Strategic Announcements of Reference Points in Disputes and Litigations

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Abstract

I rationalize the common observation of inflated claims in disputes and litigations in a model in which litigants display reference-dependent preferences, are uncertain about the arbitrator's type, and strategically announce their reference points.

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JEL classification: K41, D03, D63.

The squeaky wheel gets the grease

American proverb

1. Introduction

Disputes about how to share goods and resources generally arise because litigants hold competing claims, i.e., claims that are mutually inconsistent as their sum exceeds the available amount. Competing claims characterize bankruptcy problems (see Thomson, 2003 and 2015 for reviews). They also play an important role in the division of assets and debts in contested divorces (Wilkinson-Ryan and Baron, 2008), in the payment of

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insurance premia between insurance companies and claimants (Lougran, 2005), and in the incidence of disputes about grievances (Miller and Sarat, 1980).

Behavioral biases that unconsciously lead claimants to overestimate how much they deserve certainly contribute to generating such a phenomenon. For instance, it is well known that self-serving bias can create costly impasses in bargaining and negotiations (Babcock and Loewenstein, 1997, Farmer *et al.*, 2004, Gallice, 2011); however, the announcement of high claims can also be the result of a strategic decision by the parties. Indeed, there is evidence that strategically inflated claims play a role in lawsuits, especially in those about labor relations (Kaplan *et al.*, 2008) or physical and psychological injuries (Iverson and Lange, 2005).

I investigate the strategic aspects of announcing one's own claim to an arbitrator in a framework in which litigants have reference-dependent preferences (RDPs). RDPs explicitly acknowledge the fact that an agent's perception of a given outcome is not solely determined by the outcome *per se*, but also influenced by how the outcome compares with the agent's reference point. RDPs thus seem particularly appropriate to model the preferences of individuals involved in disputes and litigations. These are, in fact, situations in which litigants form expectations about the arbitrator's decision and then inevitably compare the actual outcome with the expected one.[1]

Gallice (2019) studies the implications that RDPs bring in the analysis of standard bankruptcy problems.[2] In such a setting, agents' claims are exogenously given and the arbitrator takes them at face value. In this paper, I instead specifically focus on litigations and thus allow for the possibility that agents strategically manipulate their claims with the goal of influencing the final verdict. Litigants are, however, uncertain about the arbitrator's type since they do not know the social welfare function that he adopts. Litigants' reference points are thus given by their beliefs about the arbitrator's type, or, analogously, by their beliefs about the outcomes that different types of arbitrators would implement.

[1] Abeler *et al.* (2011) and Ericson and Fuster (2011) empirically confirm the relevance of expectations in shaping agents' reference points.

[2] More in details, Gallice (2019) identifies the (possibly new) allocative rules that maximize utilitarian and maxmin welfare under different specifications for claimants' reference points. Gallice (2018) instead provides a survey about how social status concerns (which can be influenced by self-serving bias) impact on individuals' preferences for redistribution and on the design of optimal tax policies.

On the other hand, the arbitrator is unaware of litigants' true reference points. As he anticipates that claims are possibly inflated, he approximates the litigants' reference points by discounting their claims.

In equilibrium, litigants do indeed inflate their claims. Their true reference points, however, reflect the arbitrator's actual choice. The arbitrator, for its part, correctly anticipates the agents' reference points and allocates the endowment such as to exactly match them. Litigants thus do not experience any perceived gains or losses as they get precisely what they were expecting to get. Since RDPs imply that losses loom larger than gains, the equilibrium allocation maximizes welfare, independent of the specific social welfare function that the arbitrator uses.

2. The Model

Two litigants delegate to an arbitrator the decision about how to share a homogeneous and perfectly divisible good of size $E > 0$. Litigants have reference-dependent preferences à la Kőszegi and Rabin (2006). Their utility function is given by:

$$u(x_i \mid r_i) = x_i + \mu(x_i - r_i) \tag{1}$$

where $x_i \in [0, E]$ is the amount that the arbitrator allocates to litigant $i \in \{1, 2\}$, r_i is the litigant's reference point (to be defined later), and $\mu(\cdot)$ is a gain-loss function that satisfies the following properties:

P1: $\mu(z)$ is continuous for all z, strictly increasing and such that $\mu(0) = 0$.

P2: $\mu(z)$ is twice differentiable for $z \neq 0$, with $\mu''(z) > 0$ if $z < 0$ and $\mu''(z) < 0$ if $z > 0$.

P3: if $y > z > 0$ then $\mu(y) + \mu(-y) < \mu(z) + \mu(-z)$.

