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## *The impact of defendant offers into court on negotiation in the shadow of the law: experimental evidence*

**Brian G Main** (University of Edinburgh)
**Andrew Park** (University of Edinburgh)

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School of Economics
University of Edinburgh
30 -31 Buccleuch Place
Edinburgh EH8 9JT
+44 (0)131 650 8361
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Brian G M Main

and

Andrew Park

University of Edinburgh

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# The impact of defendant offers into court on negotiation in the shadow of the law: experimental evidence

Brian G M Main and Andrew Park*

*University of Edinburgh*

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Abstract

A common procedural arrangement that is thought to influence the pre-trial settlement of civil disputes is one which allows the defendant to make an offer to settle which, if it is rejected by the plaintiff and not subsequently bettered by the judge's trial decision ,will affect the division of the legal costs between the two sides. Operating under Federal Rule 68 in the USA, as "offers to settle" or "payments into court" in England and Wales, and as "tenders" in Scotland, these devices are generally assumed to encourage settlement. This paper extends the theoretical model of Miller (1986) and Chung (1996a) to the British context, and presents some experimental evidence on how agents react to such arrangements. The rule seems to have little empirical impact on the propensity to settle and to favour the defendant in terms of the level of settlement.

JEL Classification: C70 and K40.

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## 1. Introduction

Recent official reports by Cullen (1995) and Woolf (1996) demonstrate substantial concern with the delay and cost of resolving disputes in the civil courts. The fact is, of course, that most disputes never go near a court, and of those that do some 95% settle before the formal trial stage. Nevertheless, the legal procedures of the court room exert an influence that extends well beyond the relatively small number of cases that are formally resolved by judges. Most disputes are settled, in the well-known phrase of Mnookin and Kornhauser (1979), through bargaining in the shadow of the law. The parties know that, failing all else, there is usually a legal remedy available.

In addition, although most aspects of legal procedure are concerned with notions of accuracy and equity, there are some procedural arrangements that have been introduced with the specific intent of facilitating settlement by bringing the parties together, so avoiding the need for judicial intervention. In some ways, the choice between the American rule of cost shifting (each side pays its own legal costs irrespective of the outcome) and the English rule of cost shifting (the losing side pays the costs of both sides) can be viewed as being influenced by such concerns[1]. Less contentiously, most practitioners would describe the procedural rules that allow the defendant to make "payments into court" as being specifically designed to encourage settlement. It is the workings of such offers into court rules that this paper sets out to study.

The basic impact of such a rule is to make any post-trial allocation of costs offer-dependent. Thus, under the English rule, assume the defendant offers the plaintiff some £10000 to settle but the plaintiff declines. If this offer is officially recorded following the required procedure (which is without prejudice, as the procedure ensures that the judge remains unaware of the existence of such an offer until after the formal

[1] See Main and Park (1998) for some experimental results on this difference.

resolution of the case) and the judge subsequently finds for the plaintiff but awards damages of only £8000, then the allocation of costs is altered. Rather than being liable, as the loser, for all costs[2], the defendant only has to pay the costs up to the time that the offer was lodged. Thereafter, all trial related expenses arising are the responsibility of the plaintiff. As most costs are incurred at the trial stage (i.e., after the offer has been rejected), this is a significant departure from the loser-pays rule. The logic behind the arrangement is that it provides the defendant with an incentive to make "realistic" offers, as in so doing there is an increased chance of avoiding expenses i.e., offering more is cheaper in terms of expected cost. It also encourages the plaintiff to think carefully before rejecting a defendant's offer that is reasonable.

This arrangement operates under the label of "tenders" in Scotland and a variant of it can be found in Federal and state law in the USA. Federal Law 68 allows the shifting of expenses (although not including lawyers' fees) in federal cases where an offer to compromise has been made and the plaintiff has failed to beat the offer in court. California Rule 998 is one example of the very many state variants of this procedure.

The standard model used to describe negotiation in the shadow of the law, and the one we shall be extending below, is due to Landes (1971), Posner (1973) and Gould (1973). This uses the expected outcome of each party at trial as the starting point. Thus, under the American rule, the plaintiff expects to win the case with a certain probability and to be awarded an expected level of damages if successful. From this award, lawyers fees and other litigation expenses have to be deducted. The defendant will expect to lose the case with a given probability and in defeat faces being held liable for an expected level of damages. In addition to this, there are the costs of the litigation. Thus, even if both sides have identical expectations of trial outcomes, they are separated by the total litigation costs in terms of possible gains by early settlement. If each is pessimistic about trial outcome (i.e., the plaintiff expects to do not very well and the defendant expects the plaintiff to do very well), then the gap, and hence the

[2] More strictly speaking, for own costs and the taxed costs of the other side ('standard basis') — where taxed costs are generally significantly less than the full level of expenses incurred ('indemnity basis).

gain from settlement, increases. On the other hand, if both sides are optimistic, then the expectation of the plaintiff may be so high and the expectations of the defendant so low that they completely swamp any litigation costs, thus making settlement unlikely. The imposition of the offers-into-court procedure may seem from this perspective to have little impact on the settlement range, other than to shift it towards more modest levels (and hence in favour of the defendant) by shifting some of the litigation costs onto the plaintiff — on those occasions when the plaintiff goes to trial and fails to beat an offer. As we shall see below, things are, in fact, not quite so simple as the cost shifting rule introduces an aspect of strategic behaviour.

It is the purpose of this paper to offer some empirical evidence on the impact of offers-into-court rules by presenting data obtained under experimental conditions. The second section of the paper generalises the Landes-Posner-Gould model for the English system by extending a model due to Miller (1986) and Chung (1996). Section three offers a brief description of the set-up of the experiment that we conduct and section four presents the results from the data so obtained. The paper ends in section five with a brief discussion of the policy implications of these results.

