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IS WOMEN'S NON-MARKET TIME MORE VALUABLE THAN MEN'S?

by

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Is women's non-market time more valuable than men's?*

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Abstract

Using interview data on preferences for changes in own and spouse's labor supply, I find that men put a higher value on women's non-market time than vice versa. This is the opposite of what the unitary model of the household predicts when both spouses participate in labor market work.

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1. Introduction

A major problem for understanding decision making in households is that we usually only observe the outcome of the household decision process. It is seldom possible to observe the decision process itself and the preferences of the individual household members. Therefore it is not surprising that the empirical literature testing household models is rather small. Various approaches have been used to look inside the black box of household decision making. This paper adds to the empirical literature by using a new type of data, data on stated preferences for own and for the spouse's labor supply, to test predictions of household models.

Most of the economic models of the household belong to one of the three groups of unitary models (Becker, 1991), bargaining models (e.g. McElroy and Horney, 1981, and Lundberg and Pollak, 1993) and collective models (e.g. Chiappori, 1992). To be extremely brief, the unitary model assumes that the individuals in a household maximize a common utility function; the bargaining models assume that household decisions are a result of a non-cooperative game; and the collective model assumes that the household decisions are the outcome of a Pareto efficient cooperative game. In this paper I focus on the empirical implications and empirical tests of the models, but see Bergstrom (1997) for an overview of the theoretical literature.

The models have conflicting positive and normative implications. In the unitary model it does not matter for consumption choices who earns the income in a household as long as the total income is the same, i.e. incomes are pooled. In the bargaining and collective models the income share earned by each person typically affects the distribution of consumption within the household. Outside options, such as the state of the marriage market, can affect the distribution of consumption within the household in favor of the member with best outside options in bargaining and collective models, but not in the unitary model. There are also important differences between bargaining and collective models. In the collective models outcomes are always Pareto efficient. This is not necessarily the case in bargaining models.

The most tested assumption of any household model is the income pooling assumption of the unitary model. This is also an assumption of great normative importance. For example, using Brazilian data, Thomas (1990) shows there is a relationship between the share of household income earned by women and spending on goods that benefit children. This has been

interpreted as evidence against income pooling. However, Thomas (1990) tests whether there is a correlation between the distribution of income within the household and the consumption pattern, and it is doubtful whether such a correlation constitutes a causal relationship from income distribution to consumption distribution. There may very well be preferences driving both the share of earnings and the distribution of income within a family.

Collective models and household bargaining models are sometimes tested by regressing the share of single males versus single females for different age cohorts and regions on the distribution of consumption within the household, see e.g. Chiappori *et al* 2002. Again, causality is a crucial issue and it could be argued that the results are driven by the preferences. In older cohorts, men tend to be scarcer, but there may be other differences between age cohorts that can explain differences in the outcome variable. Regional differences in the share of single men and women are likely to driven by differences between local regional market conditions, which may have a direct impact on the outcome variables. The possible misspecification bias may go in both directions. For example, when they use instrumental variables to take account of endogeneity, Attanasio and Lechene (2002) find greater deviations from the predictions of the unitary model, than in their OLS estimation.

Three methods have been used to avoid misspecification problems when testing household models. The first and most obvious one is to find 'natural experiment' data with exogenous variation in right-hand side variables. Such data are not common, but exogenous changes in income shares of men and women have been used by Lundberg et al (1997), Ward-Batts (2007), and Attanasio and Lechene (2002). These studies found that an increase of the women's share of income changes the composition of household consumption in favor of goods typically consumed by women.[1] This goes against income pooling. Apart from income pooling none of the hypotheses generated by household models have been tested with data from natural experiments.

