

**Preprints of the
Max Planck Institute for
Research on Collective Goods
Bonn 2010/29**



Fairness Ex Ante & Ex Post
An Experimental Test of the
German “Bestseller Paragraph”

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MAX PLANCK SOCIETY



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June 2010

revised November 2010

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Abstract

The market for copyrights is characterised by a highly skewed distribution of profits: very few movies, books and songs generate huge profits, whereas the great bulk barely manages to recover production cost. At the moment when the owner of intellectual property grants a licence (“ex ante”), neither party knows the true value of the traded commodity. A seemingly odd provision from German copyright law, the so-called “bestseller paragraph”, stipulates that the seller of a licence has a legally enforceable right to a bonus in case the work (“ex post”) turns out a blockbuster. We experimentally explore the effect of the provision on market prices, on the number of deals struck and on perceived fairness. Our results show that the provision leads to lower prices for copyrights. More copyrights trade. The buyers express less ex-post discontent.

Keywords: Copyrights, Fairness, Experiment

* We would like to thank Shyam Sunder, Lars Klöhn, Karl Riesenhuber, Stefan Bechtold, Gerard Hertig, Steffi Brilon, Sebastian Goerg as well as the participants of the Conference on Empirical Legal Studies (CELS), the INTERGU conference, the ESA World Meeting, the IMPRS Uncertainty workshop, the experimental economics seminar at the University of Bonn, and the intellectual property seminar at the ETH Zürich for valuable comments and discussion. We are also grateful to Brian Cooper for translating the instructions and to Carlos Kurschilgen for programming zTree. For questions and comments please contact engel@coll.mpg.de or kurschilgen@coll.mpg.de.

I. Introduction

Determining the price of a copyright is a difficult endeavour. This has two combined reasons. First, the distribution of success is highly skewed, and second, success is highly unpredictable.

Take the example of the movie industry. In 2008, the most successful movie, *The Dark Knight*, in total gross earnings made more than \$ 1 billion worldwide at the box office, whereas the least successful release from a studio, called *\$ 9.99*, just made \$ 800.¹ In stylised facts: 20 % of the films earn approximately 80 % of the revenue (De Vany and Walls 1996; Jedidi and Krider 1998:394; Collins, Hand et al. 2002). The majority of movies even generate real losses (De Vany and Walls 1999:298 provide an illustrative scatterplot).

The dynamics of film success have been explained by herding and information cascades (De Vany and Walls 1996). However, with the information available ex ante, it is extremely difficult to predict success. Even using regression coefficients from the past, and exploiting all the information available ex ante, gross mispredictions are frequent. For instance, the movie *3 ninjas* actually made \$ 308,000, while the regression would have predicted more than \$ 10 million. By contrast, for *There's Something About Mary*, the regression predicted less than \$ 2 Mio, while the movie actually made more than \$ 175 million (Simonoff and Sparrow 2000:Table 2).²

Imagine there is an author who has written a script for a movie and there is a producer who considers buying a license in order to make a film. At the point in time when the producer has to decide how much to pay, neither of the two knows how much this script might be worth. How can either party determine its reservation price, let alone agree on a mutually acceptable deal?

In principle, there is an easy way out. Instead of agreeing on a fixed price, the parties could write a success-contingent contract that gives the artist a defined share of the final profit; in the industry, these are called royalty deals. While such deals are indeed very common with stars, they are less frequent with ordinary artists (Chisholm 1993; De Vany 2004:245). In fact, such a success-contingent arrangement would meet neither side's interests. Producers want to be the exclusive residual claimants and do not want to cut into their managerial freedom. Artists usually have nothing but their human capital for a living and, like ordinary workers, do not want to bear market risks.

The German legislator starts from the observation that, in this legal order, "buyout" contracts are widespread. In such contracts, the author sells the right to commercially exploit his creative work in any possible way and using any imaginable technology, against a fixed upfront fee.³ Often

1 Source: <http://www.boxofficemojo.com>

2 These two examples illustrate the general problem with these models. The best fitting regression model using predictors from the past to explain US revenue has a (non-adjusted) R² of only .446. Even for the past, more than half the variance remains unexplained. The model predicts a revenue of 2.5 Mio \$, but the 95% confidence interval runs from a negative revenue of 89.6 Mio \$ to a revenue of 94.5 Mio \$ (Simonoff and Sparrow 2000:Table 1).

3 BT Drs. 14/8058, 1; BT Drs. 14/6433, 9/10/11.

authors even transmit their rights against collecting societies.⁴ The German legislator thinks that this situation calls for regulation and stipulates:

“If the owner of a copyright has granted a licence such that the fee, in the light of the entire relationship between the parties, is grossly disproportionate with regard to the proceeds from the work, the buyer is obliged to agree, upon the author’s request, to a change in the contract such that the seller receives an additional remuneration, reflecting what is her appropriate share under the given circumstances.”⁵

This legal provision seems odd in at least two respects: First, the provision is unbalanced in the sense that it does not grant the buyer the right of an ex-post discount in case the initial price was disproportionately high. Second and more fundamentally, why should the legislator interfere at all in a situation where two parties have voluntarily agreed on a mutually beneficial contract?

In the legislative materials, this provision is introduced as a means to “restore fairness” between the parties⁶ in case, given the success on the market, “ex post” the remuneration agreed upon “ex ante” seems inappropriately low.⁷ So far, however, there have been no attempts to analyse the effect of the provision empirically. This paper proposes an experimental approach to tackle the following two questions: (1) To what extent does the provision “restore fairness”? (2) How does the provision affect the market for copyrights in terms of (a) number of deals closed and (b) average purchase prices?

Our experimental results show that, upon introducing the provision, more deals are struck, even though offer prices are lower. In addition, the provision leads to a reduction of perceived ex-post unfairness for buyers, but not for sellers. The latter is remarkable given that the experimental umpires, meant to represent the judiciary, apply a fairness norm that clearly benefits sellers.

The paper is structured as follows. Section II presents the design of the experiment and in section III we develop our predictions. In section IV we report the experimental results. Section V concludes.

II. Experimental Design

In stylized fashion our two treatments reflect the interaction on copyright markets *without* (baseline B) and *with* the essence of the German provision (treatment provision P).

4 BT Drs. 14/6433, 11.

5 §32a I 1 UrhG5 (German Copyright Law), our translation. § 32a III 1 UrhG states that the right is not waivable. For an overview of jurisprudence see Wandtke and Bullinger (2009:§ 32a UrhG). California has a rule in the same spirit, yet using a different regulatory technique. Under Sec. 986 Cal. Civ. Code, whenever a work of fine art is sold, the artist has a non-waivable statutory right to at least 5 % of the price.

6 BT Drs. 14/8058, 19.

7 BT Drs. 14/8058, 16.

1. Baseline (B) treatment

Two roles are randomly assigned to participants: they are either buyers or sellers.⁸ This role stays fix over the entire treatment. The design of the baseline is best illustrated in the flow chart which is part of the instructions, see Appendix. The baseline consists of 8 rounds with a maximum of 4 stages per round: (1) offer stage, (2) acceptance stage, (3) random draw, (4) punishment stage. After each round, buyers and sellers are rematched. We implement a perfect stranger protocol, i.e. a given seller never meets the same buyer twice and vice-versa. Both the matching protocol and the number of rounds are common knowledge to all participants.

At the beginning of each round, both players receive an endowment of $m=500$ Taler. In stage 1, the buyer has the opportunity to make an offer p in order to purchase commodity C. At this point, neither the seller nor the buyer know the true value v of C. They only know that with probability $\lambda = .25$ the commodity is worth $v_{hi}=1700$ Taler, while with the complementary probability $1 - \lambda = .75$ it is only worth $v_{lo}=100$ Taler. As Figure 1 illustrates, in a stylised fashion this lottery reflects the distribution of earnings in the movie industry.

