

A Service of



Leibniz-Informationszentrum Wirtschaft Leibniz Information Centre

Grebe, Tim; Ivanova-Stenzel, Radosveta; Kröger, Sabine

Working Paper

"Buy-It-Now" or "Sell-It-Now" auctions: Effects of changing bargaining power in sequential trading mechanisms

SFB 649 Discussion Paper, No. 2015-037

Provided in Cooperation with:

Collaborative Research Center 649: Economic Risk, Humboldt University Berlin

Suggested Citation: Grebe, Tim; Ivanova-Stenzel, Radosveta; Kröger, Sabine (2015): "Buy-It-Now" or "Sell-It-Now" auctions: Effects of changing bargaining power in sequential trading mechanisms, SFB 649 Discussion Paper, No. 2015-037, Humboldt University of Berlin, Collaborative Research Center 649 - Economic Risk, Berlin

This Version is available at: https://hdl.handle.net/10419/122008

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



"Buy-It-Now" or "Sell-It-Now" auctions: Effects of changing bargaining power in sequential trading mechanisms

Tim Grebe Radosveta Ivanova-Stenzel* Sabine Kröger**



* Technical University Berlin, Germany ** Laval University, Canada

This research was supported by the Deutsche Forschungsgemeinschaft through the SFB 649 "Economic Risk".

http://sfb649.wiwi.hu-berlin.de ISSN 1860-5664

SFB 649, Humboldt-Universität zu Berlin Spandauer Straße 1, D-10178 Berlin



"Buy-It-Now" or "Sell-It-Now" auctions:

Effects of changing bargaining power in sequential trading mechanisms*

Tim Grebe[‡] Radosveta Ivanova-Stenzel‡ Sabine Kröger[‡]

InterVal GmbH, Habersaathstr. 58, 10115 Berlin, Email: t.grebe@interval-berlin.de

‡ Technical University Berlin, Department of Economics and Management, Strasse des 17. Juni 135, D-10623

Berlin, Germany, Email: ivanova-stenzel@tu-berlin.de

‡ Laval University, Department of Economics, 1025 Avenue des Sciences Humaines, Québec, (QC), G1R 0A6

Canada, Email: sabine.kroger@ecn.ulaval.ca

Abstract

We study experimentally the effect of bargaining power in sequential trading mechanisms that offer the possibility to trade at a fixed price before an auction. In the "Buy-It-Now" format, the seller offers a price prior to the auction; whereas in the "Sell-It-Now" format, it is the buyer. Both formats are extensively used in online and offline markets. Despite very different strategic implications for buyers and sellers, results from our experiment suggest no effects of bargaining power on aggregate outcomes. There is, however, substantial heterogeneity within sellers. Sellers who neglect the adverse selection effect of their own price offer in the *BIN* format could benefit from giving up bargaining power by using the "Sell-It-Now" format.

JEL classifications: C72, C91, D44, D82.

Keywords: Buy-It-Now price, Sell-It-Now price, private value auction, single item auction, sequential selling mechanism, fixed price, auction

^{*}We thank Henning Philippsen for research assistance. Financial support by the *Deutsche Forschungsgemeinschaft*, SFB 649, "Economic of Risk" is gratefully acknowledged.

1 Introduction

Sequential mechanisms have become a pervasive method of exchange in online and offline markets. In such mechanisms, either the seller or a buyer offers the fixed price and an auction serves as outside option in case the price is rejected. For example, eBay.com offers a format where the seller states a price at which he is willing to sell the product before the auction. Other internet trading platforms (e.g., Hood.de) offer both types of mechanisms.¹ At many real estate markets, buyers can offer a price before the auction. Trade volumes of sequential mechanisms total billions of dollars per year. For instance, sales based on fixed prices in such combined mechanisms became the primary contributor to all fixed price sales on eBay.com, accounting for 28% of the gross merchandize volume in 2003 growing to 66% in 2012 (eBay, 2003, 2012). Hood.de ascribes 86% of the transaction volume to sales from combined mechanisms (Czyron, 2014). In the Melbourne housing market, 12% of properties listed to be auctioned off were sold in privately negotiated sales before the auction day (Quan (1994)). In Germany, 40% of scheduled foreclosure sale real estate auctions do not take place partly because interested buyers make price offers resulting in sales before the auction (Hammer, 2004).