## 2. Theoretical Model

In his section we extend Chung (1996) by examining his model in the context of the English rule for allocating legal costs as opposed to the American rule. In addition, we make explicit the probability of the plaintiff's claim being rejected should the case end up in court[3]. In what follows, it is assumed that both sides have identical and consistent views as to the chances of plaintiff success at trial and the likely damages award (if any). This reflects the legal intent that there be no 'trial by ambush', but that both sides have agreed access to the available information (through 'discovery' etc.).

[3]Chung (1996) deals only with the American rule and has no need to make this distinction as under the American rule both sides pay their own costs - who wins or loses the case is not important in deciding the costs that must be paid by each side. The use of the English Rule (the loser pays) complicates the analysis by requiring that there be a 'losing' side.

Let **P** denote the probability that the plaintiff makes a successful claim and let **x** denote the size of the court judgement awarded if the case goes to court and the plaintiff is successful. This judgement is assumed by both sides to be between $\mathbf{x_{min}}$ and $\mathbf{x_{max}}$. We denote the cumulative probability distribution of court outcomes, given that the case is successful, by **Q(.)**. Thus, **Q(x*)** denotes the probability that the court award, given the case is successful, will be less than or equal to **x*.** The total costs in the case are **F**, this being the sum of the plaintiff's expected costs, $\mathbf{F_p}$, and the defendant's expected costs $\mathbf{F_d}$. The total costs, **F**, are assumed to be positive. We denote the expected court award ('damages') as **J** where:

$$J = P \int_{x_{\min}}^{x_{\max}} x dQ(x) \qquad (1)$$

The expected court award is thus equal to the probability that the case is successful times the expected damages. The plaintiff's net expected gain from trial, $\mathbf{T_p}$, can be expressed as:

$$T_p = J - F_p \qquad (2)$$

Equation 2 states that the plaintiff's net expected gain from trial is the expected court award minus the expected costs. We assume that the plaintiff has an incentive to bring suit, in the sense that $\mathbf{T_p}$ is positive. The defendant's expected loss from trial can similarly be expressed as:

$$T_d = J + F_d \qquad (3)$$

The defendant's expected loss from trial is the sum of the expected court award (allowing for the possibility that the case is dismissed) plus the defendant's expected costs. The litigation differential, **LD**, is defined as the difference between the defendant's loss and the plaintiff's gain from trial. From (2) and (3) we have:

$$LD = T_d - T_p = (J + F_d) - (J - F_p) = F_d + F_p = F \qquad (4)$$

Thus, when both parties have the same belief about the court outcome ($\mathbf{J_p}$=$\mathbf{J_d}$=**J**), the litigation differential is equal to the total (expected) court costs, **F**. If both sides are optimistic about the court outcome ($\mathbf{J_p}$>$\mathbf{J_d}$) then the litigation differential will shrink and may become negative, leaving no incentive to come to an out-of court settlement. And if both sides are pessimistic about the court outcome ($\mathbf{J_p}$<$\mathbf{J_d}$) the litigation differential would be larger, providing an enhanced incentive to reach an ou-of-court settlement. As the impact of cost shifting rules will be proportionate, whatever the convergence or otherwise of damages expectations, the remaining analysis will focus on the identical beliefs situation.

### *2.1 The English rule*

Under the English rule, the party who loses the case pays all the costs. We can thus express the expected costs for each side as follows:

$$\begin{aligned} \mathrm{F_d} &= \mathrm{P\ F} \\ \mathrm{F_p} &= (1 - \mathrm{P})\mathrm{F} \end{aligned} \qquad (5)$$

Using (2) and (3) we can express the plaintiff's expected gain from trial and the defendant's expected loss as:

$$\begin{aligned} T_d &= P \int_{x_{\min}}^{x_{\max}} x dQ(x) + PF \\ T_p &= P \int_{x_{\min}}^{x_{\max}} x dQ(x) - (1 - P)F \end{aligned} \qquad (6)$$

### *2.2 The English rule with defendant offers into court*

To recap, if the defendants are able to make offers into court and if such an offer is rejected, then if the plaintiff fails to beat the defendant's offer when the case later goes to court, then the plaintiff is liable for the costs[4]. Note that the plaintiff can fail to beat the defendant's offer in two senses. The first is if the case is rejected by the judge. The second is if the judge finds in favour of the plaintiff but makes a damages award that is less than the offer already made by the defendant and lodged with the court[5]. In this case we can express the expected costs for each side, given that the defendant has made an offer into court of **O,** as follows:

$$\begin{aligned} F_d &= PF[1-Q(O)] \\ F_p &= (1-P)F + PFQ(O) \end{aligned} \tag{7}$$

In equation 7 the plaintiff is liable for the costs if the case is rejected or if the case is accepted and they fail to beat the defendant's offer of O. The defendants are only liable for costs if the case is successful and the plaintiff is awarded more than the offer into court. We can thus express the defendant's expected loss from trial and the plaintiff's expected gain as follows:

$$\begin{aligned} T_d^{DOC} &= P\int_{x_{\min}}^{x_{\max}} x dQ(x) + PF[1-Q(O)] \\ T_p^{DOC} &= P\int_{x_{\min}}^{x_{\max}} x dQ(x) - (1-P)F - PFQ(O) \end{aligned} \tag{8}$$

4 In practice, the plaintiff in such an event is liable for the costs of both parties only as from the date that the offer is made. In general the bulk of costs arise at or near the trial date (and, therefore, after the offer is made). For the purposes of this paper we shall assume that the whole of the costs involved (F) falls on the unsuccessful plaintiff who has not beaten the offer.

5 In the first of these two senses the plaintiff, as the 'loser' of the case, would be liable for the costs regardless of any defendant offer into court.

### *2.3 The settlement range, the conventional settlement range and the refined settlement range*

The *(standard) settlement range* is defined as the set of settlement offers that both the plaintiff and the defendant would prefer to going to trial, i.e., the range of ultimatum offers that would be accepted. The plaintiff will prefer any offer that is greater than their expected gain from court and the defendant will prefer any offer that is smaller than their expected loss. The settlement range is thus given by $\mathbf{[T_p,T_d]}$ and is equal to the litigation differential **LD**[6]. Here the settlement range is that range of settlements where both parties are better off than their respective expected outcomes from going to trial (sometimes called the Zone of Possible Agreement, ZoPA).