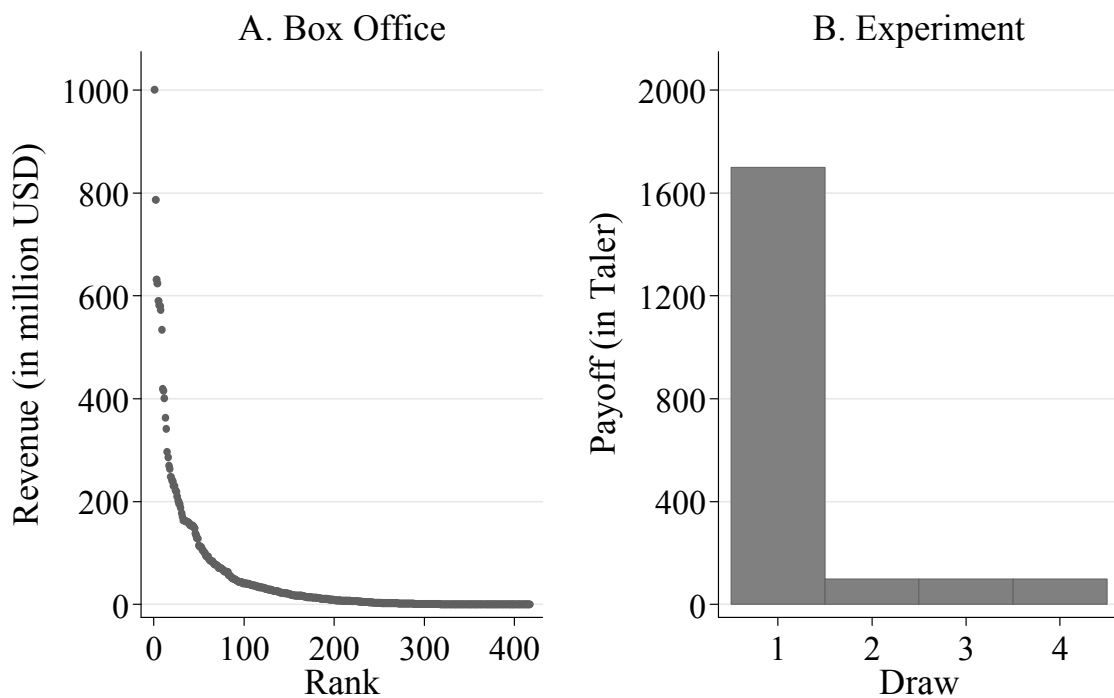


Fig. 1 – Distribution of earnings

Note: Panel A depicts the worldwide gross box office revenues of the 450 most successful movies in 2008, according to boxofficemojo.com. Panel B illustrates the distribution of earnings in the experiment: In 1 out of 4 cases the commodity is worth 1700 Taler, and in 3 out of 4 cases the commodity is worth 100 Taler.

⁸ The bargaining situation is framed neutrally as one of buying and selling a commodity (following Hoffman, McCabe et al. 1994).

If the seller rejects the offer p in stage 2, the round is over. In this case there are no gains from trade. Both players just keep their endowment of 500 Taler. If the seller accepts, the offer price is immediately transferred from buyer to seller. In stage 3, a random device determines the value of the commodity.

In stage 4, both players learn the realisation of the random draw and have the possibility to reduce their counterpart's earnings. The punishment technology is linear (following Fehr and Gächter 2002) and the fine-to-fee ratio is 3, i.e. one Taler spent by the buyer (seller) on punishment reduces the seller's (buyer's) income by 3 Talers. After stage 4, the round is over and the next round starts. In the instructions, punishment is neutrally labelled "point allotment".

In essence, the parties play an ultimatum game, with the twist that the true value of the commodity is unknown to both the proposer (buyer) and responder (seller). Ultimatum bargaining captures the essence of the situation how the German legislator perceived it, and to which it intended to react by the "bestseller paragraph": the vast mass of copyright owners is offered a fixed license fee on a "take-it-or-leave-it" basis⁹.

In the ultimatum game, if the responder rejects an offer, this can be interpreted as punishment (Güth 1995). This might explain why, to the best of our knowledge, no ultimatum game with an explicit punishment stage has been tested. Yet for understanding the effect of the provision, it is crucial to have a measure for hurt *ex-post* feelings of fairness (i.e. after the veil of uncertainty has been lifted), in addition to the *ex-ante* indicator of fairness concerns, i.e. rejection of the offer. To that end, we capitalise on a tool that is standard in the experimental public goods literature, namely costly, simultaneous punishment. In that strand of the literature punishment is motivated as a technology to discipline freeriders and thereby induce higher levels of cooperation (Fehr and Gächter 2000). However, punishment chiefly is a technology for fairness-driven retaliation (Falk, Fehr et al. 2005). People are willing to incur a cost in order to express their discontent with somebody else's behaviour. Therefore punishment is a credible indicator of hurt feelings of fairness (for a similar approach see Fehr, Hart et al. 2010). This interpretation is particularly plausible in our context. The perfect stranger protocol excludes that a participant will herself derive a pecuniary benefit from disciplining a free-rider. Strategic punishment is not possible in this design.

2. Provision (P) treatment

The German provision introduces a third actor, besides the buyer and the seller of the copyright, the court. The court has jurisdiction to intervene, upon the request of the author, in the unlikely but possible event of the work being a big success in the market. The statute does not give the court any guidance in how to change the contract. It thus introduces a discretionary element, with

9 BT Drs. 14/6433, 8: „Today, in the Federal Republic of Germany many individual contracts concluded between copyright owners and media industry are not based on collectively negotiated tariffs; copyright owners have to accept standard form contracts prepared by industry on a take it or leave it basis“ (our translation).

the ensuing ex post uncertainty. In our experimental design we attempt to capture this element of the German solution by introducing a third player: the umpire. The same way as for judges and juries in the field, the experimental umpire's earnings are unrelated¹⁰ to the decisions she takes; she is paid a fixed fee. This is known to all players. As with the courts, an applicant does not in advance know with certainty how the umpire will decide. The applicant only knows the abstract decision rule. We ask the umpire to determine the "appropriate purchase price", exactly as in the statutory provision. For the sequence of stages, the reader is again referred to the flow chart in the instructions. Stages 1, 2, and 3 of the P-treatment are identical to the baseline. If nature draws $v_{lo}=100$, stage 4 is the punishment stage, so that in fact nothing changes compared with the baseline.

Only if the random draw has determined the value of the commodity to be 1700, there are three additional stages, representing the main features of the provision from German copyright law. If $v_{hi}=1700$, the punishment stage is deferred to stage 7. In stage 4, the umpire is informed about the purchase price and the draw of nature and asked to determine an "appropriate purchase price" p_u for the commodity.¹¹ She may choose any price between 0 and 1700 Taler. Her own payoff does not depend on her choice. Moreover, p_u is not revealed to buyer and seller until stage 7.

Stages 5 and 6 repeat the negotiation protocol from stages 1 and 2. The buyer can make a new offer p_2 , which the seller is free to accept or to reject. If p_2 is accepted, it replaces p . If p_2 is rejected, the umpire's "appropriate purchase price" p_u becomes effective and replaces p . Buyer and seller learn about p_u if and only if renegotiation fails. Finally, stage 7 gives both players an opportunity to simultaneously punish each other, just as stage 4 in treatment B.

In reality, the court intervenes only if renegotiation fails. Yet conditioning the decision of the umpire also on the rejection of the second offer would have severely reduced the number of data points. This is why we ask the umpire to decide already in stage 4, but keep her decision confidential until renegotiation fails. We are aware of the fact that this manipulation makes the risk of losing in court more salient. Other experiments have demonstrated that subjects attach more weight to an event if they know that they are betting on the past, rather than betting on the future (Rothbart and Snyder 1970; Ladouceur and Mayrand 1987; Brun and Teigen 1990; Heath and Tversky 1991). However, in our setting both players face the same uncertainty. If the buyer offers too little in stage 5, she risks losing much more in court. Likewise, if the seller rejects a good offer, she risks getting much less in court. Consequently, the stage 4 manipulation might make successful renegotiation somewhat more likely, but it is unlikely to bias the renegotiation outcome if a deal is struck.

10 In Germany, judges are appointed at the beginning of their careers and then enjoy the status of civil servants with lifetime tenure. This arrangement is meant to shield them from being held personally liable for the decisions they make.

