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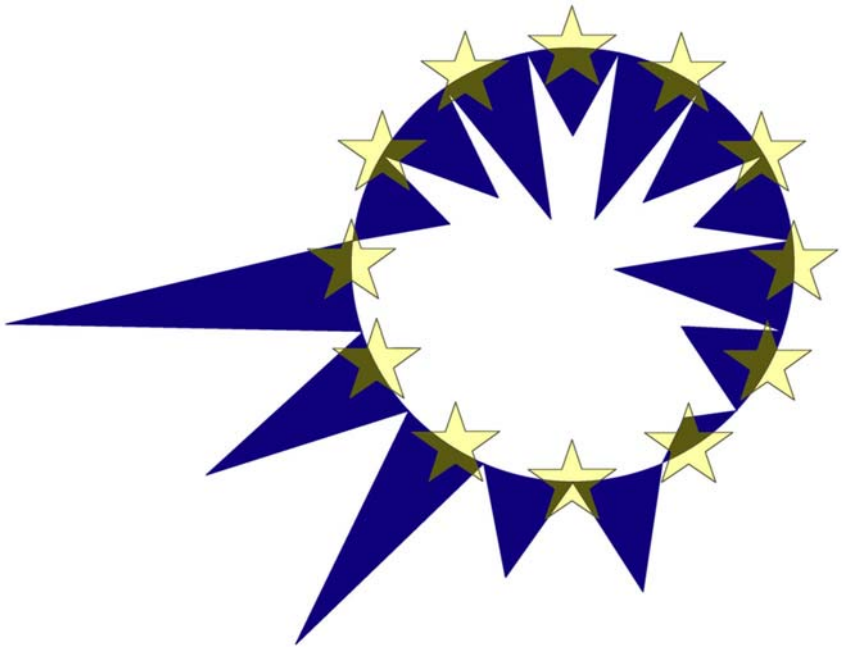

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SHARING AND CHOOSING WITHIN THE HOUSEHOLD: A SURVEY

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Sharing and choosing within the household: A survey[1]

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Abstract

This paper attempts at providing a survey of the different models of individual decision making within the household. The first section reviews the traditional approach to household decision making and emphasize its weaknesses. In addition to the standard assumption of selfish agents, other behavioral hypotheses --caring à la Becker and altruism-- are examined. This naturally leads to some economic justifications of marriage formation and dissolution. Based on these analytical building blocks, the second section proposes a typology of bargaining models of intrahousehold decision making. A first dividing line distinguishes cooperative and non-cooperative models. However, most of the models are based on cooperation amongst members of the household. While some of the cooperative models rest on a particular bargaining rule, such as the Nash-bargaining one, the collective approach, which appears to be more general, focuses on Pareto-efficiency without assuming a specific bargaining rule. The third section briefly raises two sets of methodological issues: one about the heuristic relevance of the intrahousehold decision models, and the second one relating to the empirical difficulty due to the lack of observable data. The conclusion stresses the potential of microsimulation models for enlightening these difficult, but crucial issues.

JEL: D13, J1, J2

Keywords: Intrahousehold choice, household labor supply

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Introduction

What difference does it make to individualize income taxation rules or social benefits, as opposed to splitting or pooling? Does it matter, and how, whether family and other personal circumstances are taken into account for calculating in-work benefits or tax credits? What are the likely consequences of each option in terms of *personal* income and welfare distribution, as opposed to *households'* distribution? What is the incidence of each policy on children poverty? And what difference does make, if any, on labor force participation choices and labor supply decisions of individual members of the households?

When it comes to tax reforms and welfare reforms, a large fraction of the policy debates in all European countries over the past two decades at least have focused on either these two types of consequences, which are indeed of utmost importance for tax and social policies: distributional effects and labor supply effects. Unfortunately, economists have for long been ill-equipped to tackle these issues, insofar as they have become accustomed to reason on households *as if* they were individuals, and to use household data likewise. Empirical studies of the supply and distributional effects of legislative changes have also, for the most, been conducted on this generic assumption, which may explain the difficulties encountered when it comes to evaluate the consequences of tax and welfare reforms. However, a new generation of models and analyses has blossomed over the past two decades, trying to tackle the issues raised by the understanding of individual choices and resource sharing within the household.