When a defendant has the ability to make offers into court, this unadorned notion of the settlement range is no longer useful. The reason is that the expected gain to the plaintiff and the expected loss to the defendant are conditional on any offer into court made by the defendant. At the point at which the defendant makes an offer into court, the expected court outcome changes for both sides and this change is dependent on the offer into court that is made[7]. Neither the pre-offer settlement range (using the threat values before any offer is made) nor the post-offer settlement range (using the threat points after the offer is made) is adequate to examine the set of possible settlements under defendant offers into court. Chung (1996) defines the *conventional settlement range* as the set of settlement offers that the defendant has an incentive to make and the plaintiff has an incentive to accept if the only alternative is going to trial.

To examine the conventional settlement range under defendant offers into court we define $\mathbf{O^{min}}$ by $\mathbf{T_p^{DOC}(O^{min})=O^{min}}$. This allows us to solve uniquely for the value $\mathbf{O^{min}}$, which is the amount of the offer into court by the defendant that makes the plaintiff's expected gain from trial under such an offer into court the same as the offer itself, once

[6]The (standard) settlement range is equal in magnitude to the litigation differential as $LD = T_d - T_p$.

[7] In other words, once the defendant makes an offer into court, the threat points of each side shift but difference between them (the litigation differential) remains the same.

the offer is made and rejected[8]. For any offer smaller than $\mathbf{O^{min}}$ the plaintiff is better off by going to trial[9] and will thus reject the offer. We thus have $\mathbf{O^{min}}$ as the bottom of the conventional settlement range. The top of the settlement range will be again given by $\mathbf{T_d}$, as the defendant will be better off by making any offer that is lower than their loss at trial, given that trial is the only alternative.

We can express the conventional settlement range for the two rules (from equations 6 and 8) as follows:

$$CSR_E = T_d - T_p = J + PF - \left[J - (1-P)F\right] = F$$
$$CSR_{DOC} = T_d^{DOC} - O^{\min} = J + PF - \left[J - (1-P)F - PFQ(O^{\min})\right] = F\left[1 + PQ(O^{\min})\right] \quad (9)$$

where $CSR_E$ is the conventional settlement range under the English rule alone and $CSR_{DOC}$ is the conventional settlement range under the English rule with defendant offers into court.

It is important to remember that even under offers into court the defendant is better off by agreeing to any demand made by the plaintiff that is less than the $\mathbf{T_d}$, if the only alternative is going to court. It would thus appear that the size of the conventional settlement range is raised by defendant offers into court and the settlement range is shifted downwards provided $\mathbf{P.F.Q_d(O) > 0}$ or, intuitively, provided the defendant makes an offer that is greater than the minimum possible court award[10].

An important point made by Chung (1996) that the conventional settlement range requires only a comparison between the offer made and each side's belief's about trial outcome. It does not require a comparison of the offer with other offers. Chung

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8 From the second part of equation 8, $O^{min} = J - (1-P) F - PF Q (O^{min})$. Because $Q(O^{min})>0$, $P\geq 0$, $F\geq 0$ then $O_{min} \leq J-(1-P)F$ where $J-(1-P)F$ is the bottom of the conventional settlement range under the English Rule alone (from equation 6). Thus, the (conventional) settlement range expands. See equation 9.

9 The effect of risk aversion is examined in Section 2.5.

10 If this is not the case, defendant offers into court cannot come into play and as such will have no effect.

defines an offer, $\mathbf{O_1}$ as being *equilibrium-dominated* if there exists another possible offer, $\mathbf{O_2}$, such that the worst the player can do with $\mathbf{O_2}$ is better than the equilibrium payoff she will receive with $\mathbf{O_1}$. Chung (1996a, p.275) then defines the *refined settlement range* as that which eliminates all equilibrium dominated offers from the conventional settlement range. The equilibrium domination argument is not relevant under the English rule only, but does call for refining of the conventional settlement range under offers into court.

To illustrate this point let us define $\mathbf{O^{max}}$ by $\mathbf{T_d^{DOC}(O^{max})=O^{max}}$. This, again, allows us to solve uniquely for $\mathbf{O^{max}}$, which is the level of an offer into court by the defendant that makes the defendant's loss from trial, after the offer has been made and rejected, the same as the offer. If the defendant made an offer greater than $\mathbf{O^{max}}$ then she would be better off by going to trial than having this higher offer accepted. Thus any offers higher than $\mathbf{O^{max}}$ are equilibrium dominated and are eliminated from the refined settlement range. This gives us a refined settlement range of $\mathbf{[O^{min}, O^{max}]}$. The upper bound of this range is, of course, dependent on the defendant having made an offer into court of $\mathbf{O^{max}}$. The defendant will never make an offer higher than $\mathbf{O^{max}}$ and, equally, will not accept a plaintiff demand higher than $\mathbf{O^{max}}$ if she knows she has the ability to make a such an offer into court[11].

The possible settlement ranges – the conventional settlement range under the English rule alone, $CSR_E$, the conventional settlement range under the English rule with defendant offers into court (DOC), $CSR_{DOC}$, and the refined settlement range under the English rule with defendant offers into court, $RSR_{DOC}$ - are illustrated in Figure 1. Under the English rule alone, the threat point of the plaintiff, $T_p$, will be equal to the plaintiff's (constant) expected return to trial (from equation 2), shown by the lower horizontal line in Figure 1. The threat point of the defendant, $T_d$, is given by the defendant's expected loss from trial (from equation 3) and is the higher horizontal line

[11] From the first part of equation 8, $O^{max}=J+PF[1-Q(O^{max})]$. Therefore the refined settlement range, $RSR_{DOC}$, equals $O^{max} - O^{min} = J+PF[1-Q(O^{max})] - [J-(1-P)F -PFQ(O^{min})] = F-PF(O^{max}+O^{min})$. Comparing this equation 9, shows that $RSR_{DOC} \leq CSR_{DOC}$..

in Figure 1. The conventional settlement range is simply those offers that lie between these two amounts. The diagram uses a 45° line to map these onto the horizontal axis.

