FINANCIAL MANAGEMENT, BARGAINING AND EFFICIENCY WITHIN THE HOUSEHOLD; AN EMPIRICAL ANALYSIS**

BY

SIMONE DOBBELSTEEN AND PETER KOOREMAN*

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1 INTRODUCTION

While economists have started opening the black box 'household' only recently, research into intra-household issues has a long-standing tradition in sociology. In particular, the intra-household distribution of money has received ample attention in the sociological literature. Various studies – Blood and Wolfe's (1960) 'resource theory of family power' being one of the first – suggest a significant relation between a household's financial organization and inequalities between partners in decision-making. For instance, Blumstein and Schwartz (1983) state that '... cohabiting women are watchful and independent in financial matters, the possible loss of power being the driving force behind their caution,' Treas (1991) concludes that apart from transaction cost considerations, marital power differentials influence a couple's choice between holding joint or separate bank accounts. Most studies argue that the power balance in a family relates to the comparative resources like income, education, and occupational status of husband and wife. Some authors have tested this resource theory, using data from developed as well as from developing countries; for overviews see Safilios-Rothschild (1970), McDonald (1980), and Mizan (1994). However, the results of this literature are often difficult to interpret because of the absence of a coherent analytical framework and a clear definition of power. We argue that an appropriate way to study and explicitly define the distribution of power within households is to analyze household decision-making within a game-theoretic framework. A bargaining model of household behaviour allows for the fact that both partners differ in their preferences towards spending available household income. In that case, the distribution of power between partners is reflected in the extent to which both part-

*   Ministry of Social Affairs and Employment, The Netherlands, and Groningen University, The Netherlands, respectively.

ners' preferences are weighed in the final household decisions: the most powerful spouse will be better able to realize his/her preferences. In section 4 we will further discuss our bargaining model.

Although most sociological studies on financial management focus on a possible relation with family power, some of them also point to the burden of managing household finances. Pahl (1980) finds that in low income households, where financial management is more of a chore than a source of power, women typically manage the household's money. Alternatively, in high income households men appear to be more likely to control finances while their wives receive a housekeeping allowance. So control over expenditures not necessarily means more power, but may also stand for the arduous task of making ends meet. This suggests that (at least) two aspects play a role in the household's choice how to divide household finances between both partners. One is the power aspect, based on the assumption that the one who controls can influence the final outcome. The other is the efficiency aspect, as the division of financial management between partners may be part of an efficient division of tasks within the household.

In this paper we consider two competing models explaining how finances are organized. The first model is based on a household production approach, in which behaviour is determined by an efficient allocation of both partners' time to market work, financial management, and leisure (section 3). In the second model financial management is a reflection of bargaining power (section 4). As will be discussed in section 5, the bargaining and the household production approach each suggest alternative effects of certain household characteristics on financial management within the household. Empirical estimation of these effects may inform us on which model provides the best interpretation of the financial management of households.

Our empirical analysis uses data from the British Household Panel Survey on households' financial management and financial decision-making (section 2 describes the data in detail). Financial management of households involves a diversity of decisions varying in importance, frequency and amounts of money involved. We analyze information on five different aspects of financial management: A) the household's financial allocative system; B) who has the final say in big financial decisions; C) who pays regular household bills; D) who handles everyday household spending; and E) do partners ask permission for personal spendings between £10 and £20. These various parts of financial management reflect different types of decision-making authority. Vogler and Pahl (1994) make a distinction between strategic control and executive management. They suggest that strategic control concerns important and infrequent decisions with the labour input being small in relation to resulting power. In those cases the power aspect may very well dominate the efficiency argument. Alternatively, for executive management, concerning time-consuming and routine-like decisions within certain limitations, the efficiency argument is probably more persuasive and the household production approach may be most appropriate. In section 5 we will examine

for each aspect of financial management (questions A to E) whether the power argument or the efficiency argument is dominant in the division of responsibilities between partners. Note that we refer to questions A to E as aspects of 'household's financial management'. Although several studies interchangeably use terms like 'decision-making power,' 'authority,' 'responsibility,' and 'management,' we chose to use the last term as we think it is the most neutral term.

2 DATA: THE BRITISH HOUSEHOLD PANEL SURVEY[1]

In the British Household Panel Survey (1991–1992) couples were asked to point out which financial allocative system they use to organise their financial affairs. The question was formulated as follows (Taylor (1992)):

People organise their household finances in different ways. Which of the methods on this card comes closest to the way you organise yours? It doesn't have to fit exactly – just choose the nearest one. You can just tell me which letter applies.

A I look after all the household money except my partner's personal money

B My partner looks after all the household's money except my personal spending money

C I am given a housekeeping allowance. My partner looks after the rest of the money

D My partner is given a housekeeping allowance. I look after the rest of the money

E We share and manage our household finances jointly

F We keep our finances completely separate

G Some other arrangement

The question was answered by both partners separately. We selected a subsample of couples of which we had the answers of both partners and additional information on education, current income, etc. Table 1 shows the answers of both partners, with HFAS denoting the financial allocative system reported by the husband and WFAS the allocative system reported by the wife. We excluded categories F and G from our table, as these were chosen by only a few couples and because they raised some interpretation difficulties. The codes of HFAS and WFAS are defined as follows:

1 Wife is given a household allowance

2 Husband looks after all household money, except wife's personal spending money

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    3 Both share and manage household finances jointly

    4 Wife looks after all household money, except husband's personal spending money

    5 Husband is given a household allowance

In our opinion this ordering of the codes reflects a higher influence of the wife in higher codes: while the third system is associated with joint management, the first two are 'male managed,' and the last two 'female managed' systems. One could argue, however, that the order of 1 and 2 is unclear and perhaps should be reserved, as well as the order of 4 and 5. But since the second and the fourth system explicitly exclude the partner's personal spending money from the household money looked after, we associate these with a more equal distribution of influence over partners than the first and fifth system. We will come back to this in section 5, but meanwhile we will assume that the financial allocative systems can be arranged as above.