Standard economic approach to tax and social policy issues derives the choices of the household from a single utility function. Individual preferences are then implicitly supposed to be aggregated into a set of preferences which characterizes the household, while resources are supposed be pooled. Family or household economics has developed new models in order to take the preferences of each household's member into account. A large number of empirical work has emphasized the limits of the usual model. However, the new models are scattered and no theoretical framework has clearly taken over.

Household choice patterns, public policies, the allocation of leisure and other resources within the family, labor force participation, are all closely related. As a consequence, focusing on the links between socio-fiscal policies and intrahousehold choices demands to analyze the hypotheses and the consequences of each model. These models are based on a collective bargaining household decision making or on the assumption that outcomes are Pareto-efficient. A major issue is whether socio-fiscal policies exert an influence on households' durability and stability. The answer depends on the framework which is chosen. Within intrahousehold bargaining models, a first dividing line contrasts cooperative bargaining games with non-cooperative games. Another distinguishing feature of these models is the type of sharing rule considered. The effects of socio-fiscal policies on intrahousehold choices depend on the hypotheses concerning household members' behaviors as well: they may be egoistic or selfish, if they only take their own preferences into account, caring or altruistic; they can consider a budget constraint for each member, or pool resources.

1. General framework

The bargaining models have been developed as an alternative to the usual approach of household decision making in order to specify particularly why there are marriages, how the household members make their choices, to what extent a marriage can be broken up.

1.1. The traditional approach of household decision making

The traditional approach to household decision-making (Samuelson, 1956) looks upon the household as a homogeneous group which shares identical preferences and pools wages and exogenous income. Within such a framework, the intrahousehold choices derive from the maximization of a unique function subject to a "pooling" budget constraint. The family behaves as if it was a single agent.

Let us consider a two-member household, denoted (i,j). The utility of each member depends on one's own consumption and leisure. As a consequence, the household is assumed to maximize a consensus welfare function, the expression of which is

$$U(x_i, l_i, x_j, l_j),$$

subject to the joint budget constraint. The solution to this program yields goods' demand functions and labor supplies. If the utility functions are well-behaved, these demand and labor supply functions depend only on prices and on total family income.

Such a framework obviously does not allow taking the effects of a social or fiscal policy within the household into account. For instance, inasmuch as all income is pooled, what does it matter if a child allowance is paid to the father or to the mother? The answer is straightforward. The intrahousehold choices are independent of which member receives resources. Similarly, the intrahousehold choices are independent of which member consumes goods. What are the repercussions of an increase in one spouse's wage on one's own consumption and leisure? The increase could boost only one's own consumption and leisure, while those of the other would remain unaltered, or both members' consumption and leisure could go up. In the first case, the member whose wage increases would be egoistic, in the other case caring or altruistic. However, the usual approach of household is unable to provide a satisfactory answer because it does not consider the household decision making as that of a group: the household remains a 'black box'. In fact, marriage "has been almost ignored by economists, although scarce resources are used and it has been followed in some form by practically all adults in every recorded society" (Becker, 1973).

There are several problems and shortcomings with this approach. First, the assumption of common preferences which leads to the maximization of a single utility function is in conflict with methodological individualism. Second, this framework does not address such issues as the distribution within the household. Moreover, it ignores the question of household making and stability.

1.2. Behavioral assumptions

Standard microeconomics considers egoistic agents who aim to maximize their utility. Such an assumption may not be relevant when the economist focuses on intrahousehold choices. Since love is an important factor that explains marriage, the economist may have to take other behavioral hypotheses, such as caring and altruism, into account as well.

To begin with, an agent is said to be egoistic if she maximizes his or her own utility function, depending on her own consumption and leisure. Caring and altruism have to be distinguished, since caring rests on a sharing rule which is implicitly introduced by Becker (1974), whereas altruism is a more general behavioral assumption. An agent is said to be caring when her utility depends on the utility of the other members of the household as well as her own consumption and leisure. The "full caring" case will occur if an agent cares as much about the others as about herself. The agent who cares about the other members of her family will maximize her own utility function and transfer resources to the others. In fact, a household member is assumed to maximize a welfare index which takes her own egoistic utility and the utility of the others into account. This index as the following expression:

$$W^i[U^i(x^i, l^i, x_0), U^j(x^j, l^j, x_0)] \qquad (1)$$

(x_0 is a public good).

In contrast to the caring assumption, an altruistic agent will maximize her own utility function, which depends on her own consumption and leisure as well as on the others'. Preferences are then interdependent and there is at least one positive cross partial derivative[2].

