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Does the obligation to bargain make you fit the mould? An experimental analysis.*

Eve-Angéline LAMBERT[†], Jean-Christian TISSERAND[‡]

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Abstract

In a lot of real-life legal disputes, the parties have the obligation to negotiate before an external solution is imposed to them. We investigate theoretically and experimentally the impact of such a constraint on the behavior of bargainers and on the outcome of this bargaining. Individuals initially choose whether to bargain over the division of a pie, and if one of them refuses, then the bargaining may be imposed to them with some probability. We show that individuals who are forced to bargain are significantly more aggressive than those who initially choose to bargain, and this behavior is indeed partly due to the constraint. This implies that the fact to be constrained does not bring individuals to behave as if they had freely made this decision, which proves that the way the bargaining process is enforced is not neutral, and affects the outcome of this process. This feature should be taken into account for the

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design of legal procedures of resolution of individual and collective conflicts.

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JEL Classification: C78; C91.

1 Introduction

"It shall be an unfair labor practice for an employer [...] to refuse to bargain collectively with the representatives of his employees, subject to the provisions of section 9(a). [...] It shall be an unfair labor practice for a labor organization or its agents [...] to refuse to bargain collectively with an employer, provided it is the representative of his employees subject to the provisions of section 9(a)." (National Labor Relations Act, Section 8).

Bargaining is referred to as a process through which the bargainers on their own try to reach an agreement (Muthoo, 1999). A bargaining may arise in a lot of everyday situations: in labor relationships, politics, business, in a family setting. Most often, bargaining is thought as a freely chosen way to find an agreement, precisely because this agreement is considered de facto as mutually beneficial. However, this view escapes from all situations where a rule, a law, an organization or a third party constrains agents to negotiate, whether it be collective or individual bargaining. And such constraints are widespread. Thus, most national labor laws impose to employers and labor organizations to bargain collectively about wages, hours or other conditions of employment.[1] Such an obligation also arises in individual labor disputes, through procedures of mediation or conciliation, the aims being at encouraging a transaction between the parties with the ultimate goal of avoiding judicial proceedings or avoiding a judgment.[2] Thus, for example, Spanish and French laws impose the obligation to attempt conciliation either before filing any claim in labor

[1]See, *e.g.* Section 8 of the National Labor Relations Act in the United States, and Article 19 of the *Loi relative au dialogue social et à l'emploi* in France.

[2]It is important to point out that this *duty to bargain* does not compel any party to agree to a proposal or to make any concession.

courts (Spain), or before a judgment is made by a court on labor and divorce cases (France). Such an obligation may even be larger and apply to any kind of disputes: the French civil code recently included that parties embedded in individual civil disputes must prove that a bargaining aiming at finding an amiable agreement has been undertaken before going to the Court.[3] In Quebec, conciliation is mandatory for incomes' security cases. In Ontario, mediation is compulsory for disputes related to successions, estate cases and trust deeds.[4]

This constraining feature of bargaining, though quite widespread, is surprisingly absent from economic literature, whether it be law and economics or bargaining theory. Indeed, as mentioned by Martin Osborne and Ariel Rubinstein (1990), "a bargaining theory is an exploration of the relation between the outcome of bargaining and the characteristics of the situation". Following this definition, the wide-ranging and diverse literature on bargaining theory and its applications has aimed at analyzing the main forces that determine the bargaining behavior and outcome, and weighting the potential impact of each force (Muthoo, 1999). The huge literature on bargaining thus highlights the impact of the procedure and format of negotiations, such as the initiative of making offers, the time devoted to bargaining, the design of offers (alternating offers versus ultimatum), etc. on the bargaining power and on the outcome of negotiations.[5] However, while this literature has provided fundamental results and insights explaining a variety of economic phenomena, it has been silent, to our knowledge, on an important issue concerning real-life negotiations: the potential link between the way the bargaining process is enforced and the outcome of this process. Indeed, articles about bargaining procedures all consider the bargaining from the first (and sometimes only) stage of negotiation (Nash, 1950; Rubinstein, 1982; Muthoo, 1995a and 1995b). But none asks the ques-

[3] Article 56 of the Code de Procédure Civile.

[4] See rule 75.1 of civil procedure rules.

[5] See, e.g. Muthoo (1999), Chapter 7.

tion of the parties' willingness to enter this bargaining, despite the fact that real-life negotiations are alternatively proposed or imposed to parties to a conflict. This is certainly because, from a pure theoretical standpoint, this distinctive feature should not alter the strategic elements characterizing the bargaining relationship *ex post*, so that the equilibrium behavior and outcome should remain the same whatever the way this relationship is implemented *ex ante*. However, such a conclusion abstracts from behavioral considerations which may have a considerable impact in real-world bargaining interactions. Indeed, the fact people are forced to bargain implies that at least one of them initially refused it, preferring an outside solution to their dispute. Consequently, one may question the relevance of forcing them to bargain.

From a law and economics perspective, this question has been brought up by legal scholars, but the arguments do not rely on economic models or empirical analyses. The debates are more precisely about the relevance of the institutionalization of alternative dispute resolution (ADR) schemes such as conciliation or mediation. The constraint to go through ADR could lie in the parties' unfamiliarity with the process, the institutionalization of which would help to overcome their lack of understanding (Quek, 2010). Moreoever, a rationale behind such a procedure is that it would allow parties who want to resort to ADR not to appear in a weak position by proposing it to their opponent (Cremona, 2004). Finally, a common argument is that such a constraint could bring unwilling parties to settle finally (Hardy, 2008). Conversely, several arguments stand up for leaving parties with the freedom whether to use an ADR. The main objection to a mandatory ADR is that it would undermine the very essence of such procedures which should rely on the willingness of the parties to the dispute (Quek, 2010; Green, 2010). Ingleby (1993) emphasizes that the arguments put forward specifically in favor of mandatory mediation are built on extrapolations from data that are available only in voluntary mediation, making them inapplicable to a hypothetical situation of mandatory mediation. Thus, one may question whether, once bargainers are forced, they stick on their guns or behave as if they had chosen to bargain initially. Such a question is one of importance, notably for lawmakers or other decision-makers. Most legal systems nowadays promote costless means of disputes' resolution, such as conciliation or mediation, but one may question the efficiency of such mechanisms when they are imposed to disputants.

In this paper, we analyze both theoretically and experimentally the behavior of bargainers, depending on whether they initially chose to bargain or whether they explicitly chose not to bargain but were forced to. To our knowledge, the only work about a close question was conducted by Gabuthy and Lambert (2013), who compare the behavior of bargainers in two situations: in a first one, parties bargain without giving any consent and in a second one, they bargain only if both gave previous consent to bargaining. They show that the bargaining behavior is not the same in the two situations, since individuals who previously chose to bargain are generally more aggressive during the bargaining than those who did not make any choice. This would tend to indicate that bargainers who made an explicit choice keep in mind during bargaining what they could have obtained had they chosen not to bargain. The main problem we identify in their analysis is that in the situation where indivuals bargain without explicit previous choice, they are indeed not aware of the existence of the other procedure; consequently, as they cannot think about what would happen if they did not bargain - precisely because they have no choice - they do not take the bargaining as a constraint. In this paper, in order to create real coercion, we force a number (half) of individuals who made the choice not to bargain to still bargain. This framework allows to compare properly the behavior of bargainers who wanted to bargain with the one of those who refused to bargain. The game thus proceeds as follows. In a first stage, player i indicates whether he wishes to bargain with his partner (player j) on the division of a pie ($i = 1, 2, j = 1, 2, i \neq j$). If both wish to, then bargaining takes place through alternating offers, with some exogenous division in case of an impasse after three bargaining periods. If at least one of them refuses, then a lottery takes place: with probability 1/2, an exogenous division is made immediately, and with the same probability, they are forced to bargain despite their refusal. We then compare the bargaining behavior and outcome when players choose by themselves to bargain with the bargaining outcome when players are forced to do so. Whereas the bargaining outcome is theoretically the same, we highlight that when bargaining is imposed to disputants, the agreement probability is significantly lower than when parties wanted to bargain. This is mainly due to more aggressive offers in the former case. This gives evidence that when forced to bargain, it is not because individuals are in a position of bargaining that they adopt during the bargaining the same behavior as if they had chosen it. Another result we highlight refers to the choice strategy whether to bargain: in our theoretical model, players should coordinate on bargaining choice (which is the payoff-dominant Nash equilibrium); our experiment challenges in part this result since we find that most often, players do not coordinate: player i chooses not to bargain whereas player j chooses to bargain.

