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Negotiating Inefficient Compromises: Is Less Better than More?

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Contents

Abstract

Significant efforts are made to design and implement decision and negotiation support systems to identify efficient alternatives. The underlying assumption is that decision-makers prefer an efficient alternative over an inefficient one. Experimental studies indicate that people often accept inefficient compromises and are unwilling to improve them even if prompted to do so. This report presents preliminary results for the analysis of 605 bilateral negotiations in which only 20.8% of negotiators who achieved an inefficient compromise entered the post-settlement phase in an attempt to improve the compromise.

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1. Introduction

The acceptance of inefficient compromises and the unwillingness of subjects in simulations to improve them is a intriguing phenomenon which has been observed in many experiments (see, for example, (Alemi, Fos et al. 1990; Prasnikar and Roth 1992; Roth 1995; Weingart 1996; Korhonen, Phillips et al. 1998). Different interpretations of this reluctance to improve agreements have been offered on theoretical (McClennen 1990; Varoufakis 1991; Kersten and Noronha 1998), as well as behavioural and experiential grounds. The latter includes observations about cognitive biases and limitations (Bazerman and Neale 1991; Neal and Bazerman 1991), differences in individual approaches to, and understanding of, decision and negotiation processes, and the understanding of the composition of negotiation outcomes (Adler and Graham 1989; Hofstede 1989; Faure and Rubin 1993). None of these arguments is wholly convincing, leaving the issue of why participants would reject a risk-free opportunity to improve their outcomes a substantive puzzle and a serious methodological problem.

Since 1996 the members of the InterNeg Project (InterNeg, 1998) have been conducting a series of experimental bilateral negotiations between people from diverse cultural, educational and professional backgrounds (Kersten and Noronha 1999b). The negotiators use INSPIRE (http://interneg.org/inspire), a Web-based NSS that allows for anonymous negotiation through the use of conjoint analysis for utility construction, a messaging facility for argumentation, and a visualization facility for the construction of a graph representing negotiation dynamics and history (Kersten and Noronha 1998). Participants who successfully reach agreement are then offered the opportunity to improve their compromises by utilizing post-settlement bargaining. As with other such studies, the majority of the subjects have declined.

In this paper we study the data obtained from the INSPIRE experiments to find reasons underlying negotiators' hesitation to improve their compromises.

2. INSPIRE negotiations

The negotiation problem involves two companies: Itex Manufacturing, a producer of bicycle parts and Cypress Cycles a bicycle manufacturer. The problem is a simple one

which was designed to have no identifiable cultural content. INSPIRE users are instructed to seek the best possible deal for their organization with the understanding that this contract may initiate a long-term connection between the two firms. There are four issues that both sides have to discuss: price, delivery time, payment time and the return policy. As the negotiators are not provided issue priorities, they have to evaluate their relative importance and determine the specific trade-off values between issues. For each issue a set of options, i.e., issue values, is given. Altogether, there are 180 complete and different potential offers (alternatives) that contain all four issues. All the issues and their options are given in Fig. 1. This figure depicts one of the Web pages used to formulate offer utility values.

INSPIRE negotiations move through three phases: *pre-negotiation analysis*, *conduct of negotiation*, and *post-settlement analysis* (Kersten and Noronha 1999a). The pre-negotiation phase involves an analysis of the problem, the formulation of preferences, construction of the utility function, specification of the expected compromise, and formulation of reservation levels. The negotiation ends when a compromise has been achieved, one of the users terminates the process or a deadline takes effect.

If users achieve an inefficient compromise then INSPIRE suggests the post-settlement phase. The system generates up to five efficient alternatives. An example of the INSPIRE page with efficient alternatives is given in Fig. 1. Negotiators may accept one of the displayed alternatives or propose other, efficient and non-efficient alternatives. The worst possible agreement, measured with users' individual utilities, is the compromise achieved in the negotiation phase (see Fig. 1).