Egoistic, caring or altruistic preferences and the nature of goods consumed by the household are not independent. If all goods are public, there is no difference between egoism and altruism. In the altruistic case, the distinction between public and private goods vanishes, since private goods provide utility for the whole family.

1.3. Household formation and dissolution

From the economic point of view, household formation by marriage occurs if and only if it increases the utility of both newlyweds. Similarly, marriage is broken up if both spouses could increase their utility outside the marriage. It appears that the marriage stability depends on what the spouses can find in and outside the marriage.

If the preferences of the household's members are egoistic, the economic explanation only takes strictly financial reasons for being married into account.

- A first interest in marriage is based on the fact that there are economies of scales within the household.
- A second interest lies in the fact that there probably are public goods within the household. That is goods that a member can consume without reducing the amount available to the other.

Another set of justifications focuses on the fact that the spouses' utilities are interdependent and is relevant to caring or altruistic preferences of the household's members.

- The household production --e.g., the quantity of meals, the quality and quantity of children, prestige, recreation, companionship, love, and health according to Becker (1973)-- provides another justification, on condition that household goods are not perfectly substitutable for market goods.
- The household members can enjoy sharing leisure time. Togetherness is likely to increase each household member's utility (Hamermesh, 2000).

[2] Negative cross partial derivatives would mean that a member aim to improve her own consumption and leisure at the expense of the others'. Such a case may probably be excluded when focusing on families: it would be a dictatorial and strictly egoistic case.

The first set of justifications is not very broad insofar it does not actually take account of the taste or distaste of both household's members for living together. Thus, it provides no convincing explanations for marriage formation and dissolution. That is why, for instance, Chiappori emphasizes that the collective approach he introduces with egoistic preferences can encompass caring preferences à la Becker (Chiappori, 1992).

2. A typology of the intrahousehold decision models

Intrahousehold decision models differ from the standard approach in two ways. On the one hand, each household's member obviously has a utility function. On the second hand, leisure and goods consumption does not only depend on the total amount of resources available. The control of each spouse over resources is taken into account as well. Lundberg and Pollak (1993) stress the fact that "When the British child allowance system was changed in the mid-1970s to make child benefits payable in cash to the mother, it was widely regarded as a redistribution of family income from men to women and was expected to be popular with women". Intrahousehold decision models are meant to look into such questions. But no common framework stands out.

2.1. Cooperative bargaining models

As emphasized earlier, a first dividing line distinguishes cooperative and non-cooperative bargaining games. A priori, a household should behave cooperatively and cooperative bargaining games are indeed the leading framework to analyze intrahousehold choices. Notice that cooperation and egoistic preferences are compatible. Cooperation allows reaching equilibriums that are Pareto-efficient. However, an important matter relates to the stability of this cooperation. More precisely, to what extent can socio-fiscal policies alter the stability and durability of the cooperative equilibrium?

To clarify this issue, it is helpful to introduce the concept of threat point. A threat point is the outcome that obtains if each household's member has a non-cooperative behavior. In such a case, preferences are selfish and solutions usually are not Pareto-efficient. The current literature considers that this point corresponds to the utility that can be obtained by each household member outside the family or to a non-cooperative bargaining outcome within the household (Lundberg and Pollak, 1993).

In order to emphasize the effects of socio-fiscal policies on intrahousehold demand and labor supply decisions, attention will be focused on the threat point and on the shape of the budget constraint (e.g., joint budget constraint, separate constraints). It is indeed through both these channels that socio-fiscal policies ought to act upon intrahousehold choices.

Whereas economics usually gives greater place to non-cooperative bargaining models, the analysis of intrahousehold choices focuses on cooperative games, i.e. on the formation of coalitions and on the distribution of the gains of cooperation among household members (Lundberg and Pollak, 1994). A common assumption of cooperative models is that equilibriums are Pareto-efficient. Cooperative bargaining models may be classified according the household's decision process. However, all cooperative decision processes can be described in two steps. To begin with, agents share the total income between them. Then, each agent maximizes his or her own utility function (reflecting egoistic, caring or altruistic

preferences) subject to the joint budget constraint (Chiappori, 1988; Bourguignon, Browning, Chiappori and Lechène, 1991)

Notations:
T= total time available
U_k is k's utility
w_k is k's wage rate
I_k is k's exogenous, non labor income
L_k is time that k devotes to market work, and $L=(L_k)$
X is a good vector and p is the associated price vector.

