

Beblo, Miriam; Beninger, Denis

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# Experimental Evidence on Bargaining Power Within Couples

Denis Beninger<sup>b</sup> and Miriam Beblo<sup>a</sup>

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<sup>b</sup> Corresponding author: Universität Hamburg and University of Strasbourg, 61 Avenue de la Forêt Noire, 67000 Strasbourg, France, Denis.Beninger@wiso.uni-hamburg.de, +49 40 42838-8693

<sup>a</sup> Universität Hamburg, School of Business, Economics and Social Sciences, Department of Socioeconomics, Welckerstr. 8, D-20354 Hamburg, Miriam.Beblo@wiso.uni-hamburg.de, +49 40 42838-8680

## Abstract

We conducted an experiment on the nature of income sharing within 95 established couples in Germany. In a first step, the partners revealed their individual preferences by making consumption choices independently. In a second step, decisions were taken jointly over five different rounds with varying resource allocations between the partners. From this design we are able to derive a female bargaining power index without structural restrictions, reflecting the sharing rule within the couple. We observe this index to increase significantly with the female partner's money allocation. This effect is robust to the inclusion of socio-economic, distributional and attitudinal features of the couple.

**Keywords:** Intra-household allocation, Consumption choices, Couple experiment

**JEL Codes:** C71, C91, C92, D13

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## 1. Introduction

There is a vast body of research on the so-called sharing rule between two partners in a couple. According to the collective model approach, partners' decisions on the allocation of leisure time and income (Apps and Rees 1988 and Chiappori 1988, 1992) or consumption goods (Browning and Chiappori 1998) are driven by their individual decision-making power within the couple. This bargaining power or sharing rule is typically a function of individual incomes, socio-economic characteristics, and distribution factors (for example marriage market forces, i.e. sex ratios, legislation influencing the division of marital goods upon divorce) (Browning, Chiappori and Lechene 2006, Bobonis 2009).

However, the sharing of power within a couple is difficult to investigate when using traditional household data. This is due to the lack of simultaneous information on the preferences of each spouse, the couple's mutual decisions and how these decisions depend on the spouses' relative resources. To overcome these information gaps, first-generation proponents of the collective approach have imposed rather strict constraints on the couples' behaviour (as e.g. egoism and Pareto-efficient decision making) and samples investigated in structural econometric models (e.g. only dual-earner couples without children) (Browning et al. 1994, Browning and Chiappori 1998, Chiappori, Fortin, and Lacroix 2002). Since then, the modelling and the comprehension of the intra-household sharing of resources have improved steadily. Theoretical and empirical studies (Chiappori and Ekeland, 2009; Bourguignon et al., 2009; Bonke and Browning, 2010; Cherchye et al., 2012) show a prediction gain from exploiting additional information on individual expenditures of selected goods. Recent data surveys in Denmark (DES), the Netherlands (LISS) and Germany (PAIRFAM) intend to collect information on individual expenditures for a selection of goods.

However, in these data sets neither the individual preferences and the negotiation process, nor the impact of a change of the intra-household income structure on the spouses' decisions are observed as such. Instead, they are identified within a household model and through the observation of the individual expenditures of a limited set of private goods and the income variation between households (see Chiappori and Ekeland 2009 for the model specifications in the collective framework). Furthermore, the information on expenditures is asked retrospectively in these data, while it is commonly known that retrospective consumption data differ from real expenditures.

As a result, even the new data sets do not allow a precise description of the allocation of resources within the household since we still do not observe (i) the complete household

consumption pattern, (ii) both individual and couple preferences, and (iii) decisions of the couple by variation of relative incomes (as data are not available in panel format, or the panel history is too short).