P4: $\lim_{z \to 0^-} \mu'(z) / \lim_{z \to 0^+} \mu'(z) \equiv \lambda > 1$.

The function $\mu(\cdot)$ is thus convex in the domain of losses ($x_i < r_i$), concave in the domain of gains ($x_i > r_i$), and it captures the loss aversion phenomenon (Kahneman and Tversky, 1979).

The arbitrator selects the allocation $x = (x_1, x_2)$ that maximizes the generalized utilitarian social welfare function $W(x) = \phi(u(x_1 \mid \tilde{r}_1)) + \phi(u(x_2 \mid \tilde{r}_2))$, where $\phi(\cdot)$ is an increasing and strictly concave function and $\tilde{r}_i$ is the arbitrator's perception about litigant i's reference point (in particular it is not necessarily the case that $\tilde{r}_i = r_i$).

All agents face some uncertainty. Litigants are uncertain about the arbitrator's type, as they do not know the function $\phi(\cdot)$.[3] Their beliefs are captured by the probability distribution F defined over the possible realizations of $\phi(\cdot)$.

The arbitrator does not know litigants' reference points $r = (r_1, r_2)$. In line with standard litigation procedures, each litigant announces to the arbitrator his claim $c_i \in [0, E]$ on the contested good. The arbitrator however anticipates that claims can be inflated so that $c_i \geq r_i$. Therefore, he discounts litigants' claims and approximates the vector r with $\tilde{r} = (h(c_1), h(c_2))$ where $h(c_i)$ is such that $h(c_i) \in [0, c_i]$ and $\frac{\partial h(c_i)}{\partial c_i} > 0$ for any $i \in \{1, 2\}$.[4] The arbitrator thus solves the following problem:

$$\max_x W(x) = \phi\left(x_1 + \mu(x_1 - h(c_1))\right) + \phi\left(x_2 + \mu(x_2 - h(c_2))\right) \tag{2}$$

To close the model, I still need to specify litigants' reference points $r = (r_1, r_2)$. Following Kőszegi and Rabin (2007), I let litigants' reference points coincide with their beliefs about what the arbitrator will do. Different types of arbitrators use different $\phi(\cdot)$ functions and may thus implement different optimal allocations $\hat{x} \in \hat{X}$. Litigants' beliefs about the outcome of the dispute are thus captured by the probability distribution G, which stems from F and is defined on $\hat{X}$. Formally, $r_i = G$ so that a litigant's evaluation of any allocation $x' = (x'_1, x'_2) \in \hat{X}$ is given by:

$$U(x'_i \mid r_i = G) = \int u(x'_i \mid y_i) \quad dG(y) \tag{3}$$

[3] The more concave is $\phi(\cdot)$, the more egalitarian will be the allocation $\hat{x}$. In particular, as $\phi(\cdot)$ approaches a linear function, $W(x)$ tends to the purely utilitarian social welfare function, $W(x) = u(x_1 \mid \tilde{r}_1) + u(x_2 \mid \tilde{r}_2)$, whereas as $\phi(\cdot)$ becomes "infinitely"concave, $W(x)$ approaches the maxmin social welfare function, $W(x) = \min\{u(x_1 \mid \tilde{r}_1), u(x_2 \mid \tilde{r}_2)\}$.

[4] The requirement $\frac{\partial h(c_i)}{\partial c_i} > 0$ is a key assumption of the model. I will comment on how results would differ under the alternative hypothesis $\frac{\partial h(c_i)}{\partial c_i} = 0$ and $\frac{\partial h(c_i)}{\partial c_i} < 0$ and argue that the case I focus on is the most relevant one.

where $y = (y_1, y_2) \in \hat{X}$ and $u(x'_i \mid y_i)$ is as defined in (1). The formulation thus considers how x' compares with *all* the possible alternatives in $\hat{X}$.

2.1 The Incentives to Inflate Claims

Proposition 1 describes the effects of claims on litigants' payoffs. In spite of the arbitrator's discounting, what a litigant gets allocated remains positively anchored to his claim. High claims thus benefit claimants' utility.

