

Engel, Christoph; Kurschilgen, Michael

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## Fairness ex ante & ex post: The benefits of renegotiation in media markets

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June 2010

# Fairness Ex Ante & Ex Post

## The Benefits of Renegotiation in Media Markets

Christoph Engel and Michael Kurschilgen\*

### 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 norm from German copyright law, the so-called “bestseller provision”, 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 perceive less ex-post unfairness.

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## I. Introduction

The fate of a new movie at the box office is often a greater drama even than its contents. This has two combined reasons. First, the distribution of success in the movie industry is highly skewed. 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.<sup>1</sup> 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 provides an illustrative scatterplot).

Second, there are few industries where success is so unpredictable. 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).

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. While such deals are indeed made with stars, they are very rare 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 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 fair share under the given circumstances.”<sup>2</sup>

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

<sup>2</sup> §32a I 1 UrhG<sup>2</sup> (German Copyright Law), our translation. § 32a III 1 UrhG states that the right is not waivable.

This legal provision seems odd in at least two respects: First, the norm 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 parties.<sup>3</sup> 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) Does the provision enhance the trade of copyrights? (2) Does the provision “restore fairness”?

Our 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. This 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 movie markets *without* (baseline B) and *with* the essence of the German norm (treatment norm N).

### 1. Baseline (B) treatment

Two roles are randomly assigned to participants: they are either buyers or sellers.<sup>4</sup> 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.

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 corresponding probabilit-

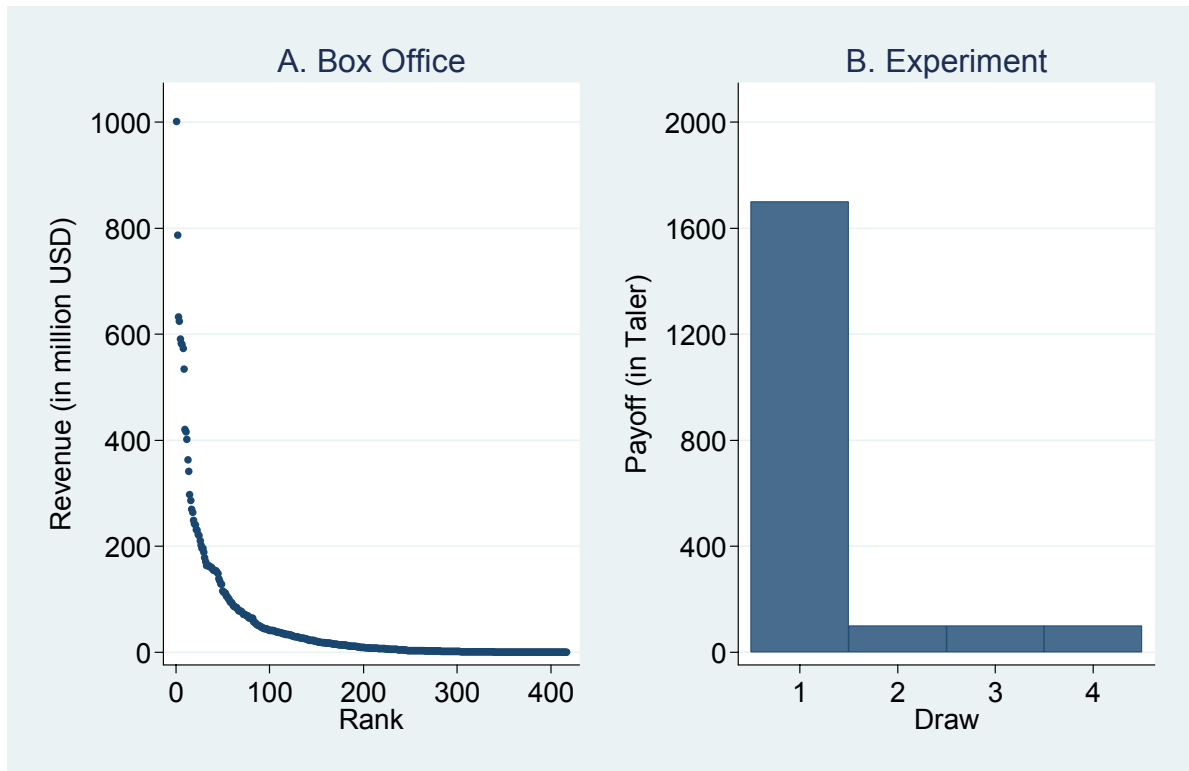
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<sup>3</sup> BT Drs. 14/8058, 19.