Our paper fills the gap and offers evidence from an experiment with real established couples, where we directly observe the outcomes of spouses' negotiations and are therefore able to estimate the sharing rule with full flexibility. The originality of our experimental study is threefold. First, the participants take their decisions in a controlled environment. We hence observe the complete individual and interacted consumption patterns. Secondly, we ask for the choice of each spouse separately, as well as for the joint decision of the couple. Thirdly, we observe the potential change in couples' decisions when the resource allocation between spouses varies, while total household allocation remains the same. We can thus directly derive an index for the relative bargaining power within the household (i.e. the sharing rule in the collective setting).

As Bobonis (2009) puts it: "The ideal experiment [on the sharing of income within a household] would require the random assignment of income transfers to different decision-makers in the household and compare households' resulting consumption choices." In survey data, partner-specific income effects are difficult to identify because individual incomes may result from variation in prices (that is, primarily wages) or other possibly unobserved factors which independently affect household resource constraints or preferences. In our experiment, we are able to intervene exactly there, by manipulating partner-specific transfers, while holding prices and participants' characteristics constant.

In the following section, we will briefly describe our experiment. Section 3 presents statistical evidence on the partners' individual and couples' joint decisions. In Section 4, we derive an index of female bargaining power and discuss explanatory factors based on a regression analysis. Section 5 concludes.

## **2. Our experiment**

For our experiment, we recruited 95 established mixed-sex couples. According to Harrison and List (2004) our experiment may be classified as an artefactual field experiment since it is conducted with non-standard subjects. This way it combines the control of a standard laboratory experiment with the realism of a subject pool from the market of interest (i.e. consumption choices with family members or partners). The pool of participants was

representative for the Mannheim population – a city in the South-West of Germany where the experiment was conducted – with respect to age, income level and employment status. University or college graduates were over-represented, though. At the end of the experiment, the participants were asked to fill out a questionnaire on socio-economic characteristics, their family values and self-assessments of personal traits related to the experiment (for example selfishness).

Our experiment consists of seven tasks two of which were devoted to individual and couples' consumption decisions.<sup>1</sup> In a first step, we asked the participants to choose between consumption goods bundles. Each spouse was allocated with four banknotes of an experimental currency,<sup>2</sup> from which she could purchase up to four vouchers for three different nearby department stores that offered distinct portfolios of either cosmetics, fashion/sports or entertainment electronics products.<sup>3</sup> Physically, each participant was asked to distribute the banknotes between three envelopes stamped with the respective shop logo according to her consumption choice.

In a second step, the couples took joint decisions in a five-round procedure. In each round, each couple received the same total amount of money, i.e. four banknotes as before. However, the allocation between the spouses varied across rounds, with both spouses being allocated two banknotes in the first round but differing asymmetric allocations in the following rounds (see Table 1).

**Table 1: Resource allocation within the couple**

Round	Female allocation (# banknotes)	Male allocation (# banknotes)
1	2	2
2	4	0
3	3	1
4	1	3
5	0	4

Note: The Table shows the allocation of four banknotes between spouses across rounds.

The order of rounds 2 to 5 was changed after half of the experimental sessions.

<sup>1</sup> See Beblo and Beninger (2012) for a more detailed description of the experiment.

<sup>2</sup> For the sake of the experiment we created 50-Taler banknotes. The exchange rate was 10 Talers = 1 Euro.

<sup>3</sup> This way, we evaded the problem of redistribution between spouses after the experiment.

### 3. Individual and couples decisions

The variety of department stores offered had not been guided by our strategy to potentially match gender-stereotypical consumption preferences but to contrast couple decisions with individually revealed preferences. As documented in Table 2, the average choices of female and male participants did not deviate very much from another anyway. Overall, fashion and sports products were the most preferred – with 1.8 banknotes (= 90 from 200 Talers) among women and 1.9 (= 95 Talers) among men. Cosmetics seemed least demanded. More than half of the women and the men were not willing to spend any banknote on this product store. These revealed individual preferences then met in the couple part of the experiment where both partners were seated together and allowed to communicate on their joint choices.