3. Data

Between December 1996 and September 1998, 1210 people used INSPIRE. Of these there were 528 usable cases in which the individual reached an agreement with her/his counterpart. In 210 of these cases the agreement was efficient so post-settlement was not offered. Although the negotiation problem was fairly simple 318 participants (60.2%) reached an inefficient compromise. Only 66 of them (20.8%) took advantage of the opportunity to try to improve their non-efficient agreements. The vast majority (79.2%) did not want to continue negotiations.

Data to examine the difference between those who proceeded to post-settlement and those who did not comes from two sources in INSPIRE. Participants are asked to fill out two questionnaires, one early in the preparation phase of the negotiation, the second after the negotiation is terminated. As the negotiation proceeds the system tracks each move made including the messages exchanged, all of which must move through the site. All exchanges of offers and messages are time-stamped. There are nine categories of data which contain factors that might affect the negotiator's choice to move to the post-settlement phase. They are: the negotiator's characteristics, the negotiation problem, the negotiator's expectations prior to the simulation, characteristics of the support system, the negotiation process, the opponent's characteristics, the negotiator's assessment of these characteristics, the negotiator's assessment of her/his own performance and the

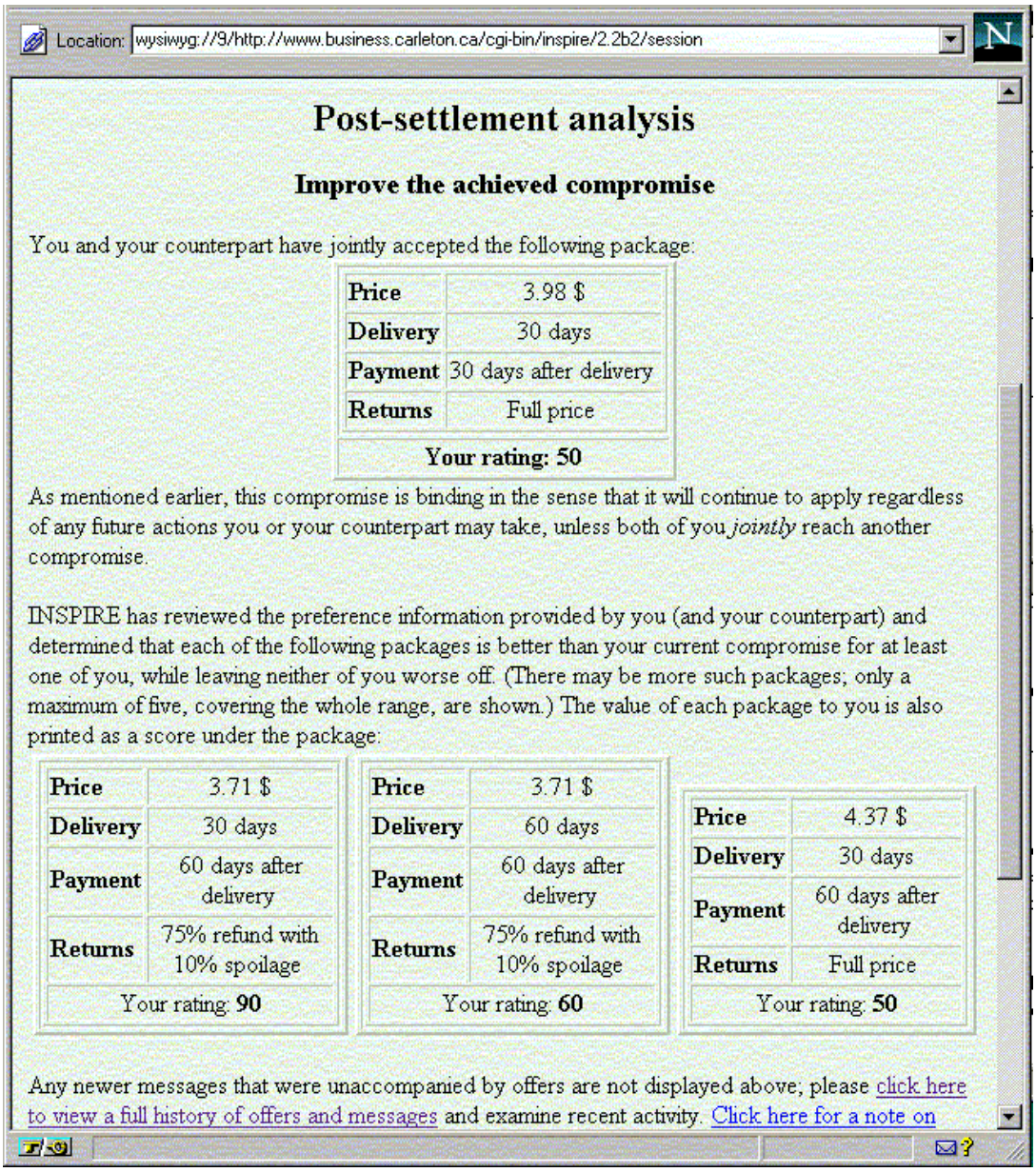

Figure 1. A page inviting an INSPIRE user to enter the post-settlement phase.

nature of the agreement. The INSPIRE system collects varying amounts of information pertaining to all these factors. Due to space limitations we will limit our discussion to the effects of the process on the tendency to proceed to post-settlement.

4. Analysis

The process of negotiation contains a number of elements which might prejudice the participants to either continue or curtail the experience. In face-to-face bargaining there are numerous factors which may come into play around the discussions, offers and disagreements that make up the process. In electronic bargaining some of these features are reduced if not eliminated in importance, especially those parts of the exchange that

are based on personality. This most likely heightens the salience of the offers and counteroffers that are exchanged and the arguments proffered to support them. The data collected by INSPIRE allows us to examine some of these factors to see if they distinguish between those who proceed to post-settlement and those who do not.

Table 1

Negotiation process versus the use of the post-settlement

	Number of valid cases	Significance level
Number of offers sent	268	.002
Friendliness	169	.939
Number of messages sent	268	.351
Average length of messages	259	.631
