



DIPLOM-/MASTERARBEIT

A network-based control approach of a banking system: Modelling, Simulation and Control

Brief project description

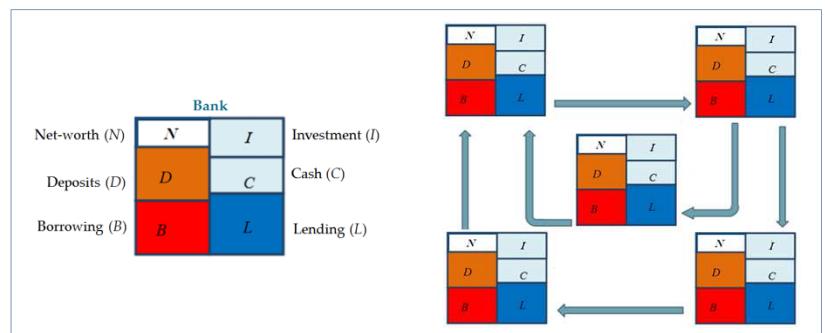
The 2008 financial crisis, which caused long-lasting effects on the real economy worldwide, was facilitated by the failure of regulators to address the fragility of the financial system: this has attracted renewed interest in studying ways of modelling interdependence and stability in the financial system.

At the University of Kent a dynamic model based on differential equations has been developed to study the banking system and its stability. The model takes inspiration from large scale, complex, interconnected systems studied within the domain of engineering. The banking system is represented as a network where nodes are individual banks and the links between any two banks consist of interbank loans and borrowing. The dynamic structure of the model is represented as a set of ordinary differential equations consisting of balance sheet dynamics. This dynamic structure not only allows the analysis of systemic risk but also the incorporation of control mechanisms. Perturbations are introduced into the system by applying stochastic shocks to bank deposits, which are assigned as an exogenous signal. The behaviour of the system can be analysed for different initial conditions and parameter sets.

Project's objectives

- Familiarise with the existing dynamic model
- Implementation of the model in Matlab/Simulink
- Stability analysis taking into account financial aspects
- Observer design in order to monitor internal banking information
- Controller design in order to avoid crashes of the banking system

Begin: Right now



Contact:

Markus Reichhartinger

Markus.Reichhartinger@tugraz.at

0316-873-7027



Gianluca Marcelli

School of Engineering and Digital Arts

University of Kent

G.Marcelli@kent.ac.uk

