UNIVERSITY OF LONDON
PhD THESIS

WOMEN'S EMPLOYMENT AND THE OWNERSHIP OF HOUSEHOLD DURABLE GOODS IN BRITAIN AND INDIA

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ABSTRACT

This thesis is concerned with the decision-making processes which take place between husband and wife. It focuses on the ownership of time-saving durable goods: why do some households own goods such as washing-machines and microwave ovens, whereas other households do not? This thesis considers three approaches to studying this issue, of which the first two are conventional in economics. The first approach assumes that a household behaves as if it had a single decision-maker (due to consensus, or because one person imposes his/her will on other household members); this suggests that ownership may be related to the price-of-time of the wife. The second approach assumes that different members of a household disagree about priorities, and bargain with each other - each attempting to obtain his/her preferred spending pattern; in this `bargaining' approach, the wife's weekly actual or potential earnings (relative to those of her husband) may determine her success in bargaining. I also consider a third approach, associated with the sociology of Jan Pahl: that the system of financial management adopted by a household tells us about underlying structures within that household.

This thesis uses survey data from Britain and India to test the above approaches. The British data are from UK government surveys - especially the British Household Panel Study, and the Family Expenditure Surveys. These give a representative picture of the whole British population, and provide data on durable goods ownership since 1969. For India, I use data from two surveys commissioned for this thesis, carried out in 1992 and 1997. The Indian survey data are limited to the four largest Indian cities (Bombay, Madras, Delhi and Calcutta).

This thesis finds considerable support for Jan Pahl's approach, in both Britain and India, and recommends this as a way forward for economics.

ACKNOWLEDGEMENTS

At the end of this thesis, I include a copy of an article (published in the journal Applied Economics in 1995) which is the result of joint work by Ben Fine and myself. My contribution to that paper was limited to preparation of the tables, and some analysis of them; the writing of the paper was almost entirely by Ben Fine.

I owe thanks to Jan Pahl (University of Kent at Canterbury) for discussion of the issues discussed in chapter 10, and for her insights into how household financial management reveals a great deal about how households operate. I am also grateful to Jan for her help in drawing up the questionnaire for the 1992 survey I commissioned in India: in particular, it was her suggestion to include a question on day-to-day household financial management, which proved to be central to this thesis.

I would like to thank Nigel Foster (Birkbeck College) for the use of his `nrs5m' FORTRAN program, which created the dramatrices. Various employees of the Data Archive (University of Essex, UK) and MIDAS (Manchester Computing, University of Manchester, UK) have been helpful with accessing UK data.

I am very grateful to the various departments of the UK government which created the Family Expenditure Surveys, and to the ESRC Research Centre on Micro-Social Change (University of Essex) which produced the British Household Panel Survey. Material from the Family Expenditure Surveys is Crown Copyright; has been made available by the Office for National Statistics through The Data Archive and has been used by permission. The British Household Panel Survey data is also protected by copyright.

I wish to acknowledge the Indian Market Research Bureau Ltd. in collecting the Indian data for this thesis; without IMRB, I might not have been able to obtain any data on Indian households.

None of the above individuals or agencies bears any responsibility for the analysis or interpretation of the data reported here. Any mistakes contained in this thesis are my own.

THESIS PLAN

LIST OF TABLES
(one group for each chapter)

CHAPTER 1

INTRODUCTION

1.1 OVERVIEW: AIMS OF THIS THESIS

This thesis is concerned with the study of `time-saving' goods, which are intended to reduce the amount of time spent on certain housework tasks. Such goods are not normally bought as status symbols (Bowden & Offer, 1994: p. 733), so households which own them must have two characteristics: the household has (or had) sufficient money to be able to purchase goods which are not essential to life; and the household chose to spend money to reduce time on housework, rather than on items such as leisure goods. Which households own such durable goods?

According to the most widely-used economic theories in this field, women's employment is expected to be an important influence on durable goods ownership:

> "both the joint utility [associated with Becker] and bargaining approaches identify employment as a key determinant of the intra-household distribution of welfare"
>
> (MacPhail & Bowles, 1989: p. 63).

Households have been widely observed to have a division of domestic labour so that a wife does most or all of the housework whether or not she is employed - in both the UK (James, 1995, pp. 281-2; Gershuny, 1983: p. 153), and India (Khanna & Varghese, 1978: p. 41; Standing, 1991: p. 71). Hence, it appears that households owning time-saving goods are those where the wife has sufficient power to buy goods which save her time. Yet, dramatrices such as **8<7>** (chapter 8) suggest that many households have enough money to buy such goods, but do not spend their money in this way: they buy leisure durables instead. What are the key differences between households, which give them different spending patterns? Conventional economic analysis (discussed in chapter 2) suggests that a wife's earnings are a vital influence on this decision; but much empirical work has failed to support such a view, and this thesis offers further evidence that conventional economic analysis is not yet sufficiently detailed to model household behaviour successfully. Women's employment and earnings are

important influences: in particular, women's employment increases total household income, and I have found this to be the most important single determinant of whether or not a household owns time-saving durables (see chapter 9). But controlling for total household income, women's employment has been found to reduce the likelihood of a household owning time-saving goods in some circumstances (see chapter 9).

If conventional economic analysis is lacking in its ability to explain household ownership patterns, what other explanations can we use? In chapter 2, I consider various perspectives from sociology, psychology, and marketing. Having tested various ideas (not all reported here, for reasons of space), I find that one of the most promising factors is whether or not the wife manages the day-to-day finances for the household - a topic usually associated with the sociologist Jan Pahl.

GEOGRAPHICAL COVERAGE OF THIS THESIS

The geographical coverage of this thesis is the UK and India, but the data used here do not represent the whole of India: it is limited to the four largest cities (Bombay, Madras, Delhi and Calcutta), so I refer to my results as applying to `urban India', and I do not claim insights into rural Indian households. For the UK, I use two different sources: Family Expenditure Surveys, and the British Household Panel Study. The former is intended to be representative of the UK, whereas the latter is limited to England, Wales, and Scotland south of the Caledonian canal; I refer to this as `Britain', on the assumption that Scotland north of the Caledonian canal is not very different to the rest of Britain. More details of the datasets used are given in chapter 6.

1.2 THESIS STRUCTURE

Chapter 2 is a review of theoretical literature, which examines the most popular theories relevant to this thesis: I emphasise theories devised by economists, but include theories from other academic fields - especially sociology. Chapter 3 outlines a selection of previous empirical research: while not exhaustive, this gives a flavour of previous empirical research. Previous empirical work is reported in other chapters, where appropriate.

Chapter 4 explains the two methodologies used in this thesis: regression analysis, and `dramatrix' analysis. I use both methodologies in this thesis, and consider them to complement each other. Chapter 5 contains a mathematical model of a household, which I devised myself, but which is based loosely on the ideas of other writers such as Manser & Brown (1980). My model uses a game theory approach, which is widely used in contemporary economics. My own model justifies empirical research on husband's employment, which I have found to be important (see chapter 9).

Chapter 6 outlines the datasets used for this thesis, and also discusses other datasets which I have considered using - this information may be helpful to future researchers. I attempt to explain briefly the advantages and disadvantages of each of these datasets. I also outline the empirical methods which I used to process these datasets.

The next four chapters contain my own empirical research. Chapter 7 tests the price-of-time hypothesis, associated with the work of Gary Becker. Then, chapter 8 tests the (currently) most widely-used economic analysis of household behaviour: `bargaining' models, based on game theory. In chapter 9, I produce evidence to suggest that neither the price-of-time hypothesis, nor the bargaining models, can adequately explain the patterns of durables ownership I observe. Chapter 10 brings in a new perspective: by adding insights from the sociologist Jan Pahl, I test the idea that household financial management gives us insights into the workings of households.

Finally, chapter 11 brings together the key elements of this thesis, and attempts to suggest directions for future research.

Bound in with this thesis ***[paper copy only]*** is a copy of a joint article by Ben Fine & myself, which was published in Applied Economics in 1995.

1.3 TYPOGRAPHICAL AND OTHER CONVENTIONS

There are eleven chapters, each divided into sections. Each section is numbered (for example, this is section 1.3). Within a section, there are often subsections, such as `geographical coverage of this thesis' (in section 1.1 above). Subsections are not numbered, but are indicated by a heading in **BOLD** text. Each section (but not each subsection) begins on a new page.

Abbreviations of dataset names are shown in italics, e.g. *FES*; the full names of these datasets are given in chapter 6.

Each table is numbered by chapter, and (within each chapter) each table is individually numbered: for example, table **8<1>** is the first table in chapter 8. For each table of regression results, there is a section in the appendix giving more details of the regression results. The appendix section number corresponds to the table number - for example, appendix section **A8<1>** has more details on the regression results reported in table **8<1>** of the main text.

Equations are identified by names such as **[5A]**, where the number 5 refers to the chapter-number; within each chapter, equations are in the order **[5A]**, **[5B]**, and so on.

CHAPTER 2

PREVIOUS THEORETICAL WORK

2.1 OVERVIEW

This chapter considers some of the previous theoretical work, which is relevant to understanding the links between women's employment and the ownership of time-saving durable goods. Because so much has been written on this area, this chapter cannot be exhaustive - rather, it attempts to give an outline of some relevant theories. This chapter is grouped in sections in my attempt to give a structure to the many references cited: they are organised in order of decreasing reliance on the assumption of `rational' economic behaviour. Neoclassical economics (section 2.2) is based on the idea that each person attempts to maximise his/her own utility (or that of his/her household) - a questionable assumption:

> "What may be questioned is whether individuals behave, even on average, coherently with their preferences when engaging in emotionally charged undertakings such as finding a mate, raising a child, or looking after an elderly relative. If that condition were not satisfied, families would not be susceptible to economic analysis."
>
> (Cigno, 1991: p. 2).

This opinion of Alessandro Cigno appears unnecessarily restrictive for economics. Cigno (1991: p. 1) describes economics as "a method for generating empirically falsifiable predictions about human behaviour under the assumption that, on average, individuals behave coherently with their own preferences (which need not be selfish)". But economists could (at least in principle) develop theories to explain forms of human behaviour which do not appear to be in the individual's best interests. Later in this chapter, a number of such theories are discussed (not all from economics) - in particular, the impact of marketing on consumer behaviour (section 2.6); the influence of culture and `social norms' (section 2.7); and the importance of financial management systems (section 2.8).

This chapter will focus on various theories on consumption: for each theory in turn, I will assess the type of explanations offered by that theory as to why different families might behave differently. This is

intended to provide an insight into the general question of how households make decisions on which durable goods (if any) to purchase.

Gary Becker, perhaps the most influential neoclassical economist in the field of household behaviour, sees the division of labour between men and women purely in terms of `rational' economic behaviour, with little scope for ideology to influence the division of labour:

> "If women have a comparative advantage over men in the household sector when they make the same investments in human capital, an efficient household with both sexes would allocate the time of women mainly to the household sector and the time of men mainly to the role of the market sector."
>
> (Becker, 1981: p. 22).

An apparently similar view was expressed by Naci Mocan:

> "Economic theory suggests that in order for the labor force participation rate to rise there must be changes in the value of market or non-market time, or tastes."
>
> (Naci Mocan, 1991: p. 1).

However, Naci Mocan went on to give a rather different impression of the way in which economists see the world:

> "The change in tastes represents changes in social and psychological attitudes like changing sex roles, life styles and family structures. [...] the changing labor force participation behavior in turn alter the attitudes towards education, family formation and fertility decisions."
>
> (Naci Mocan, 1991: p. 2).

The second of the above quotations from Naci Mocan suggests some parallels with the work of sociologists and psychologists, in which ideology is thought to have important effects on household behaviour:

> "Family behaviourists have long held that the perception of ″power-influence″ held by family members is the key towards unlocking the puzzle of household decision behaviour. According to this view, if one can adequately determine the allocation of decision influence between family members, one can predict the distribution of household role structure and responsibility. Blood and Wolfe (1960) contend that the influence held by husbands/wives upon household decisions is directly related to society's cultural norms and role expectations."
>
> (Qualls, 1987: p. 267).

Gary Becker accepts that apparently identical households vary in their behaviour, which he interprets in terms of differences in `tastes'. Orthodox consumption theory does not attempt to explain differences in

tastes (Bowden & Offer, 1994: p. 735), but this may be a weakness in economics:

> "economic theory does not explain the formation of tastes. Nor can one usually look to sociology or psychology since the theory in these fields has not been developed sufficiently to be of much help. [...] The heavy reliance on presumed differences in tastes when explaining differences in consumer behaviour is, therefore, a weakness of the traditional theory of choice"
>
> (Becker, 1971: p. 44).

Gary Becker's attitude to sociologists and psychologists may be part of a pattern, in which academics from different disciplines have little respect for each other. For example, David Levine (who appears to be a psychologist) wrote:

> "Since the seminal work of Jacob Mincer (1962), neoclassical economists have attempted to explain married women's labor supply with relative prices such as reservation wages and market wages, while assuming that tastes are fixed. As described below, <u>these attempts have met with only modest success</u>.
>
> (Levine, 1993: p. 665; emphasis added).

Levine appears to dismiss economic analysis in this field (since 1962) as being of little value; and later, he adds:

> "Married women's LFP [labour force participation] rose by approximately 1% a year from 1972 to 1982, and has continued to rise - and <u>nobody knows why</u>."
>
> (Levine, 1993: p. 667; emphasis added).

Gary Becker's dismissive view of sociology and psychology seems difficult to defend even in 1971; but I feel Levine's comments do not do justice to economics, in suggesting that economists know nothing about why women's labour force participation has risen. A central theme of this thesis is that economists have much to learn from other disciplines. This chapter continues by looking at conventional economics approaches to studying the effects of women's employment on time-saving durable goods; I then proceed to look at perspectives from other disciplines.