The remainder of the paper is structured as follows. The theoretical model is exposed in Section 2. We present the experimental design and predictions in Section 3. The results are displayed in Section 4 and Section 5 concludes.

2 Theoretical background

In this section we describe the model which is tested experimentally. We build a symmetric information model in which two risk-neutral players A (*he*) and B (*she*) must share a pie of size Π. The bargaining procedure proceeds in two stages.[6]

In the first stage, players indicate whether they wish to enter negotiations over the

[6]The extensive game tree is exposed in Appendix 6.1.

division of the pie or to obtain an immediate exogenous division of it.

The second stage runs as follows.

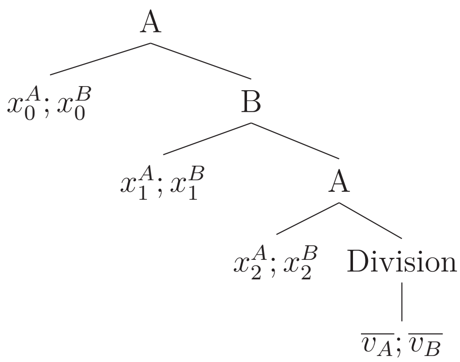
- **Case 1**. If both players choose to bargain in stage 1, then an alternating offers bargaining occurs (Stahl, 1972), as illustrated on Graph 1. Payoffs are discounted at common rate δ ($0 \leq \delta \leq 1$). In period $t = 0$, player A makes an offer x_0^A, which player B either accepts or rejects. If player B accepts, the game ends with payoffs (x_0^A, x_0^B), with $x_0^A + x_0^B = \Pi$. If player B rejects, the game proceeds to the next period. In period $t = 1$, player B makes an offer x_1^B which A accepts or refuses; if he accepts, he obtains x_1^A. If player A rejects, then in period $t = 2$, player A offers x_2^A; if B accepts, she obtains x_2^B. If no agreement has been found at the end of period 2, players receive some exogenous division (v_A, v_B) at $t = 3$, with $v_A + v_B = \Pi$. v_A (v_B) is taken from a normal distribution with mean $\overline{v_A}$ ($\overline{v_B}$) and standard error σ_A (σ_B). The payoffs in this case are v_A and v_B.

- **Case 2**. If at least one player refuses to bargain in stage 1, then the following lottery is implemented:

  - with probability 1/2, A and B receive exogenous payoffs v_A and v_B respectively.

  - with probability 1/2, bargaining is imposed to them. In that case, bargaining takes place as if both had accepted to bargain (see Case 1 above).

We solve the game by backward induction. Note first that whatever the way the bargaining process is implemented in stage 1, we get the following bargaining game in stage 2:



Graph 1: Bargaining tree of Stage 2

The bargaining result (stage 2).

Without loss of generality, we assume that if a player is indifferent between accepting and refusing a given offer, he/she accepts it.

$t = 3$: if no agreement has been found within 3 periods (from $t = 0$ to $t = 2$), then player A's expected payoff is $\delta^3\overline{v_A}$ whereas player B's expected payoff is $\delta^3\overline{v_B}$.

$t = 2$: A makes an offer x_2^A such that B is indifferent between accepting x_2^B and refusing it and going to next period (and obtaining $\delta^3\overline{v_B}$). x_2^B is thus such that

$$x_2^B = \delta^3\overline{v_B}$$

A obtains:

$$x_2^A = \delta^2\Pi - x_2^B = \delta^2\Pi - \delta^3\overline{v_B} = \delta^2\Pi - \delta^3(\Pi - \overline{v_A}) = \delta^2\Pi(1-\delta) + \delta^3\overline{v_A}$$

$t = 1$: B makes an offer x_1^B such that A is indifferent between accepting the offer, obtaining thus x_1^A (with $x_1^A + x_1^B = \delta\Pi$), and refusing it and going to the next period (and obtaining x_2^A):

$$x_1^A = x_2^A = \delta^2\Pi(1-\delta) + \delta^3\overline{v_A}$$

B obtains:

$$x_1^B = \delta\Pi - x_1^A = \delta\Pi(1-\delta+\delta^2) - \delta^3\overline{v_A} = \delta\Pi(1-\delta) + \delta^3\overline{v_B}$$

$t = 0$: A makes an offer x_0^A such that B is indifferent between accepting x_0^B (with $x_0^A + x_0^B = \Pi$) and going to the next period:

$$x_0^B = x_1^B = \delta\Pi(1-\delta) + \delta^3\overline{v_B}$$

A obtains:

$$x_0^A = \Pi - x_0^B = \Pi - \delta\Pi(1-\delta) - \delta^3\overline{v_B} = \Pi(1-\delta+\delta^2-\delta^3) + \delta^3\overline{v_A}$$

The outcome of bargaining is thus given by:

$$\begin{cases} x_0^A = \Pi(1-\delta+\delta^2-\delta^3) + \delta^3\overline{v_A} \\ x_0^B = \delta\Pi(1-\delta) + \delta^3\overline{v_B} \end{cases} \tag{1}$$

Note that this agreement is efficient. First, the entire pie is split between A and B, so that no loss occurs. Second, there is no delay before reaching an agreement.

Proposition 1. *In case of a bargaining in stage 2 and independently of whether the bargaining is chosen by players or imposed to them, an agreement is systematically found at* $t = 0$*, with the following payoffs:* $x_0^A = \Pi(1-\delta+\delta^2-\delta^3) + \delta^3\overline{v_A}$ *and* $x_0^B = \delta\Pi(1-\delta) + \delta^3\overline{v_B}$*, where* $\overline{v_A}$ *and* $\overline{v_B}$ *are the expected payoffs in case of an exogenous division.*

The choice whether to bargain (stage 1).

In stage 1, parties either choose to bargain, or an exogenous division of the pie; if at least one of them chooses exogenous division, then bargaining is imposed with probability 1/2. Moreover, if the surplus is split without bargaining, we assume (as in stage 2) that the division occurs one period later. Therefore, in stage 1, the individuals play the following simultaneous game:

Player B			
		Bargain	Exogenous
Player A	Bargain	$x_0^A; x_0^B$	$\frac{1}{2}\left(x_0^A + \delta\overline{v_A}\right); \frac{1}{2}\left(x_0^B + \delta\overline{v_B}\right)$
	Exogenous	$\frac{1}{2}\left(x_0^A + \delta\overline{v_A}\right); \frac{1}{2}\left(x_0^B + \delta\overline{v_B}\right)$	$\frac{1}{2}\left(x_0^A + \delta\overline{v_A}\right); \frac{1}{2}\left(x_0^B + \delta\overline{v_B}\right)$

Table 1 : Expected payoffs in Stage 1

Several equilibria may occur, depending on the comparison of x_0^A and $\frac{1}{2}(x_0^A + \delta\overline{v_A})$ on one side, and of x_0^B and $\frac{1}{2}(x_0^B) + \delta\overline{v_B})$ on the other side. Indeed, If B chooses the exogenous division, then player A is indifferent between bargaining and the exogenous division. In case B chooses to bargain, A chooses bargaining if $x_0^A \geq \frac{1}{2}(x_0^A + \delta\overline{v_A})$ (condition (1)). Condition (1) is always verified, since it is equivalent to $\overline{v_A} \leq \Pi\frac{1-\delta+\delta^2-\delta^3}{\delta(1-\delta^2)}$. The left term being always higher than 1, this condition is true, which implies that A chooses to bargain.