<sup>4</sup> The bargaining situation is framed neutrally as one of buying and selling a commodity (following Hoffman et al., 1994).

ity  $1 - \lambda = .75$  it is only worth  $v_{10} = 100$  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**



*Notes:* Panel A depicts the worldwide gross box office revenues of the 450 most successful movies in 2008, according to [boxofficemojo.com](http://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.

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 on punishment reduces the other player'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 seems a good approximation of the real market for copyrights where the vast mass of unknown authors is offered a fixed license fee on a "take-it-or-leave-it" basis.

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 norm, 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. 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 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 design excludes that a participant will herself derive a pecuniary benefit from disciplining a free-rider.

While for the aim of this paper punishment is mainly a diagnostic tool to measure perceived *ex-post* unfairness, punishment matters in the field, too. If the artist realises she has sold her copyright for a trifle, while the producer gains a fortune, destructive forces might well kick in. The artist may in particular aim at making the injustice publicly know, hoping to reduce the market success of the work. She can terminate the business relationship with the producer and induce other artists to do the same. Both can be very costly for the producer, especially if the media pick the story up. Likewise, producers may try to shun artists who, to their feeling, have overstretched their *ex ante* bargaining position. Again reputation is the most powerful weapon. Producers may try to make sure that in the future other producers do not contract with this artist either. All these examples of retaliation have in common that they are costly to both the punisher and the punished person.

## **2. Norm (N) treatment**

The norm treatment features one additional player: the umpire. It is meant to capture decisions of the judiciary. The same way as for judges and juries, the umpire's earnings are unrelated to the decisions she takes. 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 "adequate" purchase price. For the sequence of stages, the reader is again referred to the flow chart in the instructions. Stages 1, 2, and 3 of the norm 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.<sup>5</sup> 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.

### 3. Procedures

The experiment was run in April 2009 at the Bonn University Laboratory for Experimental Economics using z-Tree (Fischbacher, 2007). Subjects were invited with ORSEE (Greiner 2004) from a subject pool of approximately 3500 participants. 48 student subjects from different majors participated<sup>6</sup>, 27% of which were female. To allow for within-subject comparisons, each subject played first treatment B (Baseline) and then treatment N (Norm)<sup>7</sup>. We implement this specific sequence of treatments because we explore whether introducing this norm is desirable. We are not interested in the mirror question: what would happen, were the norm abolished? We therefore do not test the opposite sequence, where the norm treatment would be followed by the baseline. 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

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<sup>5</sup> The German original of the instructions reads. “Spieler S entscheidet, welchen Kaufpreis er angemessen findet”.

<sup>6</sup> 12.5% of participants were lawyers and 25% economists.

<sup>7</sup> One-third of the buyers in treatment B and one-third of the sellers in treatment B became umpires in N. 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.

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 norm treatment (5.13 € for buyers, 5.60 € for sellers, 4 € - fix - for umpires).

### III. Predictions

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 norm 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 zero<sup>8</sup>. 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  $E(p_u)$ .

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, 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 norm 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.

However, from many previous experiments with ultimatum games it is known that participants often reject deals that would make them better off in monetary terms (Güth, Schmittberger et al.

<sup>8</sup> Recall that strategic/educative punishment is pointless with perfect stranger matching.

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. This behaviour has most prominently been explained by inequity aversion (Fehr and Schmidt 1999; Bolton and Ockenfels 2000). 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 % and mean offers were in the order of 30 – 40 % of the true value of the commodity (Camerer 2003:49).

Our baseline setting, however, differs from the standard ultimatum game in one important respect: when the parties negotiate, there is uncertainty about the value of the commodity. To the best of our knowledge, such two-sided uncertainty 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. Both findings might carry over to our setting of two-sided uncertainty.

