

Social Ties and Repeated Ultimatum Bargaining

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Bargaining & Responsiveness to conflict payoffs

- ▶ Subjects under-react to changes in the conflict payoffs (Anbarci & Feltovich, 2013, 2014)
 - ▶ most responsive if one conflict payoff exceeds half the total amount bargained over
 - ▶ risk aversion cannot account for the lower marginal reactions to changing conflict payoffs
 - ▶ social preferences (e.g. inequity aversion) may account for it
- ▶ marginal reactions to changes in conflict payoffs are stronger in the ultimatum than in the Nash demand game (Fischer, Güth, & Pull, 2007)

As-If Bargaining

- ▶ Binmore, Rubinstein, Wolinsky, 1986; van Damme, 1986; Trockel, 1999, 2000, 2002: Justification to apply the NBS independent of the bargaining protocol
- ▶ Gale, Binmore, Samuelson, 1995: Don't rely on SPE in ultimatum bargaining
- ▶ Selten, 2000: players in an ultimatum game act as if they found themselves in a (implicit) bargain
- ▶ Pull 1999, 2003

Experimental Design

A repeated ultimatum game with changing conflict payoffs

X : favoured player, Y : unfavoured player

E_t : total size of cake in t

o_t : offer to Y , w_t : Y 's conflict payoff

Earnings in case the offer is accepted

$$\Pi_t^X = E_t - o_t \quad \text{and} \quad \Pi_t^Y = o_t \quad (1)$$

Earnings in case the offer is rejected

$$\Pi_t^X = E_t - w_t - 10 \quad \text{and} \quad \Pi_t^Y = w_t \quad (2)$$

Parameter Values and Treatments

1st part

- ▶ base condition

$$E = 100, w = 20$$

either 2 or 4 periods

- (A) conflict payoff w_t declines
- ▶ $E = 100, w = 10$
- (B) cake size declines
- ▶ $E = 70, w = 20$
- (C) conflict payoff and cake size decline
- ▶ $E = 70, w = 10$
- 2 periods

2nd part

- ▶ base condition

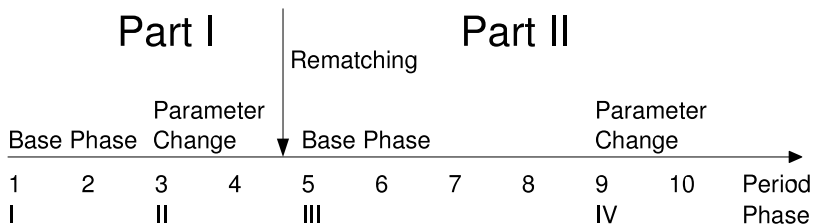
$$E = 100, w = 20$$

either 4 or 2 periods

- (D) conflict payoff increases
- ▶ $E = 100, w = 40$
- (E) cake size increases
- ▶ $E = 130, w = 20$
- (F) conflict payoff and cake size increase
- ▶ $E = 130, w = 40$
- 2 periods

Parameter Values and Treatments

- ▶ each session lasts in total for 10 periods
- ▶ $2 \times 6 \times 2$ design
- ▶ short and long base conditions
- ▶ treatments A – F
- ▶ X offers vs. Y demands



The Nash Bargaining Solution

Fischer, Güth, Müller, Stiehler, 2006: Proposer in the UG has higher (perceived) bargaining power

$$\max_{(u_X, u_Y) \in \Theta} (u_X - d_X)^\lambda (u_Y - d_Y)^{1-\lambda}$$

u_i Utility of the share of the cake assigned to player i

d_i Utility of conflict payoff b_i assigned to player i

$$\frac{u'_X}{u'_Y} = \left(\frac{\lambda}{1-\lambda} \right) \left[\frac{u_Y - d_Y}{u_X - d_X} \right]$$

Shares for player X and Y:

$$x = b_X + \lambda(E - b_X - b_Y) \quad \text{and}$$

$$y = b_Y + (1 - \lambda)(E - b_X - b_Y)$$

$$x + y = E$$

$$\Rightarrow o = w + 10 - 10\lambda$$

The Nash Bargaining Solution for 2 periods

$$\max_{(u_X, u_Y) \in \Theta} (u_{X,1} - d_{X,1} + p(u_{X,2} - d_{X,2}))^\lambda \\ \times (u_{Y,1} - d_{Y,1} + p(u_{Y,2} - d_{Y,2}))^{1-\lambda}$$

$$x_1 = \frac{(\lambda + 1)(pE_2 + E_1) - (2\lambda + 1)px_2}{2\lambda + 1} \\ + \frac{((b_{X,2} - b_{Y,2})\lambda - b_{Y,2})p + (b_{X,1} - b_{Y,1})\lambda - b_{Y,1}}{2\lambda + 1}$$

$$o_1 = w_1 + 10 - 10\lambda$$

$$o_2 = w_2 + 10 - 10\lambda$$

Social Preferences: Inequity Aversion

- ▶ Anbarci & Feltovich 2013 show that quadratic unfavourable inequality inequity aversion (together with linear favourable inequity aversion) may account for the under-responsiveness to changes in conflict payments
- ▶ With stable inequity parameters the NBS is time-invariant