    Table 1 shows that in roughly two-thirds of the cases both partners agree on which financial allocative system they use (diagonal cells). We see that more than half of all respondents (1475 males and 1454 females) report to manage household finances jointly, over a quarter reports that the wife looks after all household money, and the housekeeping allowance system and 'husband looks after all the money' are each reported by about 10 percent of all respondents. These figures correspond very well with a study by Vogler and Pahl (1994), who found percentages of respectively 50, 26, 12 and 10 using the same categories of allocative systems. However, their findings were based on a dataset in which only one spouse per household was interviewed (the British 'Social Change and Economic Life Initiative,' 1987).

TABLE 1 – A) FINANCIAL ALLOCATIVE SYSTEM USED ACCORDING TO HUSBAND AND WIFE

Wife's answers → (WFAS)	1	2	3	4	5	Tot.
Husband's answers (HFAS) ↓						
1	170	28	33	13	3	247
2	64	154	79	15	1	313
3	80	81	1138	174	2	1475
4	24	10	202	524	3	763
5	4	1	2	4	2	13
Tot.	342	274	1454	730	11	2811

If both partners give non-corresponding answers, mostly one of them reports equal sharing of finances (the highest off-diagonal numbers are found either in the third row or in the third column). Also note that on average respondents ascribe less responsibility to themselves than their partners do: husbands more often choose higher categories than their wives. Consider, for instance, the column and row corresponding with allocation type 3: given that their partners chose this type, 204 husbands *versus* 176 wives chose a category with less male responsibility, while 112 husbands *versus* 161 wives chose a category with less female responsibility. The same holds for the other management types.

Why do partners provide different answers? A priori several explanations for the discrepancies can be hypothesized. A first hypothesis is that the question asked may be ambiguous to respondents. 'Managing household finances' may cover various domains of financial decision-making and at each domain both partners can play a different role. So depending on how respondents weigh the various components of 'managing household finances' they will choose the best fitting category. In this case, partners may perfectly agree on who is responsible for various parts of household finances but still report different types of allocative systems. Another explanation of the observed discrepancies may be that respondents are simply not aware of their authority. Olson and Rabunsky (1972) find that respondents can better identify what decisions are made than who makes them. Mizan (1994) reviews some studies on discrepancies between self-report and observation. Feminist research has argued that men and women's experiences may lead them to perceive the world differently (Harding (1986)). Furthermore, respondents may be reluctant to admit or deny any authority over their partner (e.g. Turk and Bell (1972), Antonides and Hagenaars (1992)). This last suggestion would especially explain the large number of respondents in our sample reporting equal sharing of household finances. We will test a number of these hypotheses on our data.

Tables 2 up to 5 shows the responses to questions B, C, D and E, respectively. The percentages of corresponding answers for B, C, and D are much higher than for question A: 75 for B, 82 for C, and 85 for D. As suggested above, this is likely to be related to the fact that question A is defined less narrowly than the other questions. Note that for question E respondents are only asked if they themselves ask permission for personal expenditures between £10 and £20, and not if their partners ask them for permission. Therefore, we cannot check if the answers of both partners correspond with each other for question E.

Note that the questions concern various types of decision-making authority, varying from strategic control to executive management.

TABLE 2 – B) IN YOUR HOUSEHOLD WHO HAS THE FINAL SAY IN BIG FINANCIAL DECISIONS?

Husband's answers → Wife's answers ↓	Wife	Husband	Both	Other	Total
Wife	111	63	101		275
Husband	21	421	208	2	652
Both	93	240	1540	4	1877
Other		2	1	2	5
Total	225	726	1850	8	2809

TABLE 3 – C) IN YOUR HOUSEHOLD WHO MAKES SURE THAT REGULAR HOUSEHOLD BILLS ARE PAID, I MEAN THINGS LIKE THE BILLS FOR THE GAS, ELECTRICITY, TELE-PHONE?

Husband's answers → Wife's answers ↓	Wife	Husband	Both	Other	Total
Wife	1127	74	122	6	1329
Husband	32	873	76	4	985
Both	72	123	276	4	475
Other	2	2	1	11	16
Total	1233	1072	475	25	2805

TABLE 4 – D) AND WHO IS MAINLY RESPONSIBLE FOR HANDLING YOUR EVERYDAY HOUSEHOLD SPENDING? I MEAN THINGS LIKE FOOD, HOUSEHOLD NECESSITIES AND OTHER ITEMS OF GENERAL HOUSEKEEPING?

Husband's answers → Wife's answers ↓	Wife	Husband	Both	Other	Total
Wife	2010	53	163		2226
Husband	36	120	36		192
Both	84	46	257		387
Other	1			1	2
Total	2131	219	456	1	2807

TABLE 5 – E) IF YOU BUY SOMETHING FOR YOURSELF COSTING BETWEEN £10 AND £20 WOULD YOU USUALLY: ASK YOUR PARTNER IF YOU *COULD* BUY IT; MENTION IT TO YOUR PARTNER; NOT MENTION IT AT ALL?

Husband's answers → Wife's answers ↓	Ask	Tell	No mention	Other	Total
Ask	156	211	47	5	419
Tell	204	1026	220	32	1482
No mention	74	402	352	14	842
Other	8	16	10	6	40
Total	442	1655	629	57	2783

3 A HOUSEHOLD PRODUCTION MODEL OF FINANCIAL MANAGEMENT

In this section we interpret the management of household finances as a specific form of household production. Starting point is that all parts of financial management, varying from daily shopping to taking out a mortgage, cost time. We consider both partners' time inputs as the only characteristic of the household's financial management, so possible power aspects are ignored in this section. We assume the amount of home production (i.e. managing household finances, other forms of household production are ignored) to be exogenous, but the time inputs of both partners used to realize it can be chosen by the household. Note that this assumption distinguishes our approach from traditional analyses of household production, in which the household can choose the desired amount of home production as well. This distinction results from the nature of home production considered: while most examples in literature define home production to include cooking, cleaning, child care, and other services for which market alternatives may or may not be available, we limit our analysis to financial management.