2.2 NEOCLASSICAL ECONOMICS: `UNITARY' MODELS

Neoclassical economics is based on the idea of rational behaviour, in which economic agents (usually assumed to have perfect information) have a set of preferences, and maximise their utility subject to a budget constraint (Green, 1971: p. 22). Neoclassical economists assume that each household behaves as if it were a single individual - maximising a joint household utility function which is a function of the utility functions of one or more household members (Chiappori, 1992: p. 2). One of the earliest such models was the `consensus' view, associated with Paul Samuelson (see Pollak, 1985: p. 598). The household utility function can be used to predict how all household decisions are made - including decisions on employment of household members, as well as on household spending.

There is an underlying assumption in neoclassical economics that different households tend to share a similar utility function, with some variation between households due to different `tastes' of household members. Neoclassical economists could interpret evidence of **similarities** in behaviour of different households as evidence that households behave "rationally". If consumption of a durable was found to increase with rising household incomes, it would be called a `normal' good; whereas if consumption fell with increasing household income, it would be called an `inferior' good (Begg, Fischer & Dornbusch, 1994: p. 71). It appears difficult to disprove such a theory.

Differences between behaviour of households are explained by neoclassical economists as being due to different `tastes' - the implication being that `tastes' are unpredictable (random, but stable) variables, which are beyond the scope of economics to explain. If `tastes' are stable, then we may be able to make reliable forecasts of aggregate spending on certain items durables; but we are likely to be less successful in explaining the behaviour of an individual family.

The neoclassical economics approach to consumer behaviour deserves criticism on the grounds that it is not falsifiable. If empirical evidence suggested that all households behave identically, neoclassical economists could interpret this as evidence of `rational' economic behaviour; whereas if households behave differently to each other, this could be interpreted as evidence of differences in `tastes'. Neoclassical economics suggests that different households tend to behave similarly to each other - incomes

seem important in predicting behaviour; but other differences are due to (unpredictable) differences in `tastes'. To predict the effect of income on the purchase of a household durable good, we need to know whether the good is a `normal' or `inferior' good. Neoclassical economics claims that if households purchase more of a good as their incomes rise, then that good must be a `normal' good, and other households will tend to buy that good as their incomes rise. Neoclassical economics may help us to **understand** household behaviour, but it is less helpful in making **predictions**. We do not know in advance whether items such as washing-machines are inferior goods (perhaps households prefer laundry services); so we cannot predict if ownership of such goods will increase if incomes rise.

A further problem with the neoclassical economics approach is that econometric findings from testing neoclassical models may be biased - for example, Becker's theory requires us to estimate the price of a woman's time in terms of her hourly wage, if employed; the price of her time cannot be directly measured if she is not employed. If we take a sample of employed women, this sample will not be representative of households in general, and may give biased results if we generalise the findings to the whole population. Beyond these estimation problems, however, lies a more fundamental problem for econometricians: econometric analysis assumes that we can clearly distinguish between `independent' and `dependent' variables, whereas this thesis faces the problem that factors such as fertility, employment, and education level are all inter-related (this problem has been discussed before - e.g. Mincer & Polachek, 1974, p. 419, p. 428; Naci Mocan, 1991: p. 2; Sanchez, 1993: p. 435). Neoclassical economists attempt to explain purchase of durable goods in terms of the price of time (especially of wives), and to explain the price of a woman's time in terms of her earnings; but a woman's labour market participation is influenced by the presence of durable goods - a circular argument. This problem becomes more serious when we observe that women's employment may be influenced by the presence of children; and many writers have argued that employed women are likely to prefer to have fewer children (e.g. Willis, 1987). Other issues such as level of household savings, ages of husband and wife, and education levels also complicate the picture. I discuss these problems further in other chapters.

THE PERMANENT INCOME and LIFE-CYCLE HYPOTHESES

One view (within neoclassical economics) of the expected impact of women's employment on durables ownership is the `Permanent Income Hypothesis', associated with Milton Friedman (see Friedman, 1957; Holmes, 1974). This hypothesis fits into the neoclassical economics framework, in that it is based on the assumption of `rational' economic behaviour. This view suggests that women's income may be interpreted as partly `transitory' income, if she expects to take time out of the labour market to raise children. If so, the household may save a larger fraction of her wages (in order to "smooth out" consumption over the household's lifetime). Spending on durables may be used as a form of saving; so ownership of (all types of) durables should increase in households in which the wife's earnings are a large proportion of total household income. In other words, the Permanent Income Hypothesis predicts that durable goods ownership will tend to be positively associated with women's employment. However, women's attachment to the labour force is now more permanent than in earlier years, so a wife's earnings may now be treated in the same way as a husband's earnings (Strober & Weinberg, 1980: p. 339).

There are links between the `permanent income hypothesis' and the `life cycle' hypothesis, which claims that a household adjusts consumer spending over time to keep the marginal utility of wealth constant over time (Blundell, Browning & Meghir, 1994: p. 57). I do not attempt to test either the Permanent Income hypothesis, or the life-cycle hypothesis, here due to restrictions on the length of this thesis.

2.3 NEW HOME ECONOMICS and the PRICE OF TIME

Gary Becker is one of the founders of a branch of neoclassical economics, known as `new home economics' (Folbre, 1986: p. 6), or `economics of the family' (Piachaud, 1982: p. 471), or `economics of the household' (Rosen, 1993: p. 28), or the `theory of household production' (Sandmo, 1993: p. 12). Becker's approach has been described as the main approach within economics to analyze household behaviour (Sandmo, 1993: p. 12; Khandker, 1988: p. 111). Becker's ideas fit within neoclassical economics, and have been used and developed by other economists such as Gronau (1973) and Mincer & Polacheck (1974). This section outlines Becker's approach, and then considers the relevance of work by Becker and those who share his approach, to household decisions on purchases of time-saving goods and services.

Becker's ideas build on the neoclassical analysis of household behaviour. As a neoclassical economist, Becker assumes that individuals are rational agents, who maximise utility subject to a budget constraint. And like earlier economists, Becker claims that the behaviour of a utility-maximising consumer is entirely determined by prices, income, and `tastes' (Becker, 1971: p. 43). Becker emphasises the `cost of time', and created the concept of `total household income' which includes both monetary income and time availability of household members (Becker, 1971: p. 46). Becker developed a model of `household production': each household combines time of household members with resources such as time-saving durable goods, to create a set of services which the household needs - this breaks down the distinction (used by earlier neoclassical economists) of time as either work (outside the household), or leisure (often inside the household). For example, raw food (which costs money) is usually combined with cooking (which takes the unpaid work of household members) to create a meal for household members (Becker, 1971: p. 42). This emphasis of production (as well as consumption) taking place within households improves our understanding of "make-or-buy" decisions (Pollak, 1985: p. 588).

Another difference between Becker's work and standard neoclassical economics is his analysis of household utility functions. In some of his work, Becker attempts to explain how the utility function of each household member influences the household welfare function; in particular, Becker's more recent work has emphasised the idea that a household member may feel "altruistic" or "envious" towards other members of his/her household: this

view is outlined in the `caring and altruism' subsection of section 2.4 below.

In many economic models of the household, it is assumed that a married couple household has the potential to be better off than the same people as two single-adult households: this could be due, for example, to lower housing costs if a couple live together; or less time preparing a meal for two, rather than two separate meals. There is also a possibility that two people might enjoy each other's company, and prefer to live together. Such benefits from marriage are sometimes referred to collectively as the marriage "surplus" (Pollak, 1994: p. 149). In Gary Becker's recent work, the distribution of this marriage surplus is determined by the `marriage market':

> "Becker views assortative mating (who marries whom and who remains unmarried) as crucial and sometimes assumes that prospective spouses, when they meet in the marriage market, can costlessly make binding, costlessly enforceable agreements concerning distribution within marriage. If such costless, contingent agreements could be made in the marriage market, then all bargaining would take place prior to marriage. [..] Perhaps because Becker believes that the marriage market and individuals' prospects after divorce narrowly constrain distribution within marriage, his focus has been on these constraints rather than on the determinants of the division of the surpluses within particular marriages."
>
> Pollak (1994, p. 149).

Gary Becker's approach has been criticised in that his work attempts to justify the existing distribution between husbands and wives: Becker "explains, justifies, and even glorifies in role differentiation by sex" (Barbara Bergmann, cited in Nelson, 1995: p. 142). Certainly, some of Becker's writing does give the impression that women's roles are determined by biology: for example, he wrote in 1981 that

> "Women not only have a heavy biological commitment to the production and feeding of children, but they are also biologically committed to the care of children in other, more subtle, ways. Moreover, women have been willing to spend much time and energy caring for their children because they want their heavy biological investment in production to be worthwhile."
>
> (Becker, 1981: pp. 21-2).

I now move on to the aspect of Becker's work which I attempt to test in this thesis: the price-of-time hypothesis.

THE PRICE OF TIME

Implicit in Becker's approach is the idea of a trade-off between time and money (Willis, 1987: p. 69), which may help us understand household behaviour. Becker's emphasis on the price of time led him to stress the importance of the wage-rate of employed members, as a guide to how much money he/she will be prepared to spend to save time. Where a household member is not employed, Becker's approach attempts to provide a framework for assessing the value of his/her time. Becker's approach suggests that a household will buy time-saving goods (such as a washing-machine) if the value of the time saved is worth more to the household than the financial cost of the good, but not otherwise (Becker, 1971: p. 33):

> "The higher the value of time, the more likely it is that the household will substitute time-saving, "money-intensive" forms of production for money-saving, "time-intensive" forms."
> (Iannaccone, 1995: p. 181).

Becker's model suggests it can be rational for one member of a household to specialise in market work, and another member to specialise in unpaid domestic work (Ghez & Becker, 1975: pp. 142-3). This claim is based on the idea that time spent in domestic work has an opportunity cost determined by that person's market wage-rate. People who can obtain high wages are likely to choose market work, whereas those who can only obtain low-paid work will tend to choose unpaid work (Cigno, 1991: p. 70). It is likely that women (rather than men) will specialise in domestic work, because employed women typically leave the labour market to have children - and this broken employment record reduces their human capital, and hence the wage they can obtain on their return to employment (Becker, 1981: pp. 21-22).

To study Gary Becker's ideas in more detail, I now discuss the model of household behaviour in his 1965 article. Becker assumes that a household maximises a utility function: utility depends on consumption of commodities, where a typical commodity uses a combination of time and money - for example, a trip to the theatre requires not only the price of a ticket, but also the time of the playgoer (Becker, 1965: p. 495). Becker uses Z_i to represent the amount of the i^{th} commodity consumed (there are m goods available): to obtain Z_i of commodity i, the household buys quantity x_i of market goods, and spends time T_i on consumption (quantity Z_i could be obtained from various mixes of x_i and T_i). Becker (1965: p. 498) uses the concept of "full income" (W), meaning a combination of money income and unpaid domestic work. There are two constraints facing a household: money

income, and time of household members. The first of these constraints is equation (6) in Becker (1965: p. 496), which I reproduce as equation **[2A]** below:

$$\textit{GOODS CONSTRAINT}: \quad \sum_{1}^{m} (p_i x_i) = V + T_w w$$

where p_i *is the price of good* i
x_i *is the quantity of good* i *bought*
V *is non-earned income*
T_w *is time in paid work*
w *is the wage-rate*

[2A]

The above equation tells us that a household cannot spend more than it earns (a standard assumption in economic models of the household). The next constraint, though, represents one of Becker's claims to originality: in equation (7) in Becker (1965: p. 496), which I reproduce as equation **[2B]** below, Becker assumes that total time available (T) must be divided between earning money, and consuming some combination of the i commodities.

$$\textit{TIME CONSTRAINT}: \quad \sum_{1}^{m} (T_i) = T - T_w$$

where T_i *represents time spent consuming good* i
T *is total time available*
T_w *is time spent on paid work*

[2B]

Becker then multiplies the second equation by the wage-rate, and adds this to the first equation, to arrive at his equation (9):

$$\sum_{1}^{m} (p_i x_i) + \sum_{1}^{m} (T_i w) = V + Tw \qquad \textbf{[2C]}$$

This is then be re-written as Becker's equation (10), reproduced here as equation **[2D]**:

$$\sum_{1}^{m} [(p_i b_i) + (t_i \overline{w})] Z_i = V + T\overline{w}$$

where b_i *is the number of units of good* i
needed to make one unit of Z_i

t_i *is the amount of time needed*
to consume one unit of good Z_i

[2D]

In conventional economic analysis, time is spent at "work" or on "leisure"; so if a household member does more paid work, there is more money available

but less leisure-time. In Becker's model, by contrast, more income seems to require more time: for example, a theatre ticket is of no use without the time to visit the theatre. Conversely, a household can reduce the amount of paid work done by its members (to obtain more time) - but this means losing some earnings, so the household would need to produce some commodities by more labour-intensive methods. If money income falls too far, the household will lose utility because it will be unable to buy sufficient market goods (such as food) - there is a limit to how far a household can make up for this by unpaid work. Becker devises a formula for the amount of `full income' forgone or "lost" if a household reduces its paid work by a small amount: he calls it the `loss function' L, and he reports it in his equation (15) (see Becker, 1965: p. 499); I reproduce it below as my equation **[2E]**:

$$\textit{LOSS FUNCTION:} \quad L = w\sum_{1}^{m} t_i Z_i \qquad \textbf{[2E]}$$

How, then, will a household choose to combine time and money (to create commodities)? This can be broken down into two decisions: the household chooses the optimal combination of commodities; and decides how to produce those commodities. Regarding which commodities to consume, Becker (1965: pp. 498-9, footnote 2) presents his equation (3'), which I reproduce as equation **[2F]** below:

$$\frac{\partial W}{\partial Z_i} = \frac{p_i\, b_i\, \sigma}{1 + \sigma} \qquad \textbf{[2F]}$$

where σ is `marginal productivity of money income'

The above equation tells us that the household chooses the optimal mix of commodities, taking into account factors such as prices of goods (p_i), and what Becker calls the `marginal product of money income' (σ). As regards how best to obtain the chosen commodities, Becker (1965, p. 513: footnote 1) claims that utility is maximised (subject to the constraints in equations **[2A]** and **[2B]** above) by choosing x_i so that

$$\frac{\partial U/\partial x_i}{\partial U/\partial T_i} \equiv \frac{\partial Z_i/\partial x_i}{\partial Z_i/\partial T_i} = \frac{p_i}{\partial L/\partial T} \qquad \textbf{[2G]}$$

The above equation **[2G]** can be interpreted as a make-or-buy decision. Assuming that the household has decided which commodities to consume, the household could then use more time-intensive or labour-intensive methods. For example, the family could eat out in a restaurant, or cook a meal at

home; this decision would be influenced by the price of each alternative (p_i), as well as by the wage-rate (which enters via the loss function L).