11 The German original of the instructions reads. "Spieler S entscheidet, welchen Kaufpreis er angemessen findet".

3. Procedures

The experiment was run in April 2009 at the Laboratory for Experimental Economics of the University of Bonn using the experimental software z-Tree (Fischbacher 2007). Subjects were randomly invited with ORSEE (Greiner 2004) from a subject pool of approximately 3500 participants. 48 student subjects from different majors participated¹², 27% of which were female. To allow for within-subject comparisons, each subject played first the baseline and then treatment P).¹³ Before every treatment participants received paper instructions and answered a set of control questions (see Appendix). Sessions lasted about one and a half hours. In addition to the earnings that depended on their performance in the experiment, participants received a show-up fee of 2 €. On average, participants earned 12.26 €, with 5.34 € from the baseline (6.04 € for buyers and 4.66 € for sellers), and 4.91 € from the P-treatment (5.13 € for buyers, 5.60 € for sellers, 4 € - fix - for umpires).¹⁴

III. Predictions

The aim of this paper is to experimentally test the effect of a specific institutional intervention – the “bestseller paragraph” – in a stylised market for copyrights. Economic theory provides a useful roadmap for the subsequent analysis of our experimental results.

1. Standard Framework

Under standard assumptions, i.e. common knowledge of the fact that agents are selfish, risk neutral and apply backward induction, the equilibrium solution to the baseline is straightforward: Neither of the parties uses costly punishment in stage 4, the seller accepts any positive offer in stage 2, which is anticipated by the buyer, who therefore offers the smallest positive price $p > 0$ in stage 1.

In the P-treatment, we should again observe no punishment in stage 7 (or stage 4, when the commodity has low value), since for a purely profit maximising agent the benefits from punishing are zero¹⁵. Whether the seller accepts or rejects the new offer p_2 in stage 6 depends on what she believes will be the umpire's “appropriate purchase price” p_u . The seller will only accept the new offer if $p_2 \geq E(p_u)$. On the other hand, the buyer will not offer more than $E(p_u)$.

12 12.5% of participants were lawyers and 25% economists.

13 We implement this specific sequence of treatments because we explore whether introducing this provision is desirable. We are not interested in the mirror question: what would happen, were the provision abolished? We therefore do not test the opposite sequence, where the P-treatment would be followed by the baseline.

14 One-third of the buyers in baseline B and one-third of the sellers in baseline B became umpires in treatment P. The remaining buyers and sellers stayed in their roles. Buyers, sellers and umpires were re-matched after each round, such that no triad played together more than once and no buyer met the same seller twice. As we show later, umpire behaviour turned out not to be correlated to having previously experienced the role of the buyer or the seller.

15 Recall that strategic/educative punishment is pointless with perfect stranger matching.

In stage 4 the umpire has to state her appropriate purchase price p_u . Since the umpire's decision is not incentivised, we cannot predict her behaviour with rational choice theory. Instead, we assume three stylised types of umpires, each of whom having a different conception of fairness: *Umpire L* has a libertarian mindset and thinks that the initial agreement should simply be kept, hence $p_u^L = p$. *Umpire EA* is an egalitarian who looks at the situation from an ex-ante perspective, i.e. before the veil of uncertainty is lifted. Her definition of a fair price would anchor on the expected value of the lottery, yielding $p_u^{EA} = E(v)/2 = \frac{1}{2}((1-\lambda)v_{lo} + \lambda v_{hi})$. *Umpire EP* also holds an egalitarian attitude but rather considers the ex-post situation, i.e. after nature has determined the value of the commodity to be high. Therefore, her appropriate purchase price is $p_u^{EP} = v_{hi}/2$.

With umpire L, the P-treatment becomes identical to the baseline. In stage 2, the seller will accept any positive price and in stage 1, the buyer will just offer the minimum. With umpire EA, the seller accepts an offer p if and only if $0 \leq (1-\lambda)p + \lambda p_u$. Inserting the parameters of the experiment, we obtain $p \geq -E(v)/6 = -83.33$ as the minimum acceptable price. Hence, with the prospect of an ex-ante egalitarian umpire even negative offer prices appear acceptable to the seller. This is even more so with umpire EP, where, following the same logic, the minimum acceptable price in stage 2 would be $p \geq -v_{hi}/6 = -283.33$. Since we exclude negative prices by design, under standard assumptions we should not observe any difference between the two treatments with regard to offer prices, acceptance and punishment behaviour. As we have just shown, this prediction is independent of the expected type of umpire.

2. Behavioural Framework

Once we relax the standard assumptions and allow for well-documented behavioural regularities, predictions are less clear cut. Several behavioural effects are likely to play a role in our setting, most notably risk aversion, loss aversion and social preferences. So far, however, there is no general theory that integrates all of them. It is beyond the scope of this paper to propose a comprehensive theory of social preferences under risk and uncertainty, which would be needed in order to formally derive behavioural predictions. We can however use the individual behavioural building blocks in order to qualify the predictions derived on the basis of the standard model.

Numerous studies in psychology and behavioural economics have shown that most people do not behave like rational money-maximisers but that they care about fairness (Kahneman, Knetsch et al. 1986; Konow 2000). This behaviour has most prominently been explained by social preferences (Fehr and Schmidt 1999; Bolton and Ockenfels 2000; Charness and Rabin 2002). From many previous experiments with ultimatum games it is known that participants often reject deals that would make them strictly better off in monetary terms (Güth, Schmittberger et al. 1982). According to a survey by Camerer (2003:49), if the offer does not exceed 20 % of the pie, it is rejected in approximately 50 % of the cases.. Anticipating this type of seller behaviour, buyers would have to make more substantial offers if they do not want to miss the opportunity to obtain the gains from trade. In the literature on ultimatum games, median offers were in the order of 40 – 50 % of the pie and mean offers were in the order of 30 – 40 % of the pie (Camerer 2003:49).

Our baseline setting, however, differs from the standard ultimatum game in one important respect: when buyer and seller negotiate, the value of the pie is uncertain to both parties. However, only one party, the buyer, bears the risk. Our design thus involves two-sided uncertainty and unilateral risk-bearing. To the best of our knowledge, such a paradigm has not been experimentally tested. There are, however, ultimatum games with one-sided uncertainty. In Mitzkewitz and Nagel (1993) roles are constant over all 8 rounds. Responders have to accept or reject without knowing the exact pie size. They only know that, with equal probability, it is either 1, 2, 3, 4, 5 or 6. Also Abbink, Bolton et al. (2001) analyse an 8-round repeated, perfect stranger, cardinal ultimatum game with one-sided uncertainty. In this game, the proposer is uncertain about the payoff consequences of one of the actions available to her. In both experiments, average responders are willing to accept relatively low offers. It is not clear ex ante to what extent those findings might carry over to our setting.

In our design, the fact that the commodity trades before its true value is revealed implies that the buyer obtains a risky asset in exchange for a fixed fee paid to the seller. Empirically we know that most people are risk averse (Holt and Laury 2002; Fullenkamp, Tenorio et al. 2003; Dohmen, Falk et al. 2005). Risk aversion would reduce buyers' willingness to pay for a risky commodity compared to a deterministic commodity with identical expected value. Provided $p > v_{10}$, the buyer even runs the risk of making a real loss. In that event, the effect of loss aversion (Kahneman and Tversky 1979) might even go beyond the effect of mere risk aversion.

In contrast, the seller's decision does not involve risk. Hence, we should not expect risk aversion to affect her willingness to accept a certain offer price; at least not directly. Indirectly, risk aversion might influence sellers' behaviour through social preferences. If the rejection of low offers is driven by fairness concerns, we should expect that sellers are sensitive to the fact that buyers unilaterally bear the risk. This should lower the acceptance threshold of sellers, compared to deterministic ultimatum games. The dampening effect should be all the more pronounced given the distribution of gains is highly skewed. Thus, while we would expect offers in the baseline to be considerably above the minimum price, we also expect prices to be below the typical result from deterministic ultimatum games.

We have shown above for the case of standard rationality assumptions that the acceptance threshold of the seller depends on the beliefs subjects hold about the fairness conception of the umpire: the acceptance level did not change if the seller expects an umpire of type L, but decreased for type EA and dropped even further for type EP. For the parameters of the experiment, however, this would not trigger a treatment effect since we exclude negative prices.

Yet, if we account for the empirical regularity that, due to social preferences, prices need to be considerably above the minimum in order to be accepted, the predictions for the effect of the provision might indeed change. More specifically, if prices in the baseline are sufficiently high and if subjects anticipate umpires of type EA or EP, the commodity should trade at lower prices in treatment P than in the baseline. For umpires of type L, we would again expect no treatment

difference. Consequently, unless participants hold extreme beliefs about the distribution of umpire types, we expect lower average prices in the treatment.