The amount of home production resulting from the time inputs of both partners is described by a household production function:

$$Z = z(H_m, H_f) \tag{1}$$

where H_m and H_f denote the time inputs of the male and the female partner, respectively. The optimal allocation of both partners' time to home production and other activities results from the household maximizing its utility subject to certain time and budget constraints and the home production function. We assume that the two-adult household has the following (joint) utility function:

$$U = u(X, L_m, L_f) \tag{2}$$

where X is the amount of consumption goods, and L_m and L_f are hours of leisure enjoyed by the male and female partner, respectively. Note that we assume that

partners do not derive any utility from managing housefold finances, so home production does not enter the utility function. However, we assume that the existence of the household requires a certain 'amount' of financial management $\acute{Z}$, such that $z(H_m, H_f) = \acute{Z}$. If we specify Z as:

$$Z = \alpha \cdot H_m + \beta \cdot H_f,\tag{3}$$

the time input of the husband can be substituted by the time input of the wife at a constant rate α/β. This specification in most cases will lead to corner solutions, i.e. only one partner wil participate in home production, while in our data we observe both partners participating in financial management very frequently. We therefore chose a more general specification, in which corner solutions are less prevalent. We assume the production function z to be concave, so z is increasing in both its arguments, and the matrix of second derivatives is negative semi-definite, with H_m and H_f substitutable at diminishing marginal rates.

Let T be the total time endowment of each partner in a household. Each partner's time can be allocated to leisure (L_p), home production (H_p), or working in a paid job (N_p), so the following time constraint must hold:

$$L_p + N_p + H_p = T, \quad p = m, f.\tag{4}$$

Moreover, the household is restricted to the household's budget constraint:

$$X = \mu + w_m \cdot N_m = w_f \cdot N_f\tag{5}$$

where μ is the household's non-labour income, and w_p is the net wage rate of partner p.

The household maximizes its joint utility function (2) subject to the restrictions given by (4) and (5), the household production function (1), and non-negativity constraints on X, L_p, H_p and N_p, where $p = m, f$. We assume that the non-negativity constraints on L_p are not binding in an optimal allocation, so both partners have a positive amount of leisure. From the Kuhn-Tucker conditions of the optimization problem it follows that:

$$\frac{\partial U/\partial L_m}{\partial U/\partial L_f} = \frac{\partial z/\partial H_m}{\partial z/\partial H_f}\tag{6}$$

which, in case both partners participate in the labour market, results in:

$$\frac{\partial z/\partial H_m}{\partial z/\partial H_f} = \frac{w_m}{w_f}.\tag{7}$$

Alternatively, if inequality holds in equation (6) it is optimal that only one of both partners handles financial management.

Note that the right-hand side of (6) reflects the substitutability of both partners' time inputs in the home production function. If we choose specification (2), the substitutability will be constant (namely α/β) for all values of H_m and H_f. The isoquants for this case are presented in Figure 1a.
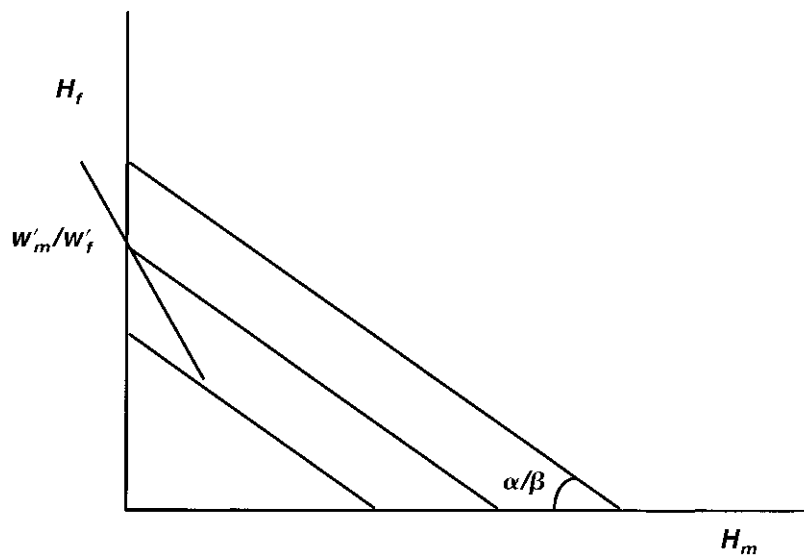

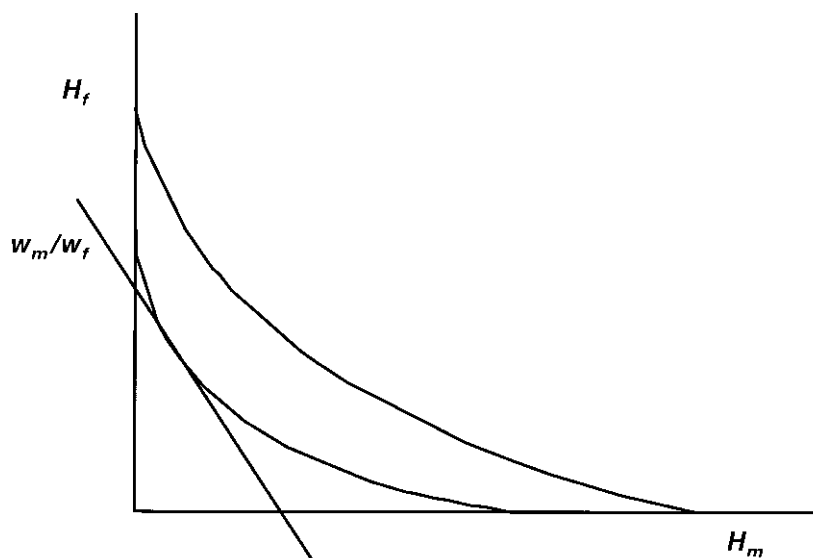Figure 1a – Isoquants for home production function $Z = \alpha \cdot H_m + \beta \cdot H_f$