Gary Becker concludes from his analysis (which I summarise in equations **[2A]** to **[2G]** above) that

> "an increase in the relative market efficiency of any member would effect a reallocation of the time of all other members towards consumption activities in order to permit the former to spend more time at market activities."
>
> (Becker, 1965: p. 512).

This gives an "incentive to economise on time as its relative cost increases" (Becker, 1965: p. 513). Becker cites the example of home-delivered milk, arguing that a household is more likely to have milk delivered to the home (rather than shopping for milk) if the value of time is high, i.e. in high-earning families (Becker, 1965: pp. 514-5). Hence, if a household member is employed at a higher wage-rate, then it becomes worthwhile for the household to spend more money to save time. We can use the above analysis for durable goods, provided we treat the above quantity x_i as the value of the services obtained by owning the durable good (Becker, 1965: p. 495).

For this thesis, the essential prediction of the above model by Gary Becker is that the `price of time' is an important influence on the decision of whether or not to buy a time-saving durable good. This decision will depend on the value of time of household members; if a durable good saves time for only one household member, then the purchase decision depends on the value of that person's time. A household will buy a washing-machine, for example, if (and only if) the **cost of time** saved is more than the value of the services obtained by owning a washing-machine.

It could be argued that this model by Becker leaves a number of questions unresolved. The cost of time of an employed person is his/her wage-rate; but if s/he is not employed, the cost of time is not so simple to assess. Willis (1987: p. 69) argues that the cost of time of a non-employed person is a <u>function</u> of the wage-rate of other household member(s) who are employed; but Willis does not tell us exactly what this function is, except that it is an increasing function. Other writers take a different view on how to estimate a non-employed person's price of time (see section 7.2 below). But in general, the above (Becker) model predicts that a

household is more likely to buy a time-saving durable good if wage-rates received by household members are higher, other things being equal.

To summarise this section, the `new home economics' approach used by Gary Becker and others is more detailed than previous neoclassical economists. Becker predicts that time-saving goods (including durable goods) will be bought by households with higher wage-rates. In chapter 7, I discuss previous research which has tested Becker's ideas, and also offer my own evidence on this approach.

2.4 BARGAINING MODELS OF THE HOUSEHOLD

The above section outlined `unitary' models of household behaviour, which assume that a household behaves as if it maximises a single utility function. The most widely-used alternative in economics is to assume that each household member has his/her own utility function, which influences household behaviour: such models are often called `collective' models (Lundberg & Pollak, 1996). But if members of a household disagree with each other (on decisions such as what durable goods to buy), which household member gets his/her own way? The `collective' models are generally based on bargaining, using insights from game theory.

Several game theory models assume a `co-operative' solution (such as Ermisch, 1993; and Handa, 1996); whereas other writers use `non-cooperative' bargaining models of household behaviour (Pollak, 1994: p. 148). The difference is that `cooperative' models assume players are able to make binding long-term agreements, whereas `non-cooperative' models assume that agreements between spouses cannot be enforced (Ott, 1992: pp. 22-7). A cooperative model always produces an outcome which is Pareto-efficient, whereas a non-cooperative model need not produce a Pareto-efficient outcome (Bourguignon & Chiappori, 1992: p. 359).

Game theory emphasises the importance of `threat points' (or `reservation utilities'), which are the minimum levels of utility which each partner will accept. Threat points are thought by game theorists to be important influences on the relative strengths of each partner's bargaining position. The difference between the minimum level of utility accepted by each `player', and the maximum possible utility if that person had his/her ideal outcome, indicate the `surplus' over which bargaining takes place; many writers assume that this surplus is distributed according to Nash bargaining (Nash, 1950), which maximises the product of husband's and wife's surplus. Bargaining models assume that if there is disagreement between husband and wife over purchase decisions, then the ability for a woman to get her own way depends partly on her earning power, because higher earnings imply a better threat point.

Game theorists disagree on what `threat points' to use in practice. Some writers (e.g. Handa, 1996) assume threat points are the utility levels each partner could get outside marriage; these are presumably linked to the earning level which (husband and) wife would expect to earn if a divorce

occurred, and a useful predictor of this may be each person's current earnings. However, some economists suggest that there are limits to how far each partner can threaten divorce:

> "it seems unlikely that couples resolve disagreements about ordinary household matters by negotiating under the pressure of divorce threats. If one spouse proposes a resolution to a household dispute and the other does not agree, the expected outcome is not a divorce. A more likely outcome is harsh words and burnt toast, until the next offer is made"
>
> (Bergstrom, 1996: p. 1926).

Other researchers (e.g. Lundberg & Pollak, reported in Phipps & Burton, 1995: p. 178) assume that threat points are the utility levels obtainable in a non-cooperative marriage - each partner threatens not to cooperate, but does not threaten divorce. Empirically, it is very difficult to measure `threat points' (Chiappori, 1992: p. 8): it is not yet clear if it will ever be possible to estimate threat points empirically (Bourguignon & Chiappori, 1992: p. 359). However, some research in this area is possible: for example, John Ermisch (1993: p. 357) refers to a study in Japan, which found that women who said they had contemplated divorce tended to be in full-time paid employment, which offers some support for a game theory view. It has been suggested that male violence against women is a method by which some men control women, and that (threats of) violence may influence `threat points' (Pollak, 1994: p. 151).

Game theorists assume that individual members use strategies to further their own interests. Myra Strober (1988: p. 176) suggests that husbands report displeasure at their wives' obtaining paid work because they think the wife may be attempting to leave an unsatisfactory marriage. In terms of game-theory, a wife's attempt to improve her bargaining power by taking employment, and her husband's attempts to prevent her employment, are both strategies.

Several writers have suggested that women may seek employment in order to strengthen their ability to control household resources (Schultz, 1990: p. 457). However, a wife's earnings could have the opposite effect:

> "the additional income from the wife's employment may serve to increase the amount of marriage-specific capital (e.g., home ownership, durable goods, children, and market and nonmarket skills), consequently making divorce or separation a less attractive alternative for both wife and husband."
>
> (Greenstein, 1990: p. 674).

The above comment illustrates the difficulties of applying game theory to household behaviour. Nevertheless, most bargaining models imply that a woman's earnings tend to increase her bargaining power within the household, and hence increase the probability of her household owning time-saving durable goods. This idea is tested in chapter 8.

CARING AND ALTRUISM

Another application of Game Theory to household behaviour is the model by Bourguignon, Browning, Chiappori & Lechene (1991), which builds on the `household production' model associated with Gary Becker (see section 2.3), and also on Becker's work on marriage and divorce (1974). Becker's more recent work has emphasised the idea that a household member may feel "altruistic" or "envious" towards other members of his/her household (Becker, 1981: p. 173). This interdependence of the utility functions of different household members may lead to complex household behaviour. For example, if a household head cares enough about other household members, then the household will behave as if it maximised the household head's utility function (Becker, 1974: p. 331). Although Becker's altruist model was not written in terms of game theory, it can be interpreted as a two-player game (Pollak, 1994: p. 148); however, Becker has consistently de-emphasized the importance of bargaining between spouses (Pollak, 1994: p. 149).

In the model by Bourguignon, Browning, Chiappori & Lechene, household members are assumed to `care' about each other in the sense of Becker's analysis of `altruism' and `envy' - in which a household member may receive utility or disutility (respectively) from the happiness of another household member. Bourguignon, Browning, Chiappori & Lechene assume that each household member has a utility function which depends on the goods consumed by the household, and that the utility function of the whole household is a function of the individual utility functions of all household members. Each household member attempts to persuade other household members to accept his/her preferred spending pattern; the income of each household member determines how likely s/he is to be successful, because a high income now indicates that a household member with a high income is likely to be relatively well-off if they were divorced: this gives that person more bargaining power. Bourguignon, Browning, Chiappori

& Lechene test their model by studying certain goods which they call `assignable goods': these are goods which are thought to be desired by one household member, but not by other household members. An example of `assignable goods' are clothes which are only worn by one household member. In this model, a household member's earnings is likely to influence the chance of their obtaining an `assignable good' which s/he (presumably) wants. The model was tested empirically in both Bourguignon, Browning, Chiappori & Lechene (1991), and in Chiappori (1992): both articles concluded that their game theory model performs better than neoclassical models of household behaviour. Note, though, that their results could be interpreted differently - for example, Becker's model suggests that households containing a high-earning wife are likely to buy labour-saving durable goods because her price-of-time is high (I return to this issue in section 8.3).

PRINCIPAL/AGENT MODELS

Some economists analyze day-to-day management of household finances in terms of a `principal/agent' model, in which the husband (the `principal') has power over the household, but he prefers his wife (the `agent') to carry out certain tasks such as shopping (which requires her to deal with household finances to some extent); hence the husband delegates some of his power to his wife:

> "if the partner who does the shopping likes dark meat, and the non-shopping partner likes light, the household may end up eating chicken legs instead of breasts. The shopper, or "agent" makes choices. However, some people may feel themselves constrained in choosing between light and dark meat by the knowledge of what might await them if they return home with chicken legs - constraints imposed by the "principal"."
>
> (Woolley & Marshall, 1994: p. 425).

It seems plausible that a principal-agent theory can be modelled by a bargaining model based on game-theory, as suggested by Maskin & Tirole (1992: p. 1).

Another view (related to principal-agent models) is the `Transactions Cost' approach, which assumes that there are generally advantages to all household members in co-operation (Pollak, 1985: pp. 584-6); but a household is a `governance structure', in which each household member is expected to carry out certain tasks, in return for rewards. Pollak's model

emphasises the incentives of each household member to work for the well-being of the household, and the monitoring of each member to ensure that they are performing the tasks they are expected to do (Pollak, 1985: p. 584).

The principal/agent approach, and the `transaction cost' approach, both imply that day-to-day involvement with tasks such as managing money and shopping may give a household member some influence on spending patterns. It seems unlikely that a wife might buy a durable good such as a microwave oven without her husband noticing; but it is plausible that she might buy such an item without first consulting her husband. In addition, a wife who is involved with financial management may be better informed on how rich (or poor) her household is. These factors may explain my findings in chapter 10.

BARGAINING MODELS IN SOCIOLOGY

The work of some sociologists appears to parallel the work of game theorists in economics: for example, many sociologists suggest that people have conflicting interests (Morris, 1989: p. 449), and negotiate on resource allocation (Wilson, 1989: p. 174). Some sociologists consider that bargaining positions depend on the individuals' earnings - referring to India, Khanna & Varghese (1978: p. 39) wrote "Some working women become bossy and authoritative because they earn as much as their husbands do": Khanna & Varghese emphasise wives' earnings as determinants of power within the home. Similarly, Wheelock (describing the UK) states

> "As employment opportunities have altered, men have become economically less powerful and their wives more so, thus changing the balance of the domestic bargain in favour of women."
>
> (Wheelock, 1990: pp. 151-2).

Several observers claimed that men often conceal their earnings/wealth from their wives, in order to maintain power within the home (including, for the UK: Pahl, 1980: p. 317; and for India, Khanna & Varghese, 1978: p. 44). This withholding of information might be interpreted as a `strategy' in Game Theory economics (although neither Pahl nor Khanna & Varghese use the term "strategy"). Bina Agarwal (1997: p. 30) suggests that many Indian women take paid work to enhance their bargaining-power, which in turn should increase their say in household decision-making. Another example

of a sociologist discussing strategic behaviour is where women take paid work to reduce their housework:

> "women's paid employment was significant in officially designating a period of time to organizational pursuits, a formal "excuse" from what would usually be seen as their household demands, and thus became valuable as currency in domestic negotiations."
>
> (Hessing, 1994: p. 628).

More generally, sociologists Brannen & Wilson (1987: p. 5) claim that `strategies' are adopted by each household member to create, dispense, or exploit household resources. Kate Young agrees:

> "In developing countries, independent access to income and resources may help wives to change the terms of the conjugal bargain and provide them with a stronger bargaining position."
>
> (Young, 1992: p. 153).

Consumer researchers, like economists and sociologists, also discuss the idea of bargaining: Schiffman & Kanuk (1994: pp. 355-6) suggest that different roles are adopted by husbands and wives in attempting to influence consumption decisions: `expert', `legitimacy', `bargaining', `reward', `emotional', and `impression': these appear to be different strategies.

While observing similarities between sociology/psychology and economics, we must not ignore the differences. Unlike most economists, sociologists using game theory approaches put bargaining in a social context (MacPhail & Bowles, 1989: pp. 62-3). As one sociologist put it,

> "Relationship bargains are framed within a social context in which societal values and norms permeate our ways of thinking about marriage and how to behave as husband and wife".
>
> (Knudson-Martin & Mahoney, 1996: p. 138).