Number of offers with messages	268	.001
Mean time between exchanges	268	.323
Time remaining until deadline	259	.402

One of the process features which might affect the decision to move to post-settlement is the number of offers exchanged. Conceivably a larger number of offers might indicate that the process had moved incrementally to the initial agreement so the participants would be more likely to continue. Conversely a larger number of offers could suggest that the bargaining had been difficult so that the participants would not wish to prolong the experience even to improve their compromise. As the results in Table 1 show there was a significant difference ($p = 0.002$) between the two groups on the number of offers sent. An inspection of the distribution shows that those who utilized the post-settlement mechanism had made more offers than subjects who did not. It would appear, then, that the familiarity with either the system or the opponent betokened by making more offers inclines the participant to persist in the effort to achieve a better agreement. This result could also be interpreted in a rather different manner. If the larger number of offers indicated a more difficult path to the initial agreement, then proceeding to post-settlement might simply be an attempt to improve an agreement that, to this point, was less than satisfactory despite the agreement reached.

We can attempt to shed more light on this result by examining two other factors in the process. If moving to post-settlement is a matter of maintaining momentum in a comfortable relationship, one would expect that this would be reflected in the evaluation of the opponent. In the questionnaire administered at the end of the negotiation subjects were asked how friendly their opponents had seemed. As can be seen in Table 1 friendliness did not distinguish at all between those who moved to post-settlement and

those who did not. The perception of the opponent as an individual does not, apparently, influence the choice of whether to proceed.

While the characteristics of the opponent do not directly influence the participants' choice it may be that communication between the negotiators might do so again by facilitating the exchange of information and so making the continuation more attractive. The results shown in Table 1 provide a somewhat contradictory answer to this question. The simple number of messages sent by a subject does not distinguish between those who proceeded and those who did not. The average length of the messages also fails to show any significant difference. Whether one sends many or few message and whether those message are long or short makes no difference to the probability of moving to post-settlement. The sheer volume of communication is not a factor. However, when we examine the number of offers that were accompanied by messages then the difference is significant at the 0.001 level.