Figure 1b – Isoquants for concave home production function $z(H_m, H_f)$

The figure shows that if w_m/w_f is either smaller or larger than α/β (for instance, w'_m/w'_f in Figure 1a, it is optimal for the financial management to be handled by one partner. Only when w_m/w_f exactly equals α/β it does not matter which partner handles financial management. However, we assumed the production function $z(H_m, H_f)$ to be concave, in which case both partners' time inputs are substitutable at diminishing marginal rates. Figure 1b shows that in this case corner solutions are likely to occur less frequently.

We are particularly interested in how the optimal distribution of home production over both partners relates to both their wages. So, we are interested in whether the functions h_m and h_f given by

$$H_m^* = h_m(w_m, w_f), \quad H_f^* = h_f(w_m, w_f) \tag{8}$$

are increasing, decreasing or constant in both partners' wage rates.

Let us first consider the case that in the household's optimal time allocation $(L_m^*, L_f^*, N_m^*, N_f^*, H_m^*, H_f^*)$ both partners participate in the labour force and in home production, so that (7) holds. We know that the amount of home production only depends on H_m and H_f. Now what will happen if w_m increases? To restore equality in (7) $(\partial z/\partial H_m)/(\partial z/\partial H_f)$ must increase as well. Figure 1.b shows that the household can achieve this by decreasing H_m in favour of H_f. Similarly, if the wife's wage increases, the household will increase H_m at the expense of H_f.

Let us briefly examine what happens in case only one of both partners handles financial management (we still assume that both have a paid job). First suppose it is entirely handled by the husband, i.e. $H_m^* > 0, H_f^* = 0$. Then the Kuhn-Tucker conditions imply:

$$\frac{\partial z/\partial H_m}{\partial z/\partial H_f} > \frac{w_m}{w_f} . \tag{9}$$

In this case an increase in w_m/w_f will affect (H_m^*, H_f^*) only if the increase is high enough to change the inequality sign in (9) into an equality. The household will then substitute units H_m by H_f until either the marginal rate of substitution equals the wage ratio, or the maximum amount of the female's time needed for home production is reached. So in correspondence with the case of an interior solution discussed above, a (large enough) rise in w_m/w_f will cause a fall in H_m^* and a rise in H_f^*. A decrease in w_m/w_f will have no effect on (H_m^*, H_f^*), as the inequality in (9) will still hold: the male will keep providing the maximal amount of his time needed for home production. The case where only the wife participates in home production is analyzed analogously.

Finally, let us briefly mention the relationship between w_m/w_f and (H_m, H_f) in case at least one of both partners does not have a paid job. In these cases we

have no information on the potential wage for the non-participating partner, but we do know that it is lower than the household's marginal utility of p's leisure time. Depending on the household's production function and the marginal utilities of both partners' leisure time, the household finances are managed by one or by both partners. It can be shown that an increase in the wage of one of both partners will either decrease this partner's share in home production, or will have no effect at all on the distribution of home production between partners. So overall we again expect to find a negative relationship between w_m/w_f and H_m.

So far we have not discussed any variables other than wages that can influence both partners' optimal time inputs in financial management. In addition to this we assume an individual's productivity in financial management to increase with his/her level of education, so the male's share in managing household finances will increase with his own education level, and decrease with the female's education level.

The main conclusion of this section is that the household production model shows a negative relationship between a partner's wage rate and his participation in financial management. Figure 2 shows how H_m^* and H_f^* can relate to w_m/w_f when the wife is more productive in home production than the husband. In section 5 we will empirically investigate if the suggested relationships between w_m/w_f and H_m and H_f hold.
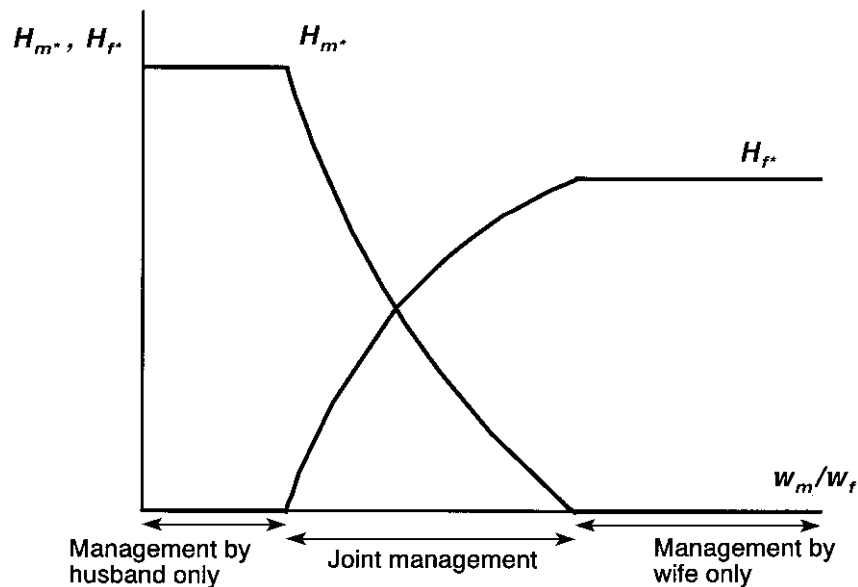