Graham Crow (1989: p. 20) claims that while analyzing strategies, we should not dispense with institutional analysis. Hilary Standing, describing Calcutta, wrote:

> "There is a great deal of pressure on married women to suffer in silence rather than end a marriage; pressure which comes partly from ideology - it is shameful and ignominious [...] but also for the profoundly practical reason that her alternatives are fairly dismal, especially if she is poorly qualified and has children to support"
>
> (Standing, 1991, pp. 157-8).

The above quote suggests the importance of the wife's perception of her own situation if divorce takes place (like economic game theorists' concept of

`threat points'); but unlike economist game theorists, Standing also emphasises the importance of ideology. Kate Young wrote:

> "In developing countries, independent access to income and resources may help wives to change the terms of the conjugal bargain and provide them with a stronger bargaining position. But this will not necessarily be transformed into greater power and control over budgetary allocations. To understand this type of power within the domestic setting, we first need to analyze and understand the differences in the social position and relative social value of men and women within their kinship group and the wider community."
>
> (Young, 1992: p. 153).

So, according to Kate Young, `social position' is an important influence on bargaining between household members: we cannot predict a woman's power simply on the basis of her earnings.

The above discussion might suggest that women are helpless victims of social pressures which (in certain societies/times) forbid women from working; but Yvonne Smith implies that a woman can use a network of friends and relatives to change her husband's values:

> "for women living in dual-adult households, labour market participation may depend on a process of negotiation and decision-making. This process may encompass not only partners, but also a support network which includes both members of the extended family and friends [...] These may be concerned with challenging a partner's perceptions about the role of working wives, the role of men in the home when women obtain employment, and the use of an `extra' wage."
>
> (Smith, 1997: p. 1174).

Other writers have discussed women's active role in attempting to influence behaviour:

> "industrial work seems to be `real' work in a way that domestic work doesn't; the latter resembles a cushy number. This ideological climate clearly makes it hard for the houseworker to establish that the industrial worker should do more work in the home. [...] However, when she returns to the labour market she, to some extent, turns the ideology to her own advantage by insisting on the right to control her own earnings."
>
> (Hunt, 1978: p. 570).

Cromwell & Olson (cited in Touliatos, Perlmutter & Straus, 1990: pp. 431-2) use a three-stage analysis of family behaviour: power bases, processes, and outcomes. French & Raven (cited in Touliatos, Perlmutter & Straus, 1990: p. 431) refer to six sources of power for each household member: `normative authority'/`legitimacy'; `identification'; `superior knowledge'; `persuasive ability'; `ability to reward'; and `ability to

punish'. These power bases include control over spending (the focus of economic bargaining models) as `ability to reward', but add other factors: for example, `ability to punish' includes the (threat of) violence, which can be used as a resource in a manner similar to money, according to Touliatos, Perlmutter & Straus (1990: p. 432). Economists who use bargaining models usually "solve" their mathematical model by making a set of assumptions such as the Nash game-theory model (see chapter 5); but the Cromwell & Olsen model analyses the bargaining process (how husband and wife reach a compromise) in more detail than economists do, which might improve the performance of economists' theories.

REDUCING CONFLICT WITHIN HOUSEHOLDS

The `bargaining' models discussed above imply that every household is in permanent conflict - each member of the household wishes to obtain their own way regarding numerous household decisions (including spending). But conflict may itself seem undesirable to an individual, so a household member may accept a less desirable decision in return for domestic harmony: Maune & Mullin concluded from their study of USA data that

> "working mothers of preschool-age children who relied on their husbands for child care were more likely to quit work. [...] Our explanation for these results centers on patriarchal values (which define the care of children as a woman's responsibility) that many men and some women continue to hold. Employed women risk conflict with their husbands when husbands supervise children while they work; this conflict may be resolved by women quitting work."
>
> (Maune & Mullin, 1993: p. 543).

Kuntal Agarwal found in a 1985 study of Meerut (India) that women often obey their husbands in order to keep peace in the family: one respondent said "My husband feels himself superior. To avoid conflict I accept his decisions" (Agarwal, 1988: p. 189). Graham Crow (a sociologist) sees limits to the usefulness of game theory models:

> "In situations of great inequalities of power, game theory's analysis of competing `players' is quite inappropriate. Where the outcome of any interaction is a foregone conclusion, it can be considered more realistic for disadvantaged individuals to concede defeat to their superiors at the outset, rather than go through the motions of being `played with'. Social structures operate not only to create but also to deny opportunities"
>
> (Crow, 1989: p. 15).

In summary, then, we can see parallels between game-theory economics and some sociological theories (including ideas analogous to `threat points', and `strategic' behaviour); however, when these sociologists explain behaviour, they do so with reference to the social norms of the society being studied. In addition, sociologists (unlike economists) do not present mathematical models, but rather attempt to describe (rather than model) the behaviour they perceive. Some sociological bargaining models are more complicated than economic bargaining models: the former include factors such as social norms. There would appear no reason to adopt a complex model, if a simpler model (based entirely on `economic rationality') is sufficient to explain observed household behaviour; but as I outline in chapter 9, the ability of economic bargaining theories to explain household durables ownership is disappointing, so sociological theories may be worth considering as a way to improve economic models.

EXCHANGE THEORY and RESOURCE THEORY

Another sociological approach (related to the above bargaining perspective) is `exchange theory', in which each partner compares his/her own contributions to the household with his/her rewards, and maximises his/her individual well-being (Benin & Agostinelli, 1988: p. 330; Burr, 1973: pp. 54-7; Wheelock, 1990: p. 101). Performing a role (such as "breadwinner") has specific rewards and costs within the home: a male breadwinner's preferences are satisfied, and a wife subjugates her preferences to those of her husband and children in exchange for other rewards (Qualls, 1987: p. 268). According to `exchange theory', a husband must successfully perform his role of wage-earning, to ensure his wife performs her role of providing love, companionship, and household services (Touliatos, Perlmutter & Strauss, 1990: p. 423). Despite being apparently unconnected with economics, resource theory appears to assume rational behaviour by each individual, in that each partner tries to maximise his/her rewards and reduce his/her costs (Van der Lippe & Siegers, 1994: p. 111).

According to Touliatos, Perlmutter & Strauss (1990: p. 423), a combination of `exchange theory' with `role differentiation theory' gave rise to `resource theory'. In `resource theory', the power of husband and wife depend on the resources (financial and other) each spouse brings to the household (Unger, 1979: p. 282): this implies that a wife's power depends

on her earnings relative to those of her husband (Lim, 1977: p. 34). In a sense, resource theory is similar to game-theory models in economics, in that a wife's earnings give her power; but the link between earnings and power are not as direct as economic bargaining models (in which a wife's earnings affect her threat point) - an employed wife still needs to "challenge" her husband's power:

> "Resource theory suggests that working women attain the ability to challenge gender inequality at home through their participation in the paid labor force."
>
> (Lim, 1977: p. 32).

The above discussion of bargaining models in economics suggests similarities between economics and sociology. I now turn to other sociological theories, which are less similar to economics.

2.5 ROLE THEORY

Several neoclassical economists (such as Becker: see section 2.3) have attempted to explain why members of a household specialise in certain tasks: for example, why we often see a household containing a "housewife" who does no paid work, and a husband who does little or no housework. Neoclassical economists explain this is in terms of rational decision-making, based on (potential or actual) wage-rates of each household member (see section 2.3 above). In contrast, one sociological approach to studying the way a person specialises in certain tasks is `role theory': for example, Talcott Parsons described post-war USA society thus:

> "To be the main "breadwinner" of his family is a primary role of the normal adult man in our society [...] "housekeeping" and the care of children is still the primary functional content of the adult feminine role"
>
> (Parsons, 1949: p. 191).

Similarly, Keller (cited in Iglehart, 1979: p. 9) considers that the core aspects of the female role emphasise nurturance; reliance on a male provider; concentration on marriage, home, and children; and a ban on expressions of assertion and aggression. The sociology of role theory, emphasising the interaction between people in different roles, has many similarities with psychological theories (e.g. Qualls, 1987), which often emphasise an individual's personality: for example, sociologist Ann Oakley (1974: p. 82) claims that a gender role defines personality traits and behavioral responses.

Role theory claims that men have more control than women over household decisions, because of culturally-transmitted ideas of "appropriate" roles for men and women (Beechey, 1983: p. 33). Role theory is linked to social norms, which are "regularities in behavior which are agreed to by all members of a society and specify behavior in specific recurrent situations" (Schotter, cited in Ott, 1992: p. 123). Berk (reported in Gershuny & Robinson, 1988: pp. 537-9) claims that the household is a `gender factory', which perpetuates traditional roles for men and for women, by defining a territory of work for each family member. Role theory suggests that roles of men and women are conveyed to the individual by socialization; and sanctions will follow if men and women do not behave according to their socialization (Van der Lippe & Siegers, 1994: p. 117). This indicates a fundamental difference between sociologists and (some) psychologists: sociologists imply that roles change as society changes; whereas some psychologists (e.g. Heylen, Dawson & Sampson, 1995) imply that some

differences between men and women's sex role orientations arise from genetic inheritance and childhood socialization, so an adult does not change his/her role within the household in response to changes in culture.

One version of role theory is the `sex-role orientation' approach from psychology, in which sex-role orientation means "the attitudes, values, opinions, behavioral standards, and cultural norms that define the appropriate behavior for men and women in their society" (Qualls, 1987: p. 270). This approach is linked to the study of `ideology', which can be defined as follows:

> "ideologies are the shared framework of mental models that groups of individuals possess that provide both an interpretation of the environment and a prescription as to how that environment should be structured"
>
> (Denzau & North, 1994: p. 4).

The `sex-role orientation' perspective claims that each social role is associated with an ideology: so a person carrying out the role of "housewife" would have a particular set of opinions about `appropriate' behaviour for a housewife. For example, a study of Irish women by Margrat Fine-Davis concluded that traditional sex-role attitudes are associated with a belief in sharp differentiation between roles of men and women, and a belief in male superiority couched in socially acceptable stereotypes (Fine-Davis, 1983: p. 129). Similarly, Webster (1994: p. 328) suggests that there is a relationship between a patriarchal power structure, and traditional sex-role orientation.

Ideologies (based on roles of men and women) have been detected in many aspects of household behaviour. Pauline Hunt (1978: pp. 568-70) argues that there is an ideology among the (British) respondents she studied, in which a household member in a paid job has the right to decide how his/her earnings are spent, so employed women insist on the right to control their own earnings. Studying 200 households in northern England, Kerr & Charles found that a typical housewife feels that her husband `deserves' a `proper' meal, whereas she herself has less right to food - indeed, by consuming food, she is "stealing" resources from other household members (Kerr & Charles, 1986: p. 122; pp. 128-9). They argue that we should not see this as men making forceful or overt demands about food consumption (Kerr & Charles, 1986: p. 116): a wife feels guilty when her husband refuses (or shows reluctance) to eat food she has prepared, or feels satisfied when her husband has enjoyed a meal (Kerr & Charles, 1986: pp. 121-2). Charles &

Kerr (1988) perceive a complex cause-and-effect relationship between ideology and role, in which food practices maintain the existing social norms (as well as food practices being affected by norms): for example, the wife's subordinate position is demonstrated to children by her preparing meals chosen by her husband (Charles & Kerr, 1988: pp. 225-6).

Gail Wilson claimed that different households have a "men's", "women's", or "children's" food system - depending on the household member whose preference are considered as most important (Wilson, 1989: p. 175). Women felt it was a woman's role to satisfy the preferences of other household members; there was no question of women meeting their own preferences, except in richer households where all household members' preferences could be satisfied (Wilson, 1989: pp. 178-9). Food consumption is usually a matter of negotiation within a household: women usually have some control over food consumption, except where the household income is low, or where women have little control over household spending (Wilson, 1989: pp. 172-4).

In the `role theory' perspective, men are thought to have more power than women, partly because men have greater access to paid work than women do (for several reasons, including legislation and social policy - see Pahl, 1980: p. 333); and men's greater income gives them more power than women within the home (Pahl, 1980: p. 330). This suggests that a woman has little control over her `role' - being born female, a women is destined to be powerless both outside and within the home. In the Hindu religion (the most widely-held religion in India: see Vijayanunni, 1995: p. x), the status of women in traditional religious values has been described as:

> "Ideologically, woman was considered completely inferior species, inferior to the male, having no significance, no personality; sociologically she was kept in a state of utter subjection; denied all rights, suppressed and oppressed"
> (Desai, cited in Ramu, 1987: p. 905).

This view of women as powerless would be an oversimplification, for two reasons. Firstly, a woman's role as housewife gives her some authority within the home: "Depending on their age and personal resources, wives [in India] have customarily exercised covert influence in domestic decisions on critical matters" (Ramu, 1987: p. 914). The second reason to doubt that women are powerless is that roles are changing. There has been a trend for women to take on paid work in recent decades (this is discussed in section 3.2 below), and this has effects on power relationships: wives' employment

tends to reduce the husband's traditional authority (Buric & Zecevic, 1967), and makes women more assertive (Sharan, 1988: pp. 304-5).

If we wish to use insights from `role theory' to improve economic analysis, we must consider the possibility that household decision-making processes have changed in recent decades. Qualls (1987: p. 269) claimed that in a traditional household, conflict resolution takes the form of concession by husband or wife to predetermined roles; whereas in a modern household, more negotiation takes place between husband and wife, due to more egalitarian values. It is interesting to observe that this (claimed) increase in bargaining between household members in recent decades coincides with economists' growing interest in bargaining models of household behaviour: it appears that economists' theories reflect the society in which they live. This might appear desirable, in that economists should be in touch with human behaviour: but it may give rise to different theories in different decades. Ideally, economics should provide theories which understand human behaviour at a deeper level - a theory which applies in the 1970s but not in the 1980s, for example, would be of limited use. The time-trend I report in chapter 8 may be evidence of a changing culture in Britain since 1969.