2.11 Nash-equilibrium bargaining rule

2.111. Divorce threat Nash-bargaining models

Household choices derive from the maximization of the product of gains from living together. These gains are the differences between utilities inside and outside the marriage. As a consequence, the weight of preferences of each household's member is therefore an increasing function of his or her threat point (McElroy, 1990).

a. Nash bargaining rule, altruism and joint resources

MacElroy and Horney (1981) stress the fact that a two-member household such as marriage is not different from two single persons on legal grounds. What matters is pooling resources and allocating them jointly. From such a viewpoint, altruistic or caring preferences become key elements of intrahousehold decision processes.

Because a two-member household can be considered as a world with two agents (e.g., husband and wife), it is possible to use the Nash-bargaining rule within the family. A seminal model has been introduced by McElroy and Horney (1981). Let $X=(x_0,x_1,x_2,x_3,x_4)$ be a vector of goods consumed by the household, where x_0 is a public good, x_1 is a private market good consumed by the husband, x_2 is a private market good consume by the wife, x_3 is the quantity of leisure of the husband and x_4 that of the wife. Labor supplies can be easily derived from leisure demands. Let $P=(p_1,p_2,p_3,p_4)$ be the associated price vector. Each household member is assumed to be altruistic: the utility of the husband depends on his own consumption and leisure as well on his wife's consumption and leisure, and reciprocally. As a consequence, the individual utility functions have the following shape, $U_m=U_m(X)$ and $U_f=U_f(X)$, are strictly quasi-concave, monotone increasing in all their arguments and have continuous, second partial derivatives. Outside marriage, each person would maximize his or her how utility function, $U_m=U_m(x_{0m},x_1,x_3)$ and $U_f=U_f(x_{0f},x_2,x_4)$ respectively, subject to the following constraint, $I_m+p_3(T-x_3)=p_0x_{0m}+p_1x_1$ for the husband and $I_f+p_4(T-x_4)=p_0x_{0f}+p_2x_2$ for the wife (where $x_{0m}+x_{0f}=x_0$). The maximum utility level (V_{0m} and V_{0f}) that each household member can reach outside the family depends thus on the prices of the goods he or she consumes, on his or her wage and on his or her exogenous income. Opportunities outside marriage can alter this level as well. V_{0m} and V_{0f} define the threat points. Provided preferences are independent from the marital status, the gain from being married is the difference between the utility inside and outside the two-member household. If a Nash bargaining rule is considered, the household maximizes the product of the individual gains from marriage. In other words, X is determined as

$$\underset{X}{Arg\max}\ [(U_m - V_{0m}).(U_f - V_{0f})] \quad (2)$$

subject to the joint income constraint and the time restraint. This program yields demands for goods and labor supplies taking intrahousehold bargaining into account.

As this setting is based on an altruistic behavioral assumption, it is in fact not relevant to distinguish public and private goods. Moreover, this model describes an economy with two individuals and five goods. It appears that the Nash bargaining rule is only one of many rules. Pareto-efficiency is here a consequence of the Nash bargaining solution (Nash, 1953). A more general case would look upon Pareto-efficiency as an assumption without accepting a particular bargaining rule (Chiappori, 1988a and 1988b). However, the description of the interactions between the household's members is then less accurate.

b. Nash-bargaining rule, egoistic preferences and joint resources

One of the models introduced by Manser and Brown (1980) is based on the Nash bargaining rule. The utility of an agent depends on the consumption of a public good, of private goods consumed by himself or herself and on an "efficiency parameter" α_i which takes account of his or her taste or distaste for the other members of his family. For instance, if he or she feels distaste for living with the other members, his or her utility will be reduced. The shape of the utility function is thus:

$$U(x_0, x_i, l_i, \alpha_i) \quad (3)$$

On the condition that the efficiency parameter stands for x_j and l_j, preferences are altruistic and this framework coincides with the previous model (McElroy and Horney, 1981). In other cases, agents are assumed to be egoistic, since the efficiency parameter describes their own taste or distaste for living with the household's other members. A household is assumed to pool resources. As a consequence, X and L are determined as

$$\underset{X,L}{Arg\max}\ (U_m - V_{0m}).(U_f - V_{0f}) \quad (4)$$

subject to the joint income constraint and the time restraint. V_{0m} and V_{0f} are the threat points, which correspond to the household's members' utility outside the marriage. This program yields good demands and labor supplies taking account of intrahousehold bargaining.

2.112. Modeling the threat point within marriage

The first model introduced by Lundberg and Pollak (1993) offers a straightforward way of modeling the threat point as a non-cooperative bargaining equilibrium within the household.