Regarding now B's choice, if A chooses the exogenous division, then B is indifferent between bargaining and the exogenous division. If A chooses to bargain, then B also chooses bargaining if $x_0^B \geq \frac{1}{2}(x_0^B) + \delta\overline{v_B})$ (condition (2)). Condition (2) is true if and only if $\overline{v_B} \leq \frac{\Pi}{1+\delta}$. The lower $\overline{v_B}$, the higher Π and the lower δ, then the more probably condition (2) is verified. If condition (2) is not verified, then B chooses the exogenous division when A chooses bargaining.

Thus, to sum up:

- If condition (2) is not verified, then two Nash equilibria arise: (Bargain; Exogenous) and (Exogenous; Exogenous).

- If condition (2) is verified, then two Nash equilibria arise: (Bargain; Bargain) and (Exogenous; Exogenous).

As our main research question is about the bargaining behavior of players depending on whether bargaining comes from a choice or from an obligation, we focus on the case where (Bargain; Bargain) is an equilibrium.[7]

Thus, under the assumption that condition (2) is verified, two Nash equilibria occur: (Bargain, Bargain), which is Pareto-optimal, and (Exogenous, Exogenous). At this stage, the game is thus one of ranked coordination. Harsanyi and Selten (1988) suggest that the selection of equilibria in games with multiple equilibria can be made with two methods: payoff dominance and risk dominance. Schelling (1960) also indicates that, when there is a unique payoff-dominant equilibrium, considerations of efficiency might induce players to focus on that equilibrium. The payoff dominance allows selecting one equilibrium, that is (Bargain, Bargain), which is Pareto-optimal. The risk-dominance criterion does not allow to select one equilibrium, so that we will not discuss this criterion.[8]

Proposition 2. *The two Nash equilibria of the extensive game are (Bargain; Bargain) and (Exogenous; Exogenous). From a payoff-dominance criterion perspective, players should coordinate on the (Bargain; Bargain) outcome. The equilibrium payoffs are* $x_0^A = \Pi(1-\delta+\delta^2-\delta^3)+\delta^3\overline{v_A}$ *and* $x_0^B = \delta\Pi(1-\delta)+\delta^3\overline{v_B}$*, where* $\overline{v_A}$ *and* $\overline{v_B}$ *are the final exogenous expected payoffs.*

Experimental analyses highlight that the payoff-dominance criterion is indeed not necessarily used, notably because players take into account out-of-equilibrium payoffs (Van Huyck *et al.* (1991), Cachon and Camerer (1996)). Van Huyck *et al.* (1990) notably show the first-best outcome, which is the payoff-dominant equilibrium, is

[7]In order that this focus makes sense, we implement in the experiment some values of the parameters that allow to make condition (2) true.

[8]Nevertheless, one could consider that the Bargaining choice is less risky: as they theoretically find an agreement, there is no risk. In the contrary, there is a risk in the case of an exogenous division.

an extremely unlikely outcome: in their experiment, only the secure (and inefficient) equilibrium describes behavior that subjects are likely to coordinate on. But again, our game shows the feature that no equilibrium is secure, which makes the equilibrium selection potentially hard to predict, regarding the risk-dominance criterion. Indeed, an important specificity of our game is that bargaining is itself a coordination game, which raises potentially two successive coordination games. In most coordination games, the resulting payoffs are always exogenous, either secure or risky. But in our coordination game, the resulting payoffs are themselves endogenous and depend on the future bargaining that might take place. Theoretically, this does not have an impact on the selection of equilibrium. But in the experiment, that feature might induce individuals to choose another strategy than the Pareto-optimal equilibrium, depending on the other player's behavior in the previous bargaining periods.

3 Experimental design and predictions

Our experiment was conducted at the Economic Experimental Laboratory at the University of Strasbourg (LEES) (BETA, CNRS, France). The subjects, coming from undergraduate and graduate courses from various fields (including notably law, economics, science, psychology and sport), are recruited through ORSEE, a web-based Online Recruitment System for Economic Experiments developed by Greiner (2015). The program of this experiment has been designed by Kene Boun My with the web platform EconPlay.[9] In total, 100 participants took part in the five sessions of this experiment. Each participant was assigned a computer upon arrival, by a draw in a bag (students picking numbers 1 to 10 are A and those picking numbers 11 to 20 are B). No student could participate in more than one session and the experimenters were the same for all of the sessions. In each treatment, there was a conversion rate of 6 euros for 100 points. Average earnings were 19,09 euros, including a 3 euros show-

[9] www.econplay.fr

up fee and the experiments last between 1 and 1.25 hour. The subjects were paid according to the sum of two randomply-picked period earnings in the experiment.

Once assigned to a computer, participants are given the first part of the instructions whose goal is to determine their attitude toward risk, with the Holt and Laury test (2002).[10] They have to make 10 successive decisions on lotteries between 2 options. Once these decisions made, one of them is randomly drawn by the computer to determine the payoff of the player.

After this, participants are given the second part of the instructions. In each session, 10 participants are given the role of Player A and 10 the role of Player B. Note that the instructions contained 2 tables showing examples of 100 random draws of the exogenous division of the pie, in order to make them informed both about the mean of the draws and their dispersion.[11] No communication was allowed. In this phase, participants played for 15 periods. At the beginning of each period, a re-matching is made, so that a player A meets a player B 1.5 times in average (quasi-stranger protocol).

As a first decision, players have to indicate whether they wish to bargain. Once their choice made, they know about the other player's choice whether to bargain. As in the theoretical model, the bargaining protocol is an alternating-offers bargaining with three periods, one offer consisting in the share one wants (*i.e.* Player A's (respectively B's) offer is what he (resp. she) wants to obtain). In the experiment, in order to fit with theory, we apply a discount factor $\delta = 0,94$ such that the pie shrinks by 6% by period. The initial pie at $t = 0$ is $\Pi = 500$. Moreover, we set $\overline{v_A} = 308$, $\overline{v_B} = 192$ and $\sigma_A^v = 22$. Note that following Ashenfelter *et al.* (1992), we do not implement an equitable division of the surplus with a mean equal to half the pie (that would be $v_A = v_B = 250$ here). The aim is to avoid mechanical $50-50$ bargaining as a focal

[10] A translation of the original instructions is available in Appendix 6.2.

[11] Giving them the standard deviation would not have made sense for all students, notably those coming from non-scientific studies.

point.[12] Moreover, this value of $\overline{v_B}$ allows to ensure that (Bargain; Bargain) is one of the subgame perfect Nash equilibria.

If both have made the choice to bargain, bargaining begins. They bargain at $t = 0$ on $\Pi = 500$, A making the first offer; in case of a refusal, the pie shrinks at $t = 1$ on $\delta\Pi = 470$ over which B makes an offer; in case of refusal, A makes an offer at $t = 2$ between 0 and $\delta^2\Pi = 441$; finally at $t = 3$ if no agreement has been found, then the exogenous division is made on $\delta^3\pi = 415$. Note that regarding the discount factor, the expected payoffs at $t = 3$ are respectively $\delta^3\overline{v_A} = 255$ and $\delta^3 v_B = 160$.