**Table 2: Separate individual decisions**

	Fashion/Sports		Cosmetics		Electronics	
	Women	Men	Women	Men	Women	Men
Average number of banknotes	1.8	1.9	0.6	0.4	1.6	1.7
Number of participants spending all banknotes on this store	12	14	2	0	14	11
Number of participants spending no banknote on this store	24	15	51	56	22	22

Note: The Table shows the voucher choices of individual partners. N=95.

As said, in each of five rounds the total sum of four banknotes was allocated differently to the partners. In some, the female partner received more notes, whereas in others, the male partner benefitted more – the order of rounds varied as well. Only in the first round we always started with a symmetric allocation to both partners. Table 3 displays how couples chose between department stores under the given resource allocation. It shows that, in cases of higher female allocation, fashion and sports products were slightly more often chosen by the couple than electronic supplies. When money was symmetrically allocated to woman and man, or when male relative resources increased, most banknotes were devoted to the electronics store.

**Table 3: Joint couple decisions**

Round	Female partner	Male partner	Fashion/Sports	Cosmetics	Electronics
	# banknotes	# banknotes	Average number of banknotes		
1	2	2	1.7	0.5	1.8
2	4	0	1.8	0.5	1.7
3	3	1	1.9	0.4	1.7
4	1	3	1.6	0.5	1.9
5	0	4	1.6	0.5	1.9
Number of couples spending all banknotes on this store at maximum female allocation			18	2	18
Number of couples spending all banknotes on this store at maximum male allocation			13	4	22

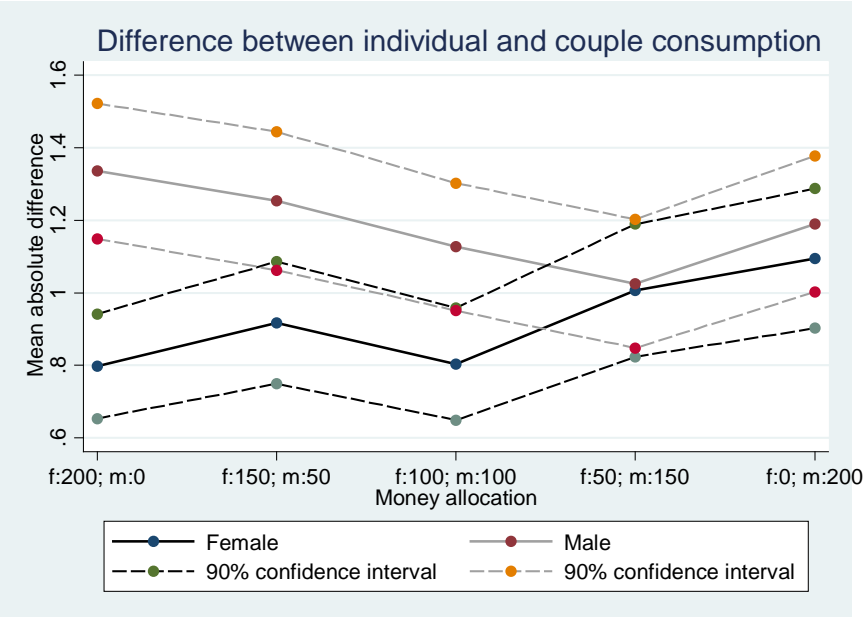
Note: The Table shows the allocation of four banknotes between partners across rounds and the respective voucher choices. The order of rounds 2 to 5 was changed after half of the experimental sessions. N=95.