There is a way for economists to defend their work against the charge that we ignore ideology: it could be claimed that an ideology is simply an effect of economic factors, and that ideologies do not greatly influence behaviour - if that is true, then economists may be justified in leaving the study of ideology to other social scientists. Perhaps a person's ideology is dependent on their economic situation, but his/her behaviour is determined by economic factors. However, a person's ideologies is not always consistent with his/her economic position: for example, we might expect employed women to feel less dependent on their husbands, but when Ramu (1987) studied single-earner and dual-earner households in Bangalore (southern India), it appeared that

> "dual-earner wives are the most conservative in their role perceptions [...] The continuing influence of traditional values governing marital roles has encouraged wives to acknowledge and defer to their husbands even though they share the provider role"
>
> (Ramu, 1987: p. 913).

Assessing if a person's behaviour depends on his/her ideology (controlling for economic factors such as earnings) is beyond the scope of this thesis.

2.6 CONSUMER RESEARCH

In this section, I consider various approaches to studying durable goods consumption, which fall into the area of `consumer behaviour'. It may be argued that academics in the field of `consumer behaviour' have the best basis to examine durable goods ownership, because they can draw on the insights from many disciplines. Fine & Leopold (1993: p. 39) point out that this field draws "in order of importance, from psychology, sociology and economics"; but that `consumer behaviour' has failed to integrate its parent disciplines (Fine & Leopold, 1993: pp. 39-45). In principle, consumer research could incorporate bargaining/game theory approaches from economics and sociology, but in practice few `consumer research' academics develop mathematical models in the way economists do - the discipline appears to be based more on psychology than on economics (Fine & Leopold, 1993: pp. 42-3).

Schiffman & Kanuk (1994: p. 13; p. 26) observe two approaches within consumer research: the `positivist' side, seeking objective theories of cause and effect; and the `interpretivist' (or postmodern) approach, which emphasises values and meanings.

DIFFUSION OF DURABLE GOODS

The idea of `diffusion' is that customers are slow to adapt to new technology, such as microwave ovens, and that this initially slows down the acquisition of new goods. The diffusion literature implies that ownership of goods tends to follow a particular pattern, know sometimes as the `product life cycle' or `product cycle' (Bowden & Offer, 1994: p. 74): ownership grows slowly at first, but then accelerates until most households possess the good; ownership levels then flatten out. The time-lag between introduction of a good and widespread ownership varies between goods: it has been claimed that this time-lag is much longer for time-saving goods than for `time-using' (leisure) goods (Bowden & Offer, 1994: p. 730).

The `diffusion' literature claims to observe a pattern, in which a small fraction of consumers may influence the purchases of other people they meet - the `diffusion' perspective suggests that the purchase of a new consumer good spreads like a communicable disease, in which contact with a person who owns a new durable good may lead others to purchase the same good (Fine

et at, 1992a: p. 2). Spiegel & Templeman (1985: p. 320), reporting Duesenberry's view, suggest "a person's preferences will be influenced more by the consumption of those with whom he has close contact". Sociologists often consider the first 2.5% of consumers to be "innovators" (Schiffman & Kanuk, 1994: p. 544); the identity of "innovators" is of considerable interest to market researchers. Hudson implies that such `pioneers' are often middle-class:

> "once the middle-classes had hot-water systems, vacuum cleaners, stainless steel cutlery, washing-machines, central heating and food-mixers, the working-classes not unnaturally demanded and got the same."
>
> (Hudson, 1983: p. 52).

Fine et al (1992a: p. 3) discuss the view that the first purchasers of a new good are "an elite who establish a new fashion which trickles down to the lower orders through emulation". However, Fine et al reject the claim that the first purchasers are necessarily different to later purchasers:

> "it is almost inevitable or tautologous that the first adopters of a new consumption good are going to be relatively wealthy and "adventurous" and "informed" in some sense. Otherwise, they would not be able to afford nor to know about what has become available. Subsequent consumers might learn about, or be able to afford, the good at a later time but this does not mean that they <u>followed</u> earlier consumers in any other than the chronological sense."
>
> (Fine et al, 1992a: pp. 3-4; emphasis in original).

Sultan & Winer (1993: p. 588) suggest that researchers have failed to identify a group of consumers who are `innovators' - some consumers may be innovators for some products but late adopters for another product.

The speed of diffusion is another issue discussed in consumer research:

> "The standard model of the diffusion of technical innovations posits an S-shaped, or logistic, curve for the time path of adoption [...] diffusion could represent a gradual learning process in which adopters acquire information about household durables as they see others purchasing them."
>
> (Besley & Levenson, 1996: p. 40).

Note, however, that the logistic pattern may not apply to all durables: Helger Bonus (1973: p. 669) found that ownership of television sets and washing-machines grew according to a logistic curve, but ownership of other goods (including refrigerators and cars) increased linearly over time.

Perhaps most or all of the logistic curve pattern observed in the diffusion literature can be explained in terms of household income: increases in

ownership are likely to be due to a combination of rising real household incomes (Besley & Levenson, 1996: p. 40) and falling real prices of some durables such as microwave ovens (Oropesa, 1993). Cigno (1991: p. 36) considers that rising female wage-rates "helps to explain the very rapid diffusion of convenience foods and domestic time-saving appliances" in industrialized countries since the second world war. Assessment of whether or not a household is a "pioneer" in consumption is beyond the scope of this thesis.

MARKETING APPROACHES

Another perspective is given by Ben Fine and Ellen Leopold, who emphasise the active role of producers in creating a market for their goods via advertising and reducing prices (via mass-production). They distinguish between different types of commodities, arguing that each commodity should be studied in terms of a `system of provision' (Fine & Leopold, 1993: p. 22). The implication of their ideas is that we should not expect consumer behaviour for one type of goods to be consistent with the behaviour of consumers over purchasing a different type of goods. For example, some commodities are more strongly influenced than others by advertisements (Fine & Leopold, 1993: p. 244). They also claim that cultural patterns tend to influence some goods more than others - a case of this is Britain's high sugar consumption, which can be partly explained by Britain's imperial past (Fine & Leopold, 1993: p. 34). A further complication is that the nature of consumption for one good may change over time: Fine and Leopold claim that "Many of the new domestic appliances that have enlarged the scope of consumption within the home [...] often enter the market as luxuries" (Fine & Leopold, 1993: p. 301), and these goods have changed from luxury[1] status to mass-consumption goods via "active marketing" such as advertising (Fine & Leopold, 1993: p. 90). A further complication is the need for consumers to be "informed", in order to be successful in buying and operating modern goods such as microwaves. To summarise the work of Fine & Leopold, they present a model in which consumption is not determined

[1] Fine & Leopold use the term "luxury" to mean "commodities produced by highly labour-intensive and skilled methods" of production, rather than by mass-production (Fine & Leopold, 1993: pp. 29-30). In economics, a more popular definition of `luxury' is a good which is of lower priorities for consumption, and hence usually only consumed by the rich (Gershuny, 1985: p. 128).

entirely by `economically rational' behaviour, but in which advertising (along with other factors along the chain of provision) plays a role; however, the importance of advertising and other factors vary between goods, and over time. Other writers claiming that advertising influences spending patterns include Grigg (1995: p. 257).

PERSONALITIES AS INFLUENCES ON HOUSEHOLD BEHAVIOUR

A common theme in psychology is emphasis on the individual's personality. An example of this is the work of Rosen & Granbois (1983: p. 254), who use the terms `internals' and `externals'. They define an `internal' as a person who sees events in his/her life as the result of his/her own actions; whereas an `external' sees their life as being affected by uncontrollable forces. Some economists consider differences between individuals to be important: regarding whether housework is done by husband or wife,

> "research shows that relative wages of the couple appear to matter some, but that much of the division of labor is independent of wages and depends on the identity of husband and wife."
>
> (Juster & Stafford, 1991: p. 498).

Psychologists emphasise differences between individuals, often using the term `personality' to indicate the aspects of a person's brain which (they claim) directs an individual to behave differently to someone else:

> "Some women early in life are able to earn a reputation for being able to handle people (including their husbands) and being able to manage things well. Such women often are able to gain considerable autonomy in their households [...] However, the <u>personality</u> of the husband and sometimes that of his mother and father can also affect this. [...] Thus, within the social, economics and cultural parameters mentioned above there is still room for significant variation among households."
>
> (Mencher, 1989: p. 139; emphasis added).

This view emphasises individual personalities of household members; this appears incompatible with the neoclassical economists' assumption of `rational' economic behaviour (which implies that people will behave identically if they are subject to the same economic forces).

2.7 CULTURE, IDEOLOGY, AND SOCIAL CLASS

This section considers the impact of culture, and of ideology, on durable goods ownership. I use the term `culture' in the same way as Max Steuer:

> "For present purposes the term culture is used to refer to that part of behaviour which is acquired by unconsciously imitating the conscious or unconscious example of the surrounding society."
>
> (Steuer, 1989: p. 2).

Alessandro Cigno, on the other hand, sees culture partly in terms of wage-rates, and relative prices of good/services:

> "some of what goes under the name of `culture' in this as in other contexts may be interpreted as the debris of past states of the economic environment - a consequence of the fact that, when the structure of incentives and disincentives changes, it takes time to realize it, time to decide how best to respond to it, and time to modify the pattern of one's life."
>
> (Cigno, 1991: p. 195).

In the opinion of many sociologists, the behaviour (including consumption patterns) of households depends heavily on the culture/ideology of household members, including social norms (Pahl, 1980: p. 319). In the words of Kate Young,

> "Any work on household resource management should involve an understanding of what marriage involves in a particular culture, especially the degree of `jointness' of a couple and their incomes and assets."
>
> (Young, 1992: p. 149).

Young's view appears to be completely incompatible with most of the economic analysis discussed earlier in this chapter, which is built on the implicit assumption of `rational' behaviour: but perhaps the gap between sociology and economics is not as great as it appears. Recently, a number of economists have become increasingly ambitious to extend the scope of economics. James Buchanan, for example, wrote

> "Economics is a science of human behavior, a behavior that is more complex than that of nonhuman animals. Genetic determinants remain central to any exploratory enterprise, but human behavior is also influenced by norms that act as internal constraints. And such constraints may differ as among separate interaction environments that may be temporally, geographically, culturally and institutionally classified."
>
> (Buchanan, 1995: p. 194).

The title of Buchanan's paper (`Economic Science and cultural diversity') implies that he has two projects: to make economics more "scientific", and to extend economics to include culture. This may seem surprising, in that

scientific methods (using controlled experiments, to produce repeatable results) seem incompatible with culture (which is difficult to measure objectively). Nevertheless, if economic behaviour does vary between cultures, then perhaps economists need to understand such differences - and Buchanan's attempt to classify cultures may be a valuable step forward. Assar Lindbeck also wishes to extend the scope of economics - to include `social norms':

> "In a broad psychological perspective, both economic incentives and social norms may be regarded as giving rise to purposeful, or ″rational″ behaviour [...] this suggests that not only economic incentives but also social norms may be analyzed by means of utility theory".
>
> (Lindbeck, 1997: p. 370).

Mair (1984) claims that in Muslim and Hindu societies (which includes most of the population of India: see Vijayanunni, 1995: p. x), a man is proud if he is able to support the household financially, without the need for his wife to earn money. Referring to India, Kate Young develops this view in more detail:

> "It is not culturally appropriate for wives to have a separate income or budget; indeed, many are not permitted to work outside the home. Those who do generally hand over all earnings to the household head or manager for reallocation. In-marrying wives are not seen as co-equals with their husbands but very much as their subordinates; in many cases the wives are also subordinate to all other members of his family, particularly all other males. As the woman grows older and as she bears children - particularly sons - the degree of her subordination decreases. If she ever achieves the status of wife of the patriarch, then as her husband's proxy she probably also simultaneously achieves the status of family-resources manager."
>
> (Young, 1992: p. 150).

Kate Young implies that women's power over the domestic budget does not derive directly from her earnings, but from her `status' within the home. A slightly different view is expressed by Gay Young:

> "A wage earning woman's position [...] depends, in part, on how vital to household maintenance her earnings are <u>perceived</u> as being"
>
> (Young, 1993: p. 9 - emphasis added).

Along similar lines, Ann Whitehead wrote:

> "Overall a woman's effective possession of the resources she has either produced, or earned, within the family based household is determined by her relative power vis-a-vis other household members, especially her husband."
>
> (Whitehead, 1984: p. 109).

Jan Pahl claimed that the relative power of men and women is influenced by various factors, including each person's views on the nature of gender relationships (Pahl, 1984: p. 46). This view appears to be more difficult to test than the neoclassical economics model of `rational' behaviour (discussed in section 2.2). Hilary Standing (in the context of Calcutta, India) claimed that

> "In households where husbands or fathers appropriate the earnings of wives and daughters, women's employment tends mainly to raise the level of conflict among household members. Employed women whose husbands take control of their wages are structurally in a position little better than that of non-employed women dependent on an allowance system."
>
> (Standing, 1991: p. 101).

Other writers have taken a similar view to Standing: for example, Gay Young (1993: p. 8) claimed that in patriarchal families, a woman's earnings may be absorbed by her father. Another possibility is that her earnings may be so low that her earnings are trivialized as "help", hence having little impact on her power. This suggests that the level of earnings of each household member is not the whole story: we also need to understand how each person's earnings are interpreted in the household context. I now consider a body of work which attempts to understand exactly what earnings `mean' in different cultures.

RESOURCES IN A CULTURAL CONTEXT

Economists may be able to learn from the `resources in a cultural context' literature, such as Rodman's attempt to classify cultures by focusing on women's employment:

> "The balance of marital power is influenced by the interaction of (1) the comparative resources of husband and wife and (2) the cultural or subcultural expectations about the distributions of marital power."
>
> (Rodman, 1967: p. 322).