In our design, the fact that the commodity trades before its true value is revealed effectively insures the seller. Provided  $p > v_{lo}$ , the buyer even runs the risk of making a real loss. If the rejection of low offers is driven by fairness concerns, in our baseline we therefore should observe a lower acceptance threshold than in deterministic ultimatum games. The dampening effect should be all the more pronounced given the distribution of gains is highly skewed. For these reasons we should expect mean offer prices well below 30% of the commodity's expected value, i.e. well below the findings reported for deterministic ultimatum games.

While we expect prices below the typical result from deterministic ultimatum games, in a behavioural perspective we predict offers in the baseline to be considerably above the minimum price. This implies for the treatment that subjects' beliefs about the umpire's type matter. If they anticipate umpires of type EA or EP, the commodity should trade at lower prices. For umpires of type L, however, 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 norm's effect on acceptance is less clear. Just as umpires of type EA and EP make low offers more acceptable to the 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  $v_{lo}$  seem very unlikely since buyers would then make a loss in 75% of the cases, never knowing whether they will be lucky enough to recoup it. In addition, a self-serving bias (Miller and Ross 1975; Loewenstein, Issacharoff et al. 1993; Babcock and Loewenstein 1997) concerning the beliefs about the umpire might make deals in the norm treatment even less likely.

Equally open is the effect of the norm 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 punishment. In the baseline this takes place in round 4; in the norm 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 norm is to reallocate profit from the buyer to the seller in case umpires are of type EA or EP<sup>9</sup>. In addition, the anticipation of those types of umpires might lower market prices in the first place. In that case buyers would be better off with the norm 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 norm might simply reallocate profits, it might also merely reallocate ex-post discontent. If lower profits<sup>10</sup> lead to more discontent, we should observe buyers (sellers) punishing less (more) in the norm treatment than in the baseline if  $v=v_{lo}$  and more (less) if  $v=v_{hi}$ . However, for the norm to not only reallocate fairness but actually “restore fairness” as the legal literature claims, overall punishment would have to go down.

## IV. Results

### 1. Prices and Deals

Fig. 2 Panel A shows that mean offer prices are way above the price of 1 taler predicted by money maximisation, but substantially below 30% of the expected value of the commodity, i.e. 150 Taler, as in deterministic ultimatum games.<sup>11</sup> More importantly, both mean offer prices and mean accepted prices are considerably higher in the baseline than in the norm treatment. These differences are significant.<sup>12</sup> Note that in both cases average offer prices are well above 100, namely 129 in the baseline and 104 in the norm. 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 norm. Moreover, offered and accepted prices are closer in the norm treatment, which hints at a more efficient functioning of the market. Indeed, the probability of acceptance rises from 73% in the baseline to 83% in the norm treatment. This suggests that the norm 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 norm.