The provision's effect on the number of deals closed is less clear. Just as umpires of type EA and EP make low offers more acceptable to sellers, they also reduce buyers' willingness to pay high prices since the v_{hi} prospect becomes less attractive in view of potential ex-post redistribution. Especially offers above v_{lo} appear even more unattractive since buyers would then make a loss in 75% of the cases, never knowing how much the umpire will let them keep in case of v_{hi} .

Equally open is the effect of the provision on ex-post unfairness. By ex-post unfairness we mean the fairness sentiments after the true value of the commodity has been revealed, which we attempt to measure by costly, simultaneous, non-strategic punishment. In the baseline this takes place in round 4; in the P-treatment it is elicited in round 4 if $v=v_{lo}$ and in round 7 if $v=v_{hi}$, hence after renegotiation and after the decision of the umpire has been revealed. As stated above, the main expected effect of the provision is to reallocate profit from the buyer to the seller in case umpires are of type EA or EP¹⁶. In addition, the anticipation of those types of umpires might lower the acceptance threshold of sellers and consequently average selling prices. In that case buyers would be better off with the provision if $v=v_{lo}$ (due to lower prices) and worse off if $v=v_{hi}$ (due to ex-post reallocation), and vice-versa for sellers. Just as the provision might simply reallocate profits but not affect the number of deals closed, it might also merely reallocate ex-post discontent. If lower profits lead to more discontent, we should observe buyers (sellers) punishing less (more) in the P-treatment than in the baseline if $v=v_{lo}$ and more (less) if $v=v_{hi}$. However, for the provision to not only reallocate fairness but actually "restore fairness" as the legal literature claims, overall punishment would have to go down.

IV. Results

In the following we discuss the impact of the provision in terms of ex-ante prices and number of deals closed as well as ex-post renegotiation, umpire decisions and expression of discontent according to our experimental results. Table 1 gives an overview of the data collected in the experiment.

16 As we have also mentioned above, the provision should have no effect on ex-post unfairness if umpires are of type L and this is correctly anticipated by the subjects.

Table 1: Data Structure of the Experiment

	Subjects	Buyers	Sellers	Umpires	Rounds	Offers	Deals	v_{lo}	v_{hi}
Baseline	48	24 (16)	24 (16)	0	8	192 (128)	141 (98)	105 (74)	36 (24)
Provision	48	16	16	16	8	128	106	82	24

Note: The numbers in parentheses denote the number of observations when we restrict the sample to those buyers and sellers who stayed in the same role during baseline and provision treatment.

1. Prices and Deals

Fig. 2 Panel A shows that mean offer prices in stage 1 are way above the price of 1 taler predicted by money maximisation. More importantly, both mean offer prices and mean accepted prices are considerably higher in the baseline than in the P-treatment. These differences are significant.¹⁷ Note that in both cases average offer prices are above 100, namely 129 in the baseline and 104 in the P-treatment. Hence, in both cases the average buyer was willing to run the risk of incurring a loss in the $v_{lo}=100$ case, in the interest of reaping high profits if $v_{hi}=1700$. Just as we hypothesised, the buyers' willingness to pay high initial prices was reduced by the introduction of the provision. Moreover, offered and accepted prices are closer in the provision treatment, which hints at a more efficient functioning of the market. Indeed, the probability of acceptance in stage 2 rises from 73% in the baseline to 83% in the provision treatment. This suggests that the provision managed to reduce the acceptance threshold of sellers relatively more than the willingness to pay of buyers. As a result, more deals were closed in the presence of the provision than in the baseline.

¹⁷ Wilcoxon signed-rank test over mean offer per buyer, using only data from those 16 participants who were buyers in both treatments, two-sided, $p = .0525$; same for mean accepted offer, $p = .0247$.

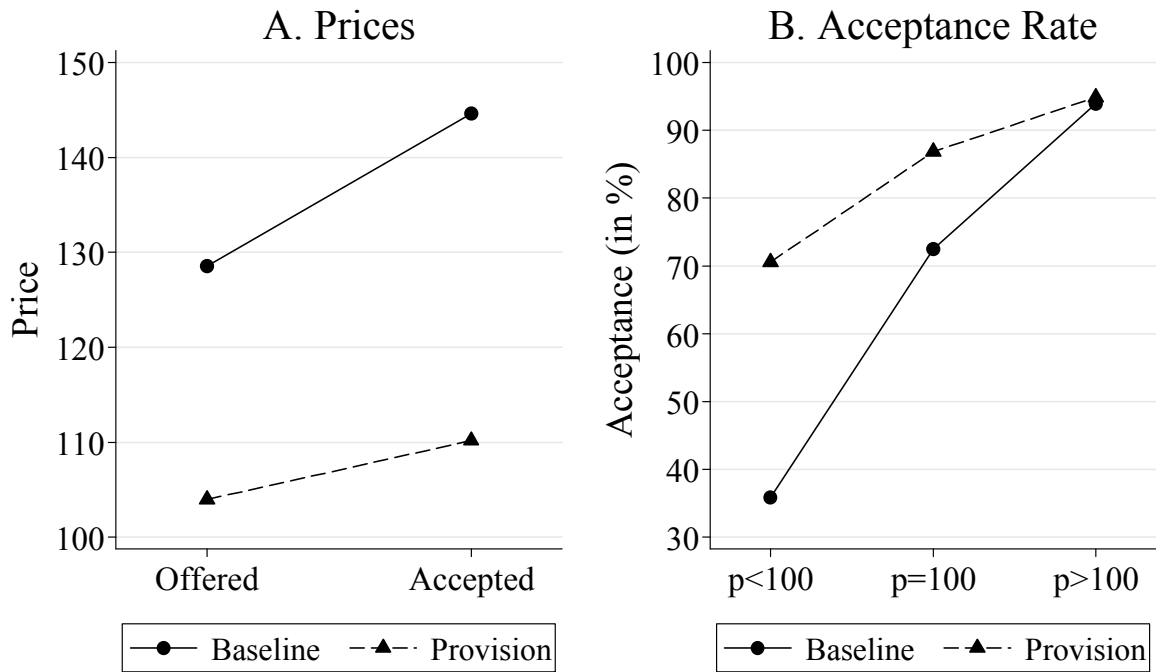


Fig. 2 – Deals reached in both treatments

Note: Panel A illustrates the average prices offered in stage 1 and accepted in stage 2 in the Baseline as well as in the Provision treatment. In the Baseline (Provision), 141 (106) out of 192 (128) offers were accepted. Panel B distinguishes the acceptance rate depending on the offer price being below, at, or above 100 Taler. The number of observations in the Baseline (Provision) is 53 (51) for $p < 100$, 40 (38) for $p = 100$, and 99 (39) for $p > 100$.

The main reason why more deals were struck is that the provision made low offers more acceptable to sellers. In Panel B we distinguish between offers below, at and above 100. This threshold is important because in the probable event of $v=100$ buyers are just equally well off with or without the deal if they paid $p=100$. At $p < 100$ they are sure to make a profit whereas at $p > 100$ they make a loss when $v=100$. In contrast, depending on the size of p sellers may make larger or smaller profits, yet they never make a loss. The Figure illustrates that while in the baseline buyers had to incur the risk of making a loss in order to strike a deal, the acceptance of risk-free offers nearly doubles in the presence of the provision.

Result 1: The provision decreases the average price paid for the commodity

Result 2: The provision increases the total number of deals reached by making low prices more acceptable to sellers.

2. Renegotiation and Umpire Decisions

The very fact that we observe lower prices in the provision treatment suggests that subjects were anticipating some sort of ex-post redistribution towards the seller in case that $v=v_{hi}$, be that through renegotiation or through the umpire's decision. Yet when it comes to splitting the large gain, there is a pronounced self-serving bias. The histogram of second offers in Panel A of Fig. 3

shows that buyers believe they are justified to keep most of the large gain, while sellers believe they have a right to a large portion. 54% of second offers are rejected. Sellers do not accept any second offers below or equal to 250 and accept only 15% of all second offers below or equal to 500. Seemingly, for second offers to be acceptable, they must be above 500; 82% of such offers are accepted.

