

## **COST Action IC1205 on Computational Social Choice: STSM Report**

**Applicant:** Peter Csoka

**Home institution:** Corvinus University of Budapest, Department of Finance, and Game Theory Research Group, Centre for Economic and Regional Studies, Hungarian Academy of Sciences

**Home country:** Hungary

**Host:** P. Jean-Jacques Herings

**Host institution:** Maastricht University

**Host country:** The Netherlands

**Dates:** 18/05/2014 to 24/05/2014

### **Purpose of the STSM:**

Fair Risk Capital Allocation in Case of Systemic Risk

If a financial enterprise (bank, insurance company, investment fund, etc.) consists of subunits (individuals, products, subportfolios, divisions etc.), not only is it important to measure properly the risk of the main entity, but also to allocate the diversification benefits to the subunits using a proper risk allocation method. Risk allocation games are cooperative games that are used to attribute the risk of a financial entity to its subunits.

Systemic risk is the risk of the whole financial system as opposed to the risk of individual banks. In case of systemic risk and risk allocation the main unit is the whole financial system and the subunits are the banks. On top of liquidity ratios, banks are regulated by setting regulatory capital, which is a buffer against possible future losses determined by a measure of risk. In a fair allocation of systemic risk, regulatory requirements would be set higher for those banks (Systematically Important Financial Institutions) bringing greatest risk to the financial system. The question is how the individual banks are contributing to the systemic risk, how much risk should be allocated to each of them to have a fair risk allocation. The definition of a risk allocation game in a network is not straightforward, since the presence of the network leads to externalities.

### **Description of the work carried out:**

During the visit I have been working together with my former PhD supervisor P. Jean-Jacques Herings. We have defined 2 major versions of risk allocation games incorporating the situation when agents have mutual claims on each other, represented by a network. In one of the versions there is always a stable way to allocate systemic risk.

We also have promising results about the generalised bankruptcy situation (described by the endowments and the circular claims of the agents) arising within the model.