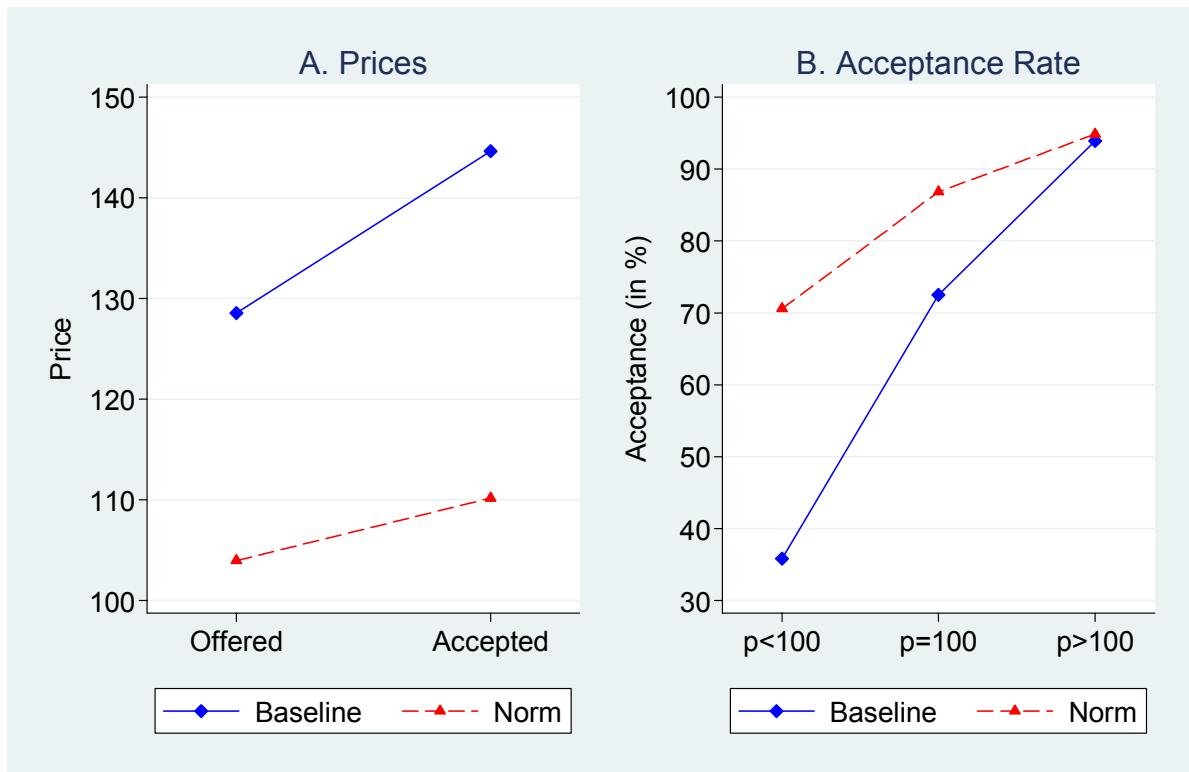
<sup>9</sup> As we have also mentioned above, the norm should have no effect on ex-post unfairness if umpires are of type L and this is correctly anticipated by the subjects.

<sup>10</sup> It is not necessary to differentiate between absolute profits and relative profits since by design one party gets more when the other party gets less.

<sup>11</sup> One sample signed-rank test, using 24 means of buyers for both treatments,  $p = .0072$ ; same for the baseline only,  $p = .0356$ .

<sup>12</sup> 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**



*Notes:* Panel A illustrates the average prices offered and accepted in the Baseline as well as in the Norm treatment. In the Baseline (Norm), 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 (Norm) 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 norm 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 norm.

**Result 1:** The norm decreases the average price paid for the commodity

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

**Table 1 – Explaining Acceptance**  
 DV: Acceptance of initial offers (0=No, 1=Yes)

	(1)	(2)	(3)
Treatment (0=B, 1=N)	1.078** (0.416)	3.656*** (0.932)	2.435*** (0.641)
Price offered		0.072*** (0.018)	
Offer < 100 (0=No, 1=Yes)			-2.703*** (0.711)
Offer > 100 (0=No, 1=Yes)			3.685** (1.270)
N	176	176	176
Chi Squared	7.333	71.869	69.123
Log likelihood	-62.948	-30.680	-32.053