Under the English rule with defendant offers into court, the expected gain from trial to the plaintiff is dependent on any offers into court made by the defendant. This is illustrated in Figure 1 by the line $T_p^{DOC}$. This line shows the relationship between the expected court outcome for the plaintiff and the offer into court made by the defendant. From equation 8, it is downward sloping[12]. We show the lower limit of the conventional settlement range under defendant offers into court by the offer into court that makes the plaintiff's expected return to court equal to that offer. It is thus at point A on Figure 1. The top of the conventional settlement range under offers into court is the same as it was under the English rule alone.

The refined settlement range eliminates any equilibrium dominated offers for the defendant. As detailed above, a defendant offer will be equilibrium dominated if it is higher than the defendant's expected loss from trial, $T_d^{DOC}$, once that offer has been made. Once the defendant has made an offer into court at point B, any higher offer by the defendant will be equilibrium dominated. We thus have $O^{max}$ at point B and the refined settlement range is defined $\mathbf{[O^{min}, O^{max}]}$.

### *2.4 The effect of bargaining power*

Following Anderson (1994) we define $\boldsymbol{\mu_p}$, $\boldsymbol{\mu_d}$ as the bargaining power that each individual (both the plaintiff and the defendant) perceives themself to have[13] ($\mathbf{0 \leq \mu_i \leq 1}$, $\mathbf{i=p,d}$). We make the assumption that these perceived bargaining strengths are constant.

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[12] If an offer into court is made that is below the minimum level of damages, $x_{min}$, then it will have no possible effect. Hence the lines $T_p^{DOC}$ and $T_d^{DOC}$ follow the lines $T_p$ and $T_d$ respectively between zero and $x_{min}$.

[13] The bargaining power that the defendant perceives the plaintiff to have is thus $\mathbf{(1-\mu_d)}$ and the bargaining power that the plaintiff perceives of the defendant is $\mathbf{(1-\mu_p)}$.

The terms represent the share of the (initial) settlement range that each side believes it has the power to claim. Thus $\mu_p = 0$ would represent a weak plaintiff who would be willing to settle at the lower point of the settlement range, $\mu_d = 0$ would represent a weak defendant who would be willing to settle at the high point of the settlement range.

The relationship between $\mu_p$, $\mu_d$ determines the likelihood of settlement given a particular settlement range. If $\mu_p + \mu_d = 1$ then we have a single solution for a settlement value - that given by a generalised Nash bargaining solution[14]. As before, we assume that both sides have identical beliefs about the court outcome. Under the English rule this defines the settlement range as the total costs and the upper and lower bounds as $T_p$ and $T_d$. We define $S_p$ as the minimum settlement the plaintiff will be willing to accept and $S_d$ as the maximum settlement the defendant will be willing to agree given their respective perceived bargaining power. Thus we have:

$$\begin{aligned} S_p &= T_d + F\mu_p \\ S_d &= T_p - F\mu_d \end{aligned} \qquad (10)$$

In Figure 2A we have the case where the sum of the perceived bargaining strengths is less than one. In this case $S_p$ is lower than $S_d$ and settlement will occur at some point in the range $[S_p, S_d]$. In Figure 2B, the sum of the perceived bargaining strengths is equal to one and settlement will occur at point $S_p = S_d$. In the final case, Figure 2C, the sum of the perceived bargaining strengths is greater than one. Thus, $S_p$ is higher than $S_d$, and settlement will not occur — even though settlement would be mutually beneficial. Relaxing the assumption of constant perceived bargaining strength, situation C would occur if the parties were not sufficiently flexible in revising their perceived strength.

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[14] Expressing this section in terms of Nash bargaining, we have the gain to the plaintiff (the excess of the offer over her expected court outcome), $G_p$, and the gain to the defendant, $G_d$, (from settling for a lower amount than her expected court outcome) from a settlement of S. Using standard techniques we can maximise:

$$G(S) = [G_p]^{\mu_p} [G_d]^{\mu_d} = [S - T_d]^{\mu_p} [T_p - S]^{\mu_d}$$

to find the Nash bargaining solution of : $S = T_p \mu_p + T_d \mu_d$ which can be shown to be identical to Equation 10 when $\mu_p + \mu_d = 1$.

When one considers offers into court, the standard settlement range no longer applies. We will analyse the effect of the refined settlement range but argue that the starting position is the conventional settlement range. We define the threat point of the defendant, before any offer is made by the plaintiff, as $\mathbf{T_d(.)}$ and remind ourselves that $\mathbf{O^{min}}$ is also dependent on any previous offer into court by using the notation $\mathbf{O^{min}(.)}$ for the amount of a the minimum offer into court by the defendant that is equal to the plaintiff's expected return to court once the offer is made. The range of possible settlements before any offer is made is thus $[\mathbf{O^{min}(.), T_d(.)}]$. The settlement possibilities are given by equation 11.

$$\begin{aligned} S_p &= O^{\min}(.) + F[1+PQ(O^{\min})]\mu_p \\ S_d &= T_d(.) - F[1+PQ(O^{\min})\mu_d \end{aligned} \qquad (11)$$

In section four we test this construction to see if perceived bargaining power can explain settlement failures.

### *2.5 The effect of risk aversion*

If the participants are risk averse, the threat point faced by the plaintiff should be less that the expected outcome at trial, and the threat point faced by the defendant should be greater than the expected trial outcome. Risk aversion makes the certainty equivalent that each party would be prepared to accept rather than face trial such that the settlement range (and hence the probability of settlement in the Landes-Posner-Gould model) increases. But with any given level of risk aversion a switch of cost regime should have an effect in the same direction. The added uncertainty brought about by the increased stakes under defendant offers into court (which include now not only the uncertain damages but the uncertain burden of the costs) will increase the zone of possible agreement, as the risk aversion of the parties rises.