Next, we are interested in the deviations of the decision at the couple level from the respective individual choices. For this purpose, Graph 1 depicts the mean distances  $d_k^{i,i=f,m}$  over all  $N$  couples between the individual consumption choice of the female or male spouse ( $c_{k,X}^{ni}$  ( $X=\text{cosmetics}, \text{fashion}, \text{electronics}$ ))) and the couple's joint decision in round  $k$  ( $c_{kX}^{nc}$ ):

$$(1) \quad d_k^i = \frac{1}{2N} \sum_{n=1}^N \left( \left| c_{k,\text{cosmetics}}^{ni} - c_{k,\text{cosmetics}}^{nc} \right| + \left| c_{k,\text{fashion}}^{ni} - c_{k,\text{fashion}}^{nc} \right| + \left| c_{k,\text{electronics}}^{ni} - c_{k,\text{electronics}}^{nc} \right| \right).$$

For instance, the variable  $d_k^f$  takes values from 0 (if couples' joint and females' individual decisions are the same for all couples) to 4 (if the four voucher choices differ between the joint and individual female preferences for all couples).

**Graph 1: Mean absolute difference between individual and couple choices across rounds**



Reading example: Absolute difference = 1 means that 3 voucher choices overlap (i.e. have been chosen for the same stores) by the couple and the individual spouse.

Interestingly, the female line (in black) remains below the male line (in grey), whatever the allocation of money between the spouses is. Therefore, the couple’s decision is, on average, always closer to the female’s preferences than to the male’s. In our experiment, women seem to have a higher negotiation power regarding expenditures for private good bundles, although the female and male distances do not remain significantly different (at the 10% level) as soon as the man receives more resources than his wife. Note that the male line is decreasing monotonically, except at the right hand end where the man shows altruistic behaviour when he receives all the resources. The female line does not show a completely corresponding pattern, as the couples’ decision at symmetric allocation (100:100) deviates more from the women’s mean choice compared to the unequal allocation (150/50), although both distances do not prove statistically different. Beyond this, the most remarkable observation in Graph 1 is that the distance  $d_k^i$  diminishes for both spouses when the own share of the household income increases, indicating a positive correlation between relative income and decision power within the couple.



#### 4. Bargaining power

The observed relationship is confirmed in a regression analysis of bargaining power on relative resources. The dependent variable depicts the female relative bargaining power  $rp^f$  and. It is defined as the ratio between the male and the sum of male and female deviations from the couple's decision:

$$(2) \quad rp^f = d_k^m / (d_k^f + d_k^m) = 1 - d_k^f / (d_k^f + d_k^m)$$

The index varies between 0 and 1. The sample mean of  $rp^f$  is 0.56, meaning that the participating women possess of slightly more bargaining power than their male partners on average, as already illustrated by the ranking of curves in Figure 1.

The variation of the female relative bargaining power with her relative allocation is investigated using socio-economic characteristics of the individual partners and the couple as well as behavioural information. Relative allocation is measured as  $ra^f = (\# \text{ banknotes the wife receives})/4$ . Hence  $ra^f$  varies from 1 (she receives the full sum of 4 banknotes, her partner nothing) to 0 (she receives nothing, her partner all).

Note that this estimation procedure corresponds to the estimation of the income sharing rule equation in the collective model but bears many advantages: First, econometric studies of the collective model estimate the sharing rule in a two-step procedure with coefficients calculated from the estimates of a labour supply equations using traditional survey data. By the design of our experiment, we are able to estimate the bargaining power directly. Secondly, we can identify the complete sharing rule, not only up to an additive constant, which is the typical caveat of structural econometric model approaches. Finally, we do not have to impose restrictions on the couples' behaviour such as egoism.

The estimation results in Table 2 confirm that the female bargaining power increases statistically significantly with her relative resource allocation. The positive effect of female resources on female power from the parsimonious model 1 remains when controlling for socio-demographic characteristics in model 2. The estimated coefficient of 0.11 indicates that an increase of the woman's income share  $ra^f$  from 0 to 1 leads to a 0.1 points higher bargaining power  $rp^f$ .