Manser and Brown (1980) and McElroy and Horney's (1981) seminal contributions assume divorce to be the threat point. The threat point is defined as the maximum utility that a household's member can reach outside the marriage. On the contrary, Lundberg and Pollak focus on a definition of the threat point within the household. In this setting, the threat point corresponds to a *non-cooperative equilibrium reflecting traditional gender roles and gender role expectations*. This non-cooperative equilibrium based on gender roles can be the outcome on the grounds of transaction costs: if the dissolution of marriage has a significant cost, the spouses may prefer a threat point within the household. As a consequence, the final equilibrium is likely not to be Pareto-efficient.

The threat point is given by a non-cooperative Cournot-Nash equilibrium within the household. Moreover, Lundberg and Pollak stress the idea that "specialization by gender is a

pervasive aspect of family life" (p. 993). The Cournot-Nash equilibrium is assumed to correspond to a "gender specialization": each member will provide goods that reflect his or her responsibilities within the family and adopt a labor supply according a division of labor based on recognized gender roles. For instance, the mother could provide goods that are necessary to children. In a more particular case, each household public good will be provided by one member of the household only. This member will therefore control the amount of this public good consumed within the household. This equilibrium is the "separate spheres" equilibrium within the family. Let us consider utility functions depending on private goods (x_h and x_f) and on two public goods (x_{01} and x_{02}) jointly consumed within the household. Preferences are thus egoistic. Considering q_{02} as given the husband will choose x_h and q_{01}, the amount of x_{01} consumed by the household, to maximize his own utility function subject to his own exogenous income restraint. Similarly, considering q_{01} as given the wife will choose x_f and q_{02} to maximize her own utility function subject to her own exogenous income restraint. These decisions give a set of reaction functions:

$$x_h=f_{xh}(p_{01},I_h,\underline{q_{02}}) \; ; \; q_{01}=f^{q01}(p_{01},I_h,\underline{q_{02}}) \; ; \; x_f=f^{xf}(p_{02},I_f,\underline{q_{01}}) \; ; \; q_{02}=f^{q02}(p_{02},I_f,\underline{q_{01}}), \qquad (5)$$

where p_{01} and p_{02} are the prices of x_{01} and x_{02}. The Cournot-Nash equilibrium corresponds to the intersection of the public good demand functions. Within such a definition of the threat point, the indirect utility functions depend on p_1, p_2, I_h and I_w. The threat points (θ_h and θ_f) are thus defined as depending on p_1, p_2, I_h and I_w as well, and the Nash welfare social function maximized by the household in case of cooperation is:

$$N = (U_h - \theta_h).(U_f - \theta_f). \qquad (6)$$

The non-cooperative equilibrium emerges if the gains from cooperation are lower than the cost of breaking up the marriage. It is important to notice that social policy as a child allowance can alter the threat point *and* the cooperative equilibrium, *even if* such a social policy would not modify the threat point defined as the indirect utility outside the family. Lundberg and Pollak's contribution emphasizes that the effects of a social polity change with the way of modeling the threat point.

2.12. Predetermined sharing rule

Pareto-efficiency is likely to characterize most of the models which are developed. A set of intrafamily models follows a path which focuses on Pareto-efficiency without assuming a bargaining rule.

a. The "collective approach" (Chiappori, 1988 and 1992)

Let us consider a two-member household and focus on both household's labor supplies. There is a unique private consumption good, whose price is normalized to 1. C refers to the total household consumption and $C = C_m + C_f$, where C_k is k's personal consumption Assume that C_m and C_f are not observable, that is that only C is known. Whereas in the traditional framework, the household would maximize a single utility function subject to the following joint budget constraint

$$C \leq y + w_m L^m + w_f L^f \qquad (7)$$

where y is the non labor income and w_m and w_f are the wage rates, in the collective approach, the household is characterized by a pair of utility functions, assumed to be strictly monotonic,

strongly quasi-concave and continuously twice differentiable. Attention is focused on egoistic preferences. The Pareto-efficiency assumption leads to the following program.

$$Max\ U_m(L_m, C_m) \qquad (8)$$

subject to $U_f(L_f, C_f) \geq \underline{u_f}$ and to the joint budget constraint (7), for some utility level $\underline{u_f}$.

This program can be interpreted as a two-stage process: to begin with, the household's members divide the total exogenous income, according to a predetermined sharing-rule; then, each member maximizes his or her own utility function.