PROPOSITION 1. $\frac{\partial u(x_i|r_i)}{\partial c_i} > 0$ *for any* $r_i \in [0, E]$ *and any* $i \in \{1, 2\}$. *Litigants thus have an incentive to inflate their claims.*

To prove the result, substitute the condition $x_2 = E - x_1$ in (2) (litigants' preferences are strictly increasing in x_i and thus the arbitrator allocates the entire endowment) and differentiate with respect to x_1. The first order condition implies that the optimal allocation $\hat{x} = (\hat{x}_1, \hat{x}_2)$ equalizes litigants' marginal utilities.[5] Formally:

$$\overbrace{\phi'\left(\hat{x}_1 + \mu(\hat{x}_1 - h(c_1)\right)}^{[p]} \cdot \overbrace{\left[1 + \mu'(\hat{x}_1 - h(c_1))\right]}^{[q]} = \underbrace{\phi'\left(E - \hat{x}_1 + \mu(E - \hat{x}_1 - h(c_2)\right)}_{[s]} \cdot \underbrace{\left[1 + \mu'(E - \hat{x}_1 - h(c_2))\right]}_{[t]} \quad (4)$$

Condition (4) is an equality between two products. With no loss of generality, assume first that $[q] \leq [t]$, i.e.:

$$\left[1 + \mu'(\hat{x}_1 - h(c_1))\right] \leq \left[1 + \mu'(E - \hat{x}_1 - h(c_2))\right] \quad (5)$$

For (4) to hold it must then be the case that $[p] \geq [s]$, that is:

$$\phi'\left(\hat{x}_1 + \mu(\hat{x}_1 - h(c_1)\right) \geq \phi'\left(E - \hat{x}_1 + \mu(E - \hat{x}_1 - h(c_2)\right) \quad (6)$$

[5]Since $W(\cdot)$ is a continuous function defined on a compact space, the extreme value theorem applies and thus problem (2) has a solution. I will later verify that the FOC is indeed sufficient to identify the (unique) maximum of $W(\cdot)$.

The function $\phi(\cdot)$ is strictly concave and monotonically increasing. Thus, its derivative $\phi'(\cdot)$ is monotonically decreasing. It follows that (6) holds if and only if:

$$\hat{x}_1 + \mu(\hat{x}_1 - h(c_1)) \leq E - \hat{x}_1 + \mu(E - \hat{x}_1 - h(c_2)) \tag{7}$$

The last condition can also be expressed as:

$$2\hat{x}_1 + \mu(\hat{x}_1 - h(c_1)) - E - \mu(E - \hat{x}_1 - h(c_2)) = k \tag{8}$$

with $k \leq 0$. Focusing for the moment on litigant 1, (8) can be written as:

$$\Psi(\hat{x}_1, c_1) = 2\hat{x}_1 + \mu(\hat{x}_1 - h(c_1)) - \mu(E - \hat{x}_1 - h(c_2)) - (E + k) = 0 \tag{9}$$

This is an implicit function that satisfies the assumptions of the implicit-function theorem. In fact, property P2 of the gain-loss function $\mu(\cdot)$ ensures that partial derivatives $\frac{\partial \Psi(\hat{x}_1, c_1)}{\partial \hat{x}_1}$ and $\frac{\partial \Psi(\hat{x}_1, c_1)}{\partial c_1}$ are continuous and different from zero for any $x_1 \neq c_1$. Total differentiation of $\Psi(\hat{x}_1, c_1)$ leads to:

$$\frac{\partial \mu(\hat{x}_1 - h(c_1))}{\partial c_1} + \left(2 + \frac{\partial \mu(\hat{x}_1 - h(c_1))}{\partial \hat{x}_1} - \frac{\partial \mu(E - \hat{x}_1 - h(c_2))}{\partial \hat{x}_1}\right) \frac{\partial \hat{x}_1}{\partial c_1} = 0 \tag{10}$$

such that the term $\frac{\partial \hat{x}_1}{\partial c_1}$ can be expressed as:

$$\frac{\partial \hat{x}_1}{\partial c_1} = -\frac{\frac{\partial \mu(\hat{x}_1 - h(c_1))}{\partial c_1}}{2 + \frac{\partial \mu(\hat{x}_1 - h(c_1))}{\partial \hat{x}_1} - \frac{\partial \mu(E - \hat{x}_1 - h(c_2))}{\partial \hat{x}_1}} \tag{11}$$

The numerator of (11) is negative given that $\frac{\partial h(\cdot)}{\partial c_1} > 0$ and thus, because of property P1 of the $\mu(\cdot)$ function, $\frac{\partial \mu(\hat{x}_1 - h(c_1))}{\partial c_1} < 0$. The denominator is instead positive. In particular, both the second term (again by P1) and the third term ($\hat{x}_2$ decreases as $\hat{x}_1$ increases) are positive. It follows that $\frac{\partial \hat{x}_1}{\partial c_1} > 0$.