If at least one of them has refused to bargain, they are informed about the result of the lottery: with probability 1/2, they are informed that bargaining has been drawn by the lottery, leading them to the bargaining stage (which follows the bargaining process above). With probability 1/2, a random division is made on $\delta\Pi = 470$. Note that in this case, $\delta\overline{v_A} = 290$ and $\delta\overline{v_B} = 180$.

After an agreement or an exogenous division of the pie, a new period with new pairs of subjects begins.

In terms of predictions, given the parameters used in the experiment, the theoretical model states that players should coordinate on the bargaining choice (rather than the exogenous division).[13]

Prediction 1. *Regarding the choice whether to bargain, players should coordinate on the bargaining choice rather than an exogenous division of the pie.*

Moreover, at $t = 0$, A should propose (312; 188), and B should accept. This raises a second prediction.

[12]Note that our results are valid for the values of parameters we have chosen and that they cannot be generalized to any exogenous division of the surplus. Nevertheless, as the parameters are equivalent whatever the choice whether to bargain, the results remain relevant from this point of view.

[13]Note however an important assumption to this prediction: we assume here that players take into account the mean of the random draws when making their decisions. But if one considers that players are optimistic or pessimistic, they might consider other values than the mean values.

Prediction 2. *The players should find an agreement immediately. Player A should make an offer of 312, leaving 188 to player B, and B should accept this offer.*

If the bargaining is not consistent with theory, and thus proceeds to $t = 1$, then B should propose the following payoffs : (282; 188), and A should accept. Finally, if the bargaining proceeds to $t = 2$, then A should propose (282; 159) and B should accept.

Beyond our theoretical results, one can also make some predictions in terms of behavior that are not taken into account by the theoretical model. Indeed, theoretically, the players should behave the same way, no matter whether they have chosen or are obliged to bargain. Nevertheless, individuals who choose the exogenous division do not, by definition, want to bargain, *i.e.* they are not intrinsically motivated to bargain. Thus, we can conjecture that individuals who are obliged to bargain will behave more aggressively than those who choose to bargain. This may come from two patterns: first, people who choose not to bargain are intrinsically not motivated to bargain (because of their ”type” or just because of an unwillingness to bargain for the period at stake) and consequently, will not be prone to attempt to reach an agreement as if they had chosen to bargain, leading them to make more aggressive offers and to reject the other player's offers. Second, the motivation crowding theory states that obligations or controls may undermine the intrinsic motivation of people, and thus lead to a situation where their effort for a given task is lower than without any external intervention (see e.g. Frey and Jegen, 2001); thus, one may think that such effect would be even worse when people's initial intrinsic motivation is low. To sum up, such aggressiveness could come both from the players' type or from the obligation that is imposed to them. This implies the following behavioral prediction.[14]

[14]Note that this prediction might be challenged by the fact that the option not to bargain might attract people who are anxious of not being able to find an agreement. Such people could thus play less aggressively when forced to bargain. Nevertheless, since such a behavior is not much documented by economic literature, we choose to emphasize the contrary prediction.

Prediction 3. *Players who are constrained to bargain will make more aggressive offers and respond more agressively to a given offer than players who initially choose the bargaining.*

This implies a corollary prediction: if players behave more aggressively when constrained to bargain, this should logically lead to a lower agreement rate in this case than in situations where both players choose to bargain.

Prediction 4. *The agreement rate under the compulsory bargaining (CB) condition should be lower than under the voluntary bargaining (VB) condition.*

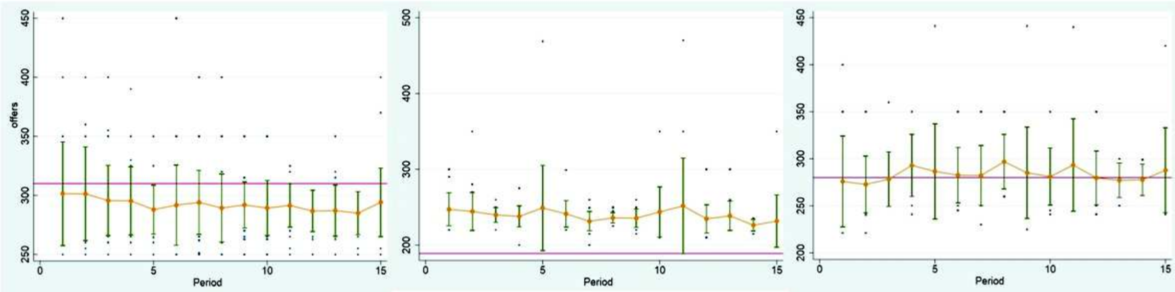
4 Results

In this section, we compare our results with the aforementioned theoretical predictions. Subsequently, we test the two hypothesis we made regarding the effect of bargaining under coercion. We first focus on the impact of coercion on players' offers and successively analyze and compare the conciliation rates for each phase under both conditions.

4.1 Comparison to theoretical predictions

According to the refined perfect subgame Nash equilibrium, both players should choose to bargain in a first time. In the lab, players behave differently: 92% of players B choose to negotiate while only 46% of players A opt for this choice. Under both conditions, amounts offered by players are biased toward the equal split in phase 1 and 2 and are in line with theoretical predictions in phase 3. Figure 1 gives an overview of players' mean offers for each phase, with both conditions pooled.The straight lines correspond to the perfect subgame Nash equilibrium of each phase of the game.

Figure 1: **Mean offers per period and per phase**



In phase 1, theoretical predictions state that players A should keep 312 point regardless of the condition under which the choice is made. Actually, players A keep an average of 290.5 points in the first phase. T-tests ($p<0.05$) for each period show that players' offers are significantly different from the theoretical prediction for all periods.

In phase 2, players B should keep 190 points according to the perfect subgame Nash equilibrium. Figure 1 shows that this is far from being the case: players B keep an average of 239.5 points in phase 2, which is significantly diffderent from the theoretical prediction for this phase (T-test, $p<0.01$ for each period). Among the observations for phase 2, even the most generous offer (200) is above the theoretical prediction. It is striking that players B attempt to get the equal split (235) despite the asymmetric bargaining power implemented by the design of the game. In fact, this result is not so surprising: since players' roles are randomly drawn, players B do not accept players' A dominant position in the negotiation. Krawczyk (2011) states that "people will generally accept a bad outcome more easily if it results from a fair or advantageously biased procedure". Players' B behavior in phase 2 perfectly illustrates this statement.

In phase 3, players' A offers match with the perfect subgame Nash equilibrium of the game. While players A should keep 280 points in this phase, figure 1 shows that the average offer is equal to 283.[15] It is very likely that the shorter time horizon of

[15] tests

the game in phase 3 makes the equilibrium of the game easier to identify for players. This is consistent with Johnson *et al.* (2002) who detect failures in players' backward reasoning, especially when they are not explained the overall principle of backward induction. Furthermore, the fact that players' decisions are in line with theoretical predictions in the last stage shows that they are aware of the extent to which they are favored in the random draw.

4.2 Players' offers

Table 1 summarizes players' mean offers for each phase of the game. At first sight, there is only little differences in players offers under both conditions. Descriptive statistics are nevertheless insufficient to determine whether players are more aggressive in their demands when they are forced to bargain. To analyze the influence of coercion on the amount offered by players, we perform an econometric analysis with a separate regression for each phase. As the offer is a continuous variable and can be treated as cross-sectional time series (or panel) data, we use a random effects model for our estimates. We use robust inference to control for unknown form of autocorrelation and heteroskedasticity.

Table 1: **Mean demand per phase and per condition**

	Phase 1	Phase 2	Phase 3
Compulsory bargaining	295.3	243.2	283.3
Voluntary bargaining	290.5	237.2	282.9

In the following regressions, explanatory variables include a dummy variable "CB" which is equal to "1" if players make their decisions under the compulsory bargaining condition and "0" otherwise.