Theoretically, who makes the price offer has different strategic implications. While the seller needs to take care of the adverse selection effect of his price offer, the format where buyers make the price offer constitutes a signaling game. However, maybe surprisingly, who has the bargaining power has no effect on how revenues are shared. Predicted final outcomes in both formats are the same: the price offer is always rejected and sales take place in the auction when agents are risk neutral (see Ivanova-Stenzel and Kröger (2008) –IK, hereafter–, Shunda, 2009, and Grebe (2008) –G, hereafter). The empirical evidence above shows, however, that a substantial part of the fixed sales ends before the auction. The question arises whether who has the power prior to the auction has an effect on the number of fixed sales, prices, profits and efficiency. The answer to this question is of practical interest for auctioneers (i.e., the market platform) as well as for sellers and buyers in case they can choose between formats.

2 Experimental design and risk neutral benchmark

In this article, we compare experimentally two formats that consist of a fixed price offer followed by a second-price sealed-bid auction, similar to those used in reality. The price offer is either made by the seller, the "Buy-It-Now" auction (BIN treatment hereafter), or by a buyer, the "Sell-It-Now" auction (SIN treatment hereafter). The item for sale is indivisible and offered in the bargaining phase to one of the two buyers (henceforth first buyer). If the price offer is rejected, the price is determined by a second-price sealed-bid auction without a reservation price with the first buyer and one additional buyer.² Both buyers place their bids simultaneously. Buyers' valuations for the good are private and iid $v_i \sim U[0,1]$ with $i = 1, 2.^3$ The seller values the object at 0. The seller's valuation and the distribution of buyer valuation were common knowledge.

The experiment was computerized and conducted with zTree (Fischbacher (2007)). Trading groups

¹eBay and Hood.de name the format where the seller makes the price offer "Buy It Now" auction. Hood.de offers the format where the buyer makes the offer under the name "Preis vorschlagen" ("Make an offer").

²The additional buyer is not informed about the price offered at the bargaining stage.

³In the experiment, values were integers drawn from [0, 100]. For the ease of comparison to the theoretical predictions, all results are reported for normalized valuation in the [0, 1] range.

were randomly rematched in every period. The roles of buyers and sellers were determined randomly and kept throughout the experiment. Each buyer was in the position of the *first buyer* in 16 out of 32 periods. We adopted a between subjects design with 10 sessions per treatment and a total of 210 participants (BIN: 90, SIN: 120).⁴

The risk neutral benchmark predicts for both formats no transactions to take place prior to the auction regardless of who has the bargaining power. For both formats one can derive a threshold price $\tilde{p}(v_1) = (1 - (1 - v_1)^2)/2$ for the first buyer with valuation v_1 above which he does not accept any price in the BIN format and above which he will not make a price offer in the SIN format. Sellers need to condition on this threshold. For the BIN format, sellers need to take the adverse selection effect of their offer into account – low offers not only generate low profits in the bargaining stage but also in the auction stage as buyers who reject low offers are those who have low values.⁵ It can be shown that offers of $p_{BIN} \geq 0.5$, that are high enough to avoid the selection effect, maximize expected profit. Given that the threshold is monotone in the first buyer's valuation and that the maximum threshold is $\tilde{p}(1) = 0.5$ for the highest possible valuation $(v_1 = 1)$, price offers are always too high to be accepted $p_{BIN} \geq \tilde{p}(v_1) \forall v_1$, and all trades end in the auction. For the SIN format, it can be shown that the expected revenue of the seller equals the first buyer's threshold, $\tilde{p}(v_1)$.⁶ Thus, sellers would accept price offers of $p_{SIN} > \tilde{p}(v_1)$. However, prices above the threshold will never be offered and in consequence the seller should always reject and all trades end in the auction.⁷

In summary, the risk neutral benchmark predicts BIN prices above 0.5 and SIN prices below $\tilde{p}(v_1)$. Price offers are never accepted and all sales take place in the auction. Thus, bargaining power has no effect. Outcomes in both mechanisms are the same as in a second-price sealed-bid auction: seller revenues of 0.33, buyer profits of 0.16 and 100% efficiency (where efficient outcome is defined as one where the buyer with the highest valuation gets the object).