Thus, risk averse plaintiffs will tend to accept lower defendant offers to avoid the risks

of trial and risk averse defendants will tend to accept higher plaintiff claims for the same reason. It is thus quite likely that there will be a strong correlation between risk aversion and bargaining power, as outlined in the preceding section. This is a point to which we will return in the empirical analysis below.

### *2.6 Parameterisation of the model*

This section outlines the above model in terms of the parameters and award probability distributions used in the experiments. Fuller experimental detail is provided in the next section, but, to summarise, plaintiffs and defendants have common knowledge of a 75% chance of a judge finding for the plaintiff. In such an event, the damages awarded have an equal probability of being anywhere between £2000 and £10000. The total legal costs of both sides is £6000.

In more general terms, the court award, if the case is successful, is given by a uniform probability distribution from $\mathbf{X_{min}}$ to $\mathbf{X_{max}}$. Thus, any award in this range is equally likely. This allows us to express $\mathbf{Q_d(O)}$ as:

$$Q(O) = \frac{O - X_{\min}}{X_{\max} - X_{\min}} \tag{12}$$

The expected court award is simply $\mathbf{(X_{min}+X_{max})/2}$. This allows us to express the expected gain and loss for each side under the English rule (from equation 6) as:

$$\begin{aligned} T_d &= P\frac{X_{\min} + X_{\max}}{2} + PF \\ T_p &= P\frac{X_{\min} + X_{\max}}{2} - (1-P)F \end{aligned} \tag{13}$$

and under the English rule with offers into court (from equation 11) as:

$$T_d^{DOC} = P\frac{X_{\min} + X_{\max}}{2} + PF\left[1 - \frac{O - X_{\min}}{X_{\max} - X_{\min}}\right]$$
$$T_p^{DOC} = P\frac{X_{\min} + X_{\max}}{2} - (1-P)F - PF\left[\frac{O - X_{\min}}{X_{\max} - X_{\min}}\right] \quad (14)$$

Our expression $\mathbf{O^{min}}$, the bottom of the conventional (and refined settlement) range is such that $\mathbf{T_p^{DOC}(O^{min})=O^{min}}$. We thus have:

$$O^{\min} = \frac{P(X_{\max}^2 - X_{\min}^2) - 2F\left((1-P)X_{\max} - X_{\min}\right)}{2(FP + X_{\max} - X_{\min})} \quad (15)$$

Our expression $\mathbf{O^{max}}$, the top of the refined bargaining range is such that $\mathbf{T_p^{DOC}(O^{max})=O^{max}}$**.** We thus have:

$$O^{\max} = \frac{P(X_{\max}^2 - X_{\min}^2 + 2F\,X_{\max})}{2(F\,\mathrm{P} + \mathrm{X}_{\max} - X_{\min})} \quad (16)$$

The parameters used reflect the experimental arrangements (discussed below) and are shown in Table 1. From these parameters the various settlement ranges under the two cost allocation rules were calculated and are shown in Table 2. These values can be seen in Figure 1. Under the English rule alone, the conventional settlement range is from 3000 to 9000, and under the English rule with defendant offers into court the conventional settlement range is from 2640 to 9000 and the refined settlement range is from 2640 to 6480.

Finally, considering the question of bargaining power, substituting values into equations 10 and 11, we have:

| *British Rule* | *British Rule DOC* |
|---|---|
| $S_p = 3000 + 6000\mu_p$ | $S_p = 2640 + 6360\mu_p$ |
| $S_d = 9000 - 6000\mu_d$ | $S_d = 9000 - 6360\mu_d$ |

(17)

## 3. Experimental Setup

A total of 38 participants are used over 4 sessions. These participants are all students at the University of Edinburgh. Participants are randomly allocated the roles of defendant or plaintiff on arrival and retain these roles for the entire two-hour session. Written documentation explaining the experiment is provided[15] to each participant. The parameterisation is that outlined in section 2.5 and Table 1.

Participants in the experiments negotiate over a computer network using software developed by the authors for this purpose[16]. The pairings are randomised from game to game and at no time does any participant know against whom they are playing. Three trial games are played to allow the participants to become familiar both with the technology employed and the nature of the experiment.

Once participants are comfortable with the arrangements, data is collected for twelve games - three of the English rule, followed by six of the English rule with defendant offers into court (DOC), followed by another three of the English rule. Every participant is given a starting amount of game money in each game This is to pay any costs, damages awards or settlements incurred. It differs by participant type and is calculated to ensure a non-negative end result for each participant. Those assigned to the defendant roles are given £16000 for each game, and those assigned to the plaintiff role are given £6000[17]. In each game the plaintiff has the chance to make the first bid[18].

Games last for 3 minutes each and if time runs out without a settlement being reached,

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[15]The documentation can be found on the World Wide Web at: http://www.ed.ac.uk/~ejaa17

[16]Details of the software developed and used can also be found at http://www.ed.ac.uk/~ejaa17

[17] For example, the worst outcome for the defendant would be to end up at trial with the judge finding for the plaintiff (£6000 costs) and awarding maximum damages of £10000.

[18]A previous experiment (see Main and Park 1998) shows that varying the side who has the first bid had no effect on either the frequency or value of settlement. For simplicity and realism, the plaintiffs were chosen as the first player in each game.

a trial result is imposed on those who have not settled. Participants can also elect to go to trial at any time during the negotiation period. To simulate the trial process, at the end of each game a roulette wheel is spun (36 numbers - the zero is always ignored and the wheel respun if it comes up) and a number between one and nine taken to represent the case being rejected, i.e., with a probability of 0.25. If the case is accepted (any number 10 to 36), a ball is drawn from a bingo cage containing equal numbers of balls numbered from 20 to 100. The value of the randomly ball represents the court award in £100's. After this process is complete, each player's screen shows their individual 'score' for that game.