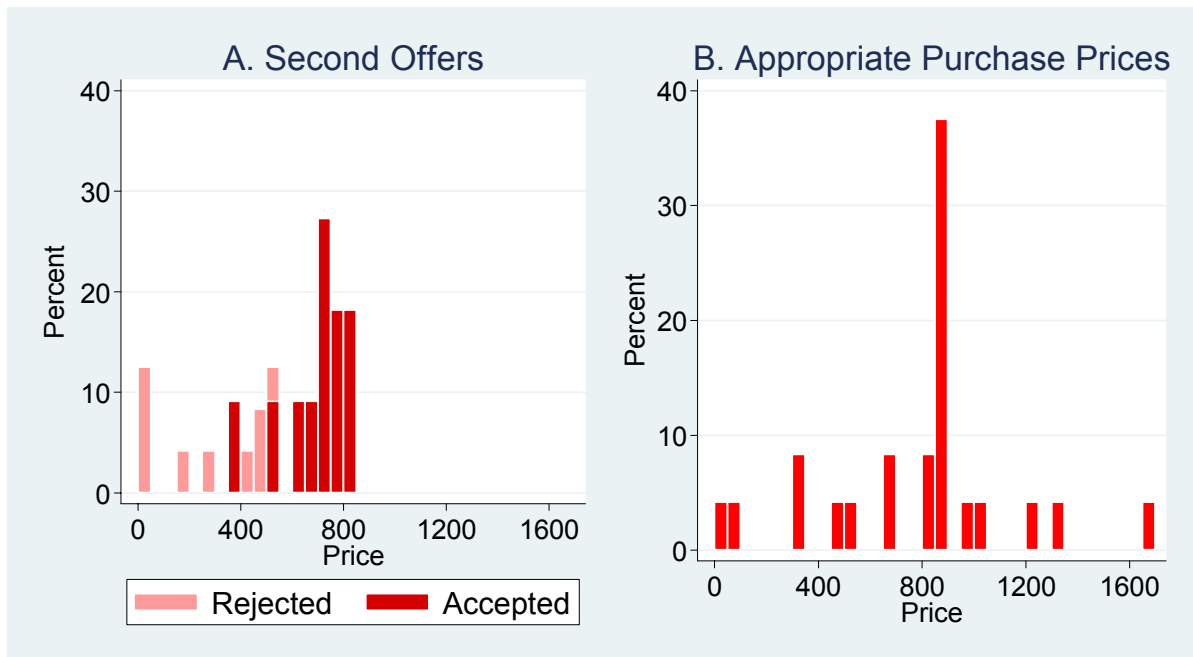
*Notes:* Fixed Effects Panel Logit Regression. Standard errors are shown in parentheses. Players were sellers in both treatments. \* denotes significance level of 5 percent, \*\* of 1 percent and \*\*\* of 0.1 percent. In (3) the reference group is Offer = 100.

The regression analysis displayed in Table 1 yields further support to result 2: Model 1 shows that acceptance is significantly higher in the Norm treatment. This effect is even stronger when we include the offer price as a regressor in model 2, or distinguish between prices below, at or above 100 as in model 3.

## 2. Renegotiation and Umpire Decisions

The very fact that we observe lower prices in the norm 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. Clearly, neither second offers nor their acceptance are meant to implement ex ante equality: there are very few second offers at or around 250.

**Fig. 3 – Renegotiation and Umpire Decisions**



*Notes:* Panel A shows the second offers made by the buyers in the Norm 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.

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.<sup>13</sup> 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 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 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. But regardless of the previ-

<sup>13</sup> With average accepted prices the difference is even larger: 225 to 275.

ous role they had a clear preference for ex-post equality. Former buyers even gave on average more to the seller (873 Taler) than former sellers (691 Taler).

**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 Fairness

We have seen that the norm 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 norm was necessary to "restore fairness".<sup>14</sup> 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 norm treatment.<sup>15</sup> They also use the punishment option more frequently in the baseline (21% of all possible cases) than in the norm treatment (12%). 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 norm treatment than in the baseline. In addition, this difference is considerably more pronounced in the norm 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 norm 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 norm's effect on buyers' use of punishment. All models have a highly significant treatment coefficient.

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<sup>14</sup> BT Drs. 14/8058, 19.

<sup>15</sup> Wilcoxon signed rank test over mean punishment in the baseline and the norm 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=N)	-1.694* (0.719)	-1.741* (0.777)	-2.034* (0.856)	-2.399* (1.130)	-7.045* (2.977)
Price offered		0.009 (0.009)			
Value = 1700 (0=No, 1=Yes)		1.446 (0.785)	1.400 (0.788)	1.042 (1.009)	1.419 (1.072)
Offer > 100 (0=No, 1=Yes)			-0.468 (1.003)	-0.330 (1.023)	-2.842 (1.784)
Treatment x Value=1700				0.983 (1.690)	2.068 (1.925)
Treatment x Offer>100					5.690 (2.942)
N	79	79	79	79	79
Chi Squared	6.587	11.033	9.936	10.285	15.531
Log likelihood	-21.922	-19.699	-20.247	-20.073	-17.450

Notes: Fixed Effects Panel Logit Regression. Standard errors are shown in parentheses. Players were buyers in both treatments. \* denotes significance level of 5 percent, \*\* of 1 percent and \*\*\* of 0.1 percent.