All the regressions including the "CB" variable have also been run with the "choice" variable instead. The "choice" variable is a dummy variable that refers to the individual players' choice instead of the negotiation environment: it is equal to 1 if the player selected the "bargaining" option and 0 if the player selected the "exogenous division" option. In the three following regressions, the "CB" variable always shows an higher significance and is more robust to model changes, suggesting that the bargaining environment overrides the subject's initial choice. For obvious collinearity issues, it is not possible to use these two variables in the same model.

All regressions also include a time-control variable, four dummies session-control variables and a variable to control for subjects' risk aversion. Since players can adjust their request according to the previous offer they received, control variables also include the offer received at the previous period (for phase 2 and 3).[16] Results are displayed in table 2.

[16] According to the intention-based model of preferences by Rabin (1993), people are driven by fairness motives: "they help those who are helping them and hurt those who are hurting them". In this game, it is reasonable to think that aggressive offers could result in aggressive counter-offers.

Table 2: **Offers estimations**

	(1) **Phase 1**	(2) **Phase 2**	(3) **Phase 3**
Phase 1 offer		-0.0746	0.156
		(0.0588)	(0.109)
Phase 2 offer			0.221
			(0.150)
Risk aversion	0.239	-5.474**	-2.605
	(0.602)	(2.735)	(2.706)
CB	5.742***	5.710	6.459
	(2.172)	(3.901)	(5.642)
Period	-0.759***	-0.852*	0.935*
	(0.263)	(0.474)	(0.512)
Session2	-0.087	8.024	-19.49*
	(5.647)	(9.392)	(11.72)
Session3	-5.826	1.029	-5.445
	(4.968)	(7.462)	(11.89)
Session4	2.235	30.79***	13.47
	(6.197)	(9.714)	(14.50)
Session5	-4.464	28.68***	4.951
	(6.002)	(10.33)	(12.06)
_cons	296.4***	290.3***	181.2***
	(5.926)	(28.44)	(45.21)
N	493	252	192

Robust standard errors in parentheses

* p<0.1, ** p<0.05, *** p<0.01

In the first phase, players A are significantly (p<0.01) more aggressive when they are forced to negotiate. In the two following phases, the “CB” variable shows no statistically significant effect: coercion has no influence on players’ offers in phase 2 and 3.

In phase 2, coercion has no effect on players’ offers. The attempt of players B to get an equal split in phase 2 causes the rejection rate to be high (80%) under both conditions. It is thus reasonable to believe that these aggressive offers might inhibit the coercion effect we aim to identify in phase 2.

In phase 3, players’ offer are close to the theoretical equilibrium under both conditions. Even if it would be reasonable to believe that focal points in phase 2 and 3 weaken the coercion effect we aim to identify, we conclude that coercion only shows little effect on players offers in this experimental setting.

Result 1. *Coercion only shows a slight but significant effect on phase 1 offers while it shows no effect on phase 2 and 3 offers. Overall, coercion do not imply important changes in players offers.*

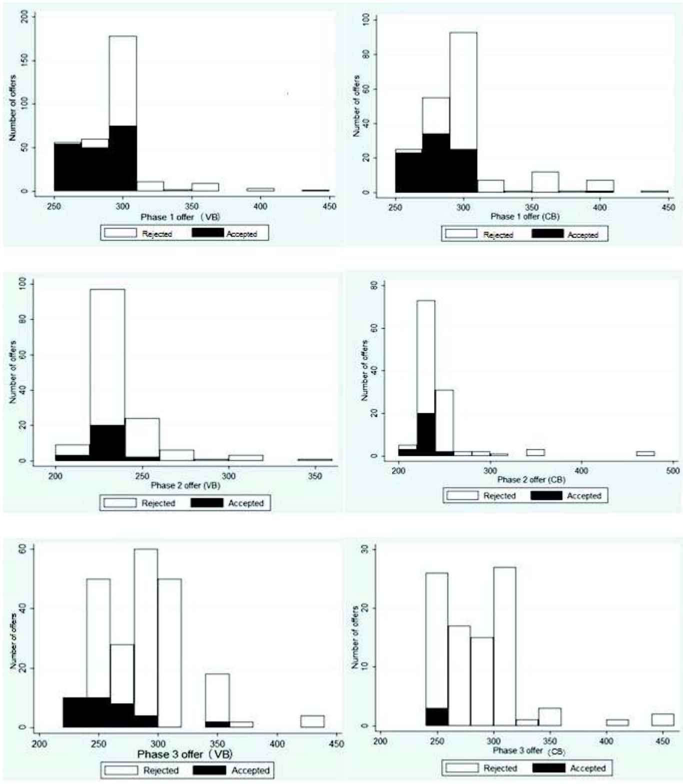
4.3 The settlement rate

Table 3 and figure 2 give an overview of settlement rates for each condition and for different amount offered.

Table 3: **Settlement rates per condition and per phase**

	Phase 1	**Phase 2**	**Phase 3**	**Global settlement rate**
Compulsory bargaining	40.5%	21%	3.2%	55%
Voluntary bargaining	54%	19%	15%	69%

Figure 2: **Settlement rates per condition and per phase for different amount offered**



In phase 1, 54% of negotiations are successful in the VB condition while only 40.5% are under CB. Turning to phase 2, settlement rates are very similar: negotiations are successful in 19.2% of cases when players decided to bargain, while it is 21.2% when players are forced to bargain. The very low difference in players' A rejections rates in phase 2 is not surprising given the observed offers made by players B. Indeed, supposing a moderate risk aversion, rationale players A may realize that they would be way better off facing the final random draw (255) than accepting the equal split in phase 2 (235). In these conditions, players' A have no incentive in accepting players' B offers, no matter the condition under which they make their choice.

In phase 3, the settlement rate is higher under the VB condition (15.31%) than under the CB condition (3.2%). We recall that phase 3 is the only phase in which players' offers fit to the theoretical equilibrium. Given that player A makes the equilibrium offer, player B should be almost indifferent between accepting this offer or facing the random draw. In this situation, the requested amount by player A has thus a minimal influence on players' B acceptation or rejection, which provides an ideal setting to analyze the effect of coercion.

To substantiate these descriptive statistics, we perform an econometric analysis in which the agreement probability is the dependent variable. The agreement variable takes the value 1 in case of agreement in first period and 0 otherwise. In addition to previous independent variables, we include the current period offer.[17] Given the binary design of this endogenous variable and the panel dimension of our data, we use a random-effect logit model with a separate regression for each phase. The regression results are displayed in Table 4.

[17] Phase 1 offer for phase 1 regression, phase 2 offer for phase 2 regression and phase 3 offer for phase 3 regression.

