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.

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

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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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