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 norm 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 norm to improve upon the baseline situation.

**Result 5:** The norm 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. In the unlikely, but possible event of high success in the market, the licence fee is nonetheless binding for the artist. This reflects the type of contracts that is most common in the market for copyrights, most notably between large production firms and little known au-

thors. In contrast, the second setting introduces renegotiation under the shadow of legal intervention. In case the work turns out a blockbuster, 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.

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 main finding is that, in the presence of the norm, copyrights are considerably more probable to trade. This happens because 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 norm's effect on market outcome. In contrast, the legal literature has concentrated on the ex-post dimension of fairness, claiming that the main function of the norm is to "restore fairness" between the two parties. Our results suggest that, indeed, the norm 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.

The most surprising result from this study is the fact that ex-post equality turns out the umpires' single distinct fairness norm. This is especially notable since the 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. 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.

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). Yet our data shows that the norm 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 production of the copyright endogenous, to study the dynamic effects of different institutional arrangements.

Given the neutral frame of our experimental design, our results are also relevant for other markets with similar characteristics. We have used the movie industry to illustrate the German provision because we have precise data on this market. Yet it seems justified to extend the explanation to other copyright markets, characterised by comparable unpredictability of earnings, like exhibitions (Skinner 2006) and music (Davies 2002). Future research might want to study whether other markets with highly skewed earnings, like venture capital, are affected by a similar fairness problem.

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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.

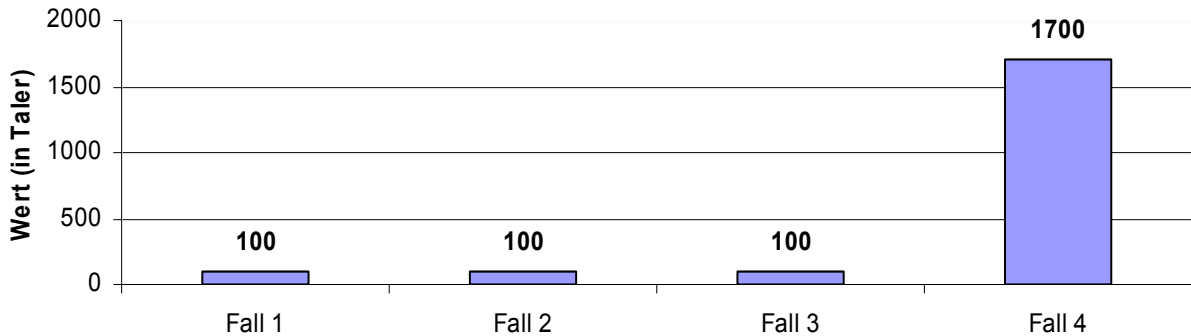
Stage 4: Distribution of points.