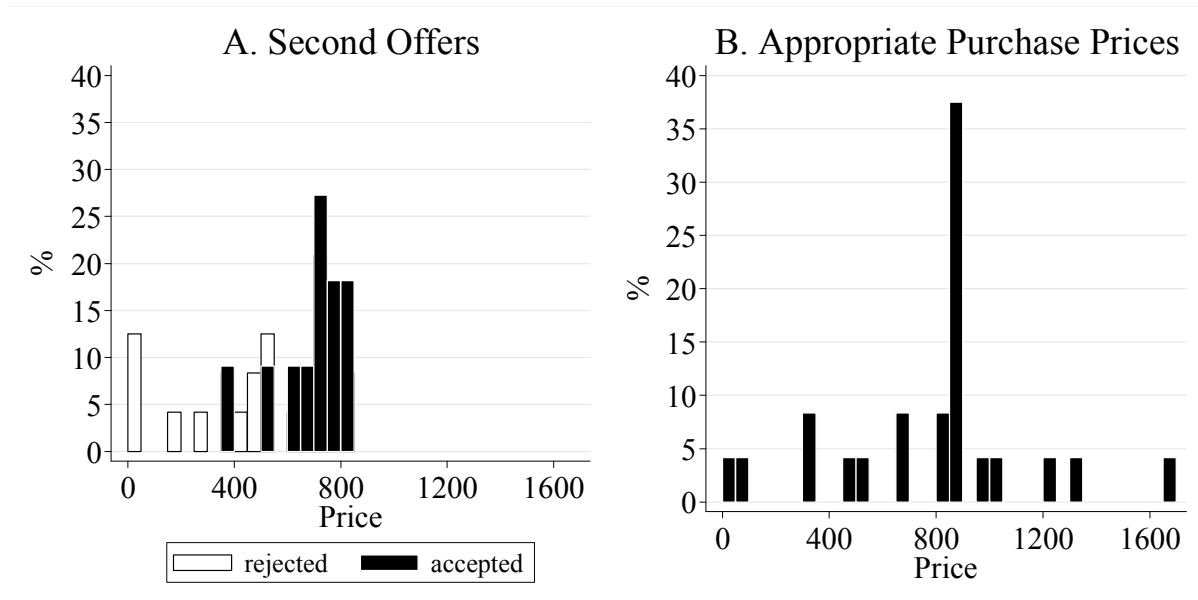


Fig. 3 – Renegotiation and Umpire Decisions

Note: Panel A shows the second offers made by the buyers in the Provision treatment in case the commodity turned out to have value 1700. The light (dark) bars denote the second offers rejected (accepted) by the sellers. Panel B displays the umpires’ choices of “appropriate purchase prices” in case the commodity had value 1700. The number of observations is 24.

Apparently, sellers had a better intuition of how umpires would view the “appropriate purchase price”. On average, umpires decided that 767 Taler should go to the seller, which leaves 933 Taler to the buyer. From an ex-post perspective this average umpire decision may appear to slightly favour buyers. However, from an ex-ante perspective it clearly favours sellers: Considering that initial offer prices averaged 104 Taler, buyers could expect to make $0.75*(-4)+0.25*933=230$ Taler whereas sellers would receive 270 Taler.¹⁸ The fact that buyers ran the risk of making a real loss does not seem to enter the fairness considerations of the average umpire. If any, the risk premium is negative.

This result is highly surprising. The experiment was designed such that umpires had the same information as buyers and sellers. They knew that the initial offer price was paid in exchange for a lottery ticket which could be worth either 100 or 1700 Taler. They further knew that the game was repeated 8 times so that there were repeated opportunities to land the jackpot. We therefore expected many umpires to focus on the expected value of 500 and judge the fair price to be somewhere around 250, which would be in line with ex-ante equality. We also expected some

¹⁸ With average accepted prices the difference is even larger: 225 to 275.

umpires to confirm the initial offer. Yet, we find no peak whatsoever around 250 and there is only a single instance in which an initial offer was confirmed. Instead, as can be seen in Panel B of Fig. 3, 38% of the umpires behaved like prototypical ex-post egalitarians and precisely split the ex post gain equally between the buyer and the seller. Moreover, our within design implied that half of the umpires were former buyers and the other half former sellers. However, previous experience as buyer or seller had no significant effect on the umpire's fairness preferences.¹⁹

Result 3: Ex post, buyers and sellers hold self-serving views about the equitable division of gains from trade.

Result 4: Umpires' choices are predominantly guided by ex-post equality.

3. Ex-Post Discontent

We have seen that the provision increases the acceptability of low offers and thus enhances the incidence of trade. Yet despite the fact that the parties bargain under the shadow of the umpire's decision (cf. Mnookin and Kornhauser 1979), more often than not renegotiation fails. This already suggests that there is a potential for conflict which makes legal intervention instrumental. The German legislator claimed that the provision was necessary to "restore fairness".²⁰ We measure the seriousness of perceived unfairness by the amount of experimental money the two parties are willing to burn in order to express their discontent, and inflict harm on the other party.

Buyers punish more severely in the baseline: 10 Taler per buyer per round versus 7 Taler in the provision treatment.²¹ They also use the punishment option more frequently in the baseline (21% of all possible cases) than in the provision treatment (12%). Descriptively, this effect appears to be driven by the fact that buyers punish with higher probability (25%) if they have made an offer above 100, i.e. if they have accepted the risk of a real loss. With offers at or below 100, the punishment probability is only 8%. As we saw in Fig. 2, deals at or below 100 are much more probable in the provision treatment than in the baseline. In addition, this difference is considerably more pronounced in the provision treatment (3% at or below 100 and 30% above 100) than in the baseline (15% to 24%). This shows an interesting relationship between the ex-ante and the ex-post dimension of fairness: In the baseline, offers below 100 appear (ex-ante) unfair to the sellers and offers above 100 seem (ex-post) unfair to the buyers. The provision increases the acceptability of low offers for the sellers. This is anticipated by the buyers who make more low offers, which in turn reduces their ex-post discontent. Table 2 underpins the robustness of the provision's effect on buyers' use of punishment. All models show a large and significant treatment effect.

19 Descriptively, former buyers on average even gave more to the seller (873 Taler) than former sellers (691 Taler).

20 BT Drs. 14/8058, 19.

21 Wilcoxon signed rank test over mean punishment in the baseline and the provision treatments, for those 16 participants who were buyers in both treatments, $p = .0037$.

Table 2 – Explaining Buyer Punishment
DV: Use of punishment by the buyer (0=No, 1=Yes)

	(1)	(2)	(3)	(4)	(5)
Treatment (0=B, 1=P)	-1.634*	-1.638*	-1.666*	-1.948*	-5.514*
Price offered		0.007			
Value = 1700 (0=No, 1=Yes)		1.350	1.294	0.895	1.130
Offer > 100 (0=No, 1=Yes)			0.313	0.452	-1.355
Treatment x Value=1700				0.952	-1948
Treatment x Offer>100					4.392
cons	-3.517**	-5.243**	-4.193**	-4.122**	-3.649**
N	204	204	204	204	204
Chi Squared	5.334	7.541	6.989	6.695	6.519
Log likelihood	-47.435	-45.523	-46.055	-45.878	-43.758

Note: Random Effects Panel Logit Regression. * denotes significance level of 5 percent, ** of 1 percent and *** of 0.1 percent. The Hausman test is insignificant for all models, hence the Random Effects Model is consistent.

Sellers make very little use of punishment. Only in 16 cases, i.e. only in 6% of all possible instances, sellers have punished buyers. In the baseline, they twice did when the commodity had value 1700, in the provision treatment they did in a single case. Patently, sellers' fairness sentiments are not hurt. For them, it does not cause a problem if, eventually, the commodity has high value, although the chance of making so much money has not been reflected in initial offers. So, apparently, sellers do not feel ex post discontent in the first place and, as a consequence, there is no margin for the provision to improve upon the baseline situation.

Result 5: The provision reduces buyers' ex-post discontent but does not affect sellers' feelings of perceived ex-post fairness.

V. Conclusion

In this experiment we have compared two institutional arrangements for the market of copyrights. The two most important features of this market are the skewed distribution of earnings and their unpredictability. In the first institutional setting, the copyright must be traded under the veil of uncertainty for a fixed fee. In the unlikely, but possible event of high success in the market, the licence fee is nonetheless binding for the two parties. This situation reflects a type of contracts that is very common in the market for copyrights, most notably between large production firms and little known copyright owners. In contrast, the second setting introduces renegotiation under the shadow of legal intervention. In case the work turns out a bestseller, the artist

may appeal to a third party who is entitled to adjust the fee. This situation corresponds to a provision from German copyright law, the so-called “bestseller paragraph”.