3 Results

In the experiment, we observe a total of 2 240 trades, (BIN:30 sellers x 32 periods= 960; SIN:40 sellers x 32 periods = 1 280). Columns (1)–(3) of Table 1 present descriptive statistics and test results for the key variables of interest for both formats. We find seller revenues and buyer profits close to the theoretical risk neutral benchmark prediction without significant differences between treatments. Efficiency rates do not differ across treatments and are with 85% (BIN) and 83% (SIN) comparable to results from other second-price sealed-bid auction experiments (e.g., Kagel and Levin (1993): 79%, Güth, Ivanova-Stenzel, and Wolfstetter (2005): 88%). Contrary to the risk neutral benchmark, we observe a substantial amount of agreements reached in the bargaining phase. The share of transactions at the fixed price comprises around one third in both treatments.

Altogether, we do not observe significant differences between the two treatments, suggesting that the bargaining power in the BIN and SIN format does not affect aggregate outcomes. These findings suggest

⁴Complete sets of the original (German) or translated instructions are available upon request to the authors.

⁵Seller's maximization problem in BIN: $\max_p (\Pr\{p \leq \widetilde{p}(v_1)\}p + (1 - \Pr\{p \leq \widetilde{p}(v_1)\})E[R_A|\widetilde{p}(v_1) < p])$, with R_A expected revenue from the auction.

⁶Seller's expected auction revenue in SIN: $E[R_A|v_1] = (1-v_1)v_1 + \int_0^{v_1} (x)dx = (1-(1-v_1)^2)/2 = \widetilde{p}(v_1)$.

⁷For details of the theoretical results, for n > 2 buyers and for asymmetric buyers, see IK and G.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All Sellers			BIN sellers with :					
				$p_{BIN} < 0.5$			$p_{BIN} \ge 0.5$		
Format	BIN	SIN	p-value	BIN	SIN	p-value	BIN	SIN	p-value
Seller revenue	0.33	0.32	$0.33 \stackrel{MWU}{n=20}$	0.31	0.34	0.01 n = 18	0.36	0.34	$0.04 \ n = 12$
Bidder profit	0.15	0.15	$1.00 \stackrel{MWU}{n=20}$						
Efficiency	85%	83%	$0.65 \stackrel{MWU}{n=20}$						
Acceptance rate	0.33	0.37	$0.12 \begin{array}{c} {}^{MWU}_{n=20} \\ \end{array}$	0.39	0.25		0.24	0.08	
Nobs BIN	960			576			384		
Nobs SIN		1 280		737 280			491 520		
Nobs sessions	10	10		10					
Nobs sellers	30	40		18			12		

Table 1: Descriptive statistics for both treatments for all transactions, and separately for *BIN* sellers. P-values from two sided non-parametric tests of no difference (Mann-Whitney-U and Sign Rank) in columns (3), (6) and (9).

for market platforms, that usually earn a share of the sales price, there is no difference in their expected revenues between both formats.

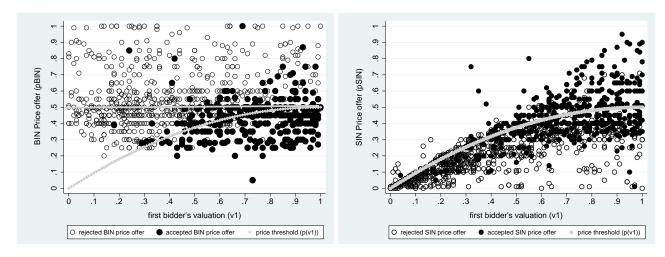


Figure 1: Scatter plot of accepted (solid circles) and rejected (empty circles) price offers, and threshold $(\tilde{p}(v_1))$ in relation to the *first buyer*'s valuation for *BIN* (left panel) and *SIN* (right panel) treatment. Benchmark prediction for *BIN* at p = 0.5.

