Rent-seeking and surplus destruction in unanimity bargaining

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In non-cooperative bargaining games in the tradition of Rubinstein, the proposer's bargaining power stems from the prospect of a delay in case of disagreement. Since players are impatient, this delay is costly for everyone. We consider a unanimity bargaining game in which the proposer can strategically choose the length of this delay. We assume that the size of the surplus depends endogenously on the chosen length of the prospective delay. Intuitively, the proposer faces the following trade-off: The more he exploits his proposer power, the smaller is the surplus that can be divided. One interpretation is that aggressive bargaining tactics hurt the fruitful cooperation among players, and thus the surplus. We characterize stationary equilibrium strategies and payoffs, and obtain sharp predictions on the extent of surplus destruction, the size of the social loss, and the surplus allocation.

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1. Introduction

Unanimity bargaining games in the tradition of Rubinstein (1982) are widely used in economics and political science to study negotiations on the division of a surplus. The bargaining process is modeled as a sequence of rounds. In each round, one player makes a proposal. Unless this proposal is unanimously accepted, bargaining proceeds to another round. Every unsuccessful round comes at a social cost of disagreement ("bargaining friction") which is typically modeled as a delay. The proposer's bargaining power increases with this social cost of disagreement. It is therefore interesting to consider situations in which players can influence the extent of the social cost of disagreement in order to sway the bargaining outcome in their favor.

One classical economic example is the threat by a trade union to initiate a strike unless its demands are met in a wage negotiation (see, for instance, Fernandez and Glazer, 1991). In international relations, one example could be a country that threatens to walk away from the bargaining table for some time if certain red lines are crossed (Li, 2011). The bargaining literature has long since recognized that such commitments, postures, and threats are highly effective tactics at the negotiating table (see Schelling, 1956, 1960; Muthoo, 1992, 1996; Abreu and Gul, 2000, and Ellingsen and Miettinen, 2008). Much of the analysis in the literature focuses on the credibility of commitments and threats. What is oftentimes neglected, however, is that credible threats may be harmful even if they are not executed. To be more precise, suppose that the surplus consists of the gains from some kind of cooperation between the players. These gains may crucially depend on good relations of trust among the parties, and may thus be compromised by aggressive and threatening behavior.

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To be more specific, consider the example of a labor dispute. The firm might have the ability to bargain aggressively and obtain agreement on a very low wage. However, it needs to take into account that its success also depends on many non-contractible forms of cooperation or goodwill by its employees, and could therefore be hurt when employees feel treated unfairly.

Similarly, a union could decide to bargain aggressively and threaten a strike. Even if an agreement is reached and the strike never actually takes place, the threat might have scared away customers and thus done damage to the firm's profitability.

As a final example, aggressive bargaining behavior in international negotiations may damage prospects for future cooperation between the countries involved, and thus be detrimental to the "surplus" that parties can generate. Moreover, when countries threaten each other with sanctions or war, the mere threat may scare away investors and harm economic development. In a nutshell, many such bargaining situations involve welfare considerations while the literature has often treated them as mere surplus division problems.

Our aim in the present paper is to model a unanimity bargaining game which can capture trade-offs of the type illustrated above: Proposers are able to threaten other players with a high social cost of disagreement. The more a proposer exploits this power, however, the smaller is the available surplus. More specifically, we consider the following model: When making a proposal, the proposer can endogenously choose the time lapse which occurs in case this proposal is rejected. Due to players' impatience, choosing a long time lapse is akin to making a harsh threat. The size of the available surplus decreases with the length of the chosen time lapse. Thus, the proposer can strengthen her individual bargaining position by diminishing the surplus. This behavior is a form of "rent-seeking."

Our bargaining model has the following additional features: We allow for any finite number of players. They share a common rate of time preference. A player who rejects a proposal has the right to make a counter-proposal. This rejector-proposes bargaining protocol is appealing for several reasons: It is a proper generalization of Rubinstein's alternating offers protocol to the case with more than two players. Moreover, it treats all responding players symmetrically. Following the work of Selten (1981), the rejector-proposes protocol has been commonly used in a variety of bargaining games involving both surplus division and coalition formation problems, examples include Chatterjee et al. (1993), Bloch (1996), Ray and Vohra (1999), Ray (2007), and Kawamori (2013). In addition, Kawamori (2008) and Britz et al. (2014) study a class of bargaining protocols that generalizes the rejector-proposes protocol. In accordance with the standard approach in the literature, we restrict attention to subgame-perfect equilibria in stationary strategies.

More specifically, we focus on two main questions: We investigate the equilibrium level of surplus destruction, and we assess the extent of the endogenously determined proposer premium, that is, the extra payoff that the proposer can obtain compared to other players.

Our main results are as follows: There is a unique equilibrium prediction for the level of surplus destruction as well as for the shares of surplus allocated to each player. Agreement is always immediate. If players are either very patient or very impatient, no surplus destruction occurs so that equilibrium is efficient. If players' rate of time preference falls within an intermediate range, some surplus destruction does occur in equilibrium. Within this range, there is a unique value for the rate of time preference at which surplus destruction peaks.

The intuition underlying this non-monotonicity is as follows: If players are very patient, then the threat of a lengthy delay is not very effective, and it is not worthwhile to waste surplus for it. On the other hand, if players are very impatient, then the prospect of delay is a very effective threat, even if the prospective delay is only quite short. Hence, it does not make sense to waste a lot of surplus in order to create the threat of a very lengthy delay.

We establish a tight upper bound on the share of the surplus which is destroyed in equilibrium. Although equilibrium surplus destruction depends non-monotonically on the rate of time preference, it is still true that the proposer premium is monotonically increasing in the rate of time preference. Moreover, we demonstrate that, in the presence of equilibrium surplus destruction, the proposer receives a greater payoff than in standard Rubinstein bargaining.

In the bargaining literature, several papers have considered the possibility that a proposer can impose a social cost after the rejection of his proposal. Haller and Holden (1990), Fernandez and Glazer (1991), and Manzini (1999) model wage bargaining between a union and a firm where the firm can go on strike after a disagreement. Avery and Zemsky (1994) and Busch et al. (1998) are interested in the possibility of "burning money" after the rejection of a proposal. Li (2011) allows a proposer to suspend bargaining for some time after an unsuccessful round. One important feature of these earlier papers is that, prior to the rejection of the current proposal, the proposer cannot commit to imposing a cost in case of rejection. Therefore, the main question in a model like Li's is how the proposer can give credibility to the threat of suspending the negotiation. Given that Li (2011) analyzes subgame-perfect equilibria in a setting with two players, this credibility comes from a cascade of punishment modes that the game enters after deviations from the equilibrium strategies. The approach in the present paper is different: We are not concerned with the credibility of the threat to delay. Instead, we assume that the proposer simultaneously chooses the proposal and the length of the time lapse which occurs in case of rejection. Due to this assumption, the threat of delay is perfectly credible. However, it comes at the cost of diminishing the surplus. This cost limits the leverage that the proposer can gain by such a threat. Another difference between Li (2011) and the present paper is that we allow for an arbitrary number of players, and therefore need to restrict ourselves to equilibria in stationary strategies. Hence, punishment modes after deviations as in Li (2011) are not relevant in our context.

In this way, our work is related to the idea of costly commitments. Bargaining games in which players incur a private cost to credibly commit themselves have been studied repeatedly in the literature. For instance, Cunyat (2004) considers the