Table 4: Estimation of the agreement probability

	Phase1		**Phase2**		**Phase3**	
	Coefficient	Margnal effects	Coefficient	Marginal effects	Coefficient	Marginal effects
Phase 1 offer	-0.122***	-0.0304***				
	(0.0233)	(0.00569)				
Phase 2 offer			-0.129***	-0.0000816		
			(0.0362)	(0.0000663)		
Phase 3 offer					-0.0608*	-0.00123*
					(0.0311)	(0.000710)
CB	-0.756**	-0.185**	0.0657	0.0000417	-1.875***	-0.0396
	(0.349)	(0.0822)	(0.697)	(0.000435)	(0.721)	(0.0348)
Risk aversion	-0.131	-0.0325	-0.0233	-0.0000148	0.175	0.00353
	(0.201)	(0.0502)	(0.233)	(0.000151)	(0.253)	(0.00628)
Period	0.0908**	0.0226**	-0.157**	-0.0000995	0.0160	0.000324
	(0.0446)	(0.0111)	(0.0686)	(0.0000989)	(0.0815)	(0.00146)
Session2 (d)	-0.683	-0.165	0.0708	0.0000458	-1.249	-0.0192
	(1.030)	(0.234)	(1.304)	(0.000869)	(1.114)	(0.0175)
Session3 (d)	-0.0809	-0.0201	0.0618	0.0000399	1.271	0.0389
	(0.840)	(0.209)	(1.517)	(0.00100)	(0.837)	(0.0445)
Session4 (d)	1.692	0.388	-24.32***	-0.0606	-1.185	-0.0181
	(1.314)	(0.247)	(2.351)	(0.0403)	(1.662)	(0.0208)
Session5 (d)	0.254	0.0634	-0.112	-0.0000685	-0.521	-0.00922
	(1.259)	(0.314)	(1.272)	(0.000774)	(1.401)	(0.0242)
N	513	513	242	242	198	198

Robust standard errors in parentheses

* p<0.1, ** p<0.05, *** p<0.01

Results in Table 4 confirm the descriptive statistics and show that the compulsory bargaining condition has a negative effect on settlement rate in phase 1 and 3 (p<0.001). Unsurprisingly, results also show that the lower the amount offered, the less likely the settlement in any phase.

Result 2. *Coercion has a negative effect on settlement rates in phase 1 and 3, while this is not the case in phase 2 where players B focus on the equal split in both conditions. Overall, players are less likely to settle when they are forced to negotiate (55%) than when they are free to do it (69%).*

5 Summary and discussion

The purpose of this paper has been to analyze the impact of coercion on individuals' bargaining behavior. Gabuthy and Lambert (2013) also addressed this issue with a different experimental setting but were not able to make sure of the players' awareness to be forced to bargain. In this experimental setting, we compare the behavior, in terms of offers and settlement rate, of people who have made the choice to bargain with those who have refused to bargain but are imposed to.

Our results show in particular that the way negotiations are enforced have an influence on parties' willingness to settle but not on the amount offered by parties. Coercion scarcely alters players offers in this experimental setting. Actually, players' offers are more aggressive under coercion only in phase 1. In phase 2 and 3 players' offers are not significantly different under both conditions. Even if it would be reasonable to believe that focal points in phase 2 and 3 weakened the coercion effect we aim to identify, we conclude that coercion has very little bearing on players' offers. We further show that coercion has a significant negative influence on settlement rates on phase 1 and phase 3. Overall, the settlement rate is higher when parties are willing to negotiate (69%) than when they are forced to do so (55%).

*** PARTIE A ADAPTER ECO DU DROIT ******

In terms of policy implications, our paper raises the question of whether individuals

should be forced to bargain. Such pattern may be found within the judiciary (such as for compulsory mediation), regarding labor relationships or at the international level. Our conclusion over the opportunity of such an obligation is mitigated. Indeed, forcing people who initially refused to bargain allows to generate agreements that would not have been found without this obligation, so that it raises the overall agreement rate. Nevertheless, it would be fallacious to argue that individuals who do not want to bargain and who are obliged to will then behave as if they had chosen to bargain. We show that it is not the case: when forced to bargain, people are more aggressive, both in terms of offers and of responses to a given offer, than when they have initially made this choice. Moreover, constraining them to bargain most often raises external costs (such as the enforcement of a judicial procedure or the intervention of third parties) which are not taken into account in our experiment, but which should be considered when considering this question. If the cost of imposing bargaining is high, then there can be situations where an exogenous decision over the division of a pie may be better than an imposed bargaining which even though end with an impasse.
****

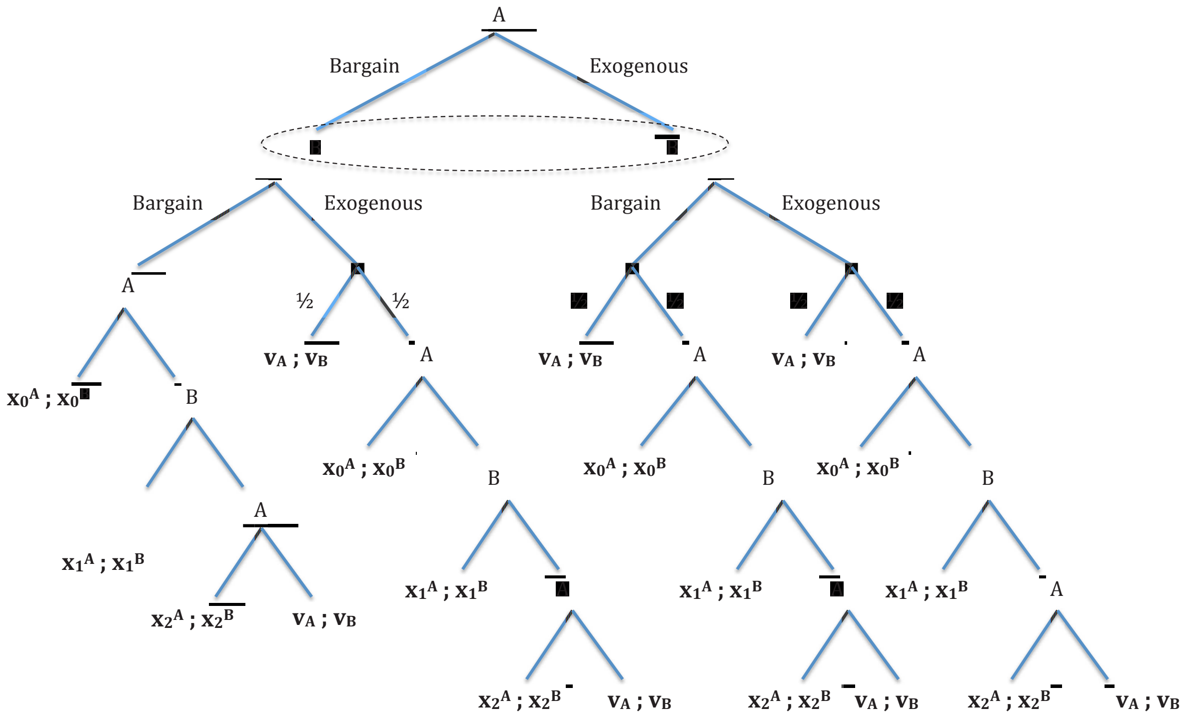
Several limits to our approach can be discussed. First, our experimental design involves a three-stage alternating offers bargaining in which players A have a greater negotiation power. Since the roles of players are randomly assigned and not based on previous performances, disadvantaged participants (players B) try to reach the equal split, which leads to no differences in both settlement rates and offers between the two conditions in phase 2. This shortcoming could have been avoided by implementing a preliminary phase to allocate players' roles based on merit. Such design could nevertheless imply different problems. In particular, we believe that the current design is more suited to obtain a balanced number of observations of both conditions. Earned role would enforce a legit asymmetry in players' bargaining power which could lead to fewer disagreements between players. If most bargaining pairs settled on phase 1, the data would not allow us to answer the research question with high statistical significance.

Furthermore, we choose to implement random drawings instead of predetermined payoffs in case of exogenous division or settlement failure. While this choice could be questionable from the standpoint of protocol clarity, this choice has been made in order to avoid settlements on focal points as much as possible. Despite the incomplete information, players' offers in phase 3 are in line with the theoretical prediction. Even if it is possible that fully informed players would make enlightened choices that could lead to more clear-cut results, we are confident that this choice did not alter the main results of the paper. We remain hopeful that our study will open the path to further research on this topic.

The effect of coercion on individuals' bargaining behavior did not received much attention in the economic literature. This is however in important issue since forced negotiations are part of numerous legal systems. We remain hopeful that our study will open the path to further research on this topic.