Social Ties

- ▶ Charness & Rabin, 2002: A model of simple altruism (increasing social welfare) fits experimental data better than inequity aversion
- ▶ e.g. Dur and Tichem, 2012 use 'altruism' and 'spite' instead of inequity aversion (see also Bergstrom, 1999)

$$U_X = \Pi_X + \alpha U_Y$$

$$U_Y = \Pi_Y + \beta U_X \quad \text{with } -1 < \alpha, \beta < 1$$

$$U_X = \frac{1}{1 - \alpha\beta} (\Pi_X + \alpha\Pi_Y)$$

$$U_Y = \frac{1}{1 - \alpha\beta} (\Pi_Y + \beta\Pi_X)$$

The Nash Bargaining Solution with Social Ties

If p does not differ for different subjects and the social ties remain constant the one-period and multi-period case result in the same offer:

$$o = w + \frac{(10\alpha\beta - 10)\lambda - 10\beta + 10}{(\alpha - 1)(\beta - 1)}$$

$$\frac{\delta o}{\delta w} = 1$$

$$\frac{\delta o}{\delta \lambda} = \frac{10\alpha\beta - 10}{(\alpha - 1)(\beta - 1)} < 0$$

If social ties change over time there will be a time trend in offers, however:

$$\frac{\delta o_t}{\delta w_t} = 1$$

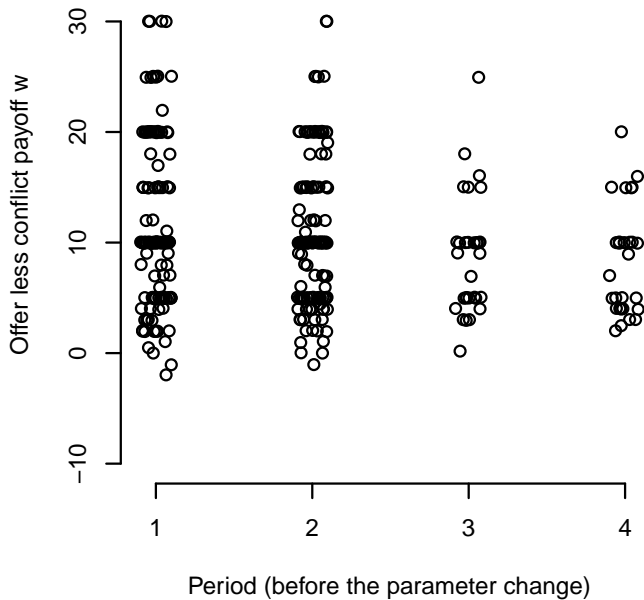
Hypotheses

- ▶ The proposer has higher (perceived) bargaining power and therefore demands a higher share for herself
- ▶ Offers fully react to changes in the conflict payoffs.
- ▶ It seems more plausible that the responder's social tie intensifies more (and faster) than the proposer's social tie. Therefore it is more likely that the responder's share of the surplus will decline over time.

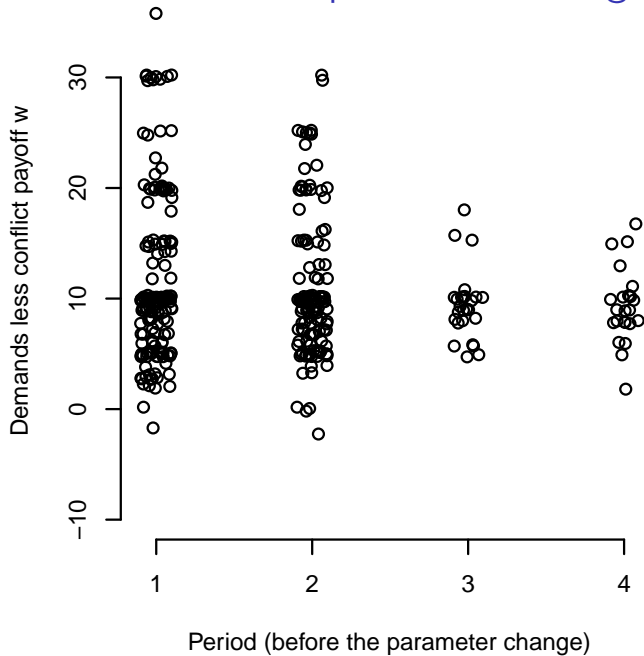
The data sample

- ▶ 316 undergraduate students
- ▶ on average 22.6 years old
- ▶ 59.2 % female participants
- ▶ a session lasts up to 45 minutes
- ▶ excluding show-up fee, earnings range from EUR 3.40 to EUR 7.30

Offers before the parameter change



Demands before the parameter change



RE panel regression on Offers & Demands before parameters change

conflict payoff is subtracted from offer and demand

Variable	Coefficient	b/St.Er
Constant	9.19**	15.38
demands	4.42**	5.25
Round	-0.84**	-4.27
demands:Round	1.78**	6.18

Adj. $R^2 = 0.13$

Variable	Coefficient	b/St.Er
Constant	9.04**	14.84
Long	-0.12	-0.17
Round	-0.92**	-4.81
demands	4.61**	5.37
w low	2.83**	3.65
E low	-2.18**	-2.47
interaction: both low	-1.45	-1.05
w high	-2.09*	-2.39
E high	7.77**	8.23
interaction: both high	-4.62**	-2.94
Long:demands	1.77	1.73
Round:demands	1.89**	6.68
demands:w low	-0.59	-0.48
demands:E low	-1.29	-1.00
demands:both low	-1.51	-0.72
demands:w high	-3.06*	-2.42
demands:E high	-6.13**	-4.28
demands:both high	6.30**	2.75

Summary

- ▶ In the proposer role a player receives more, reflecting her perceived higher bargaining power
- ▶ There is a time trend in offers and demands; the proposer increases her share over time
- ▶ Offers and demands adjust to the conflict payoffs but under-react

Adjustments do not depend on the length of the relationship

Demands are smaller than offers if the unfavoured player's conflict payoff or the cake size increase

- ▶ Bargaining offers and demands exceed the surplus