

Report on Bachelor / Master Thesis

Institute of Economic Studies, Faculty of Social Sciences, Charles University in Prague

Student:	Waheed Brown
Advisor:	PhDr. Martin Gregor, PhD.
Title of the thesis:	Seller Strategies for Virtual Auctions Using Real Currencies

OVERALL ASSESSMENT (provided in English, Czech, or Slovak):

Video games have long been an indulgence for the purposes of entertainment and socializing. However, since the monetization of online gaming, publishers have implemented economic models in video games in an effort to increase revenue.

The thesis is based on hypothesis that an equilibrium price function can be constructed, which results in a stable likelihood function, predicting the probability of a successful sale that maximizes profitability. An equilibrium price function determines the value of an auctioned good after historical winning bids converge to a relatively constant price, in practice this means a reduction in price variance to one that is less logarithmic but more linear (flat) over time; a likelihood function is a probabilistic term in an equation; a successful sale should maximize profitability for the seller only, as this thesis focuses on an optimum selling price, not an optimum bidding price.

This thesis attempts to identify rational seller strategies to maximize profits and achieve Bayesian equilibria. Bayesian equilibria are crucial for virtual economies as they are the closest approximations to fairness for player interactions. Specifically, over several repeated auctions in the Diablo 3, real currency auction house, the values of goods tend to normalize. Seeing each individual auction as a game in a series of repeated games, bidder behavior reaches an equilibrium where they do not deviate too much from the previous winning bid price. The idea of auctions as a repeated game between bidders is explored. Following that, auctions as a signaling game between a bidder and a seller are evaluated. Additionally, auctions as a single stage Bayesian game are presented.

After a discussion on game theory the hypothesis is reviewed. In support of the hypothesis statement are definitions of the terminology as well as a time series plot, illustrating the main point of the thesis. The next section is a review of existing research and literature. Following a loose chronology that matches their appearances in the thesis, the cited texts are discussed and validated in their contribution to this paper. Following this is a section on the methodology used in determining the optimum selling price, which leads into the theoretical analysis section. A section on the empirical analysis is divided into data collection, OLS regression, correlation of currencies, and actually using the optimum selling price in practice. The bulk of the experimental investigation is conducted using MATLAB. Trial runs are designed to observe numerical convergence to the optimum selling price. From these experiments, it is determined that a correction factor is needed that incorporates the logarithmic decay of prices over time. Prior to the final section on the thesis conclusions there is a section on applications of the optimum selling price.

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The theoretical analysis of this thesis concludes that a feasible, closed-form expression for calculating the optimum selling price was realizable. In practice, however, the numerical calculation of the optimum selling price gives a value that is significantly higher than the most recent winning bid. This is due to the number of rational players increasing over time in proportion to the number of irrational players. Evidently, the optimum selling price equality cannot compensate for this behavior as it assumes a constant mean throughout the set of repeated auctions for the same good. Perhaps this is also due to a change in player preferences over time, which is why the idea of deriving an optimum selling price expression through preference relations was suggested. Academic reasoning hints that if the utility maximization and expenditure minimization problems could be combined (in a mathematically feasible expression) then the logarithmic decay in the utility of a good could somehow also be incorporated.

The thesis presents an innovative interesting application of the game theory. It is logically structured, uses relevant references and contributes to the topic. My only critical comment is to the Czech abstract missing correct orthography.

I recommend submit the thesis for defense and in the case of successful defense grade it as 1 (A).

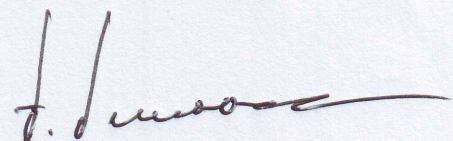
SUMMARY OF POINTS AWARDED (for details, see below):

CATEGORY	POINTS
Literature (max. 20 points)	20
Methods (max. 30 points)	30
Contribution (max. 30 points)	30
Manuscript Form (max. 20 points)	15
TOTAL POINTS (max. 100 points)	95
GRADE (1 - 2 - 3 - 4)	1

NAME OF THE REFEREE:

Prof. RNDr. Ing. František Turnovec, CSc.

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Referee Signature