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Research Topic: Female Labour Supply

Intra-household decision-making and labour supply : An estimation on the British Household Panel Survey

1) Theory / Model

- Question to be researched

The aim of my research project is to study intra-household labour supply decision making from a microeconomic point of view. I will stress two essential aspects :

- The effects of a family or individual state allowance on each family member labour supply decision
- Intra-household redistribution effects of variations in the environment of the couple

The originality of my work is to estimate a recently developed model on a British database which has particularly interesting properties to study those two aspects.

- Historical / Economic / Political Relevance

This topic is fundamental for the design of appropriate work incentives, and has already had a major impact on current fiscal reforms like the « Prime pour l'emploi » law in France or the « Welfare Family Tax Credit » in UK¹. These economic policies concern a large proportion of women as they are more affected by the so-called « poverty trap »: women generally work fewer hours, and they are more likely to face precarious working conditions (in France 1 female employee out of 4 is a part-time worker, in Britain, they are 40 %). Moreover, the inactivity rate for 15-65 year olds in France is 31.6 % for women against 15.9 % for men (respectively 38.7 % and 25.6 % in Britain), and their labour supply is much more elastic than that for males. Hence, labour market participation needs to be analysed jointly with hours of work.

- Theoretical Relevance

What has been written on this question

The question of female labour supply has been widely dealt with since the 1960's. The model usually used to analyse this topic is the so-called «unitary model » which takes the household as a unique decision-making unit, facing a unique budgetary constraint pooling the income of every family member. This model is, however, not acceptable from a theoretical and an empirical viewpoint.

¹ Those reforms have the same aim : giving incentives to work, but the mean is different : the « prime pour l'emploi » is an individual allowance, whereas the WFTC is a family allowance.

What is inadequate that prompts the researcher to research it ?

On the theoretical side, this model is contrary to the background of microeconomic theory. We know, since Arrow's theorem, that we cannot generally construct an aggregate utility function. Although some researchers have tried to find justifications for dictatorial preferences within the household², these explanations have not satisfactorily settled the issue.

The empirical implications of the unitary model have also been widely criticised. Two results are particularly suspect: the first, which comes from the symmetry property of the Slutsky matrix, imposes identical compensated cross substitution effects. The consequence for labour supply is the equality of the effects of spouse's wage on individual labour supply.

The other empirical aspect criticised (cf. Fortin B. and G. Lacroix [1997]) is the « income-pooling » property, which ensues from the use of a family budget constraint: no matter whose non-labour income rises, the effect on labour supply decision will be the same. Hence, according to the unitary model, the identity of the family allowance beneficiary should not affect labour supply.

- Proposed alternative theoretical solution

What are the causal claims I am interested in

All of these reasons encourage the researcher to construct models that can take into account individual preferences and produce less restrictive properties than the unitary model.

What is the simplest model I can propose

In this respect, Game Theory offers promising directions for research. The family can be viewed as a negotiation place where the confrontation of individual interests leads to a « cooperative³ » solution of negotiations. Therefore, the issue of the negotiation is pareto-efficient, which means that the wife can't improve her utility without reducing her husband's and vice-versa. McElroy and Horney (1981) suppose that the intra-household negotiation process leads to a Nash solution, the issue of the negotiation will be the solution of the maximisation of the gain product utility function. This depends on each member's threat point. Hence the household utility function will depend on prices, each member's income and other extra-environmental parameters influencing the threat point.