6 Appendix

6.1 Representation of the extensive game



6.2 Instructions of the game

Thank you for participating in this experiment in decision-making. In this experiment, your earnings will depend on your decisions and on random events. This experiment is separated into two independent parts. At the end of the experiment, the earnings in points that you will get in each part will be added up. In addition, you will receive 3 Euros for participating in this experiment. Your earnings will be paid in cash at the end of the session confidentially.

All your decisions are anonymous. You will never be asked to write your name on the computer.

During the experiment, you are not allowed to communicate with other participants. If you have any question, raise your hand. An experimenter will come to answer your questions privately.

You have received the instructions for part 1 of the experiment. The instructions for part 2 will be given once part 1 is over.

6.2.1 Part 1

In this part, you have to take 10 successive decisions. At the end of the experiment, one of these 10 decisions will be randomly drawn by the computer and will determine your earnings for this phase. Each decision is a choice between a "left option" and a "right option". All decisions and options are shown in the following Table. Decisions will appear one after another on your screen (decision 2 will appear once you will have made a choice for decision 1 and so on). You will have to choose between these options by clicking either on the "left option" or on the "right option".

Figure 3: **Decision table**

Option Gauche : X chance(s) sur 10 de recevoir 2€ et Y chance(s) sur 10 de recevoir 1,6€.	Gauche	Droite	Option Droite : X chance(s) sur 10 de recevoir 3,85€ et Y chance(s) sur 10 de recevoir 0,1€.
(X=1, Y=9)			(X=1, Y=9)
(X=2, Y=8)			(X=2, Y=8)
(X=3, Y=7)			(X=3, Y=7)
(X=4, Y=6)			(X=4, Y=6)
(X=5, Y=5)			(X=5, Y=5)
(X=6, Y=4)			(X=6, Y=4)
(X=7, Y=3)			(X=7, Y=3)
(X=8, Y=2)			(X=8, Y=2)
(X=9, Y=1)			(X=9, Y=1)
(X=10, Y=0)			(X=10, Y=0)

Look at decision 1 (in the first row). "Left option" gives you 2 with a 1 in 10 chance and 1.6 with 9 out of 10 chances, while the "right option" gives you 3.85 with a 1 in 10 chance and 0.1 with a 9 out of 10 chances.

Look at decision 2 (in the second row). "Left option" gives you 2 with a 2 in 10 chance and 1.6 with a 8 in 10 chances while the "right option" gives you 3.85 with a 2 in 10 chance and 0.1 with a 8 in 10 chances. The eight following decisions are similar. Note that the chances of high earnings increase over decisions. For the last decision, each option gives you the higher payoff with a 10 in 10 chances.

Summary:

You make 10 decisions. For each decision, you choose between the "left option" and the "right option". You can choose the "left option" for some decisions and the "right option" for other decisions. There is no correct or incorrect answer.

Once you have made your 10 decisions, you must confirm your choice by clicking on the "ok" button. Once you have clicked on this button, you cannot modify your choices anymore.

At the end of the session, the computer will randomly draw one of your ten decisions. Each decision has the same chance to be randomly drawn. Then the computer will proceed to a second random draw to determine your earnings according to the option you have chosen for this decision.

If you have questions, raise your hand. You will be answered privately.

6.2.2 Part 2

During this session, your earnings will depend on your decisions and on the decisions of the other participants with whom you will interact during this part's periods. During this part, your earnings are expressed in points with the following conversion rate: 100 points = 6 Euros. This part includes 15 independent periods. At the end of the experience, the computer will randomly draw 2 periods; the points of these 2 periods will be added up to determine your payment, which will be the mean of these 2 periods.

Participants are randomly assigned to roles A or B at the beginning of this part and keep this role for the 15 periods. There is a total of 20 participants. 10 of the 20 participants are randomly assigned to role A and 10 to role B. At the beginning of each period, groups of 2 participants are formed. Each group includes a participant A and a participant B. Thus, if you are a participant A, you will be paired with a participant B. If you are a participant B, you will be paired with a participant A. It is impossible to know the identity of the person you are paired with. Moreover, the participant you are paired with is randomly determined before each new period.

6.2.3 Rules of the experiment

A number of points must be shared between participants A and B at each period. At the beginning of each period, both of the coupled participants in each group have to choose between two options: Bargain and Not to bargain.

If both partners choose to negotiate:

A and B have to split a number of points that decrease over time: the initial amount is equal to 500 points in the first bargaining step, 470 in the second step, 441 in the third step and 415 in the fourth (and last) step.

First step. A and B have to split a pie of 500 points. A makes an offer to B. This offer represents **the amount that A demands for himself.** This amount must be between 0 and 500 points. B can either accept or reject this offer.

If B accepts the offer, the period is over. A receives an amount of points equal to his offer. B receives the difference between the pie to divide (500 points) and the offer she accepted. *Example: assume that A offers* S_1 *to B. If B accepts the offer, the period is over. A receives* S_1 *and B receives* $500 - S_1$.

If B rejects the offer, both participants proceed to the next step.

Second step. A an B have to split a pie of 470 points. B makes an offer to A. This offer represents **the amount that B demands for herself.** This amount must be between 0 and 470 points. A can either accept or reject this offer.

If A accepts the offer, the period is over. B receives an amount of points equal to her offer. A receives the difference between the pie to divide (470 points) and the offer he accepted. *Example: assume that B offers* S_2 *to A. If A accepts the offer, the period is over. B receives* S_2 *and A receives* $470 - S_2$.

If A rejects the offer, the participants proceed to the next step.

Third step. A and B have to split a pie of 441 points. A makes an offer to B. This offer represents **the amount that A demands for himself.** This amount must be between 0 and 441 points. B can either accept or reject this offer.

If B accepts the offer, the period is over. A receives an amount of points equal to his offer. B receives the difference between the pie to divide (441 points) and the offer she accepted. *Example: assume that A offers* S_3 *to B. If B accepts the offer, the period is over. A receives* S_3 *and B receives* $441 - S_3$.

If A rejects the offer, both participants proceed to the next step.

Fourth step. The remaining pie is equal to 415 points. A receives an amount of points that is randomly drawn by the computer between 0 and 415 points. In this random draw, some values have more chances than other ones to be selected. This procedure is called ALEA. Table 1 shows the last 100 values drawn by this procedure. After the draw, A receives the randomly drawn value and B receives the difference between 415 and this value. The period is over.*Example: suppose the randomly drawn value is S_4. The period is over. A receives S_4 and B receives $415 - S_4$.*

If at least one of the two partners for that period chooses not to bargain:

In this case, the computer proceeds to a random draw to determine which one of these 2 situations will occur with a 50% probability each:

First possibility

Participants do not bargain. The pie to divide is equal to 470 points and is shared by the computer according to a random draw (ALEA procedure). Table 2 shows the last 100 values drawn by this procedure. After the draw, A receives the randomly drawn value and B receives the difference between 470 and this value. The period is over.*Example: suppose the randomly drawn value is S_5. The period is over. A receives S_5 and B receives $470 - S_5$.*

Second possibility

The bargaining option is imposed to participants. In this case, the game is played as if both participants had chosen the bargaining option (In this case, please refer to the previously described procedure). The period is over.

At the end of each period the computer will display a summary of your previous decisions and the number of earned points for each period.