Payment for the participants is determined by picking one of the twelve games at random (at the end of the session) and using this game as the basis of payment for everyone. This arrangement is designed to avoid any wealth effects arising as the session progressed. The participant's score in game money, in the chosen game, is divided by a thousand to convert it to actual pounds. In addition, all participants are paid a £5 attendance fee. The average payment for the two hour session is £16 for those individuals who settled in the chosen case and £13 for those who did not, although the total actual outcome for any individual could be anywhere between £5 and £27[19].

## 4. Results

The basic results are presented in Table 3 which shows the total number of settlements, f, under the two cost allocation rules - the English rule ($f_E$) and the English rule with defendant offers into court ($f_{DOC}$) and some basic summary statistics on the value of the settlements, Y, again for the two rules.

We test, using a Fisher Exact Test and a Chi-square test, the null hypothesis that the frequency of settlements under the English rule ($f_E$) was equal to the frequency of

[19] The actual payments ranged from £5 to £21 with an average of £15.40.

settlements under the English rule with defendant offers into court ($f_{DOC}$ ). The results are presented in Table 4. We were unable to reject this null hypothesis (that the frequency of settlement was the same under the two cost allocation rules).

Turning to the location of the settlement point we would expect the value of the settlements reached under the English rule ($Y_E$) to be greater than those reached under the English rule with defendant offers into court. Table 5 presents a standard t-test and a Wilcoxon-Mann-Whitney (ranksum) test of the null hypothesis that the value of the settlements is the same under each rule against the alternate hypothesis that the value of settlements under the English rule ($Y_E$) is larger. It also reports a Kruksal-Wallis test of the same null hypothesis against the alternative hypothesis that the settlements are different. For each of the three tests we were able to reject the null hypothesis that the settlement levels are equal and we thus find that, as predicted, the addition of defendant offers into court lowers the settlement value. The rule, therefore, seems to act in the interest of the defendant. Note, however, that our earlier results in Table 4 suggest that it leaves the propensity to settle unaffected.

We now consider the settlement dynamics. The average settlement time under the English rule was 34.3 seconds (i.e., 34.3 seconds remaining out of a total of 180 seconds allowed for negotiation) and the average settlement time under the English rule with defendant offers into court was 38.9 seconds. A standard t-test showed no significant difference between these values[20].

Table 6 presents the results of a multivariate analysis of the settlement propensity observed in the experiment. Whether or not a game ends in settlement (1/0) is analysed in a probit as a function of various descriptors of the negotiating dyad. These descriptors include the type of cost shifting regime in place (Type: 1 if defendant offers into court are available, 0 otherwise), the gender composition of the dyad (MaleFemale: a dummy for mixed gender; and FemaleFemale: a dummy for two women; the omitted

20 A value of t=0.2748 compared with the critical value of 1.9746 at 163 degrees of freedom.

category being all male dyads), a risk aversion measure for each individual[21] (RAD and RAP for defendant and plaintiff respectively), and a measure of the willingness to horse-trade or log-roll as indicated by opening bids (Spread-d and spread-p: for the defendant and plaintiff respectively, the difference between their first two bids or the first bid and settlement, if settlement happens directly[22]).

It can be seen that in all specifications the variable "Type" remains insignificant. This confirms the results presented above. There is some indication of gender effects, however, with all female dyads being markedly more likely to settle than all male dyads. Even the presence of one woman in the negotiating dyad seems to increase the propensity to settle significantly. These effects are significant in a statistical and empirical sense. Thus, a two woman negotiating pair are here some 55.9% more likely to settle than an all-male dyad, and the inclusion of one female increases settlement probability by some 35.2%. Of the other influences, only the risk aversion of the defendant has an significant impact. More risk averse defendants increase the probability of reaching an out-of-court settlement. It is interesting to note that the defendants start out each game with a relatively large endowment of money. They also face a loss frame (in Tversky and Kahneman (1986) terms) and would be expected, other things being equal, to be more risk taking.

As mentioned in Section 2.4, one possible explanation for a failure to settle may be that the sum of the perceived bargaining strengths of the two parties exceeds one. To test this hypothesis we calculate the perceived bargaining strength for each individual based on the first six games played. From this we are able to select which potential pairs of subjects have a perceived bargaining strength that is statistically greater than unity (at 5%, 10%, 15% and 20% confidence). We then use this information to predict the results (settle or not settle) in the pairings that emerge in the remaining six games. We

[21] The risk aversion measure utilised is the response to a question each participant is asked about the most they would be prepared to pay for a 50:50 chance of winning £10. The data used come from a question asked at the end of the experiment when individuals do not yet know how much they have earned, but all are guaranteed at least £5. The participants also answer the question knowing that the highest bidder will be asked to engage in the 50:50 gamble on a spin of the roulette wheel, albeit being charged the value of the second highest bid for entry to the gamble.

[21] There was no occurrence of the first bid being accepted

compare the actual and predicted results in each case using a sign-test. The results are shown in Table 7.

An examination of Table 7 shows that, broadly, as we increase the confidence level the number of correctly predicted settles falls and the number of correctly predicted non-settles rises. At confidence levels up to 10% the predicted outcomes are not statistically different from the actual outcomes[23]. It would thus seem that a possible reason for the failure to settle would indeed be an inconsistent perceived bargaining strength on the part of the two sides[24].

## 5. Conclusion

From the empirical results presented above we can confirm the earlier predictions of Posner (1973) that the introduction of offer-dependent cost shifting rules such as defendant offers into court makes little or no difference to the propensity to settle. These results also support Chung (1996) who revised and modified Miller's (1986) original predictions regarding an expanded settlement range. Chung demonstrates that the settlement range is in fact shortened when one eliminates dominated offers. This notion of a refined settlement range suggests that there might be a lower propensity to settle under offers into court regimes. In our empirical experiments, we find no statistically significant difference between the two regimes in terms of settlement propensity.