Non labor income is assumed to be shared according to a *sharing rule* φ, that depends on the given wage rates and on non labor income. According to the sharing rule, m gets a share $\varphi(w_m, w_f, y)$, while f gets $1 - \varphi(w_m, w_f, y)$. Each household chooses his or her consumption and leisure –hence also labor supply—subject to his or her own budget constraint. For instance, m's program consists in maximizing his utility function subject to

$$w_m(T - L_m) + C_m \leq w_m T + \varphi(w_m, w_f, y) \qquad (9)$$

and similarly for f. Chiappori shows that there exists a sharing rule φ such that L_m and L_f, the corresponding pair of labor supply functions, are solutions to m's and f's programs and are collectively rational.

The "collective approach" provides a more general setting, since the sharing rule is predetermined. The only assumption is that outcomes are Pareto-efficient. The following paragraph gives an illustration of this approach.

b. A model of choices with agricultural production

Udry (1996) presents a model of household taking account of agricultural production by the family. Let us consider a two-member household and an economy with K private goods. C is the vector of good consumption within the household. C_f and C_m are the quantities consumed by each member respectively, so that $C = C_f + C_m$. L_f and L_m are the labor supplies and Z refers to the consumption of public goods within the household. As a consequence, if preferences are altruistic, $U_i(C_f, C_m, Z, L_f, L_m)$ is i's utility function ($i=\{f,m\}$). The household produces at least some of the K private goods. A_j is the area of the j-th plot and P_k refers to the areas devoted to k-th good production. In this setting, the production of good k within the household is

$$Y^k = \sum G^k(L_f^j, L_m^j, A_j) \qquad (10),$$

where L_f^j and L_m^j are the time devoted by each household's members to produce the j-th good. Public good production within the household is

$$Z = Z(L_f^Z, L_m^Z) \qquad (11).$$

Since Udry focuses on Burkina Faso villages, there is no labor market and

$$N_f = \sum N_f^j + N_f^Z \qquad (12)$$

$$\text{and } N_m = \sum N_m^j + N_m^Z \qquad (13).$$

If P is the price vector, the budget constraint is

$$P.C \leq P.Y \qquad (14)$$

where Y is the household's production vector. Therefore, a Pareto-efficient allocation solves for some λ:

$$\max_{C,N_i^j,P^k} \left\{ U^f(.) + \lambda U^m(.) \right\} \qquad (15)$$

subject to (10)-(14).

2.2. Non-cooperative bargaining models

Cooperative intrahousehold bargaining models raise some difficulties. Lundberg and Pollak (1994) stress the fact that "cooperative game theory begins by assuming that players can communicate freely and make binding, costlessly enforceable agreements". Such external agreements, which would enforce the allocation within the household to be optimal, do not exist. For instance, in the Nash cooperative bargaining setting, the household is assumed to maximized the product of both household's members' gains from being married. However, the reason why the members should respect this program is disposed of and the stability of the solution is not guaranteed, since each player within the household could turn off course (Bourguignon, 1984). Of course cooperation seems to be obvious when focussing on family. In a repeated game nevertheless, non-cooperative behaviors could occur if the household's members had divergent interests that they failed to reconcile.

2.21. Non-cooperative decision making and labor supplies

Few non-cooperative bargaining models of allocation within the household have been developed. Bourguignon's seminal contribution focuses on labor supplies within a two-member household (Bourguignon, 1984). The preferences of the household's members are egoistic and are defined over their own leisure and consumption. The amount of goods consumed by each member depends on a sharing rule taking account of wages, labor time and exogenous resources. The interest of being married rests on some economies of scale and on some public goods consumed within the household. The non-cooperative solution leads here to a Cournot-Nash equilibrium. As a consequence, each household member is assumed to maximize his or her own utility function subject to the joint budget constraint and to the time constraint given the behavior of the other member. Both members' reaction functions are derived from this program and the final outcome corresponds to their intersection.

2.22. Non-cooperative bargaining decisions and voluntary contributions of public goods within the family

Let us consider a simple repeated game with a single household public good (Lundberg and Pollak, 1994). Each spouse can contribute to the supply of this public good. Marriage cannot be broken up and the spouses are assumed to maximize their discounted values of infinite streams of utilities. Moreover, the spouses are assumed not to discount the future too much. Preferences are egoistic, so that utility functions depend on the amount of public and private goods consumed by each member. Both spouses decide simultaneously to what extent they aim to contribute to the public good purchase. Lundberg and Pollak stress the fact that "in the repeated game, the voluntary contribution game is a "stage game" played in each period, for ever". There is no borrowing or saving.