**Table 2: Linear regression of the female power index  
(adjusted robust standard errors for correlated panels)**

	Model 1		Model 2		Model 3	
	Coef.	Std. err.	Coef.	Std. err.	Coef.	Std. err.
Female relative allocation	<b>.114</b>	.023	<b>.112</b>	.025	<b>.098</b>	.023
Female age			<b>-.003</b>	.001	<b>-.005</b>	.001
Number of children			<b>.086</b>	.009	<b>.033</b>	.017
Duration of relationship			-.002	.002	.001	.001
College/university degree, male (0/1)			<b>-.111</b>	.009	<b>-.090</b>	.013
High income household (0/1)			<b>.080</b>	.036	.043	.037
Male has higher earned income (0/1)					<b>-.050</b>	.011
Difference in working hours, m-f					<b>.003</b>	.001
Female does more housework (0/1)					<b>-.097</b>	.023
Female prefers equity over efficiency previously in the experiment: (0/1)					<b>.048</b>	.016
Male reports selfish behaviour (0/1)					<b>-.116</b>	-.015
Male reports traditional values (0/1)					<b>-.037</b>	.017
Constant	<b>.510</b>	.134	<b>.670</b>	.040	<b>.925</b>	.067
N	395		380		375	
R-squared	.010		.059		.114	

Notes: In this estimation we ignore all couples where the female and the male partner reveal the same individual preferences because we are not able to draw conclusions on the sharing of these couples. The number of couples therefore reduces to 76. Each of them is observed five times (i.e. in each round). As a robustness check, we performed estimations considering all households in setting  $rp^f = 0.5$  for those households in which the female and the male have same preferences. Estimation results barely changed. Female and male responses to individual attitudes are highly correlated. We thus do not include both in the list of explanatory variables. Bold coefficients indicate a significance level of at least 5%.

Furthermore, the index is related positively to the number of children and being a high-income household and negatively to the woman's age and the man's education level. The specification in model 3 takes also distributional and attitudinal aspects of the couple into account. In this extended equation, the power index ceases to be related to the household's income level. However, unequal earnings and unequal repartition of the partners' time devoted to paid and unpaid work are statistical predictors. Not surprisingly, male participants who self-report in the questionnaire to be selfish tend to enforce their own preferences, and hence diminish female power, and so does a traditional role model favoured by the man. We observe further that female participants who prefer equity to efficiency in another part of the experiment (see analyses of this particular aspect in Beblo and Beninger 2013 and Beblo et al.

2014) are more likely to compromise on their will. The duration of the relationship appears irrelevant in determining the female's relative bargaining power.

## **5. Conclusions**

In this note we presented experimental insights into the mechanisms of the intra-couple bargaining process beyond the existing literature. Typical analyses of the sharing rule are structural econometric models which rely on the observation of the spouses' incomes and labour supplies, or consumption at the household level. Some papers use assignable goods to identify intra-family decisions (e.g. Browning et al., 1994). As these are very specific groups of goods, the procedure may still lead to biased results.

In light of these shortcomings, our experiment provides the first direct evidence on the part of bargaining power within a couple when taking joint consumption decisions. It allows us to compare individual preferences of each spouse for a set of private goods with the mutual decisions of the partners when the resource allocation between them is varying. We observe the participants' real actions, capturing their true behaviour with regard to their spending preferences. Our results on the intra-couple negotiation process are not limited by the model restrictions on the couples' behaviour usually imposed in family economics. On the contrary, the experimental design allows us to derive an empirical index of female bargaining power directly from the participants' behaviour. We observe this index to increase significantly with the female partner's money allocation. The positive relationship is robust to the inclusion of socio-economic, distributional and attitudinal features of the couple.

Despite the usual doubts towards any findings from laboratory experiments with a small number of participants, we are not too pessimistic about the external validity of our results – due to the artefactual-field nature of our experiment. If non-standard subjects, namely established couples of all ages and backgrounds, and a positively selected group of couples in terms of satisfaction with the relationship on top of that, show economic bargaining behaviour when (inter-)acting in their familiar environment as a couple, we shall expect this behaviour at least partly for the average population as well.

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