Figure 2 – Possible relationship between H_m^* and w_m/w_f and between H_f^* and w_m/w_f when the wife is more productive in home production than the husband

4 A BARGAINING MODEL OF FINANCIAL MANAGEMENT

In the previous section we assumed that both partners' time inputs into financial management result from an efficient distribution of labour within the household. Alternatively, we will now focus exclusively on possible power aspects of the financial management of households. In sociological literature several authors have suggested that patterns of financial management within the household reflect the division of power in decision-making between partners (e.g. Blumberg (1991), Blumstein and Schwartz (1983), Hertz (1992), Vogler and Pahl (1994), and Wilson (1987)). Unfortunately, most of these papers do not clearly define what is meant by marital power. To explicitly define the division of power between partners we analyze household decision-making in a bargaining framework.

A bargaining model of household behaviour allows both partners to have different utility functions, so their preferences may differ. We denote the utility functions of both partners by $U^m(X, L_m, L_f)$ and $U^f(X, L_m, L_f)$, respectively.[2] In case of egoistic agents, the leisure of one spouse does not directly affect the utility of the other spouse, so the utility functions reduce to $U^i(X, L_i)$, $i = m, f$. We assume that if partners choose to behave noncooperatively, each will maximize his or her own utility function given the behaviour of his/her partner, yielding a Nash equilibrium. We also assume that in this case there is no pooling of resources and no joint consumption. The corresponding utility levels for husband and wife are denoted by Ψ_N^m and Ψ_N^f, respectively. These noncooperative outcomes depend on both partners' wages and nonlabour income.

Alternatively, partners can behave cooperatively by making agreements. As the partner who would lose the most in case of disagreement is more likely to make concessions, the utility levels in the noncooperative outcome can be interpreted as 'threat points' in the bargaining process. The partners will therefore choose an allocation from the set of Pareto-optimal allocations of the household. In particular, we consider the cooperative Nash bargaining solution; see e.g. McElroy (1990) and Barmby (1996). Such an allocation is defined as the solution of maximizing

$$
\begin{aligned}
U^{hh} = \{U^m(X, L_m, L_f) - \Psi_N^m(w_m, w_f, \alpha)\}^\lambda \cdot \\
\{U^f(X, L_m, L_f) - \Psi_N^f(w_m, w_f, \alpha)\}^{(1-\lambda)},
\end{aligned}
\tag{10}
$$

subject to budget and time constraints. Here α denotes all variables (apart from wages) that determine the noncooperative outcomes for both partners, like non-

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2 X, L_m and L_f have the same meaning as in the previous section; X is the amount of consumption goods, and L_m and L_f are hours of leisure enjoyed by the male and female partner, respectively.

wage incomes, human capital, or the opportunity costs of being married.[3] The higher a spouse's threat point utility level, the stronger the relative bargaining power of the spouse will be in the sense that the solution will be more favourable for that spouse.

If patterns of financial management reflect the division of power in decision-making between partners, we would expect to find a relationship between the participation in financial management of both partners and their relative bargaining power. A possible explanation for such a relation is that if a partner has a larger share in the management of household finances, this person can influence household decisions in favour of his/her own utility function.[4] If both partners know that this is the case, their participation in the household's financial management will exactly correspond with their bargaining power. The larger a partner's relative power, the larger will be his/her share in the management of household finances.

As shown by McElroy (1990) a rise in the wage w_i increases his/her threat point utility level Ψ_N^i and, as a consequence, the outcome of the maximization of (10). Thus a rise in the male's wage rate increases his relative bargaining power, which will raise his share in household financial management. Alternatively, an increase in the wife's wage rate will cause a positive (bargaining) effect on her share of household finances. So in contrast with our results in the previous section, in the bargaining framework the wage rate of a partner has a positive effect on his/her participation in financial management.

5 TESTING THE HOUSEHOLD PRODUCTION MODEL *VERSUS* THE BARGAINING MODEL

Both the household production model and the bargaining model can be used to explain the financial management of households theoretically. The previous sections show that a crucial difference between both approaches is the expected influence of both partners' wage rates. While the household production model predicts a negative relationship between an individual's wage and his/her share in financial management, the bargaining model implies a positive relationship. This difference between both models forms the basis of our empirical analysis.

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3 McElroy (1990) mentions various so-called *extrahousehold environmental parameters* (EEPs) that may shift the threat points in Nash bargaining models of household demand but do not affect prices and nonwage incomes faced by married individuals. Examples are measures of competitiveness in the marriage market, parents' wealth, additional nonwage income received in the form of welfare when unmarried, and tax changes due to leaving a marriage.

4 For instance, Gray (1979) found that husbands who handed over their entire wage to their wives were less likely to work overtime than husbands who gave their wives a fixed housekeeping allowance. In the latter case husbands often regard extra earnings as personal spending money and so had a greater incentive to do overtime.

To investigate how the financial management of households relates to various household characteristics we will estimate an ordered probit model for each of the five different aspects of household finances: A) the household's financial allocative system; B) the final say in big financial decisions; C) payment of regular household bills; D) handling of everyday household spending; and E) permission for personal expenditures between £10 and £20. As noted before, each aspect is likely to reflect a different level of decision-making authority. A priori, in accordance with Vogler and Pahl (1994), we expect that 'handling everyday household spending' and 'taking care of regular household bills' are examples of executive management, i.e. unimportant and time-consuming decisions within limitations. For these parts the efficiency argument seems to be more persuasive than the power argument, so they probably best fit the household production model. Alternatively, we expect that 'having a final say in big financial decisions' and 'asking permission for small personal expenditures' involve strategic control. Consequently, they may better fit the bargaining model. We do not postulate any expectations with respect to 'the household's financial allocative system' since it is likely to reflect both efficiency and power considerations. The empirical results may give us some hints on whether we should interpret the various parts of financial management in terms of marital power or as the result of an efficient division of duties within the household.