The relative lack of data suitable for testing household models has led some researchers to look beyond data on actual labor supply and actual consumption choices. Iversen *et al* (2006) perform experimental tests and find that household members cooperate to a large extent, but

[1] However, see Hotchkiss (2005) for criticism of Lundberg et al (1997), and Ward-Batts (2007) footnote 2 for a discussion of Hotchkiss' critique.

not to the extent that total income maximization is a reasonable approximation of observed behavior. They also observe substantial differences between the two villages they have studied in the degree of total income maximization. Their results thus suggest that different household models, or at least different parameterization of household models, are appropriate in different cases. Experimental tests seem to be a promising avenue for future research on household models. They have one drawback, however. It is always possible for the spouses to redistribute the monetary gains from an economic experiment after the experiment. Therefore it is not possible to observe the final distribution of consumption, when the income shares for men and women are changed in an experiment.

The third approach to avoid the difficulties commonly present when testing household models is to analyze interview data to obtain information on the decision making process. Attanasio and Lechene (2002) investigate the Mexican Progresa reform, which targets substantial economic support to women. They use interview data on the bargaining power of men and women in the decision process in the family.[2] They find that women's bargaining power increases when their income share increases.

In this paper, I use interview data on preferences for own and partner's labor supply. Thereby I can observe preferences directly. To my knowledge this is the first time data on stated preferences for partners labor supply is used to test household models. However, the idea is not new. Kooreman and Kapetyn (1990) and Kapetyn and Kooreman (1992) suggest that data on preferences for partners as well as own labor supply would be useful for identifying bargaining models in empirical studies of household models. Using stated preferences is uncommon since economists, for good reasons, prefer to study revealed preferences instead. One reason for deviating from this practice when studying household decision making, is that we only observe actual choices at the household level, and thus cannot observe the revealed preferences of the individual members of the household.[3] If we for example observe that the husband does less housework than the wife, we cannot determine whether this is a result of

[2] They also analyze consumption data and find that increasing the income share of women affects consumption patterns, which is in line with their finding of increased bargaining power of women.

[3] If we know the household decision making process, we may be able to recover individual preferences. For example Blundell *et al* (2007) assume that the collective model of household labor supply is the correct one, and can, given that assumption, estimate individual utility functions. In this paper I test household models, which, of course, is a different exercise.

the preferences or of the bargaining positions of the household members. To preview the results I find that men put a higher value on women's non-market time[4] than vice versa. This is in contrast to the unitary model, since the marginal utilities of non-market time should equal the wage rate, which is usually higher for men.

2 Empirical analysis

The data in this study was originally used by the Swedish Metro newspaper for an article on work and leisure. The data were thus not tailor-made to test household models. Still it contains information that is useful for testing such models.

2.1 Data

The data is obtained from a telephone survey conducted by the market intelligence company TNS Gallup. It is a random sample of individuals in the three biggest cities in Sweden, Stockholm, Gothenburg, and Malmö. The survey contains questions on the respondent's background characteristics and a number of questions related to labor supply.

Two questions explicitly ask the respondent whether he/she would be willing to reduce his/her working time by 2 days a month with a pay reduction of SEK 1000 and whether he/she would be willing to work ten more hours a month for SEK 1000. The respondents were also asked to answer the same questions but as if the offers were given to their partner instead.

The responses to the question on lowering income by SEK 1000 (approximately USD 150) to get two days off from work are shown in Table 1. This is a generous offer since forgone income is well below two days' pay for almost all workers. Out of 271 workers, 146 would accept the offer, and 179 would like their partner to accept the offer. There is a positive correlation of 0.57 between preferences for own and partner labor supply.

[Table 1 about here]

The answers to question 2, whether the respondent would be willing to work ten more hours per month for SEK 1000 (approximately USD 150) are shown in Table 2. In general the respondents were less interested in this offer, and most respondents declined it. The

[4] It is also common to use the term leisure for non-market time.

correlation between preferences for own and partner's labor supply is somewhat lower for question 2 than for question 1, 0.47.

[Table 2 about here]

2.2 Results

In the unitary model labor could be supplied either by one or both spouses. The casewhere one spouse does all the labor market work, while the other spouse is a full-time home-maker is very uncommon in Sweden. Less than two percent of the women and less than half a percent of the men aged between 16 and 64 were full-time home-makers in 2003. We therefore only consider the case where both spouses supply labor. The prediction of the unitary model is then that marginal income should equal the marginal value of non-market time, and thus that the marginal value of non-market time is lowest for the spouse with the lowest wage, see Becker, 1991. In this case, the spouse with a higher income would be less willing to accept an increase in working hours on behalf of himself or herself than on behalf of the spouse. Unfortunately, we only have data on the total income of the household. However, we can use the fact that the husband usually earns more than the wife and split the sample into men and women. This is done in Table 3 and 4.