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[23] It should be noted that the power of this test is very low.

[24] A Heckman Selection Model, using the probit model reported earlier, is used to examine the effect of bargaining power on settlement values. Using the data from the final six games, the settlement value in those cases that did settle is regressed against game type, gender of each side, risk aversion of each side and the calculated bargaining power coefficients for each side. The only significant variables are type and the defendant's bargaining power, with signs in the direction expected - settlement values are lower under defendant offers into court and high defendant bargaining power reduces the settlement values.

In terms of the level of settlement, however, our results do confirm earlier theoretical analysis in that the rule is pro-defendant in lowering the size of the agreed settlements. The empirical magnitude of the effect is, however, small, with the average settlement falling from £6627 to £6324. This is an important move, however, as once defendant offers are introduced a range of possible settlements (including the £6627) are dominated by lower offers-to-settle that the defendant can make. The cut-off here is £6480 and, thus, the £6324 figure can be seen to lie in the feasible range, although it does seem that defendants do not exploit the advantage of offers into court to any great extent.

Earlier experimental work by Coursey and Stanley (1988) examines the impact of the American rule versus the English rule versus Rule 68 (similar to defendant offers into court) and finds that the Rule 68 arrangement did have a tendency to shift settlements in favour of the defendant and, under some conditions (an asymmetric award distribution) Rule 68 was also seen to encourage settlement.

Our findings can be compared with those produced in an earlier pilot study Main (1997), where a manual pen-and-paper experiment similar to that of Coursey and Stanley is conducted but where there were much weaker monetary incentives. There, defendant offers into court produces no statistically significant impact on the propensity to settle. Nor, in that study, is there any statistically significant impact on the level of settlement. Other empirical studies in this area, such as those by Anderson and Rowe (1996) and Rowe and Anderson (1995) have developed a simulation approach first attempted by Rowe and Vidmar (1988), in which participants (often law students or practising lawyers) are invited to react to certain hypothetical case situations. Their results generally point in the direction of defendant offer rules having an impact on the level of settlement, but influencing the settlement process itself more through eliciting offers in a more timely manner rather, than increasing the likelihood of settlement itself.

The analysis above focuses attention on the main "problem" of offer-based fee shifting rule. As long as they merely shift the fee burden from one party to the other, they do little to increase the propensity to settle. If one side is markedly more risk averse than the other (entirely plausible in some areas where one-shot personal injury plaintiffs are suing repeat-player insurance companies), then there may be some scope for encouraging out of court settlement. But this would be produced at a distributional price of lowering the gains of the plaintiff and decreasing the costs of the defendant. Policy proposals in Cullen (1995) and Woolf (1996) involve extending the offers into court procedure to both sides (i.e., so that the plaintiff could make similar offers to compromise). If, with either defendant offers or plaintiff offers, the extra expense were to be awarded to a third party rather than to the other side, then this may indeed produce a genuine expansion of the settlement range. There is considerable resistance to such a move in the legal community, who are prepared to accept the shifting of expenses but are resistant to the notions of fines or penalties.

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Table 1 - The parameters used

| Parameter | Value |
|---|---|
| P | 0.75 |
| F | 6000 |
| Ymax | 10000 |
| Ymin | 2000 |

Table 2 - The conventional and refined settlement range under the two cost allocation rules.

| | Conventional Settlement range | | | Refined Settlement range | | |
|---|---|---|---|---|---|---|
| Cost rule | Range | Minimum | Maximum | Range | Minimum | Maximum |
| English rule | 6000 | 3000 | 9000 | - | - | - |
| English rule (DOC) | 6340 | 2640 | 9000 | 3840 | 2640 | 6480 |

Table 3 - Basic Results-

| | Cost Allocation Mechanism | | |
|---|---|---|---|
| | English | English with Defendant offers into Court | Total |
| No of Settlements ($f_e$, $f_{doc}$) | 83 | 82 | 163 |
| No of 'Gone to Courts' | 31 | 32 | 63 |
| Total | 114 | 114 | 228 |
| Value of settlements (Y) | | | |
| Mean (μ) | 6626.5 | 6324.4 | |
| Std. Dev. | 825.96 | 759.56 | |
| Minimum | 5000 | 4000 | |
| Maximum | 8500 | 8400 | |
| Range | 3500 | 4400 | |

Table 4 - Analysis of frequency of settlement

| Hypothesis | Test | Statistic | Critical Value (5%) | Probability | Conclusion |
|---|---|---|---|---|---|
| Ho: $f_e=f_{DOC}$ | Fisher Exact | - | - | 1.000 | Accept Ho |
| $H_1$: $f_e \neq f_{DOC}$ | Chi-square (df=1) | 0.0219 | 3.84 | 0.882 | Accept Ho |

Table 5 - Analysis of settlement points

| Hypothesis | Test | Statistic | Critical Value (5%) | Probability | Conclusion |
|---|---|---|---|---|---|
| Ho :$Y_e=Y_{DOC}$<br>$H_1$ :$Y_e>Y_{DOC}$ | Standard t | 2.44 (226 df) | 1.67 | 0.0078 | Reject Ho |
| Ho :$Y_e=Y_{DOC}$<br>$H_1$ :$Y_e>Y_{DOC}$ | Wilcoxon-Mann-Whitney | 2.42 | 1.65 | 0.0078 | Reject Ho |
| Ho : $Y_e = Y_{DOC}$<br>$H_1$: $Y_e \neq Y_{DOC}$ | Kruksal-Wallis | 5.845 (1df) | 3.84 | 0.0156 | Reject Ho |