Division of a pie of size 470 : Last 100 random draws

317	294	300	262	264	326	226	324	332	318
230	279	338	328	273	351	339	231	349	272
293	325	231	302	286	263	306	310	259	261
334	333	302	354	344	254	316	353	256	294
238	356	313	226	300	237	238	329	262	230
263	274	264	349	353	277	261	245	245	309
278	278	318	267	308	251	249	301	235	284
344	259	328	274	262	345	307	307	281	237
298	316	345	334	227	296	345	281	313	290
292	285	271	277	260	231	256	353	232	276

Division of a pie of size 415 : Last 100 random draws

254	244	281	213	245	261	297	260	245	256
219	271	254	279	306	238	229	228	209	259
218	266	237	305	252	214	279	288	270	292
210	296	216	315	198	197	294	239	250	205
204	212	195	283	259	263	218	251	288	288
242	308	287	201	273	283	191	246	242	225
319	295	281	244	286	226	236	246	314	205
274	235	203	213	199	246	316	261	254	317
218	239	241	226	255	207	257	316	263	309
276	247	280	198	289	281	255	210	219	232

6.3 Econometric and statistical analyses

Table 5: Analysis of the probability of bargaining per role: logit random effects model

	(1)	(2)
	Role= 0	Role= 1
Choix		
Aversion	0.227	0.296
	(0.61)	(0.89)
Periode	-0.120	0.0813
	(-1.65)	(1.35)
Session1	-2.745	2.431
	(-1.44)	(0.85)
Session2	-2.468	0.755
	(-1.20)	(0.37)
Session3	-0.190	2.381
	(-0.10)	(1.14)
Session4	1.823	1.233
	(0.94)	(0.70)
Session5	0	0
	(.)	(.)
Role	0	0
	(.)	(.)
Arpp	0.266	-0.368
	(0.51)	(-0.82)
Constant	-0.401	0.779
	(-0.18)	(0.24)
lnsig2u		
Constant	2.785***	2.028***
	(5.96)	(5.65)
N	462	481

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6: Comparisons to theoretical prediction: phase 1

Period	**t statistic**	**Statistical significance**
1	1.95	5%
2	2.18	5%
3	4.85	1%
4	5.08	1%
5	10.66	1%
6	5.39	1%
7	5.88	1%
8	7.18	1%
9	9.3	1%
10	8.9	1%
11	10.11	1%
12	13.28	1%
13	10.65	1%
14	13.79	1%
15	5.47	1%

Table 7: Comparisons to theoretical prediction: phase 2

Period	**t statistic**	**Statistical significance**
1	17.00	1%
2	14.02	1%
3	33.06	1%
4	22.20	1%
5	6.80	1%
6	19.06	1%
7	21.07	1%
8	43.38	1%
9	24.55	1%
10	10.56	1%
11	6.33	1%
12	15.56	1%
13	16.31	1%
14	30.76	1%
15	5.47	1%

Table 8: Comparisons to theoretical predictions: phase 3

Period	**t statistic**	**Statistical significance**
1	0.45	H0 not rejected
2	1.59	H0 not rejected
3	0.34	H0 not rejected
4	-2.21	5%
5	-0.67	H0 not rejected
6	-0.45	H0 not rejected
7	-0.39	H0 not rejected
8	-2.87	1%
9	-0.59	H0 not rejected
10	-0.15	H0 not rejected
11	-1.34	H0 not rejected
12	0.05	H0 not rejected
13	0.77	H0 not rejected
14	0.34	H0 not rejected
15	-0.88	H0 not rejected

Table 9: Phase 1 offers per range and condition

CB			
Range	*Number of offers*	*Number of accepted offers*	*Acceptance rate*
250-269	25	23	92.00%
270-289	55	34	61.82%
290-309	93	25	26.88%
310-329	7	0	0.00%
330-349	1	0	0.00%
>349	21	1	4.76%
VB			
Range	*Number of offers*	*Number of accepted offers*	*Acceptance rate*
250-269	56	54	96.43%
270-289	60	49	81.66%
290-309	178	75	41.85%
310-329	11	0	0.00%
330-349	2	0	0.00%
>349	13	0	0.00%

Table 10: Phase 2 offers per range and condition

CB			
Range	*Number of offers*	*Number of accepted offers*	*Acceptance rate*
200-219	5	3	60%
220-239	73	20	27.40%
240-259	31	2	6.45%
260-279	2	0	0.00%
280-299	2	0	0.00%
>299	6	0	0.00%

VB			
Range	*Number of offers*	*Number of accepted offers*	*Acceptance rate*
200-219	9	2	22.22%
220-239	97	22	22.68%
240-259	24	3	12.50%
260-279	6	0	0.00%
280-299	1	0	0.00%
>299	4	0	0.00%

Table 11: Phase 3 offers per range and condition

CB			
Range	*Number of offers*	*Number of accepted offers*	*Acceptance rate*
220-239	0	0	0.00%
240-259	26	3	11.54%
260-279	17	0	0.00%
280-299	15	0	0.00%
300-319	27	0	0.00%
>319	7	0	0.00%

VB			
Range	*Number of offers*	*Number of accepted offers*	*Acceptance rate*
220-239	5	5	100.00%
240-259	25	5	20.00%
260-279	14	4	28.57%
280-299	30	2	6.67%
300-319	25	0	0.00%
>319	12	1	8.33%

References

[1] Cachon, Gérard P., Camerer, Colin (1996), Loss-Avoidance and Forward Induction in Experimental Coordination Games. The Quarterly Journal of Economics, 111(1), pp.165-194.

[2] Frey, Bruno S., Jegen, Reto (2001), Motivation Crowding Theory. Journal of Economic Surveys, 15(5), pp.589-611.

[3] Gabuthy, Yannick, Lambert, Eve-Angéline (2013), Freedom to Bargain and Disputes' Resolution. European Journal of Law and Economics, 36, pp.373-388.

[4] Greiner, Ben (2015), Subject pool recruitment procedures: organizing experiments with ORSEE. Journal of the Economic Science Association, 1(1), pp.114–125.

[5] Harsanyi, John, Selten, Reinhard (1988), A General Theory of Equilibrium Selection in Games. Cambridge, IMA:MIT Press, 1988.

[6] Hoffman, Elisabeth, McCabe, Kevin, Shachat, Keith and Vernon Smith (1994), Preferences, Property Rights, and Anonymity in Bargaining Games. Games and Economic Behavior, 7, pp.346-380.

[7] Janssen, Maarten C.W. (2006), On the Strategic Use of Focal Points in Bargaining Situations. Journal of Economic Psychology, 27(5), pp.622-634.

[8] Johnson, Eric J., Camerer, Colin, Sen, Sankar and Talia Rymon (2002), Detecting Failures of Backward Induction: Monitoring Information Search in Sequential Bargaining. Journal of Economic Theory, 104, pp.16-47.

[9] Krawczyk, Michal (2011), A model of procedural and distributive fairness. Theory and Decision, 70(1), pp.111-128.

[10] Muthoo, Abinhay (1999), Bargaining Theory with Applications. Cambridge University Press, 357 pages.

[11] Muthoo, Abhinay (1995a), A Bargaining Model with Players' Perceptions on the Retractability of Offers. Theory and Decision, 38, pp.85-98.

[12] Muthoo, Abhinay (1995b), Bargaining in a Long-Term Relationship with Endogenous Termination. Journal of Economic Theory, 66, pp.590-598.

[13] Nash, John (1950), The Bargaining Problem. Econometrica, 18, pp.155-162.

[14] Rabin, Matthew (1993), Incorporating Fairness into Game Theory and Economics. The American Economic Review, 83(5), pp.1281-1302.

[15] Rubinstein, Ariel (1982), Perfect Equilibrium in a Bargaining Model. Econometrica, 50, pp.97-110.

[16] Schelling, Thomas (1960), The Strategy of Conflict. Harvard University Press.

[17] Stahl, Ingolf (1972), Bargaining Theory, Stockholm: Stockholm Research Institute.

[18] Van Huyck, John B., Battalio, Raymond C. and Richard O. Beil (1991), Strategic Uncertainty, Equilibrium Selection, and Coordination Failure in Average Opinion Games. The Quarterly Journal of Economics, 106(3), pp.885-910.