[Table 3 about here]

[Table 4 about here]

In the 'total' columns of Table 3, men are actually more willing than women to increase their working hours, for the given wage of SEK 1000 for ten hours of work. This is at odds with the prediction of the unitary model. The pattern in Table 4 is more in line with the unitary model; women are less willing than men to reduce working time, for a given wage decrease. A possible explanation for this finding is that men are less loss averse than women (see e.g. Brooks and Zank, 2005). Loss aversion causes individuals to avoid negative changes from a reference value, for example current income and current leisure. If men are less loss averse than women, they will therefore be more willing to accept changes in general. This may explain why men are more willing than women to accept both increases and decreases in working time. Only looking at the total columns of Table 3 and 4 does not offer any

conclusive evidence for or against the unitary model, but the lack of support for the predictions of the unitary model could be viewed as weak evidence against the model.

In Tables 3 and 4, we can also see how the respondents answer the same questions on behalf of their partner. Generally, the respondents are more willing to let their partner change labor supply, in either direction, than they are willing to do themselves, the difference being significant at the five percent level in all tables but 3a. One possible interpretation of this is that each member of a household, at least to some degree, has a separate budget. In other words there is a sharing rule under which each member of the household keeps his/her own money (at least to some degree). In both the collective and bargaining models an increase in own income affects the bargaining power positively and each member of the household is therefore more affected by own choices than by the choices of the other member of the household. For the unitary model we would expect a symmetry in the number of persons willing to change their own labor supply and the number of persons willing to change the labor supply of their partner. The finding that respondents answer 'yes' to questions 1 and 2 more often when their partner is concerned than when they themselves are concerned is at first sight compatible with the bargaining and collective models, but not with the unitary model. However, there is an alternative explanation. Perhaps the respondent does not wish to appear 'dominant' towards his or her partner, and therefore answers that he or she would be willing to accept changes in the labor supply of the partner, i.e. answer yes more often on behalf of the partner than on behalf of himself or herself. On the other hand, most respondents answer no on behalf of their partner on question 1, so most people do not seem to be afraid of appearing dominant when answering the questions.

So far the evidence has not been conclusive. We have seen that men are more willing to increase working hours, which goes against the unitary model, but this may also be explained by a lower loss aversion for men. We have also seen that the respondents are more willing to let their partner change labor supply, in either direction. Again, this is at odds with the unitary model, but it may also be explained by the alternative explanation that respondents do not want to appear dominant towards their spouse. However, when combing the responses given regarding changes in own and partner's labor supply we find an interesting pattern to which I have found no alternative explanation. Women are more willing to let their partner increase working time when answering question 1. When answering question 2 women are less willing to let their partner increase their non-market time, conditioned on that women are in general

less willing to accept the offer of increased non-market time. A binominal test comparing the number of No/Yes and Yes/No responses for men and women for question 1 (18/5 compared to 8/7) is significant at the three percent level. A binominal test for question 2 (23/4 compared to 23/9) is significant at the five percent level. This definitely goes against the unitary model, since if anything we would expect women to put a higher value on their partner's non-market time, since men's wages are usually higher. The asymmetry of preferences between men and women is an indication of a conflict of interests regarding work/non-market time decisions within families and is in that very general sense compatible with the bargaining and collective models. However, nothing in these models gives the prediction that men and women (or high and low wage spouses) should be asymmetrical in the way found in the data.

We may ask why men put a higher value on women's non-market time than vice versa. One interpretation is that the respondents may expect that their own time doing housework would decrease if their partner's non-market time increases. Men may, due to gender roles, expect to gain more from this effect and are therefore more willing to increase the non-market time of their spouse than vice versa.