An analysis of behavior at the individual level for both treatments is presented in Figure 1. There, all individual price offers for both treatments (BIN – left panel and SIN – right panel) are shown relative to the valuation and price threshold ($\tilde{p}(v_1)$) of the first buyer. Most accepted BIN prices and offered SIN prices are below the threshold (SIN: 70% and BIN: 57%). Those deviations from the risk neutral benchmark can be easily reconciled with risk aversion (G, IK, and Reynolds and Wooders (2009)). Also seller behavior seems similar between treatments. 52% of the BIN offers (left panel) and 67% of the accepted SIN prices (solid circles in right panel) are below 0.5. The debate is ongoing to what extent risk preferences or bounded rationality cause making and accepting such low price offers (Mathews and

Katzman (2006), G, and IK). If those deviations are not random, the question arises whether our result of no differences in aggregate profits for sellers and buyers also apply at the individual level.

We do not find differences in individual buyer behavior. Among sellers, however, we observe heterogeneity in behavior, that we summarize in the left panel of Figure 2 as BIN price offer quartiles. Of all BIN sellers, 27% behave according to the theoretical prediction (75% or more of their price offers $p_{BIN} \geq 0.5$), whereas 33% deviate substantially, i.e., hardly ever offer above 0.5 (75% or more of their price offers $p_{BIN} < 0.5$). A similar analysis in the SIN treatment reveals that only 8% of all SIN sellers never accept offers below 0.5.

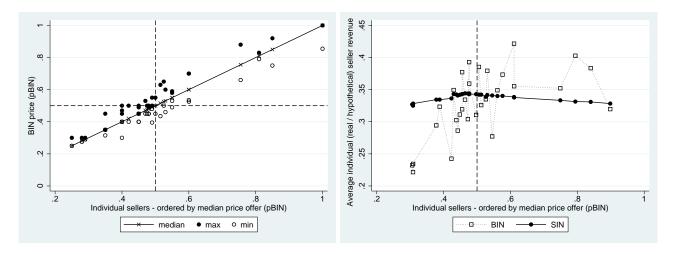


Figure 2: Scatter plots for each individual seller in the *BIN* treatment. Reference lines at 0.5. Left panel: *BIN* prices (median, 25th percentile (min) and 75th percentile (max)). Right panel: Average realized *BIN* profits and hypothetical *SIN* revenues.

To answer the question whether different seller types gain from one or the other format, we construct for BIN sellers a counterfactual SIN treatment by interpreting their BIN price as the minimal price they would have accepted in the SIN format. Then, we confront each observed SIN price offer with the BIN price and presume that a seller would accept the SIN price if it lays at or above his BIN price. Otherwise, an auction is held presuming both buyers bid their true values. The right panel of figure 2 presents for each seller the average (actual) revenue from the BIN treatment and the average (hypothetical) revenue in the counterfactual SIN treatment. Columns (4)–(9) of Table 1 report the corresponding average numbers for all sellers and results of testing for revenue equality. The results suggest that sellers can benefit from a particular format. Sellers who offer average BIN prices below the theoretical benchmark prediction, $p_{BIN} < 0.5$, would make a higher profit in the SIN format. This is due to the fact that first buyers with higher valuation offer prices in the SIN format that lay above the prices those sellers ask for in the BIN format. We also find that sellers offering prices in line with the theoretical benchmark prediction, $p_{BIN} \ge 0.5$, benefit from their bargaining power as they make higher profits in the BIN format compared to their profits in the counterfactual SIN format.

4 Conclusions

We study two sequential trading mechanisms with an auction as outside option when a negotiation fails to produce a sale. The mechanisms differ in who has the bargaining power - the seller (BIN auction) or a buyer (SIN auction). We do not find differences between the two formats in aggregate outcomes, i.e., seller revenue, buyer profit, acceptance rates, and efficiency. Hence, market makers whose profits usually comprise a share of seller revenues can freely choose between both formats.

An examination on the individual level reveals no advantages for buyers being in one or the other format. A counterfactual analysis suggests, however, that some sellers might benefit from either having or giving up their bargaining power. Sellers who make too low price offers in the BIN format would benefit and earn higher profits when they give up their bargaining power and let the buyer offer the price in the SIN format. Sellers who demand high BIN prices, in line with the risk neutral benchmark prediction, make larger profits in the BIN compared to the SIN format.