In a market characterised by high uncertainty about the value of the traded goods, conflicting fairness norms between buyers and sellers are amongst the biggest obstacles to trade. Yet even when the parties have reached an agreement in the first place, substantial discontent may arise as soon as the true value of the commodity is revealed. In this experiment we have measured fairness ex ante by looking at the acceptance of initial offers, and fairness ex post by analysing the expression of discontent through punishment. In addition, we had a third party judging fairness, the so-called umpire, who was totally free to choose among or compromise between competing fairness norms.

Our first finding is that, in the presence of the provision, copyrights trade at lower prices. Second, they trade more often as the acceptance level of sellers is reduced more than the willingness to pay of buyers. Higher acceptance is a strong indicator of enhanced ex-ante fairness. Interestingly, so far the legal discourse has been totally neglecting the provision’s effect on the market outcome. In contrast, both the German legislator and the legal literature have concentrated on the ex-post dimension of fairness, claiming that the main function of the provision is to “restore fairness” between the two parties. Our results suggest that, indeed, the provision reduces perceived unfairness for buyers. Rather surprisingly, though, we do not find a similar effect for sellers. This might of course be due to the fact that, in our design, sellers are not personally attached to the commodity they trade. Copyright combines a property right with a moral right. The latter is absent from our design.

In the provision treatment, a third party, the so-called umpire, was asked to determine her “appropriate purchase price” in case the commodity had a high value. Even though our design was rather prone to highlight ex-ante equality (by repeating the game 8 times, by having umpires experience the roles of buyer and seller, and by telling subjects the exact probabilities so that they could calculate expected values), ex-post equality turns out the umpires’ single distinct fairness norm. If probabilities were not known, as it is the case in reality, ex-ante equality would possibly be even less appealing. Similarly, there were no umpires whatsoever following a libertarian approach according to which voluntarily closed contracts should simply be kept.

We have used the movie industry as our primary example because we have precise data on this market. Yet, given the neutral frame of our experimental design, the insights from this study should also be relevant to other copyright markets, characterised by comparable unpredictability of earnings, like exhibitions (Skinner 2006) and music (Davies 2002). Other markets with highly skewed earnings, like venture capital, might also be affected by a similar fairness problem.

Obviously, our stylised experimental setting had to abstract from features of reality. For instance to make a movie, a large number of holders of intellectual property rights must contribute. This feature of the market makes ex ante deals with all holders of such rights paramount. One might argue that there is less reason for legal intervention if the number of copyright holders is much

smaller (as sometimes with music) or if there is just a single copyright (as sometimes with literature).²² Yet our data suggests that the provision helps even if the relationship is strictly bilateral. Future work might want to introduce different allocations of market power, reflecting the fact that there is usually less competition among buyers than among sellers. In addition, one could make the sellers' production of the copyright endogenous, to study the dynamic effects of different institutional arrangements. Another extension could allow the buyers' effort to influence the probability of success. One might also want to study to which degree reputation is a substitute for legal intervention.

The German solution discussed in this paper neglects more sophisticated schemes that have been proposed in the economics literature to guide contracting about copyright when success is uncertain (Watt 2006) surveys this literature). Further research might want to experimentally compare the performance of those alternative schemes. Eventually, this paper has clearly illustrated the need for a general theoretical framework that integrates social preferences – both of interested and neutral parties – with decision making under risk and uncertainty.

22 In the special case of the music business, many authors are at the same time performers of their work. As a consequence they are often willing to accept very low or even negative license fees, just to get access to a larger audience, which increases concert revenues.

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Appendix A – Instructions Baseline

General Instructions for Participants

Welcome to our experiment!

If you read the following explanations carefully, you will be able to earn a substantial sum of money, depending on the decisions you make. It is therefore crucial that you read these explanations carefully.

During the experiment there shall be absolutely no communication between participants. Any violation of this rule means you will be excluded from the experiment and from any payments. If you have any questions, please raise your hand. We will then come over to you.

In any event, you will receive a lump sum of 2 euro for taking part in the experiment.

During the experiment we will not calculate in euro, but instead in Taler. Your total income is therefore initially calculated in Taler. The total number of Taler you accumulate in the course of the experiment will be transferred into euro at the end, at a rate of

700 Taler = 1 Euro.

At the end you will receive from us the 2 euro plus the **cash** sum, in euro, based on the number of Taler you have earned.

Experiment Overview

The experiment consists of **8 rounds**, each of which has **4 stages** (maximum). In the experiment, there are 2 different roles, **Player S** (Seller) and **Player B** (Buyer).

At the beginning of the experiment, you are randomly allocated one of these two roles. During the entire 8 rounds of the experiment, you will remain in the same role.

At the beginning of each round, each Player S is paired with a Player B at random. In the course of the experiment, Player S **never plays twice** with the same Player B. And Player B, in the course of the experiment, **never plays twice** with the same Player S.

Stage 1: Player B makes Player S an offer.

Stage 2: Player S decides whether to accept or decline the offer.

Stage 3: A draw decides whether the object is worth 100 or 1700 Taler.

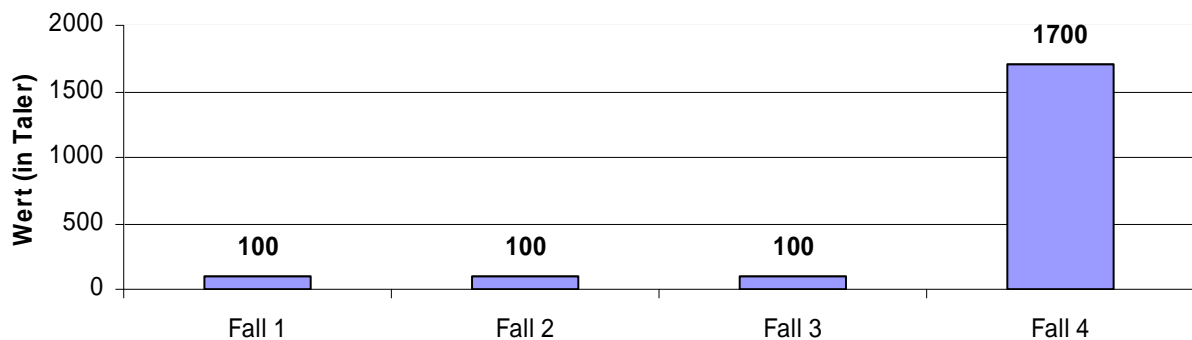
Stage 4: Distribution of points.

Information on the Exact Proceedings of the Experiment

Stage 1:

Each player receives an **initial endowment** of 500 Taler onto a **Taler account**.

Player S is in possession of an object, Player B can purchase this object. **The object only has a value if Player B buys it.** At the time of purchase, however, the value of the object is still unknown. All you know is the distribution of these values.



In **3 out of 4** cases, a value of **100 Taler** is realized later.

In **1 out of 4** cases, a value of **1700 Taler** is realized later.

In order to purchase the object, Player B makes an **offer** to Player S.

Stage 2:

Player S hears about Player B's offer and decides whether to **accept** or **decline** Player B's offer.

If Player S **accepts** the offer, the object becomes Player B's possession, and the purchase price is transferred to Player S's Taler account ($500 + \text{purchase price}$). Player B's Taler account is reduced by the purchase price paid ($500 - \text{purchase price}$).

If Player S **declines** the offer, the round is ended. Stages 3 and 4 of this round are not played in that case. Both players' Taler accounts remain unchanged (500 Taler).

Stage 3:

A draw decides whether the object is worth 100 or 1700 Taler. You are told the result of this draw and of the account balances resulting from it.