In the one-shot game, the Cournot-Nash equilibrium corresponds to the intersection of the public goods reaction functions. As a consequence, each member maximizes his or her own utility function subject to his or her own private budget restraint depending on his or her exogenous resources and considering the voluntary contribution of the other member as

given. The reactions functions derive from this program. The equilibrium is not Pareto-efficient.

In this repeated game however, other equilibriums are possible. Since each spouse can punish the other, a Pareto-efficient equilibrium may be reached (Folk theorem). The "punishment points" are defined as the security levels each spouses would achieve if the other refused to contribute to the public good. A social policy can alter these punishment points in favor of one spouse. For instance, "A redistribution of resources from husband to wife shifts the set of equilibriums in favor of the wife in the sense that, if the equilibrium were chosen randomly from this set, then the expected utility of wives would be higher and the expected utility of husbands lower" (Lundberg and Pollak, 1994, p. 135). The punishment is based on lower contribution to the public good.

Non-cooperative bargaining models follow another path to look into the effects of social policies upon the household decision making. Control over resources become essential. The separate-spheres bargaining model aim to take account of non-cooperative bargaining models by defining the threat point inside marriage.

3. Some methodological issues

Two sets of methodological issues seem worth stressing. The first one concerns the heuristic relevance of the intrahousehold decision models. A good theory of intrahousehold choices must indeed satisfy a number of requirements including: testability, integrability, and minimum limitation of the assumption on the decision process occurring within the household. The second methodological point is linked to an empirical difficulty: since the distribution of the consumption within the household cannot generally be observed, a good theory should provide some way of recovering it from observable data.

3.1. Heuristic relevance of the intrahousehold decision models

The traditional approach deals with the household decision-making as that of a single person. If empirical evidences can highlight the weaknesses of this approach, they do not provide a proof of the heuristic relevance of alternative approaches. In the traditional approach, demand functions generated by rational preferences have to satisfy three requirements: homogeneity of degree zero; Walras' law; substitution matrix $S(p,w)$ that is symmetric and negative semi-definite at all (p,w), where p is the price vector and w the wealth. In other words, the traditional approach generates *testable restrictions*. The reverse question (*integrability problem*) is about recovering structural components from observed behavior. For instance, if we observe a demand function that satisfies the previous testable restrictions, is it possible to find preferences that rationalize it? Notice that integrability is a stronger requirement than identifiability, since two different functional forms can lead to a same structural form (Bourguignon, 1984). Testability and integrability requirements have to be satisfied by any alternative approach to household decision-making (Bourguignon and Chiappori, 1992).

3.11. Testability and integrability of the collective setting

Our aim is just to underline the issues at stake. Testable restrictions concerning the collective approach are derived in Chiappori (1988a) in the case of household labor supply. This setting has been presented above. Let us consider

$$A = \frac{\dfrac{\partial L^m}{\partial w_f}}{\dfrac{\partial L^m}{\partial y}} \text{ and } B = \frac{\dfrac{\partial L^f}{\partial w_m}}{\dfrac{\partial L^f}{\partial y}} \qquad (16)$$

(on condition that the denominators differ from zero). Under some regularity assumption, it can be shown that any given pair of demand for leisure functions $\left(T - L^m, T - L^f\right)$ is solution to the programs (17) $MaxU_m\left(L^m, C^m\right)$ subject to $U_f\left(L^f, C^f\right) \geq \overline{u_f}$ and (18) $MaxU_f\left(L^f, C^f\right)$ subject to $U_m\left(L^m, C^m\right) \geq \overline{u_m}$ if the following conditions hold:

$$\begin{cases} \dfrac{\partial \alpha}{\partial y} A + \alpha \dfrac{\partial A}{\partial y} - \dfrac{\partial \alpha}{\partial w_f} = 0 \\ \dfrac{\partial \beta}{\partial y} B + \beta \dfrac{\partial B}{\partial y} - \dfrac{\partial \beta}{\partial w_m} = 0 \\ \dfrac{\partial L^m}{\partial w_m} - \dfrac{\partial L^m}{\partial y}\left(\dfrac{\left(T - L^m - \beta B\right)}{\alpha}\right) \leq 0 \\ \dfrac{\partial L^f}{\partial w_f} - \dfrac{\partial L^f}{\partial y}\left(\dfrac{\left(T - L^f - \beta A\right)}{\beta}\right) \leq 0 \end{cases}, \qquad (19)$$