Table 5. Summary of results

Hypothesis from unitary model	**Results**	**Alternative explanation?**
Men's non-market time more valuable than women's.	Hypothesis rejected	Yes, men less loss averse
Symmetry between valuation of own and partner's non-market time	Hypothesis rejected	Yes, respondents may not want to appear 'dominant' towards spouse
Men should put a lower value on women's non-market time than vice versa	Hypothesis rejected	No

3 Conclusions

Many economic decisions are made in a household setting and the interaction between household members may have large economic consequences. Unfortunately, we usually only observe the outcome of he household decision process. The decision process itself and the preferences of the individual members of the household are rarely observed. In this paper, I use interview data on preferences for own labor supply and for the labor supply of one's

partner. The main finding is that men put a higher value on women's non-market time than vice versa. This is at odds with what the unitary model predicts. Given that men's wages are usually higher than women's, the value of non-market time should be higher for men than for women. However, the difference between the genders in the valuation of the non-market time of one's partner is not evidence in favor of bargaining or collective models, except in the very general sense that there seems to be some divergence of interests between the members of the household.

The use of stated preferences on own and partner's labor supply for studying household decision making was proposed already by Kooreman and Kapetyn (1990) and Kapetyn and Kooreman (1992). The findings in this paper show that this approach yields interesting results. The data used in this paper were not tailor-made to study household decision making, but to obtain richer data, for example by interviewing both spouses and collecting more background variables, seems to be a promising way of gaining more knowledge on household decision making.

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Table 1. Question 1: Increase of non-market time

		Could you imagine your partner reducing his/her salary by SEK 1000 giving him/her two extra days off compared to today?		
		Yes	No	Total
Could you imagine reducing your salary by SEK 1000 a month if it gave you two extra days off work a month?	Yes	133	13	146
	No	46	79	125
	Total	179	92	271

Correlation 0.57

Table 2. Question 2: Increase of income

		Could you imagine your partner working 10 hours more a month so that you would get SEK 1000 more a month?		
		Yes	No	Total
Could you imagine working 10 hours more a month for an extra SEK 1000?	Yes	22	12	34
	No	26	225	251
	Total	48	237	285

Correlation 0.47

Table 3a. Question 1: Increase of income, sub-sample men

		Could you imagine your partner working 10 hours more a month so that you would get SEK 1000 more a month?		
		Yes	No	Total
Could you imagine working 10 hours more a month for an extra SEK 1000?	Yes	13	7	20
	No	8	114	122
	Total	21	121	142

Table 3b. Question 1: Increase of income, sub-sample women

		Could you imagine your partner working 10 hours more a month so that you would get SEK 1000 more a month?		
		Yes	No	Total
Could you imagine working 10 hours more a month for an extra SEK 1000?	Yes	9	5	14
	No	18	111	129
	Total	27	116	143

Table 4a. Question 2: Increase of non-market time, sub-sample men

		Could you imagine your partner reducing his/her salary by SEK 1000 giving him/her two extra days off compared to today?		
		Yes	No	Total
Could you imagine reducing your salary by SEK 1000 a month if it gave you two extra days off work a month?	Yes	72	4	76
	No	23	33	56
	Total	95	37	132

Table 4b. Question 2: Increase of non-market time, sub-sample women

		Could you imagine your partner reducing his/her salary by SEK 1000 giving him/her two extra days off compared to today?		
		Yes	No	Total
Could you imagine reducing your salary by SEK 1000 a month if it gave you two extra days off work a month?	Yes	61	9	70
	No	23	46	69
	Total	84	55	139

Appendix

The exact phrasing of question 1 and 2
Could you imagine working 10 hours more a month for an extra SEK 1000?

Could you imagine reducing your salary by SEK 1000 a month if it gave you two extra days off work a month?

If you have a partner, could you imagine him/her working 10 hours more a month so that you would get SEK 1000 more a month? (If the interviewee does not have a partner, ask them to answer hypothetically, i.e. if they had a partner, could they conceive/imagine)

Similarly, could you imagine your partner reducing his/her salary by SEK 1000 giving

him/her two extra days off compared to today?