References

- CZYRON, S. (2014): "for Hood.de GmbH in email conversation with Henning Philippsen," email in German and available upon request.
- EBAY INC. (1999): "Internet presentation," http://eBay.com, accessed last time: 2015-06-19.
- ——— (2003): "Fourth Quarter and Full Year 2003 Financial Results," http://investor.ebay.com/news/Q403/EBAY012104-712351.pdf, accessed last time: 2004-08-10.
- (2012): "Annual report 2011," http://investor.ebayinc.com/secfiling.cfm?filingID=1065088-12-6\&CIK=1065088, accessed last time: 2015-06-19.
- FISCHBACHER, U. (2007): "z-Tree: Zurich toolbox for ready-made economic experiments," *Experimental Economics*, 10(2), 171–178.
- Grebe, T. (2008): Four Essays on Auction Mechanisms, chap. 4, pp. 52 76.
- GÜTH, W., R. IVANOVA-STENZEL, AND E. WOLFSTETTER (2005): "Bidding Behavior in Asymmetric Auctions: An Experimental Study," *European Economic Review*, 4, 1891 1913.
- HAMMER, T. (2004): "Wenn sich das Traumhaus als Mogelpackung entpuppt," Süddeutsche Zeitung, 2004-05-25, p. 25.
- HOOD.DE (1999): "Internet presentation," http://www.hood.de/, accessed last time: 2015-06-19.
- IVANOVA-STENZEL, R., AND S. KRÖGER (2008): "Price Formation in a Sequential Selling Mechanism," Journal of Economic Behavior and Organization, 67(3-4), 832–843.
- Kagel, J. H., and D. Levin (1993): "Independent private value auctions: Bidder behavior in first-, second- and third-price auctions with varying numbers of bidders," *Economic Journal*, 103, 868 879.
- MATHEWS, T., AND B. KATZMAN (2006): "The Role of Varying Risk Attitudes in an Auction with a Buyout Option," *Economic Theory*, 6(3), 597 613.
- Quan, D. (1994): "Real Estate Auctions: A Survey of Theory and Practice," *Journal of Real Estate Finance and Economics*, 9, 23 49.
- REYNOLDS, S., AND J. WOODERS (2009): "Auctions with a Buy Price," Economic Theory, 38(1), 9–39.
- Shunda, N. (2009): "Auctions with a buy price: The case of reference-dependent preferences," *Games and Economic Behavior*, 67(2), 645–664.

SFB 649 Discussion Paper Series 2015

For a complete list of Discussion Papers published by the SFB 649, please visit http://sfb649.wiwi.hu-berlin.de.

- "Pricing Kernel Modeling" by Denis Belomestny, Shujie Ma and Wolfgang Karl Härdle, January 2015.
- "Estimating the Value of Urban Green Space: A hedonic Pricing Analysis of the Housing Market in Cologne, Germany" by Jens Kolbe and Henry Wüstemann, January 2015.
- "Identifying Berlin's land value map using Adaptive Weights Smoothing" by Jens Kolbe, Rainer Schulz, Martin Wersing and Axel Werwatz, January 2015.
- "Efficiency of Wind Power Production and its Determinants" by Simone Pieralli, Matthias Ritter and Martin Odening, January 2015.
- "Distillation of News Flow into Analysis of Stock Reactions" by Junni L. Zhang, Wolfgang K. Härdle, Cathy Y. Chen and Elisabeth Bommes, January 2015.
- "Cognitive Bubbles" by Ciril Bosch-Rosay, Thomas Meissnerz and Antoni Bosch-Domènech, February 2015.
- "Stochastic Population Analysis: A Functional Data Approach" by Lei Fang and Wolfgang K. Härdle, February 2015.
- "Nonparametric change-point analysis of volatility" by Markus Bibinger, Moritz Jirak and Mathias Vetter, February 2015.
- 009 "From Galloping Inflation to Price Stability in Steps: Israel 1985–2013" by Rafi Melnick and till Strohsal, February 2015.
- "Estimation of NAIRU with Inflation Expectation Data" by Wei Cui, Wolfgang K. Härdle and Weining Wang, February 2015.
- "Competitors In Merger Control: Shall They Be Merely Heard Or Also Listened To?" by Thomas Giebe and Miyu Lee, February 2015.
- The Impact of Credit Default Swap Trading on Loan Syndication" by Daniel Streitz, March 2015.
- "Pitfalls and Perils of Financial Innovation: The Use of CDS by Corporate Bond Funds" by Tim Adam and Andre Guettler, March 2015.
- "Generalized Exogenous Processes in DSGE: A Bayesian Approach" by Alexander Meyer-Gohde and Daniel Neuhoff, March 2015.
- "Structural Vector Autoregressions with Heteroskedasticy" by Helmut Lütkepohl and Aleksei Netšunajev, March 2015.
- "Testing Missing at Random using Instrumental Variables" by Christoph Breunig, March 2015.
- "Loss Potential and Disclosures Related to Credit Derivatives A Cross-Country Comparison of Corporate Bond Funds under U.S. and German Regulation" by Dominika Paula Gałkiewicz, March 2015.
- "Manager Characteristics and Credit Derivative Use by U.S. Corporate Bond Funds" by Dominika Paula Gałkiewicz, March 2015.
- 019 "Measuring Connectedness of Euro Area Sovereign Risk" by Rebekka Gätjen Melanie Schienle, April 2015.
- "Is There an Asymmetric Impact of Housing on Output?" by Tsung-Hsien Michael Lee and Wenjuan Chen, April 2015.
- "Characterizing the Financial Cycle: Evidence from a Frequency Domain Analysis" by Till Strohsal, Christian R. Proaño and Jürgen Wolters, April 2015.