where $\begin{cases} \alpha = \left(1 - \dfrac{B\dfrac{\partial A}{\partial y} - \dfrac{\partial A}{\partial w_m}}{A\dfrac{\partial B}{\partial y} - \dfrac{\partial B}{\partial w_f}}\right)^{-1} \text{ if } A\dfrac{\partial B}{\partial y} - \dfrac{\partial B}{\partial w_f} \neq 0 ; \alpha = 0 \text{ otherwise.} \\ \beta = 1 - \alpha \end{cases}$

This set of conditions has to be checked for any pair of demand for leisure functions $\left(T - L^m, T - L^f\right)$ that is solution to the household members' programs. It provides a set of restrictions that labor functions have to satisfy and is therefore very important. That is why it can be interpreted as the *analogue* to Slutsky conditions *within the collective framework*. Such a set of restrictions can be derived from another viewpoint, focusing on revealed preferences. It is also possible, under some assumptions, to derive integrability condition, up to an additive constraint.

3.12. Methodological issues concerning intrahousehold Nash-bargaining decision-making

The use of the Nash-bargaining rule in order to describe the decision-making within the household raises important methodological issues.

The tests presented by McElroy and Horney (1981) are in fact similar to the *usual* Slutsky restrictions: if these tests may disqualify the usual approach to household choices, they are not sufficient for basing another setting. That is why their use in order to base the Nash-

bargaining model would be irrelevant. In fact, Chiappori (1988b) has shown that such a Nash-bargaining model actually is not testable.

The Nash-bargaining rule provides a precise way of modeling both household members' behaviors: it leads to the maximization of the product of the gains to cooperation. This accuracy constitutes nevertheless a weakness, at least if no sociological data concerning the intrahousehold bargaining are available. Pareto-efficiency is a more general assumption.

3.2. Recovering non-observable intrahousehold distribution of consumption

In general, data concerning consumption within the household are not available. For the sake of simplicity, assume that each household member consumes only private goods and let $C = C_m + C_f$ be the household consumption, where C_k is each member's personal consumption. C is often observable, contrary to C_m and C_f. Two definitions are useful to clarify the issue at stake:

- A good is assignable if it is possible to observe the individual consumption of this good by each household member.
- A good is said exclusive if it is consumed by only one person within the household.

Browning, Bourguignon, Chiappori and Lechène (1994) stress the fact that the distinction between assignable and exclusive goods is not always very clear when price variations are ruled out. For instance, are clothes assignable or exclusive? Within the collective setting, if an assignable good or two exclusive goods are observable, then the individual consumptions of the non-assignable goods can be recovered up to a constant (Chiappori, 1992; Bourguignon and Chiappori, 1992). Finally, the collective approach to intrahousehold choices has the advantage of satisfying (under precise conditions) the requirements stressed above and is therefore more capable of tackling reality.

Conclusion

The aim of this paper was to survey the different models that have been developed as alternatives to the standard approach of household decision-making. A first dividing line distinguishes cooperative and non-cooperative games. Since marriage is assumed to rest on love, most of the models are based on cooperation between the household members. The weakness is that nothing is said about why the members should respect the program that determines their behavior.

Some of the models based on cooperation assume that the decisions within the household follow a particular rule, such as the Nash-bargaining one. On the contrary, the collective approach considers that the outcome is Pareto-efficient, without assuming a specific rule. This approach is therefore more general, even if the description of the interactions between the mates is perhaps less accurate. In particular, it does not shed any light on intrahousehold resource distribution, a major aspect in any policy-oriented analysis.

The next step should be to investigate the links between intrahousehold choices and socio-fiscal policies, both from a distributional and from a labor-supply point of view. Insofar as they are based on micro (household) data and explicitly model the rules of the tax-benefit systems, microsimulation models may offer a convenient tool to evaluate these consequences

of public policies on individual resources and decisions[3]. By assuming a sharing rule, it is possible to investigate the distributional effects of national tax-benefit systems and to compare them, as exemplified in Orsini and Spadaro (2004). A complementary analysis would be to use simple assumptions in order to recover marginal effective tax rates for individuals within the households, and to evaluate the way they are affected by the tax-benefit system.

[3] Other recent examples of analyses relying on microsimulation include Bargain (2005).

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