In this spirit, I follow Chiappori's collective models of household behaviour (cf. Chiappori [1988,1992], Bourguignon and Chiappori [1992] and Browning and Chiappori [1998]). The originality of this approach is that the negotiation process is not explicitly described which facilitates the estimation of the model. The only assumption needed is the Pareto-efficiency of the issue of the negotiation. A distribution function places the outcome of negotiations on a point of the efficiency frontier. The form of this distribution function is not described; in this sense this approach resembles a reduced form approach. The interest of this model is that we can view the negotiation process as if spouses negotiate in the first stage a « sharing rule » for income, and, in the second stage, each one takes his decision in a decentralised way, given the share of the income obtained in the first stage. The interest of Chiappori's result [1992] is that, on the basis of the observation of assignable consumption (leisure for example), we can

² See, for example Gary Becker's [1981] « rotten-kid theorem », in which, in its simplest formulation, egoistic members of the family follow the preferences of an altruistic and benefactor patriarch.

³ Note, for non specialists, that a cooperative issue of negotiations means that there is no lose of efficiency in the sense that we can't improve simultaneously the situation of every household member.

reconstitute the shape of the derivatives of this sharing rule, hence, we can have a representation of the intra-household labour supply decision process.

- Theoretical significance of the research

Why do I like the model, in what way is my model superior to what existed in the field, how it advances our knowledge of the problem I'm analysing

This model encompasses the unitary and the Nash-bargained models as special cases. As it also allows us to relax the symmetry of the Slutsky matrix and the income-pooling properties, we can test these properties against those implied by the collective framework. As a result of this model, labour supply decisions will depend on the standard substitution and income effects, plus a supplementary effect linked to intra-member negotiation via changes in the sharing rule. In particular, if we enter specifically in the distribution function each member's non labour income, the individual labour supply decision will depend on the identity of the beneficiary of the additional exogenous income. Moreover the income sharing rule (which can be estimated up to a constant) can be used as a good instrument to analyse intra-household inequalities variations.

- Historical / Political significance of the research

What policy implications can we draw from this research, how and where can they be applied, how could it change the policy making process or policy output and outcomes

The implications of the collective model are of different orders. First, it allows us to test the validity of the usual theory : the unitary model, widely used in economic policy simulations, and, if the unitary specification is rejected, it can be used to obtain precise estimates of labour supply elasticities. Second, the household is very often the basic unity of measure for a lot of policies⁴. Therefore, policy makers must have an idea of the impact of some familial or individual policies on the intra-household negotiation process : some measures could change the balance of the bargaining power between spouses, which could have impacts on the expected decision of each family member and on intra-family inequalities.

2) Research Design

To implement this research project, I intend to estimate a collective model of household behaviour, strictly following Chiappori, Fortin and Lacroix [2001] framework in a first step. I will use the British Household Panel Survey, from 1991 to 1997, concerning 10 000 individuals in 5 500 households each year. I would be able to test the validity of the unitary model against the collective one. The BHPS includes information about consumption, time use, wages, income (distinguishing labour and non-labour income), and a great number of social-demographic characteristics which can be used as heterogeneity parameters of preferences, or as distribution factors⁵. In addition we have many opinion variables (regarding religion, politics, or the family). I hope all this will give us informations about the intra-household negotiation process. British databases are likely to work with collective models, because the labour market in Great Britain is more flexible and we observe a great variability in female hours of work.

⁴ For example, in France, income tax is collected at the household level, given equivalence scales which are supposed to take into account household composition on individual welfare.

⁵ A distribution factor is a factor which can affect the balance of bargaining powers between spouses without affecting individual preferences.

Domestic production is an important aspect to develop in such models, since non labour market time is not necessarily leisure time. The sharing rule's parameters and wage and income elasticities will probably be different according to the consideration of household domestic production. Apps and Rees [1997] proposed an extension of Chiappori's model with domestic production, which can be useful to compare estimation results with and without domestic production (cf. Chiappori [1997]).

Going further, discrete choice labour supply can be an interesting way of research, especially when there are rigidities on the labour market. Blundell et al. [1998] took into account non participation in the collective model, they used panel data methods to remove the participation selection bias. Such estimates could be interesting to compare with my previous results. Other developments of the unitary models, are to be incorporated into the collective framework. Taxation, for example, which implies non linear budget set, could be interesting to consider.

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