We will now elaborate on how to apply the two models to parts A to E of financial management and how to define the dependent variables in the ordered probit equations. In the analysis of parts A to D we only use observations for which both partners have chosen the same answer categories. For part E, however, we only have the answers of one partner available.

The central explanatory variables in our estimations are both partners' wage rates and their education levels. Other possibly influential variables we will consider are the number of children present, importance of religion, and the amount of nonlabour income of the household. These variables were not mentioned in the previous sections as they play no particular role in the distinction between the household production and the bargaining interpretation of financial management. We have chosen not to include hours of work or wage income (defined as hours of work times the wage rate). Note that both theoretical models generate a relationship between financial management and exogenous variables (such as wages), and a relationship between hours of work and exogenous variables. Here we only estimate the former.

Estimation of the model requires information on both partners' (potential) wage rates, also of individuals who do not report to have a job in the survey. We therefore first estimate a wage equation for males and females separately, based on the individuals for which we do have wage rates. Using these equations we calculate predicted values of wage rates for individuals in our sample that do not

participate in the labour force. For all other individuals we use observed wage rates in our estimations.[5]

A) *Financial allocative system*

The question asked to respondents was (slightly reformulated):
'Which of the following methods comes closest to the way your household finances are organised?'
1) Female partner is given a housekeeping allowance
2) Male partner looks after all household money, except wife's personal money
3) Both share and manage household finances jointly
4) Female partner looks after all household money, except husband's personal money

Other answering categories are excluded in this analysis. Note that the financial management methods reflect different structures of the individual sub-budget constraints.

The interpretation of the four answer categories and their ranking may be different in the bargaining framework than in the household production approach. In terms of marital power we would order the four systems as indicated above, reflecting an increasing influence of the wife going from answer category 1 to 4.[6] In order to test if the bargaining approach can explain the allocative system used by the household we estimate an ordered probit model based on these four answer categories. In the household production model only the time inputs of both partners matter. In that case the 'household allowance' system (answer category 1) is somewhat difficult to interpret, as both partners spend some time on managing household finances but each operates at his/her own level of authority. As we do not want to aggregate this category with answer category 3 (shared management), we leave it out of our analysis so that three categories remain: 2, 3, and 4. We analyze the household's choice by estimating an ordered probit equation with the dependent variable being defined by:

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5 We use age, age squared and four dummy variables for level of education as explanatory variables. The resulting wage equations are (*t*-values in parentheses):

$w_m = 0.21 + 0.18age - 0.002age^2 + 0.87e1 + 1.64e2 + 3.42e3 + 3.38e4$
$\quad\quad (0.21) \quad (3.84) \quad\quad (-3.22) \quad\quad (4.30) \quad (7.34) \quad (10.55) \quad (12.07)$
$w_f = 1.30 + 0.09age - 0.001age^2 + 0.60e1 + 0.84e2 + 2.89e3 + 2.65e4$
$\quad\quad (1.90) \quad (2.82) \quad\quad (-2.34) \quad\quad (4.53) \quad (4.63) \quad (12.01) \quad (12.78)$

with R^2s of 0.11 and 0.16, respectively. These equations are estimated by OLS. In principle, one should correct for the selection bias caused by only using participating individuals in the estimation of the wage equation. However, Heckman's two-step procedure gives poor results for the males and the implied estimate of ρ lies outside the (-1.1) range. For the females the procedure offers no problem, but the selection bias has no significant effect in the wage equation.

6 One could argue that the mutual ordering of 1 and 2 is unclear and perhaps should be reversed. But since the second category explicitly excludes the wife's personal spending money from the household money looked after, we associate it with a more equal distribution of power between partners than the first category. Below we will test the ordering of allocative systems empirically.

(A)   0 = Husband looks after all household finances   (147 obs)
      1 = Both share household finances   (1055 obs)
      2 = Wife looks after all household finances   (491 obs)

The empirical results for question A are presented in the first column of Table 6. The estimated coefficients show that a lower male wage rate results in a higher share of the female in the management of household finances, which supports the bargaining model. The female's share is also increased by a lower education level of the male and a lower household nonlabour income. An alternative model in which the order of 'wife is given an allowance' and 'husband looks after' were reversed could not be estimated.[7] This finding confirms our assumption that the household allocative systems should be ordered as suggested above.

TABLE 6 – ORDERED PROBIT ESTIMATION RESULTS (*T*-VALUES IN PARENTHESES)

Explanatory variables	Financial allocative system (A)	Final say in big financial decisions (B)	Regular household bills (C)	Everyday household spending (D)
constant 1	1.679 (12.7)	1.148 (8.8)	0.843 (6.6)	1.713 (12.0)
constant 2	1.964 (39.3)	2.464 (45.1)	0.329 (17.1)	0.100 (1.3)
$ln(w_m)$	−0.160 (−2.5)	−0.177 (−2.8)	−0.257 (−4.4)	−0.033 (−0.3)
$ln(w_f)$	0.139 (1.6)	0.009 (0.1)	0.153 (1.9)	−0.066 (−2.1)
education male	−0.123 (−4.1)	−0.051 (−1.7)	−0.154 (−6.0)	−0.098 (−2.8)
education female	−0.014 (−0.4)	0.110 (3.3)	0.041 (1.5)	0.135 (4.4)
# children	0.039 (1.4)	−0.092 (−3.3)	0.032 (1.2)	−0.025 (3.7)
nonlabour income	−0.032 (−4.9)	0.000 (0.0)	−0.057 (−7.9)	0.045 (0.6)
religion important	0.033 (0.5)	−0.123 (−1.8)	−0.126 (−2.0)	0.663 (16.3)

We also find that a higher nonlabour income increases the male's share and decreases the female's share in the management of household finances. This appears to be similar to Pahl's (1980) finding that in high income households men are more likely to control finances (while their wives receive a housekeeping allowance) than in low income households. However, in contrast with Pahl the result does not concern total income but only nonlabour income, so wage incomes of both partners do not account for the effect. Furthermore, the probability of 'wife looks after' increases with the number of children, and decreases with the educational level of her partner. The latter effect can be explained within the household production context when the male's productivity in financial management increases with his education level.