Rodman's views are reminiscent of `bargaining' (game theory) perspectives discussed in section 2.4 above; but Rodman implies that we should go beyond this, to understand how real households behave in different countries (and in different subcultures within one country). In this approach, the earnings of women are central aspect of women's power over decisions:

> "Research on the wife's resources has concentrated predominantly on her employment. The results suggest that women who work, whether in more economically developed nations like the United States and Germany or in less economically developed nations like Yugoslavia and Puerto Rice, have more power in decision making within the family than women who do not work"
>
> (Cooney, Rogler, Hurrell & Ortiz, 1982: p. 622).

Note, however, that (according to Rodman et al) women's earnings do not increase her power within the home in all societies. Rodman classified countries according to their level of development (Cooney, Rogler, Hurrell & Ortiz, 1982: pp. 621-2): he considered India to be at the lowest stage (`patriarchal'), at which a husband's power is so strong that his socioeconomic status is irrelevant. In a `modified patriarchal' society (such as Greece), modern values weaken a husband's power. In a `transitional egalitarian' society such as USA, higher socioeconomic status gave a man more power in his household. But in `egalitarian' societies such as Sweden, egalitarian values make socioeconomic status irrelevant to a husband's domestic power. Britain would, presumably, be an `egalitarian' society in Rodman's analysis, given that the British are significantly less "anti-feminist" than other European citizens (Morgan & Wilcox, 1992: p. 158). In a `patriarchal' society such as India,

> "the interests of the husband are paramount; wives cannot influence marital decisions because the norms prevent them from doing so, regardless of their relative contributions of resources to the marriage"
>
> (Warner, Lee & Lee, 1986: p. 122).

In research on intergenerational Puerto Rico families by Cooney, Rogler, Hurrell & Ortiz (1982: p. 630), they found that higher socioeconomic achievement by a man in the younger generation enhanced his power (by increasing his income); but that higher socioeconomic achievement by a man in the parent generation reduced his authority, by socialising him to modern attitudes and values. If employment exposes women to modern values, then this change might be as important as her earnings, as an effect on her power over household spending. Morgan & Wilcox (1992: p. 163) suggest that women may become more `feminist' in response to discrimination they encounter at work (especially likely where female participation rates are low). If we use economic models based on the wife's employment (such as those outlined in chapters 7 and 8 below), we may find apparent support for the model, because employed women have powerful ideas (rather than because their earnings make them powerful).

THE EFFECTS OF SOCIAL CLASS

The importance of social class on behaviour is a common view among sociologists. A thorough treatment of the issue of social class would require an entire thesis, but I offer this section as a brief introduction to the some of the issues relevant to this thesis.

Perhaps the most striking feature of social class is that while sociologists agree that class is important, there is little agreement on what class is. Wright & Cho (1992: p. 89) suggest that there are three aspects of class differences: `property' (ownership); `authority'; and `expertise'. A quite different list of three factors is given by Julie Nelson (1994): an individual's `standard-of-living'; `agency', which refers to behaviour such as paid work, and control over earnings; and `affiliation', which represents affection or love between partners.

Given the disagreements about what class is, it is not surprising to find disagreements on how to measure it. Many alternative measures of social class have been proposed - for example, the *BHPS* survey includes the following measures of class based on respondents' job: SEG, RGSC, Goldthorpe, Hope-Goldthorpe, Cambridge, and ILO-ISCO 88; and *BHPS* also includes a measure of subjective class - whether the respondent thinks of him/herself as middle-class or working-class (Taylor et al, 1996).

In addition to disagreements about how to identify groups of social classes, there is also disagreement about what it is we are trying to classify: is social class a characteristic of an individual person, or of a household? A key issue here is how to classify wives: is a wife's social class the same as that of her husband (on the grounds that he is probably the chief wage earner in the household), or should we work out a wife's class from her own job if she is employed? Annemette Sørensen wrote

> "The distinction between the class position of individual men and women, and the class position of families is crucial"
>
> (Sørensen, 1994: p. 44).

Despite agreeing that this question is important, sociologists do not agree on the answer:

> "little consensus exists on either the best way to combine information about both husband's and wife's occupational class into a joint measure of the family's class position, or on the wisdom of doing so"
>
> (Sørensen, 1994: p. 41).

Perhaps many effects of social class are irrelevant to this thesis, but one class difference I consider relevant is the ideology of "sharing". Hilary Standing, describing Calcutta, wrote

> "high income professional households are characterized by a self-conscious model of shared decision making which is less in evidence in poor households."
>
> (Standing, 1991: p. 98).

If an ideology of "sharing" does exist (in a particular social class), we should not assume that affects actual behaviour. Susan McRae studied families where husband and wife are in different social classes:

> "one might well ask why so many cross-class families choose to regard their income as joint funds. I would like to suggest that the answer lies in the couples' efforts to ease difficulties which seem to be inherent in cross-class family. [...] Regarding both incomes as joint funds - family funds - allows these differences to be smoothed over in family life, allows an ideology of equality to surmount a reality of inequality"
>
> (McRae, 1987: p. 121).

Social class may partly explain the household behaviour I have observed in Britain and India: see the quote by Nelson (1994) in section 9.2 below.

2.8 THE `HOUSEHOLD ALLOCATIVE SYSTEMS' APPROACH

Many sociologists have criticised economists for treating households as a "black box" between earning and spending (Pahl, 1990: p. 120). One attempt to peer inside this black box is the study of `Household Allocative Systems' (associated with Jan Pahl). Writers in the Household Allocative Systems school argue that Household Allocative Systems influence spending patterns of the household and decisions on the amount of paid employment (if any) each household member will seek. The Household Allocative System is a mechanism through which various forces (economic and social) influence household behaviour. The `Household Allocative System' approach is based on dividing households into different types, depending on which household member(s) have day-to-day responsibility for management of spending decisions. In her 1985 article, Jan Pahl indicates that the idea of studying Household Allocative Systems arose from her study of women who had left violent partners to move into a refuge for battered women (Pahl, 1985: p. 34). Many of the women interviewed by Pahl found that they gained greater control over the household income when they separated from their partner; many of these women were better able to feed their children by allocating a larger share of the household income to food - despite the fact that the household income had fallen (often considerably). Pahl, and others, use this method of analysis to study **all** households: by carrying out in-depth interviews of a small sample of (mainly) women, it was claimed that each household could be categorised into one of a small number of types of household - each type based on a `Household Allocative System'. Pahl found that Household Allocative Systems appears to explain the change in behaviour of women with violent husbands/partners, when they leave their partner. This may have led her to over-emphasise the importance of Household Allocative Systems in more conventional households.

Kerr & Charles (1986: p. 144) is another study which discusses the importance of who manages the household finances. They studied households in northern England, and found that women with joint or exclusive responsibility for money management usually spend more household money on their children or themselves, than do women in households where husbands control money. Kerr & Charles appear to see control over income as a reliable indicator of power inequalities within marriage (Kerr & Charles, 1986: p. 152).

Jan Pahl (1980: pp. 316-327) divided households into four types of `Household Allocative System':

1: In the `Whole Wage' system, the husband/male partner hands over the entire wage-packet to his wife/partner, and she returns some of it as his personal spending money; she uses the remainder to pay for household expenses.

2: In the `Allowance' system, a husband gives his wife/partner an allowance, keeping the rest of his wage (a large part of which is his personal spending money); she pays most household expenses from the allowance. The size of the allowance depends on social norms, and the husband's income level.

3: In the `Pooling' system, the husband and wife pool their incomes and pay household expenses from the common pool.

4: In the `Individual control' system, the husband and wife have separate incomes, and each is responsible for certain areas of household spending.

The above (four-way) system of classification is not the only system which has been used in the Household Allocative System literature. For example, Vogler (1989) uses **six** categories (`female whole-wage', `female pool', `male whole wage', `housekeeping allowance', `male pool' and `joint pool' systems). On the other hand, Barrett & McIntosh (1982) use only **three** types of Household Allocative System categories[2]. A criticism of the `Household Allocative Systems' approach is this problem of definition - writers disagree on what categories of Household Allocative System can be observed; they even disagree on the **number** of categories to use (varying from three, to six or more). None of the articles discussed in this chapter explains why one classification system is `better' in understanding household behaviour. This lack of precision may be due to the lack of an underlying model of household behaviour. It is not clear how power is distributed within households in the writing of Household Allocative System theorists - at certain times, they appear to explain male household power as a result of sexist attitudes caused by defective upbringing of children; at other times, as a result of labour markets which discriminate against women.

Pahl (1983: p. 251) argues that money is a `tracer' - it can be used to reveal patterns of power and deference within households. In practice, this appears to mean classifying a household into one type of Household

[2] `tipping-up' - apparently another term for a whole-wage system; `allowance'; and `pooling'.

Allocative System - and presuming that the Household Allocative System adopted tells us a great deal about relative power within the household. This is another problem with the Household Allocative Systems approach: it could be argued that whether or not a household uses an `allowance' system is **less important** than the size of the allowance, when one is paid; but this aspect is not captured by the classification system suggested by Pahl (or others).

Several writers who use qualitative (rather than quantitative) research methods have commented on the importance of handling money for women's autonomy. For example, Mencher wrote

> "it is clear that having control over the family purse strings, and especially the fact that some of the money comes from her own work, does seem to improve the status of women within the household."
>
> (Mencher, 1989: p. 128).

It has been suggested that women sometimes seek greater earning-power to increase their control over domestic resources: Hilary Land wrote

> "In households in which there is a rigid housekeeping system the wives are more likely to take paid employment. This is so that they can have some control as well as having additional resources for the family."
>
> (Land, 1977: p. 168).

This suggests that links between `household allocative system' may be complicated by strategic behaviour of wives (and husbands). This appears to give support to use of a bargaining model, of the type discussed in section 2.4 above. However, many writers reject the claim (implicit in some bargaining models) that an increase in a wife's earnings automatically gives her more control over household spending. Susan McRae studied households in which the wife earns more than her husband, and concluded "There is, then, no simple connection to be made between the level of earnings and decision-making processes" (McRae, 1987: p. 119), although McRae appears to consider household allocative systems to be important influences on a woman's power. Other writers suggest that day-to-day management of household finances does not give women real power over financial decisions. In Hilary Standing's (1991) study of households in Calcutta (India), she appears rather dismissive of the importance of who manages household money (as an influence on control over household decisions). She wrote:

> "the common fund manager is more like a caretaker who oversees the disbursement of funds according to already determined understandings of need. The locus of decision making lies elsewhere than with the manager."
>
> "The allowance system [...] though nominally female, is notable for the lack of control which it bestows on the manager, the absence of any area of autonomy over even small amounts of money"
>
> (Standing, 1991: p. 97; p. 100).

Some, but not all, of the above comments suggest that women's influence on household money may be important for household decisions in general.

If we focus on Household Allocative Systems as intermediate structures between societal forces (such as social norms) and household behaviour, we may be in danger of exaggerating the importance of Household Allocative Systems. Factors such as household income and ideologies appear to be very important in determining household behaviour; studying Household Allocative Systems should not distract our attention from these factors. Even if we do find evidence that Household Allocative Systems appear to be relevant to durable goods ownership (see chapter 10 below), we cannot easily understand why. Lewenhak (1988: p. 110) claims that

> "It has been noted in Egypt, in Kenya and in South India that when men who had been working away from home in towns or as contract labour abroad, returned, their wives had more self-confidence and were disinclined to revert to their previous degree of inferiority so that sometimes family friction resulted."
>
> (Lewenhak, 1988: p. 110).

This may indicate that wives' management of household decisions is important in increasing management skills and understanding; or perhaps there are other forces at work - women (temporarily) without husbands may seek independent incomes, or become habituated to the absence of domineering men.

Another weakness in the `household allocative systems' literature is that it has not yet developed a clear theory of which households will be wife-managed, which joint-managed, and which husband-managed. If money is a `tracer', as Pahl (1983: p. 251) suggests, then increases in women's power should also give women more control over financial management - but this pattern is not always observed:

> "More women are going out to work. They earn part of the family income. They participate in making decisions for the family. [...] In almost all activities the wife's autonomy prevails except in the case of financial management when the differentiation pattern submits to her husband's authority."
>
> (Khanna & Varghese, 1978: p. 41).

Another problem with the household allocative systems approach is that it emphasises differences between household types - yet households with different allocative systems may share common behaviour patterns (for example, husbands/male partners may exercise a large degree of control over household spending, whatever type of allocative system the household adopts). Study of allocative systems may distract us from what is really important about intra-household decision-making, by focusing on the day-to-day management of cash - when the more important decisions are on issues such as the type of goods bought by the household, and whether or not the wife/female partner is employed. Shirley Dex claimed that

> "Pahl (1983) has recently opened up the issue of the allocation of money within the household, but the detail of our present knowledge is insufficient to know what women's income is spent on."
>
> (Dex, 1985: p. 184-5).

Nevertheless, Household Allocative Systems appear to be linked to important aspects of household behaviour, and may be of some help in understanding why households behave as they do. It seems that Household Allocative Systems offer us a possibility of seeing inside the `black box' of the household, and hence may be useful tools to aid our understanding of how social and economic forces shape household behaviour. The question we need to answer is: **does the Household Allocative System tell us more about the household's behaviour than do the forces (such as women's employment) which determine which Household Allocative System is adopted?** Chapter 10 tests the Household Allocative Systems approach, by assessing whether or not households with different allocative systems have different patterns of durable goods ownership.

COMPARISONS BETWEEN `HOUSEHOLD ALLOCATIVE SYSTEMS' AND `BARGAINING' MODELS

The `household allocative system' adopted by a household may reveal information on the bargaining power and skills of household members. MacPhail & Bowles state

> "the more complex variants of the bargaining approach suggest that the relationship between employment and bargaining power should not be viewed mechanistically but must take account of other factors influencing the ability of individuals to bargain effectively."
>
> (MacPhail & Bowles, 1989, p. 63).