The same result can be derived under the alternative and mutually exclusive assumption $[q] > [t]$ (see condition (4)). The only difference is that in this case $k > 0$. However, the sign and the magnitude of k do not influence equation (11) as k disappears in the total differentiation of $\Psi(\hat{x}_1, c_1)$. Moreover, $\Psi(\hat{x}_2, c_2)$ is analogous to $\Psi(\hat{x}_1, c_1)$ (the two litigants are symmetric). Thus, the condition for $\frac{\partial \hat{x}_2}{\partial c_2}$ is equivalent to the one for $\frac{\partial \hat{x}_1}{\partial c_1}$. Thus:

$$\frac{\partial \hat{x}_i}{\partial c_i} > 0 \quad \text{for any } i \in \{1, 2\} \tag{12}$$

Given that $u(x_i \mid r_i)$ is strictly increasing in x_i, the condition $\frac{\partial u(x_i|r_i)}{\partial c_i} > 0$ then necessarily holds and this concludes the proof of Proposition 1.

2.2 Equilibrium Analysis

By Proposition 1, litigants' optimal claims are as high as possible: $\hat{c}_i = E$ for any $i \in \{1, 2\}$. The arbitrator thus perceives the two litigants as identical and attributes them the same reference point $\tilde{r}_1 = \tilde{r}_2 = h(\hat{c}_i)$. In equilibrium, the arbitrator's guess is correct (i.e., $\hat{h}(\hat{c}_i) = r_i$ for any $i \in \{1, 2\}$) and litigants' true reference points match the actual allocation ($r_i = \hat{x}_i$ for any $i \in \{1, 2\}$). Given that $\tilde{r}_1 = \tilde{r}_2$ it must then be the case that $\hat{x}_1 = \hat{x}_2$. Therefore, $\hat{x} = \left(\frac{1}{2}E, \frac{1}{2}E\right)$ so that $\hat{h}(\hat{c}_i) = r_i = \hat{x}_i = \frac{1}{2}E$ for any $i \in \{1, 2\}$.

Indeed, it is easy to verify that given $\hat{h}(\hat{c}_i) = \frac{1}{2}E$, the allocation that maximizes (2), *for any* possible realization of $\phi(\cdot)$ (the arbitrator's type), is $\hat{x} = \left(\frac{1}{2}E, \frac{1}{2}E\right)$: when $\hat{x}_i = \hat{h}(\hat{c}_i) = \frac{1}{2}E$ for any $i \in \{1, 2\}$, the FOC in (4) simplifies to $\phi'(\hat{x}_1) = \phi'(E - \hat{x}_1)$, which necessarily requires $\hat{x}_1 = E - \hat{x}_1$, i.e., $\hat{x}_1 = \frac{1}{2}E$.[6] Any alternative allocation x' achieves strictly lower welfare: litigant $i \in \{1, 2\}$ experiences a gain of size $x'_i - \frac{1}{2}E = \delta > 0$ but litigant $j \neq i$ experiences a loss of size $x'_j - \frac{1}{2}E = -\delta < 0$. By properties P3 and P4 of the $\mu(\cdot)$ function, the net effect on aggregate welfare is strictly negative as the perceived loss of agent j looms larger than the perceived gain of agent i.

Finally, since $\hat{x} = \left(\frac{1}{2}E, \frac{1}{2}E\right)$ for any admissible $\phi(\cdot)$ function, litigants' expectations about the outcome of the dispute collapse to the equilibrium allocation, i.e., $g(\hat{x}) = 1$ where g is the density of G. I summarize all these results in the following proposition.

PROPOSITION 2. *In equilibrium, litigants inflate their claims* ($\hat{c}_i = E > r_i$ *for any* $i \in \{1, 2\}$),

[6] The second order condition is given by $2\phi''\left(\frac{1}{2}E\right) < 0$ given that $\phi(\cdot)$ is strictly concave.

the arbitrator properly discounts them $\left(h(\hat{c}_i) = \frac{1}{2}\hat{c}_i\right)$*, and litigants' expectations about the outcome of the dispute match the actual allocation* $\left(r_i = \hat{x}_i = \frac{1}{2}E\right)$.

3. Conclusions

I explored the strategic aspects that underlie litigants' decision to inflate their claims and showed that this is indeed an optimal strategy to pursue when litigants have RDPs and are uncertain about the arbitrator's type. Clearly, agents' incentives would differ if one allows for the possibility that the arbitrator may punish the announcement of overly high claims. The actual punishment of inflated claims, while certainly common in some specific contexts (say, a parent who wants to discipline his/her children), is rarely observed in the courtroom. Such a behavior would in fact be perceived as unfair and arbitrary and would thus increase the odds of the verdict being appealed. Arbitrators may stigmatize exceedingly high claims but will then, at worst, ignore them in deciding the actual allocation of the contested good. When this is the case, the announcement of an inflated claim still survives as a weakly dominant strategy.

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