7   The estimation algorithm stops as the calculated ordered probit constants turn out not to obey the required order.

B) *Final say in big financial decisions*

The dependent variable is in this case defined by:

(*B*)   0 = Husband has final say in big financial decisions   (394 obs)
        1 = Both have final say in big financial decisions   (1432 obs)
        2 = Wife has final say in big financial decisions   (106 obs)

An interpretation of these answer categories in the bargaining framework is straightforward: the power of the female partner increases with higher answer codes. An interpretation in terms of time inputs involved is less trivial; the time spent on the final say may be small in comparison with the search for information preceding the final say, and possibly these two stages concern different partners. However, we assume that if a partner has the final say, he or she is the only person spending time on making the final decision. Note that in our probit equations only differences in time inputs between the various answer categories matter, the exact assumption of time spent on an activity is not important.

The second column of Table 6 presents the ordered probit estimation results for question B. The signs of the wage coefficients point to the bargaining model, although $ln(w_f)$ is not significant. A higher education level of the female increases the probability that she has the final say in big financial decisions. Alternatively, a larger number of children increases the probability that the husband has the final say. The latter result may also point at the bargaining model; Ott (1992) argues, considering fertility as a prisoner's dilemma, that childbearing decreases the bargaining position of the wife. We also find that importance of religion significantly reduces the probability of the wife having the final say.

C) *Regular household bills*

The dependent variable is in this case defined by:

(*C*)   0 = Husband takes care of regular household bills   (813 obs)
        1 = Both take care of regular household bills   (260 obs)
        2 = Wife takes care of regular household bills   (1051 obs)

This question is also expected to concern executive management. Regular household bills are mostly taken care of by only one partner: in 49 percent of households the wife takes care of them, and in 38 percent of households the husband does. The interpretation of the answers in terms of time inputs and power is similar to that of the previous question: in category 2 both the time input and the share in family power of the female partner is higher than in category 0.

The fourth column of Table 6 shows that the signs of the coefficients for both partners' wage rates correspond with the bargaining interpretation: a rise in a part-

ner's wage rate increases the probability that this person will take care of regular household bills. This contradicts our suggestion (and Vogler and Pahl's) that this aspect of financial management reflects executive management and should have little to do with power. Apparently, the labour intensity of paying regular household bills is small in relation to power gains associated with it.

The share of the husband in taking care of regular household bills also increases with his level of education, the amount of nonlabour income, and the importance of religion. The number of children seems to slightly increase the probability that the wife takes care of regular household bills.

D) *Everyday household spending*

The dependent variable is in this case defined by:

(*D*) 0 = Husband handles everyday household spending   (111 obs)
       1 = Both handle everyday household spending   (241 obs)
       2 = Wife handles everyday household spending   (1865 obs)

This question is expected to concern executive management. In 84 percent of households the wife exclusively handles everyday household spending, while for the husband this is the case in only 5 percent of the households. Deriving the time inputs of partners is again not straightforward because of the use of the word 'mainly' (see section 2). We assume, however, that if one partner is mainly responsible he or she spends more time on everyday household spending than the other partner. Our interpretation of the answer categories in terms of power is that power rises with a higher involvement of a partner. So in category 2 both the time input and the share in family power of the female partner is higher than in category 0. The third column of Table 6 shows the estimation results.

The signs of the wage rates correspond with the household production approach, although the estimated coefficient for $ln(w_m)$ is not significant. A larger number of children and a lower nonlabour income increase the probability that the wife handles everyday household spending and decrease the probability that the husband handles everyday household spending. Moreover, a lower educational level for both partners increases the probability of the wife handling everyday household spending on her own. Overall, the results provide weak evidence in favour of the household production model.

E) *Permission for personal expenditures*

Our analysis of this aspect of financial management is somewhat different from the rest. In the first place, a household production interpretation does not seem plausible as no time inputs are involved in this question. We therefore concentrate exclusively on possible power aspects to the extent in which partners feel

inclined to ask permission for personal spending. Secondly, in categories A to D we have answers of both partners at our disposal, and we only select observations for which both partners provide the same answer. Recall, however, that in category E respondents are only asked if they themselves ask permission for personal expenditures between £10 and £20, and not if their partners ask them for permission so that we cannot check if the answers of both partners correspond with each other.

We will start our analysis by examining both partners' answers separately. We estimate ordered probit equations on the following dummy variables, reflecting the answers provided by wives ($E1$) and husbands ($E2$), respectively.