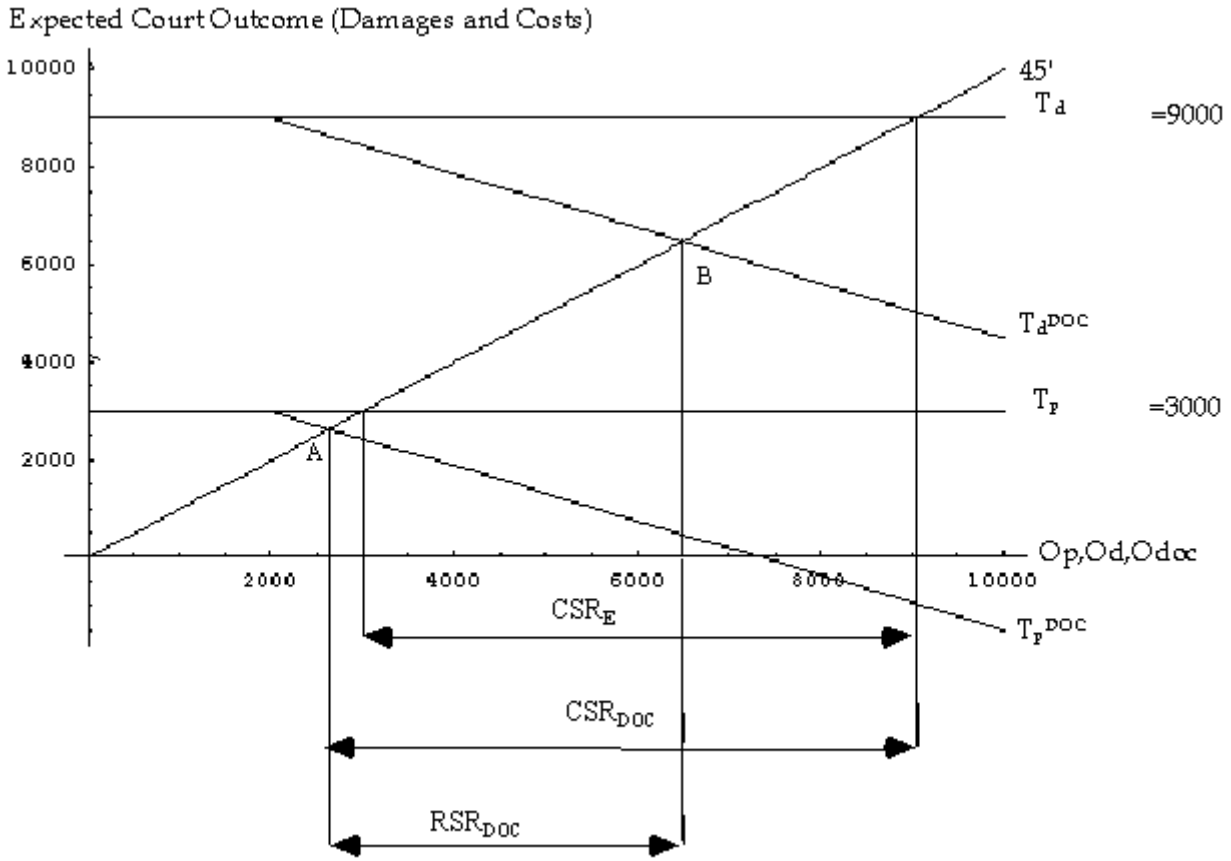
Table 6 – Probit results (standard errors in parentheses) (228 observations)

| Variable | Description | Model 1 | Model 2 | Model 3 |
|---|---|---|---|---|
| Constant | | 0.129<br>(.199) | 0.442<br>(0.328) | 0.119<br>(0.353) |
| Type | Game type – 1 represents defendant offers into court, 0 represents English rule alone. | -0.0116<br>(0.181) | -0.00365<br>(0.182) | 0.0449<br>(0.185) |
| MaleFemale | Dummy variable – 1 represents subject pair comprising one male, one female | 0.510<br>(0.217) | 0.504<br>(0.22112) | 0.475<br>(0.224) |
| FemaleFemale | Dummy variable – 1 represents subject pair comprising two females | 0.876<br>(0.259) | 0.834<br>(0.272) | 0.755<br>(0.278) |
| R.A.D. | Stated risk aversion of the defendant | - | -0.0865<br>(0.0551) | -0.0825<br>(0.0555) |
| R.A.P. | Stated risk aversion of the plaintiff | - | -0.01224<br>(0.0477) | -0.0214<br>(0.0481) |
| Spread-d x $10^{-3}$ | Difference between defendant's first and second claim. | - | - | 0.172<br>(0.114) |
| Spread-p x $10^{-3}$ | Difference between plaintiff's first and second claim. | - | - | 0.212<br>(0.107) |
| | | | | |
| Goodness of Fit Statistic | Chi-Squared (df) | 12.042 (3) | 14.553 (5) | 21.35077(7) |
| | Significance Level | 0.0072399 | 0.012452 | 0.003284 |

Table 7 – Test of bargaining power hypothesis

| Confidence Level<br>Sum of bargaining power coefficients greater than one | 5% | | 10% | | 15% | | 20% | |
|---|---|---|---|---|---|---|---|---|
| Predicted Settle/Actual Settle | 60 | 78 | 56 | 76 | 49 | 71 | 42 | 64 |
| Predicted Non-Settle/Actual Non-Settle | 18 | | 20 | | 22 | | 22 | |
| Predicted Settle/Actual Non-Settle | 16 | 36 | 14 | 38 | 12 | 43 | 12 | 50 |
| Predicted Non-Settle/Actual Settle | 20 | | 24 | | 31 | | 38 | |
| Sign-test prob. value | 0.7789 | | 0.3994 | | 0.0928 | | 0.0188 | |
| Conclusion<br>Ho: Predicted Outcomes = Actual Outcomes<br>$H_1$: Predicted Outcomes ≠ Actual Outcomes | Accept | | Accept | | Reject | | Reject | |

Figure 1 – Settlement ranges under the English rule and under the English rule with defendant offers into court




KEY

$CSR_E$ - Conventional Settlement Range with English Rule

$CSR_{DOC}$ - Conventional Settlement Range with defendant offers into court

$RSR_{DOC}$ - Refined Settlement Range with defendant offers into court

Figure 2 - Settlement possibilities under the English rule