What "other factors" might we take account of? Sudhanshu Handa, using a game theory approach, includes a term (**ø**) as a potential influence on consumer spending: "from an empirical perspective, any variable which reflects relative authority or bargaining power within the household is a candidate for **ø**"; **ø** includes variables such as wage rates, and the "cultural environment" (Handa, 1996: p. 121). But for economists who use a `bargaining' approach, the findings of this chapter may offer hope of new insights into the bargaining process. This application of `household allocative systems' might be taken as evidence that information is a source of power. Presumably a woman who manages her household's finances is likely to be better informed (than other women) about the extent to which her household could afford to purchase new durable goods. There is some evidence that husbands withhold information on their income level from their wives - in both Britain (Michael Young, 1952: p. 307) and India (Khanna & Varghese, 1978; p. 44).

Many sociologists interpret the position of women as being powerless victims of a `patriarchal' society, in which men dominate women due to the social norms and cultural expectations. By contrast, game theory suggests a symmetry between men and women: humans behave rationally, and it is only the greater earning power which gives husbands greater control than wives over household decisions.

Judith Treas suggests that the decision on which financial management system is adopted may be linked to the level of commitment to the marriage:

> " "Separate purses" describes the financial strategies of husbands and wives who preserve individual property rights by holding resources back. The "common pot" characterizes couples who merge their individual interests into a single economic collective."
>
> (Treas, 1993: p. 723).

But this perspective (of Treas) raises more questions than it answers. Treas herself asks

> "Why do some couples see themselves as an integral economic unit with inseparable fates and fortunes rather than as two free agents joined expediently for the exchange of goods and services?"
>
> (Treas, 1993: p. 723).

A possible answer to the question posed by Treas is suggested by Burgoyne (1990: p. 638), who argues that adoption of a `joint' or `husband-managed' financial management system may help to avoid conflict when the norm of man-as-breadwinner is violated. Alternatively, perhaps a `joint' management system is adopted in response to practical problems associated with the presence of children:

> "In first marriages, a joint account can facilitate management in the child-bearing years when wives are less likely to be contributing substantially to the household income"
>
> (Burgoyne & Morison, 1997: p. 394).

They suggest that once a joint account is set up, the couple may retain it when the wife returns to employment "because of ideology, or inertia" (Burgoyne and Morison, 1997: p. 394).

To summarise this discussion, several sociologists appear to use a perspective related to `bargaining' (game theory) models; but they also consider other forces not widely studied by economists. For example, a woman's ability to control her own earnings may be linked to her status within her household, which (it is claimed) can vary between different cultures.

2.9 SUMMARY

This chapter has attempted to summarise the main schools of thought in contemporary economics (and sociology), as regards consumer behaviour. In general, the various approaches have very different assumptions, and arrive at quite different conclusions.

There are many overlaps between different approaches discussed in this chapter; and many comments made by economists can be compared with similar comments by sociologists. An example of this is the analysis of `bargaining' (game theory) models in section 2.4 above.

Most of the theories discussed in this chapter suggest a clear link between a woman's employment, and her power within the household: this improves her `price of time' (according to Becker et al), or her `threat point' (in bargaining models). However, some of the above theories disagree: for example, the `resources in a cultural context' theory claims that a wife's employment only enhances her domestic power in `transitional' societies (i.e. not in extreme patriarchal societies, such as India; nor in egalitarian societies, such as Sweden).

The following chapters will try to present testable models based (loosely) on the various theories discussed above, at the risk of oversimplifying each view.

CHAPTER 3

PREVIOUS EMPIRICAL RESEARCH on DURABLES OWNERSHIP and WOMEN'S WORK

3.1 INTRODUCTION

In this thesis, I compare India with the UK because these two countries are at different levels of development. This difference is apparent in GNP (Gross National Product) per person estimates, in `international Dollars' (these use `Purchasing Power Parity', to create an appropriate exchange-rate to compare UK £s with Indian Rupees). In 1995, the average UK income was $19,260 compared with only $1,400 in India (World Bank, 1997: table 1). The gap between UK and India may be exaggerated by these GNP figures, because subsistence farming is excluded from GNP. But India and UK are very different; and differences between UK and India (reported in this thesis) may shed some light on economic development.

It could be argued that Britain is a more "developed" country than India, and hence that India today is comparable with Britain in previous decades. However, I am cautious about this view - for example, there may be many cultural, religious, and other differences between two countries at the same development level.

This chapter considers evidence on women's paid work, and on women's unpaid domestic work. Many writers report that women spend a lot of time on time-consuming domestic tasks - for example, Hilary Standing found in Calcutta (India):

> "The low incidence of items such as pressure cookers and fridges means that there is little scope for saving time or fuel or for storing cooked food. House cleaning and washing utensils are likewise made laborious by the lack of domestic appliances and cleaning aids"
>
> (Standing, 1991: p. 70).

In order to understand why many women spend a long time on domestic work, I study the causes, and the effects, of women's paid and unpaid work; and consider why some households own labour-saving devices when others do not.

The following topics are included in this chapter: a discussion of the causes and effects of wives' employment (section 3.2); time spent on housework, by husbands and wives (section 3.3); class differences in time-use and consumption (section 3.4); the potential for durable goods to reduce time spent on housework (section 3.5); assessing what women's priorities are for durables ownership (section 3.6); and some other factors which might influence durable goods ownership (section 3.7). Section 3.8 summarises the key issues in this chapter.

3.2 FACTORS INFLUENCING WOMEN'S EMPLOYMENT

This thesis studies the effects of women's employment on durable goods ownership. In this section, I consider some influences on women's paid work; many have been studied, such as wife's age (Dex, 1988: p. 101); wife's education level (Dex, 1988: p. 101); and children (see below).

WOMEN'S EMPLOYMENT IN THE UK AND INDIA

In this subsection, I compare employment patterns between the UK and India. As an overview, table **3<1>** below contrasts the UK with India: it reports the `general level of employment', for men and for women. The data refer to 1996, which is the latest year for which I could obtain such data.

TABLE 3<1>: LABOUR FORCE PARTICIPATION RATE, UK and INDIA, 1996

	MEN	WOMEN
UK	55.5 %	45.3 %
India	57.4 %	28.6 %

source: ILO (1997), statistical annex: table 7.

The above table highlights one way in which India differs from the UK: women's employment. In Britain, the proportion of women who are employed is almost as great as that of men; but for India, the labour force participation rate of women is less than half that of men. Yet, in other ways, the difference between India and the UK is less than might be expected: the proportion of men employed is similar in India (57.4%) to the UK (55.5%). More details on work (paid and unpaid) can be found by looking at time-use patterns, which I report in table **3<2>** below.

TABLE 3<2>: TIME-USE IN BRITAIN AND INDIA
(hours per week)

	MEN		**WOMEN**	
	PAID	UNPAID	PAID	UNPAID
UK (1984)	30	11	14	30
India (1989-92)	43	14	28	41

source: computed from UN (1995: pp. 108 & 132).

Note that the time-use data in table **3<2>** above are indicative only - the data are reported in different tables in UN (1995), and hence the UK data may not be comparable with that for India. The "unpaid" work consists of housework - for the UK, this includes `household chores', and childcare;

in India, "unpaid" work also includes subsistence work, which is reported as 4 hours for week for men and 7 hours per week for women (no data on this are reported for the UK). Table **3<2>** suggests that the total workload (paid and unpaid) of women is higher than men: this applies to both India and the UK. A difference between countries appears to be that women do more hours of paid work in India (28 hours per week) than in the UK (14 hours per week). This seems difficult to reconcile with table **3<1>** above, which showed many more women being employed in the UK than in India; I believe that this apparent contradiction is a result of the prevalence of part-time employment among women in the UK.

To shed more light on the differences in employment between the UK and India, I now consider education levels. It has been argued (Cigno, 1991: p. 137) that women's employment in postwar Britain rose because of increases in women's education. Perhaps the higher participation rate of British women (compared with Indian women) in table **3<1>** above is a result of greater education levels? I report some evidence on this in table **3<3>** below. Table **3<3>** reports the latest comparable evidence in World Bank (1997): it refers to school enrolment in 1980. But this table tells us something about the education level of people who are now of working age.

TABLE 3<3>: SECONDARY SCHOOL ENROLMENT, UK and INDIA, 1980

	MALES	FEMALES
UK	82 %	85 %
India	39 %	20 %

source: World Bank (1997), table 7.

There are two striking features of table **3<3>**. The first is that secondary school enrolment was much higher in Britain than in India. The second feature is that UK enrolment rates are very similar for males and females in Britain, whereas in India there is a big gap between male and female enrolment - in India, the female enrolment ratio is about half that for males. The generally low level of female education in India could explain (at least partly) Indian women's low participation in employment.

To summarise tables **3<1>** to **3<3>** above, I would claim that there are clear differences between the UK and India, in both employment and education. Indian women have low participation rates in employment and education, and women's low education level may partly explain their low participation in paid work. I now consider other possible influences on women's employment.

THE PRESENCE OF CHILDREN

Several writers report a pattern of women's employment over the life-cycle in the UK: a woman may be employed full-time before the birth of her first child, then leave the labour market while her child(ren) are young; she returns to employment (perhaps part-time) as her children reach school age (Dex, 1984). Many writers emphasise the importance for women's employment of the presence, and ages, of children - the age of the youngest child in the household is especially important (Floge, 1989; p. 51; Layard, Barton & Zabalza, 1980: p. 60) because "The younger the child, the more care they need" (Van der Lippe & Siegers, 1994: p. 121). The presence of a child under school age is important (Joshi, 1978: 16); and children tend to attend school for longer hours as they get older (Blundell & Walker, 1982: p. 360). Children influence not only the decision to take employment, but also how many hours of paid work to take:

> "any measure of female labour supply (for example, participation or hours of work if participating) is negatively correlated with any measure of young children (for example, the number of preschool children or the presence of an infant). Casual observation and any number of surveys from different places and different times have found this"
>
> (Browning, 1992: p. 1449).

If the presence of children is an important influence on women's paid work, then changes in the number of children may produce a trend in women's employment. This thesis uses data from 1969: many writers report changes in birthrates over this period, in the UK and India. Referring to the UK:

> "The baby boom of the 1960s, for example, was the outcome of the rise in tempo of fertility over the 50s and 60s, and subsequent fall at the start of the 70s. What caused those changes of tempo? Three major changes took place, over the period in question, in the factors affecting a woman's participation in the labour market. One was the rapid increase in the amount of education received by women [...] The other two were the increase in labour productivity (through technical progress) and the mitigation of sexual discrimination."
>
> (Cigno, 1991: p. 137-8).

Cigno offers no evidence in support of his analysis of demographic changes, and it would be difficult to test his ideas: so many changes have taken place in Britain (and other countries) over the last few decades, that it seems virtually impossible to separate cause from effect. Links between fertility and women's employment are difficult to measure, due to numerous inter-relationships.

As well as the above estimation problems, there is a further difficulty: it has been suggested that relationships between these variables may vary over time. Calhoun & Espenshade, examining U.S. data, concluded that

> "the negative impact of children on the labour market hours and earnings of women have been declining over time. [...] In some instances, market substitutes for parents' time may be available in the form of direct expenditures on goods and services related to child care."
>
> (Calhoun & Espenshade, 1988: p. 29).

Assessing if trends in fertility are a cause or effect (or both) of trends in female employment is not central to this thesis; but such trends may explain the trend I found in my empirical work, reported in chapter 8.

TRENDS IN WOMEN'S EMPLOYMENT

There seems general agreement that there have been large changes in women's employment in recent decades, both in Britain (Dex, 1985: p. 3; Fine, 1992: p. 145; Kalleberg & Rosenfeld, 1990: p. 331) and in India (Khanna & Varghese, 1978: p. 41). England & McCreary (1987: p. 161), referring to Western countries, imply that this is due to economic forces: "As the wage rate paid to women rose (in absolute real terms, not relative to men's pay) between 1950 and the early 1970s, more women went into paid employment". However, the reason for increased female participation may be due to cultural rather than economic changes: several writers have reported changing attitudes to gender roles in recent decades - there is increasing acceptance of women's employment, which is part of a general change in attitudes, in Britain and elsewhere:

> "In Britain, as in most other European countries over the last decade or so, there has been a clear change in sex role attitudes: both men and women have increasingly espoused more egalitarian views"
>
> (Kiernan, 1992: p. 101).

Laura Sanchez (1993: p. 435) suggests that women's increased labour-force participation in the Third World since the 1960s is due to both economic changes and population growth. But Veronica Beechey sees social norms as important: she argues that it is impossible to explain the fluctuations in married women's employment without reference to (strongly-held) beliefs about which jobs are `acceptable' for women (Beechey, 1983: p. 33). Shirley Dex, describing Britain, suggests that new employment patterns have led to women being seen as employees rather than as housewives:

> "Whilst women's growing visibility in the workforce has occurred gradually, the recognition of women as employees or workers has been more sudden, dating from the late 1960s".
>
> (Dex, 1985: p. 3).

It has been argued, however, that these changes (in recent decades) were less dramatic in India than in Britain:

> "The working woman is not a new phenomenon. A rural culture which is predominantly agricultural does not impose any major adjustment problems in marriage even when the woman plays a vital role outside the home, participating with the male in sowing, planting, husking and pounding."
>
> (Khanna & Varghese, 1978: p. 38).

The trend for an increase in women's earnings has been widely discussed: for example, Hutton (1994: p. 21) suggests that women's increased labour-force participation since the 1960s "gave the impression of considerable progress" but adds that "The incomes available to a woman are unlikely to be high enough to provide an adequate independent living standard for herself and any dependent children" (Hutton, 1994: p. 21). The question of whether women's employment is increasing rapidly in India is complicated by regional variations: see the `geographical variations' subsection below.