These two results indicate that offers play an important part in the movement to post-settlement. Simply communicating with one's opponent does not seem to have an effect on this aspect of the bargaining process. Many of the messages exchanged without offers contain explanations, arguments or partial offers (formal offers can only be made by including values for all four issues). However, a number of these messages are also social in nature. It is interesting that these seem to have no effect on the likelihood of proceeding to post-settlement. When combined with the lack of any effect for perceived friendliness this casts some doubt on the importance of the human side of the process for proceeding to post-settlement although it may be that the nature of electronic bargaining, the lack of face-to-face interactions, attenuates these influences.

Two other factors were also examined for their possible influence on the post-settlement decision. Given the importance of offers it appeared possible that the timing of interactions might also be important in edging participants toward post-settlement. If the exchanges were frequent then the parties might be more willing to continue the process. The results shown in Figure 1 do not bear out this supposition. The average time between messages had no significant effect.

Finally we examined the influence of deadlines. The INSPIRE system imposes deadlines both for pedagogical reasons and to prevent a large number of negotiations remaining open even though they have recorded no recent activity. We considered the possibility that the existence of the deadline might inhibit the use of post-settlement either because there was insufficient time left or because it was perceived as imposing closure on the process. The findings reported in Table 1 show that the gap between the agreement and the deadline had no effect on the tendency to move to post-settlement.

5. Discussion

In the title of this paper we ask if "less is better than more". This question reflects INSPIRE's use of the utility values to assess the compromise efficiency. If utility plays no role for INSPIRE negotiators then this would be a sufficient reason for their rejection of post-settlement. However, this is not the case, as 64.4% of the total population of users and 63.8% of users who achieved inefficient compromises stated that utility is extremely or very useful (values of 1 or 2 on a 7-point scale).

We have seen that 65.2% of users who did not enter the post-settlement phase and 59.6% per cent of those who did enter the post-settlement phase considered utility to be

extremely or very useful. Further, there is no significant difference between those who entered post-settlement and those who did not on their consideration of the utility importance (p=0.441). This implies that the use of utility, while considered very important in negotiations, does not influence negotiators' decisions on compromise improvement; most of them accept less rather than more.

While our examination of the factors that might affect the movement to post-settlement is limited, it does suggest some of the dynamics that may underlie a more thorough explanation of the general reluctance of negotiators to move to the post-settlement phase. The emphatic lack of any effect of friendliness on utilizing post-settlement makes it doubtful that the characteristics of the opponent will have much impact. This result would need to be verified by examining face-to-face negotiations and other desirability traits but it does suggest that the importance of such factors may be overrated. Such research would also help to shed light on the question of how much influence the personal anonymity inherent in electronic bargaining has on the process as a whole.

The importance of offers and the messages that accompany them places much more emphasis on the substantive elements of the process as drivers of the move to post-settlement. There appears to be some momentum, perhaps a mutual momentum, that builds as more offers are exchanged. This momentum is aided by the inclusion of information that supports and details the offers. Coupled with the finding on friendliness these results point to the structure of the process, in terms of the more formal parts of the interaction, as at least one important factor in understanding why negotiators do nor do not employ post-settlement mechanisms.

What does this imply for experimenters who would like to persuade their subjects to employ post-settlement techniques? First of all, our results, like many others, do indicate that simply offering post-settlement as a no-risk means of improving an agreement is not sufficient. Fewer than 21% of the subjects eligible availed themselves of the opportunity. Furthermore, 39.4% of those who entered the post-settlement phase did not selected an efficient agreement.

For experimenters our results imply that simple bargaining scenarios which may involve only a few exchanges of offers are unlikely to persuade participants to accept offers of post-settlement. Our work also suggests encouraging or requiring that offers be buttressed by arguments should facilitate further bargaining after the initial agreement is reached. It may even be fruitful to make the exercise more realistic by extending it over several sessions. This would increase the number of offers and provide the momentum that appears to help at least some negotiators to embrace both the concept and practice of post-settlement bargaining.

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