- If the object is worth **100 Taler**, Player B's Taler account is: $500 - \text{purchase price} + 100$.
- If the object is worth **1700 Taler**, Player B's Taler account is: $500 - \text{purchase price} + 1700$.
- In both cases, Player S's Taler account is: $500 + \text{purchase price}$

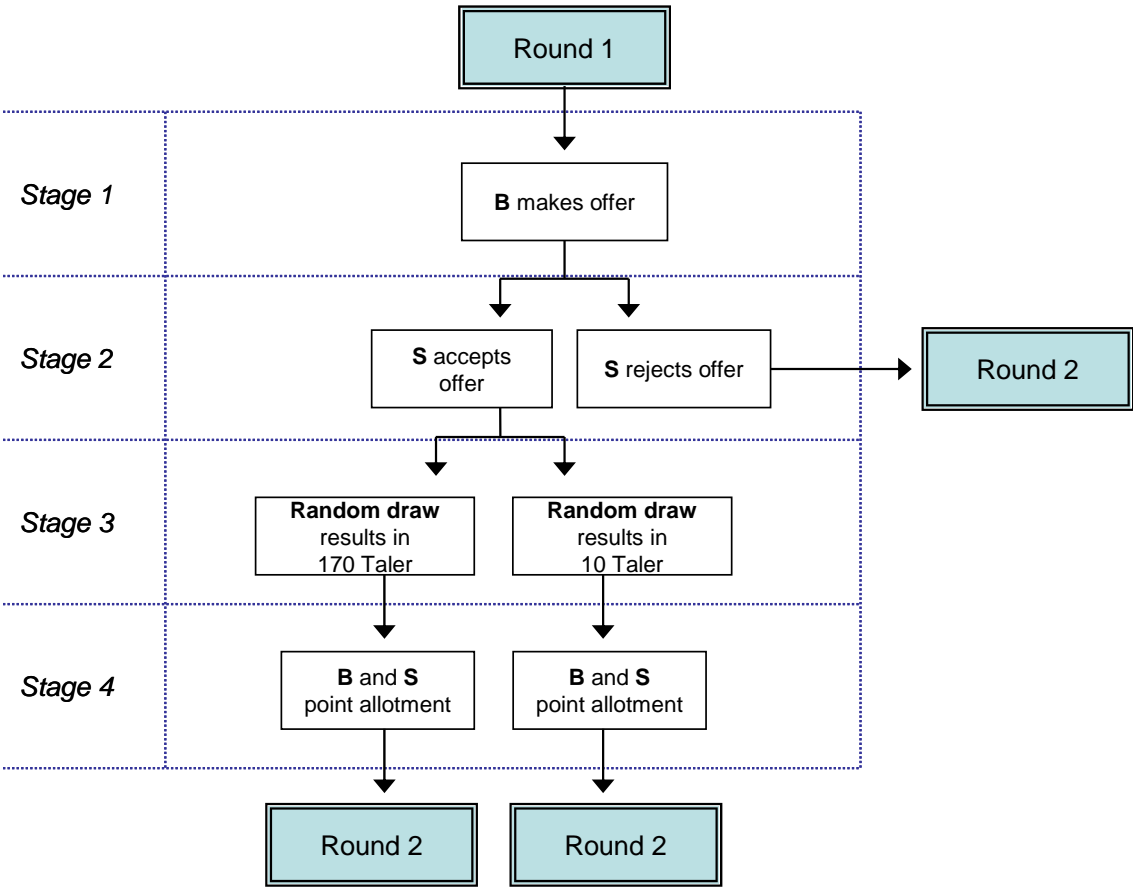
Stage 4:

Player B and Player S are given the opportunity to reduce the other player's Taler account by **distributing points**. Each point that you allocate to another player costs you **1 Taler** and reduces the other player's Taler account by **3 Taler**.

(At the latest) after Stage 4, the round is ended. Stage 1 of the next round follows, in which each Player S is paired with a new Player B and each Player B is paired with a new Player S. The Taler accounts of all players are saved (for the later payment) and reset to zero (for the new round).

After the 8 rounds, the Taler accounts saved after all 8 rounds are added up in order to calculate your payoff.

The following graph summarizes the procedure of the experiment once again:



Appendix B – Control Questions Baseline

Control Questions

1. In Stage 1 Player B has offered Player S a purchase price of 10 Taler. In Stage 2 Player S has rejected the offer.

What is the

- a) Income of Player B after Stage 2?.....
- b) Income of Player S after Stage 2?.....

2. In Stage 1 Player B has offered Player S a purchase price of 150 Taler. In Stage 2 Player S has accepted the offer. In Stage 3 the random draw has determined the value of the commodity to be 100 Taler.

What is the

- a) Income of Player B after Stage 3?.....
- b) Income of Player S after Stage 3?.....

3. In Stage 1 Player B has offered Player S a purchase price of 80 Taler. In Stage 2 Player S has accepted the offer. In Stage 3 the random draw has determined the value of the commodity to be 1700 Taler.

What is the

- a) Income of Player B after Stage 3?.....
- b) Income of Player S after Stage 3?.....

4. After the random draw in Stage 3 (Price=90 Taler, Value=100 Taler) Player B has an income of 510 Taler and Player S of 590 Taler. In Stage 4, Player B allots 50 Points and Player S 0 Points.

What is the

- a) Income of Player B after Stage 4?.....
- b) Income of Player S after Stage 4?.....

5. After the random draw in Stage 3 (Price=150 Taler, Value=1700 Taler) Player B has an income of 2050 Taler and Player S of 650 Taler. In Stage 4, Player B allots 4 Points and Player S 200 Points.

What is the

- a) Income of Player B after Stage 4?.....
- b) Income of Player S after Stage 4?.....

Appendix C – Instructions Provision Treatment

Experiment Overview

We now repeat the experiment and introduce a few changes.

Once again, the experiment consists of **8 rounds**. Each of these rounds, however, no longer consists of 4 stages, but of (a maximum of) **7 stages**.

Stages 1, 2 and 3 are the same as in the first experiment. Stage 7 corresponds to Stage 4 of the first experiment. Stages 4, 5 and 6 are new.

There are now 3 different roles, **Player S** (seller), **Player B** (buyer) and **Player U** (umpire). At the beginning of the experiment, you are allocated one of the three roles at random. During the entire 8 rounds of the experiment, your role shall remain the same.

At the beginning of each round, a random procedure pairs each Player S with a Player B and a Player U. In the course of the experiment, Player S **never plays twice** with the same Player B. And Player B **never plays twice** with the same Player S in the course of the experiment.

Stage 1: Player B makes an offer to Player S.

Stage 2: Player S decides whether to accept or decline the offer.

Stage 3: A draw decides whether the object is worth 100 or 1700 Taler.

Stage 4 (only if 1700): Player U names an appropriate purchasing price.

Stage 5 (only if 1700): Player B can make Player S a new offer.

Stage 6 (only if 1700): Player S decides whether to accept or decline the new offer.

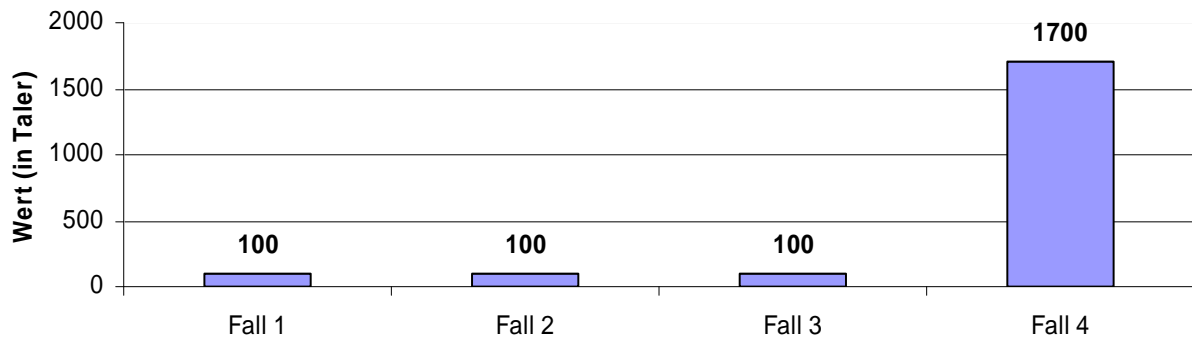
Stage 7: Distribution of points.

Information on the Exact Proceedings of the Experiment

Stage 1:

Each player receives an **initial endowment** of 500 Taler, transferred to their **Taler account**.

Player S is in possession of an object, Player B can purchase this object. **The object only has a value if it is bought by Player B**. At the time of the purchase, however, the value of the object is still uncertain. You merely know the distribution of these values.



In **3 out of 4** cases, a value of **100 Taler** is realized later.

In **1 out of 4** cases, a value of **1700 Taler** is realized later.

In order to purchase the object, Player B makes Player S an **offer**.

Stage 2:

Player S is told the offer by Player B and decides whether to **accept** or **decline** Player B's offer.

