but tends to evaporate under conditions of stress. To that end, we are experimenting with agent-based models of a simplified corporate bond market. Our initial model includes three classes of investors: 2 classes represent "real money" investors, while the 3rd investor class maintains leveraged positions. Real money investors are long only; the 2 classes represent a pension fund (value investor) and a mutual fund (using passive index tracking). The leveraged investor represents an unconstrained participant (such as a hedge fund) who can maintain long and short positions. All trading in our model occurs between the investors and a network of dealers using a simple request-for-quote (RFQ) mechanism. Using our agent based models we aim to provide insights into the behavior of price and liquidity under a variety of stress conditions.

Biography: Don Berndt is an Associate Professor in the Information Systems and Decision Sciences Department in the College of Business at the University of South Florida (USF). He received his Ph.D. in Information Systems from the Stern School of Business at New York University. He also holds a M.S. in Computer Science from the State University of New York at Stony Brook and a B.S. from the University of Rhode Island. Dr. Berndt's research and teaching interests include the intersection of artificial intelligence and database systems, data warehousing, data and text mining, as well as a long-standing interest in parallel programming. Of particular interest is the application of data and knowledge management techniques in the healthcare sector, including work on text mining electronic medical records as part of the Consortium for Health Informatics (CHIR), a multi-institution Department of Veterans Affairs (VA) research initiative. His work has appeared in leading journals, including Communications of the ACM, IEEE Computer, Decision Support Systems, Discrete Applied Mathematics, Journal of Biomedical Informatics, and Journal of the American Medical Informatics Association. Along with his academic focus, he has been involved in a series of entrepreneurial ventures most recently co-founding SiteWit.com, a data mining-based online advertising company, after co-founding Medegy Inc. in the USF Business Incubator, which focused on transferring healthcare data warehousing to the commercial marketplace. Previously, Dr. Berndt worked at Yale University and Scientific Computing Associates, where he participated in the development of commercial versions of the Linda parallel programming environment. He also developed artificial intelligence applications in academic settings and at Cognitive Systems, Inc.

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