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Essays on markets over random networks and learning in Continuous Double Auctions

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This dissertation studies the behaviour of traders under different market designs. The setup of a market contains the information available to traders, the decisions traders have to make and the trading mechanism. We have extended models to consider the effect of the market design. In markets over networks we have introduced randomness and derived bounds on the maximal efficiency given the network structure. Moreover, under strategic behaviour of traders, we derived a non-monotonic effect of the information about the network structure that is available on expected efficiency. This effect depends also on the information about traders' valuations. We studied an alternative payoff function used in the Evolutionary Individual Learning algorithm under a Continuous Double Auction. Furthermore we extended this model by allowing traders to submit a two dimensional decision; their order and their preferred moment of trade, and studied the distribution of submission moments. We study whether it is optimal to allow traders this extra decision. A general conclusion of this dissertation is that market design has a large impact on efficiency. More information about the network structure, about trading history or allowing traders extra decision may have a negative effect on efficiency.

Michiel Chr. W. van de Leur (1986) holds a B.Sc. in Mathematics, a M.Sc. in Stochastics and Financial Mathematics and a M.Sc. in Econometrics from the University of Amsterdam. In 2011 he joined the European Doctorate in Economics - Erasmus Mundus, a joint PhD programme at the University of Amsterdam and the Università Ca' Foscari Venezia and included a research stay at Universität Bielefeld. His research interests cover financial networks, learning algorithms, bounded rationality, agent-based models and game theory.

Michiel van de Leur

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and learning in Continuous Double Auctions

This dissertation has been written within the European Doctorate in Economics-Erasmus Mundus (EDE-EM) programme in order to obtain a joint doctorate degree at the Faculty of Economics and Business at the University of Amsterdam and the Department of Economics at Università Ca' Foscari Venezia.

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ten overstaan van een door het college voor promoties
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Michiel van de Leur

September 2014

”Why are numbers beautiful?

It’s like asking why is Beethoven’s Ninth Symphony beautiful.

If you don’t see why, someone can’t tell you.

I *know* numbers are beautiful.

If they aren’t beautiful, nothing is.”

(Paul Erdős)

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