($E1$)	0 =	Wife reports that she asks permission	(382 obs)
	1 =	Wife reports that she only tells partner	(1357 obs)
	2 =	Wife reports that she does not mention it	(767 obs)
($E2$)	0 =	Husband reports that he asks permission	(400 obs)
	1 =	Husband reports that he only tells partner	(1539 obs)
	2 =	Husband reports that he does not mention it	(567 obs)

A majority of respondents only *tells* his of her partner about personal expenditures between £10 and £20: 54 percent of wives and 61 percent of husbands. Moreover, 15 percent of wives and 16 percent of husbands say they ask their partner for permission. However, it is not clear if this information can be interpreted in terms of power. The extent to which partners ask permission may be mainly determined by the total amount of household income available: a very low household income may require more control by both partners than an abundant household income. If this is the case, each partner's answer on asking permission may be more related to financial means than to power. Alternatively, it may be informative to examine *differences* in the responses of partners. Irrespective of the amount of household income, one partner may feel more inclined to ask permission than the other. To investigate this we create a new variable *E3*, which is defined as follows[8]:

($E3$)	0 =	Wife gives more account to husband than *vice versa*	(442 obs)
	1 =	Wife and husband chose the same answer category	(1429 obs)
	2 =	Wife gives less account to husband than *vice versa*	(635 obs)

This variable may reflect several differences between partners to the extent in which they feel free to use household income for personal expenditures. In 18 per-

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8 The value of *E3* follows from the difference between the values of *E1* and *E2*:
If: $E1 < E2$, then *E3* equals 0;
   $E1 = E2$, then *E3* equals 1;
   $E1 > E2$, then *E3* equals 2.

cent of the households the husband gives less acount to his wife than she to him, while in 25 percent of the households the opposite holds. Estimating an ordered probit on *E3* may inform us on what variables influence these differences between partners.

The results of all three ordered probits are presented in Table 7. The first column shows that the wife is less likely to ask permission for personal expenditures if both her own and her partner's wage rate increases, and if the number of children is smaller. This may confirm our suggestion that asking permission has more to do with lower financial means and 'making ends meet' than with power. We also find that wives with higher educational levels feel less inclined to ask permission. The second column shows that the husband is less likely to ask permission if his own wage rate increases and if he has a smaller number of children; his partner's wage rate has no significant influence. A rise in his partner's education level, however, makes him less likely to ask permission. Both results are a bit difficult to interpret in terms of power.

The variable analyzed in the third column may be more related to power. We find that a higher value of the wife's wage rate results in a higher value of *E3*. So wives with a higher wage rate are more likely to give less account to their husbands than their husbands to them. This suggests that the extent to which partners feel free to spend household income on personal expenditures increases with the amount of money brought in by themselves. This supports the bargaining model, in which the access of both partners to common household income depends on their wage rates. Further note that only the wife's wage rate is significant. Perhaps, her contribution to the household's income is more important in this respect than the traditionally 'taken for granted' contribution of the male.

TABLE 7 – PROBIT ANALYSES OF ASKING PERMISSION FOR PERSONAL SPENDING
(*t*-VALUES IN PARENTHESES)

Variables	*E1*		*E2*		*E3*	
constant	0.427	(4.0)	0.536	(5.3)	0.751	(7.0)
$ln(w_m)$	0.197	(3.9)	0.283	(5.9)	−0.068	(−1.3)
$ln(w_f)$	0.290	(4.0)	0.051	(0.8)	0.222	(3.3)
education male	0.010	(0.4)	−0.001	(−0.1)	0.019	(0.9)
education female	0.066	(2.5)	0.054	(2.1)	0.017	(0.7)
# children	−0.090	(−4.2)	−0.042	(−2.0)	−0.037	(−1.8)
nonlabour income	−0.009	(−1.5)	−0.004	(−0.7)	−0.003	(−0.6)
religion important	−0.082	(−1.5)	−0.091	(−1.6)	0.011	(0.2)
$mu(1)$	1.572	(44.3)	1.775	(48.5)	1.602	(46.4)

6 CONCLUSIONS

In this paper we have investigated what determines a household's choice of financial management. We have estimated two competing models explaining how finances are organized: a household production model and a bargaining model. In the first model behaviour is determined by an efficient allocation of both partners' time to market work, financial management, and leisure, whereas in the second model financial management is a reflection of bargaining power.

The empirical results show that the household production model does not very well in explaining various management systems: only for aspect D (everyday household spending) we find coefficients with signs corresponding with this model, but not all coefficients are significantly different from zero. Apparently, this aspect of financial management is mainly a form of executive management, with the possible power gains being small in relation to the labour input involved. For all other parts the estimated effects of wage rates point at the bargaining interpretation. Even for 'who makes sure regular household bills are paid?' power aspects appear to dominate efficiency considerations. We also find, in accordance with earlier results by Pahl, that the participation of wives in financial management is higher in low income households than in high income households. For future research, it would be interesting to further investigate if efficiency aspects play a larger role in low income households than in high income households. In future work we also plan to include employment (rather than wage) as an explanatory variable. However, since employment is endogenous and may be both a consequence and a source of marital power, such an extension is not a straightforward exercise.

One possible caveat in the interpretation of our results should be mentioned. To the extent that wage is a better proxy of a person's ability to perform tasks in financial management than education, a positive relation between involvement in financial management and wage may after all be a reflection of efficiency rather than of power.

We have considered the two alternative models separately. Probably, both efficiency and power aspects play a role simultaneously. The opposite wage effects will then cancel out to some extent. For instance, the insignificant male wage coefficients for aspect D may be caused by opposite bargaining and efficiency effects of equal magnitude. Alternatively, the bargaining effects found for aspects A, B, C, and E do not exclude that efficiency considerations also apply, albeit to a smaller extent.

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Summary

FINANCIAL MANAGEMENT, BARGAINING AND EFFICIENCY WITHIN THE HOUSEHOLD;
AN EMPIRICAL ANALYSIS

This paper analyzes data from the British Household Panel Survey on households' financial management and financial decision-making. Direct subjective information was collected by asking questions like 'Who has the final say in big financial decisions?'. All questions were answered separately by both partners. We consider two competing models explaining how finances are organized. The first model is based on a household production approach, in which behaviour is determined by an efficient allocation of both partners' time to market work, financial management, and leisure. In the second model, which is game-theoretic in nature, financial management is a reflection of bargaining power. The two models have different implications for the effect of explanatory variables, in particular wages, on the dependent variables. Empirical results indicate that financial management is primarily determined by bargaining considerations.