### 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:  $500 + \text{purchase price}$

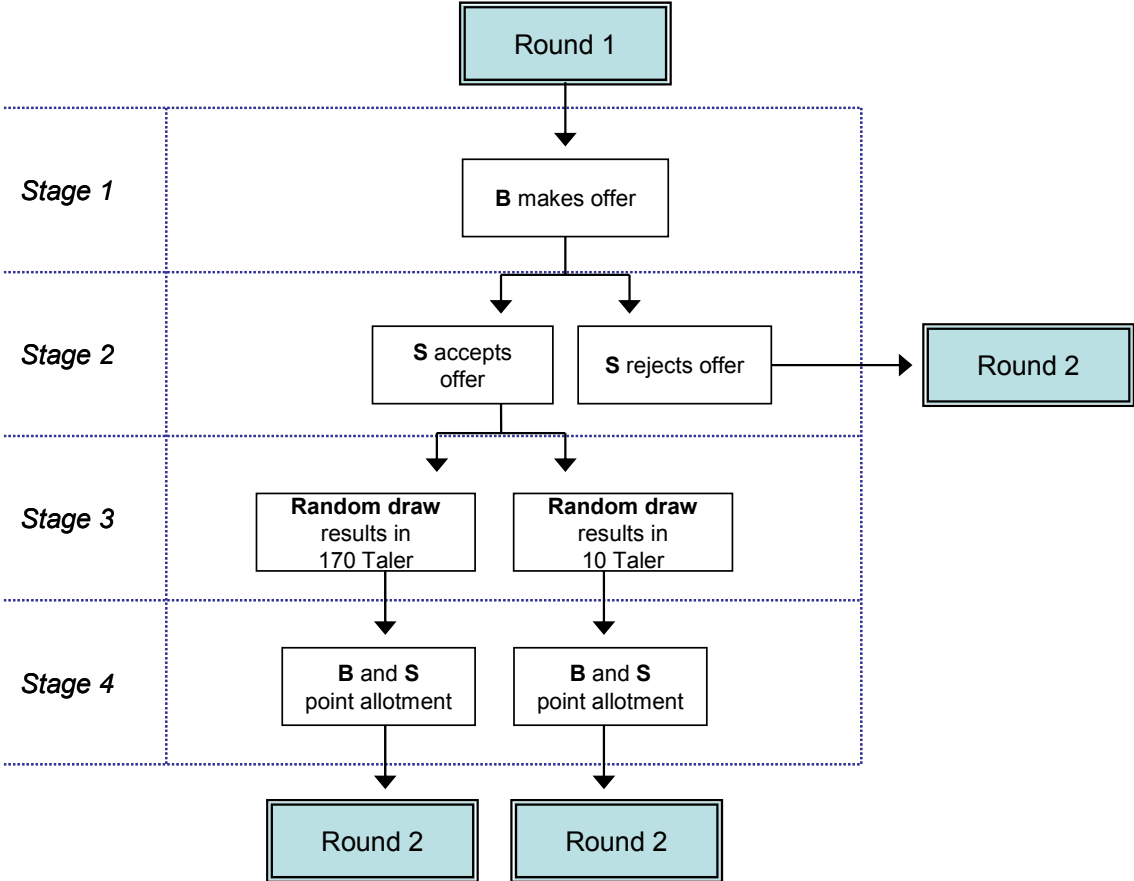
### Stage 4:

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 Norm 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.

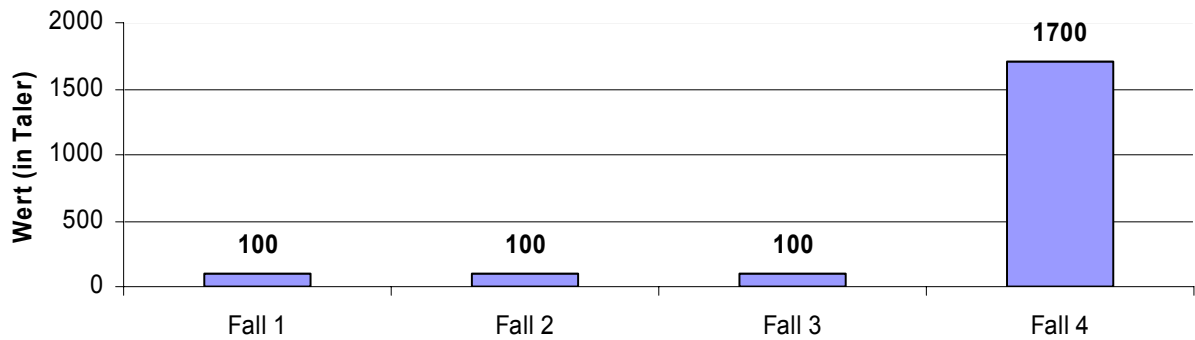
Stage 7: Distribution of points.

### 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 ( $500 + \text{purchase price}$ ). Player B's Taler account is reduced by the purchase price paid ( $500 - \text{purchase price}$ ).