If Player S **accepts** the offer, the object becomes Player B's possession, and the purchase price is transferred to Player S's Taler account (500 + purchase price). Player B's Taler account is reduced by the purchase price paid (500 – purchase price).

If Player S **declines** the offer, the round ends. Stages 3 to 7 of this round are not played in such a case. The players' Taler account remains unchanged (500 Taler).

Stage 3:

A draw decides whether the object is worth 100 or 1700 Taler. You are told the result of the draw as well as the account balances resulting from it.

- If the object is worth **100 Taler**, Player B's Taler account is: 500 – purchase price + 100.
- If the object is worth **1700 Taler**, Player B's Taler account is: 500 – purchase price + 1700.
- In both cases, Player S's Taler account is: 500 + purchase price.

Stage 4:

(Stage 4 is only played if the object is worth 1700 Taler.)

Player U decides which purchase price is to be deemed **appropriate**. This decision is initially not passed on to Player S and Player B.

Stage 5:

(Stage 5 is only played if the object is worth 1700 Taler.)

Player B now has the chance to make Player S a **new offer**. Player B may augment the purchase price that was paid to Player S in Stage 2, or reduce it, or leave it as it is.

Stage 6:

(Stage 6 is only played if the object is worth 1700 Taler.)

Player S is told Player B's new offer and decides whether to **accept** or **decline** Player B's new offer.

If Player S **accepts** the new offer, the purchase price paid in Stage 2 is no longer valid, and the new purchase price is transferred to Player S's Taler account.

Player S's Taler account is therefore: $500 + \text{new purchase price}$.

Player B's Taler account is then: $500 - \text{new purchase price} + 1700$.

If Player S **declines** the new offer, the purchase price paid in Stage 2 is no longer valid either.

Player B and Player S are told which purchase price Player U deemed appropriate in Stage 4.

This "**appropriate purchase price**" replaces the old purchase price.

Player S's Taler account is therefore: $500 + \text{appropriate purchase price}$.

Player B's Taler account is then: $500 - \text{appropriate purchase price} + 1700$.

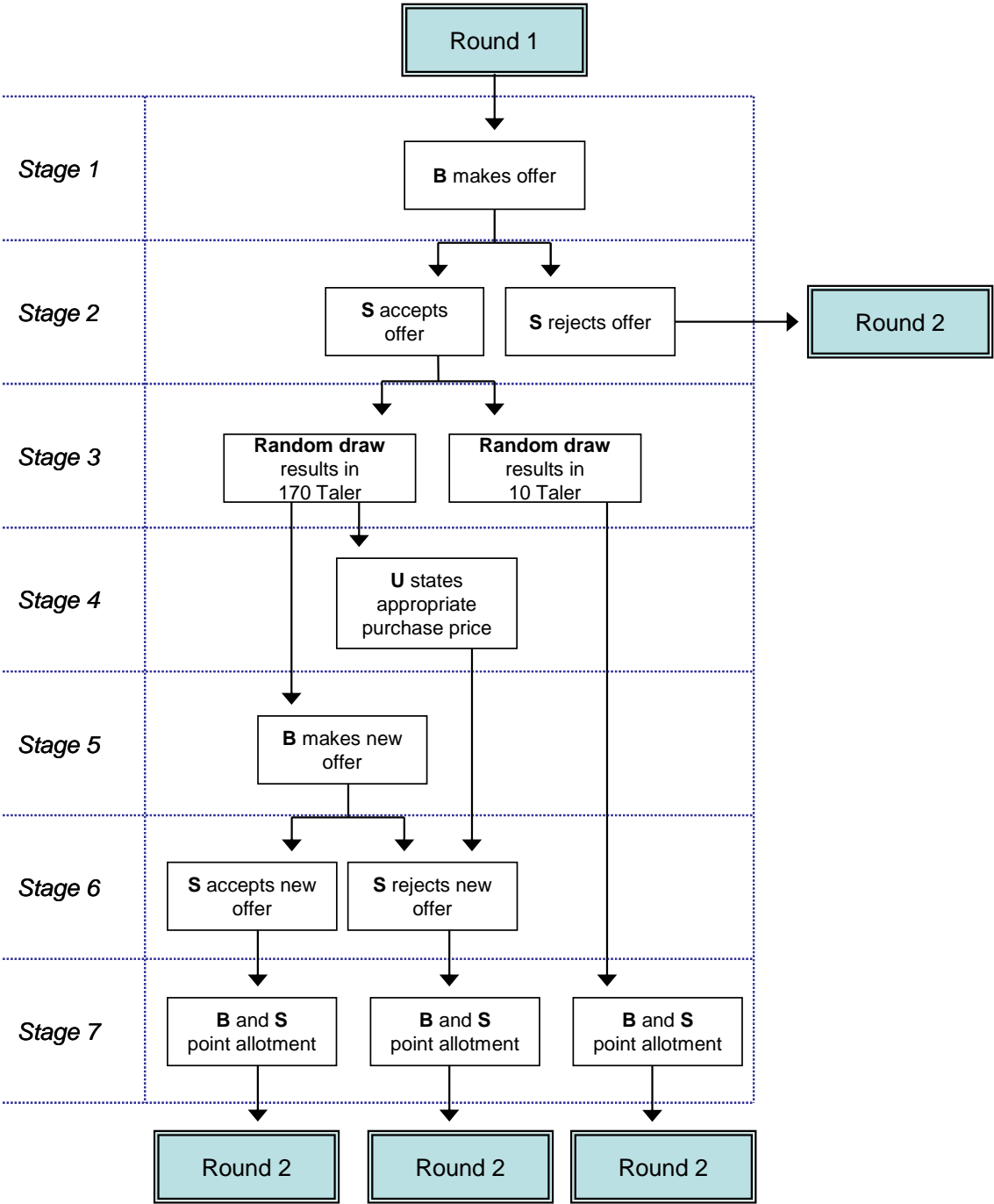
Stage 7:

Player B and Player S are given the possibility of reducing the other player's Taler account by **distributing points**. Each point you distribute to the other player costs you **1 Taler** and reduces the other player's Taler account by **3 Taler**.

(At the latest) after Stage 7, the round ends. Stage 1 of the next round follows, in which each Player S is paired with a new Player B and a new Player U, and each Player B is paired with a new Player S and a new Player U. The Taler accounts of all players are saved (for the subsequent payoff) and reset to zero (for the new round).

After the 8 rounds, the saved Taler accounts from all 8 rounds are added up in order to calculate your payoff.

The following graph summarizes the exact proceedings of the experiment once again:



Appendix D – Control Questions Provision Treatment

Control Questions

1. After the random draw in Stage 3 (Price=150 Taler, Value=1700 Taler) Player B has an income of 2050 Taler and Player S of 650 Taler. In Stage 5, Player B confirms her offer from Stage 1 (150 Taler). In Stage 6, Player S accepts the new (=old) offer. In Stage 7, Player B allots 4 Points and Player S 200 Points.

What is the

- a) Income of Player B after Stage 7?.....
- b) Income of Player S after Stage 7?.....

2. After the random draw in Stage 3 (Price=150 Taler, Value=1700 Taler) Player B has an income of 2050 Taler and Player S of 650 Taler. In Stage 5, Player B increases her offer to 400 Taler. In Stage 6, Player S accepts the new offer. In Stage 7, Player B allots 0 Points and Player S 0 Points.

What is the

- a) Income of Player B after Stage 7?.....
- b) Income of Player S after Stage 7?.....

3. After the random draw in Stage 3 (Price=150 Taler, Value=1700 Taler) Player B has an income of 2050 Taler and Player S of 650 Taler. In Stage 5, Player B increases her offer to 747 Taler. In Stage 6, Player S rejects the new offer. The Players B and S are informed that Player U regards the appropriate purchase price to be 50 Taler. In Stage 7, Player B allots 0 Points and Player S 0 Points.

What is the

- a) Income of Player B after Stage 7?.....
- b) Income of Player S after Stage 7?.....

4. After the random draw in Stage 3 (Price=150 Taler, Value=1700 Taler) Player B has an income of 2050 Taler and Player S of 650 Taler. In Stage 5, Player B increases her offer to 583 Taler. In Stage 6, Player S rejects the new offer. The Players B and S are informed that Player U regards the appropriate purchase price to be 950 Taler. In Stage 7, Player B allots 250 Points and Player S 100 Points.

What is the

- a) Income of Player B after Stage 7?.....
- b) Income of Player S after Stage 7?.....

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