SFB 649, Spandauer Straße 1, D-10178 Berlin http://sfb649.wiwi.hu-berlin.de

SFB 649 Discussion Paper Series 2015

For a complete list of Discussion Papers published by the SFB 649, please visit http://sfb649.wiwi.hu-berlin.de.

- "Risk Related Brain Regions Detected with 3D Image FPCA" by Ying Chen, Wolfgang K. Härdle, He Qiang and Piotr Majer, April 2015.
- "An Adaptive Approach to Forecasting Three Key Macroeconomic Variables for Transitional China" by Linlin Niu, Xiu Xu and Ying Chen, April 2015.
- "How Do Financial Cycles Interact? Evidence from the US and the UK" by Till Strohsal, Christian R. Proaño, Jürgen Wolters, April 2015.
- "Employment Polarization and Immigrant Employment Opportunities" by Hanna Wielandt, April 2015.
- "Forecasting volatility of wind power production" by Zhiwei Shen and Matthias Ritter, May 2015.
- "The Information Content of Monetary Statistics for the Great Recession: Evidence from Germany" by Wenjuan Chen and Dieter Nautz, May 2015.
- "The Time-Varying Degree of Inflation Expectations Anchoring" by Till Strohsal, Rafi Melnick and Dieter Nautz, May 2015.
- "Change point and trend analyses of annual expectile curves of tropical storms" by P.Burdejova, W.K.Härdle, P.Kokoszka and Q.Xiong, May 2015.
- "Testing for Identification in SVAR-GARCH Models" by Helmut Luetkepohl and George Milunovich, June 2015.
- "Simultaneous likelihood-based bootstrap confidence sets for a large number of models" by Mayya Zhilova, June 2015.
- "Government Bond Liquidity and Sovereign-Bank Interlinkages" by Sören Radde, Cristina Checherita-Westphal and Wei Cui, July 2015.
- "Not Working at Work: Loafing, Unemployment and Labor Productivity" by Michael C. Burda, Katie Genadek and Daniel S. Hamermesh, July 2015.
- "Factorisable Sparse Tail Event Curves" by Shih-Kang Chao, Wolfgang K. Härdle and Ming Yuan, July 2015.
- "Price discovery in the markets for credit risk: A Markov switching approach" by Thomas Dimpfl and Franziska J. Peter, July 2015.
- "Crowdfunding, demand uncertainty, and moral hazard a mechanism design approach" by Roland Strausz, July 2015.
- ""Buy-It-Now" or "Sell-It-Now" auctions: Effects of changing bargaining power in sequential trading mechanism" by Tim Grebe, Radosveta Ivanova-Stenzel and Sabine Kröger, August 2015.