If Player S **declines** the offer, the round 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:  $500 - \text{purchase price} + 100$ .
- 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:**

*(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:  $500 - \text{appropriate purchase price} + 1700$ .

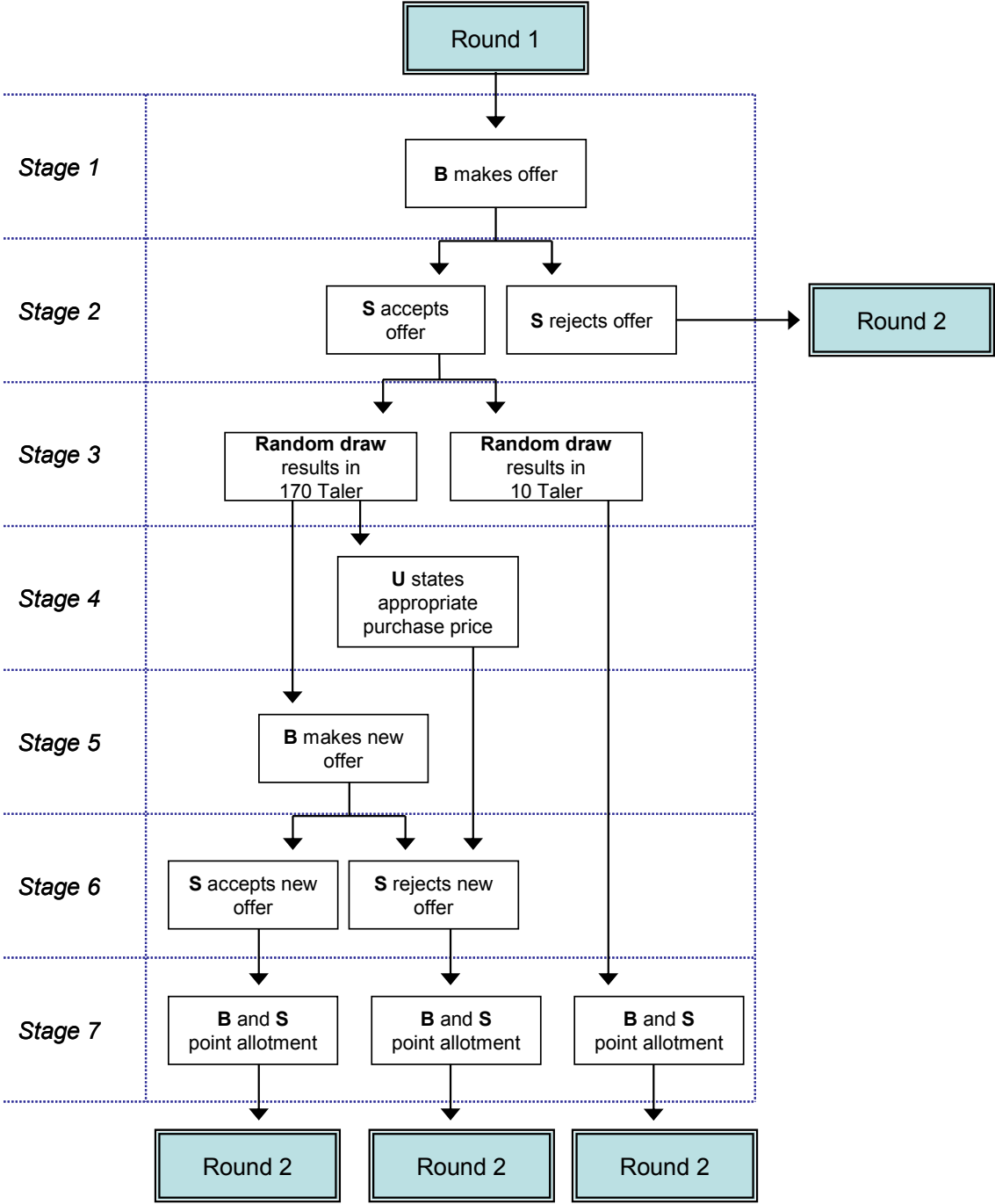
### **Stage 7:**

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 Norm 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?.....