For Britain, it is often claimed that the industrial revolution took place in the eighteenth century (Fine & Leopold, 1993: p. 10); but many writers consider India a developing country (Bardhan, 1989-90: p. 104) or a low-income country (Rosenzweig & Schultz, 1982: p. 813), so I look at Indian employment trends in the context of `developing countries'. Many writers claim that women lose ground as economic development proceeds (see Buvinic, 1983); but other writers suggest that economic development has helped women (see Sanchez, 1993: p. 435). A third view is that women's employment shows a U-shaped pattern as development proceeds - declining in the early stages of development, but later rising again as development proceeds (Mathur, 1994: pp. 474-6; World Bank, 1995: p. 25). Ester Boserup, an influential writer on development economics, claimed that

> "A main characteristic of economic development is the progress towards an increasingly intricate pattern of labour specialization. In communities at the earliest stage of development, practically all goods and services are produced and consumed within the family group, but with economic development more and more people become specialized in particular tasks and the economic autarky of the family is superseded by the exchange of goods and services."
>
> (Boserup, 1986: p. 15).

In Boserup's view, the increasing ownership of time-saving durable goods is part of a pattern, in which households are increasingly spending money to save time on housework. If such changes have taken place, are they related to changes in culture? Alessandro Cigno, an economist, argues:

> "As societies develop and mature, the optimal household size tends to become smaller and, at the same time, the role of the family as an allocator of resources tends to decline. Neither of these developments is caused, according to our analysis, by changes in preferences or culture. They are, rather, a response to changes in the structure of incentives and disincentives associated with the process of economic development."
>
> (Cigno, 1991: p. 195).

Other writers disagree with Cigno, placing more importance on cultural forces. A major theme of Ester Boserup's analysis is the importance of culture as an influence on development: for example, she wrote "American influence and presence in the Far East has helped to open office doors to women and make office employment acceptable to them" (Boserup, 1986: p. 132). Ehrenfels (1956: pp. 197-8) claims that Indian women, especially upper-class women, have gained some freedoms (such as the ability to move outside their homes) due to the influence of the western cultural value of equality between sexes. Heather Joshi (1989: p. 163) claimed that we must understand both economic forces and prevailing customs/values, to make sense of the division of labour between husband and wife. And David Levine (1993: p. 665) claimed that in the USA, "a woman's attitudes are important predictors of which women work any given year". Other writers deny the importance of links between attitudes and behaviour:

> "A dual-earner marriage does not necessarily result from, nor lead to, androgynous attitudes (House, 1986) and, therefore, a range of sex-role attitudes are represented among two-earner couples. [...] nontraditional sex-role attitudes are not always reflected in behavior, particularly in the domestic sphere (Araji, 1977). The relationship between sex-role attitudes and division of household labor and responsibility has consistently been shown to be slight, at best"
>
> (Lewis & Cooper, 1988: p. 155).

How is increasing female employment relevant to durable goods ownership? Many writers have reported a trend for increasing ownership of time-saving durable goods (see the subsection on `diffusion' in section 2.6); but with so many changes (increasing wife's employment, increasing women's wage-rates, increased durables ownership, etc), it is difficult to disentangle these factors. Some writers deny that there is a simple cause-and-effect explanation for these trends: Fine & Leopold suggest that there are

"interactions" between time spent cooking and women's employment; and also interactions between women's employment and ownership of "durables, most notably fridges, freezers and microwaves" (Fine & Leopold, 1993: p. 166).

DIFFERENT MOTIVES FOR WOMEN'S EMPLOYMENT

It has been argued by many writers that women have different reasons for taking paid work. Myrdal & Klein (1968), describing Western societies, wrote of two distinct "streams" of employed women: women in poor households are forced to take paid work to supplement their husband's income; whereas other (educated) women seek paid work to give them some independence from their husband. Many writers echo the ideas of Myrdal & Klein in observing a marked difference between rich and poor women's employment, for Britain (Gomulka & Stern, 1990: p. 184), and for India (Kapadia, 1993: p. 314; Liddle & Joshi, 1986: p. 90; Sengupta, 1974: p. 245). Many of these writers imply that women are only employed in the poorest and the richest households - but this pattern may be changing: referring to Calcutta (India), Standing found

> "A `culture' of women's employment is thus beginning to emerge which is no longer confined to a few upper-middle-class women and the very poor."
>
> (Standing, 1991: p. 123).

It has been claimed that a woman is more likely to be employed if her husband is lower-paid (Nelissen, 1990: p. 49); I now turn to two possible (economic) reasons for this: relative poverty, and absolute poverty.

WIFE'S EMPLOYMENT AND RELATIVE POVERTY

One hypothesis on why certain women take paid employment is that employed women take paid work in order to bring their household up to a particular standard of living - perhaps comparing their own standard of living to that of a `life-cycle reference group', as suggested by James Duesenberry (see Strober, 1977). Hilary Standing (1991: p. 117) wrote "Economic necessity is itself partly a subjective category, trading class-specific expectations of living standards against wives' socially reproductive work". Research in the Netherlands suggests that women's employment was negatively correlated with husband's income, up to about 1970; but after 1970, the

relationship weakened due to the women's movement and efforts to equalise opportunities (Nelissen, 1990: p. 49).

If women's wages do bring household incomes up to some sort of `reference' level, we would expect employed-wife households to have about the same number of durable goods as non-employed-wife households. Alternatively, perhaps women's employment is linked to the level of dissatisfaction with the marriage. For either of these reasons, an observed link between women's employment and durable goods ownership may be a result of the more independent women seeking paid work (such women may be more likely to seek their own personal goals, such as ownership of time-saving durables).

ABSOLUTE POVERTY AND WOMEN'S EMPLOYMENT

It seems plausible that a husband on a very low income-level is less able to prevent his wife from taking paid work. In Britain, it is feasible for households to live (partly or entirely) on state benefits, if the husband is unemployed (Joshi, 1984: p. 25) or is on a low income; but in India, state unemployment benefits are virtually non-existent, so an Indian woman may be forced to seek employment if her husband's income is low (Jain, 1985: p. 248; Khanna & Varghese, 1978, p. 177; Sengupta, 1974: p. 245). Referring to India, Joan Mencher wrote

> "even women who are active in union activities sometimes take work that pays below the minimum wage if there is nothing else available, especially if they have had to stay at home for a few days listening to the cries of hungry children"
>
> (Mencher, 1988: p. 100).

The above discussion suggests some complications in the links between durable goods ownership and women's employment: it is difficult to isolate the effect of women's earnings from other influences on household behaviour. A fundamental problem with the economic theories of durables ownership discussed in the previous chapter is suggested by Ben Fine (1992: p. 186): if employed-wife households are mainly those in which women are forced to take paid work (due to poverty), then these will be least able to afford (time-saving) durables. This is the opposite of most economic analysis discussed in this chapter, which predict women's employment will be associated with <u>greater</u> durable goods ownership. I provide evidence in chapter 9 that to understand the effects of women's employment on durables ownership, we should divide employed women into different groups - those

in poor households (perhaps forced to take paid employment by poverty), and those in rich households (who may prefer to be employed).

A POOR WIFE IN A RICH HOUSEHOLD

The previous few paragraphs considered the possibility that a woman might be forced into employment because her household has a low income. But there is another type of poverty: a woman might live with a rich husband, but have little access to household money (Pahl, 1980: p. 316). Smith (1997: p. 1164) wrote "wives may feel impelled to obtain paid work because they are denied access to husbands' earnings or because of the desire for some financial independence". Similarly, a woman may take paid work to reduce her feelings of powerlessness (Morris, 1989: p. 462). These issues might be explained using bargaining models (see chapter 8), or in terms of `Household Allocative Systems' (see chapter 10).

PART-TIME EMPLOYMENT AND THE POVERTY TRAP

It has been suggested that for Britain at least, part-time employment is seen as normal for women with young children: this may help women to combine employment with domestic tasks such as childcare (Dex, 1984).

Several writers have suggested that there are discontinuities in the benefits of employment. Consider, for example, a person who was offered employment for one hour per day: by the time transport costs and travel time are taken into account, the person might be better off unemployed. This is known as the `poverty trap', and may well keep women out of employment. An extra complication is the possibility that part-time employment may be paid at a lower hourly wage-rate than similar full-time employment: in the USA, part-time workers may be paid 30% less per hour than comparable full-time workers (Averett & Hotchkiss, 1997: p. 461).

THE `FAMILY WAGE'

In the `family wage' ideology, a man is expected to earn enough money to support himself and his wife and children. This employment pattern appears to be linked to a set of attitudes: "the breadwinner-versus-homemaker specialization is often justified by beliefs about innate sex differences" (Iglehart, 1979: p. 9). Nicholas & Oxley (1992: p. 17) trace the birth of this `breadwinning husband' ideology back to the mid-nineteenth century, at least in England. Similarly, describing colonists from Britain who settled in the USA, Zelizer states

> "the 19th-century domestication of housewives placed married women outside the productive economy. [...] Families [in the twentieth century] thus constructed distinct forms of monies shaped by a powerful domestic culture and by changing social relations between husbands and wives"
>
> (Zelizer, 1994: pp. 140-1).

Leonore Davidoff (1976), describing England in the late 18th and 19th century, claims that housework had a symbolic role: tasks such as cooking, preparing food, and childcare were seen as essential to maintaining order and morality in the household. This suggests that there has been a `family wage' ideology in Britain since the 19th century; but there are reasons to think that this ideology has been breaking down in recent decades:

> "the conflict model in sociology implies that change comes from women organising collectively to overcome male advantage [...] the post-1970 declines in occupational segregation (Beller, 1984) have increased the interest of women in organized efforts to improve their pay and opportunities for promotion"
>
> (England & McCreary, 1987: p. 160).

Chamberlayne (1993: p. 190) claimed that "Until the mid-1970s the family wage still formed the centrepiece of union wage bargaining" in Britain, and Beechey (1983) claims that many employers and trade union members prefer the `family wage' system to the employment of women. Pahl (1980: p. 333) wrote that the idea of a man earning a `family wage' was enshrined in UK legislation during the first half of the twentieth century.

Harriet Bradley (1989: p. 107) claimed that the `family wage' system "mirrored the family arrangement of pre-industrial families, where ultimate control of the household's resources lay with the male head of house". Bradley suggests that the prevalence of the `family wage' is a result of social norms inherited from previous generations, in which men controlled all household resources. Bradley also implies that industrialisation has been beneficial for women, in giving opportunities for a woman to earn

money in her own right. Veronica Beechey claims that over a long period of time, employers have tended to substitute women employees for male employees, to reduce labour costs: and the domestic labour patterns interact with local demand for women workers (Beechey, 1987: p. 45). Beechey's analysis implies a circular relationship between women's employment and consumption: as more women are employed, they spend more money on labour-saving goods and services, which increases demand for such goods, and hence increases the demand for women's employment.

Vickery (1979: p. 167) claims that observed changes in women's paid employment are constrained by customs. Francis Vella, who studied data from Australia, claimed that attitudes to gender roles have a dramatic impact on labour force participation (Vella, 1994). British research on women's (consideration of) return to paid work after childbearing reveals that a man often expresses negative attitudes to his wife's employment - because he consider financial support of the family to be a man's role, or because he sees his wife's employment as a challenge to his authority (Smith, 1997: p. 1163).

The above paragraphs suggest that the `family wage' ideology is a form of oppression of women by men, in which employers and trade unions conspired to prevent women's employment - leading to women becoming dependent on their husbands. Not all historians take this view, however: Jack Goody (1983: p. 30, footnote 15) described life in the nineteenth-century village of Lark Rise, in which villagers lost their land and men were employed as labourers. Goody claims that at the same time, there was a process of `embourgeoisement', in which any work outside the home was considered "unwomanly" for women in Lark Rise - and "even the vegetable garden and allotment were forbidden". Yet, for Goody, this is not oppression of women: he argued that the poor reputation of `field women' had "given most country-women a distaste for `goin' afield'" (implying that women **chose** not to leave their own home). Further insight into Goody's view is given by his observation that "Later on the women even managed to shift the fetching of water from the well to their husbands" (Goody, 1983: p. 30, footnote 15), as if being confined to the house is evidence of women's power. Here, Goody's view of history seems out of step with that of most observers; but other writers caution against an over-simplistic analysis in which oppressive husbands control powerless wives: referring to 1987 research in Turkey, Mine Cinar wrote that

> "Among those who never worked, the majority did not work before marriage due to lack of father's permission [...] When they married, they did not look for jobs outside the home due to lack of their husband's permission. Most of the women were proud of the fact that their husbands would not let them work outside the home."
>
> (Mine Cinar, 1994: p. 374; emphasis added).

There is a widespread feeling among sociologists that a feminist revolution has taken place in Britain. Prue Chamberlayne wrote that in Britain,

> "from 1970-89 [...] on the agenda were policies aimed at the reconstruction of gender roles, male and female, as were policies aimed at more public validation of `female' roles".
>
> (Chamberlayne, 1993: p. 192).

The `feminist' agenda was thought by many to be successful in Britain: for example, Coote & Campbell wrote

> "By 1986 we were writing about something that was no longer with us in the same form: women's liberation as a self-contained and singular movement had become part of our recent history."
>
> (Coote & Campbell, cited in Chamberlayne, 1993: p. 191).

The changes in British society went beyond women's employment: in her research in Sunderland (North-East England) in 1985-6, Jane Wheelock found "traditional gender roles breaking down in North East working-class families, when men become unemployed, but their wives remain at work" (Wheelock, 1990: p. 164). Other writers, though, are less convinced that fundamental changes have been taking place in Britain:

> "Sceptics argued that women's greater entry into the public sphere had simply led to a shift in subjection from private to public patriarchy, in the nature of oppression and subordination rather than its elimination."
>
> (Chamberlayne, 1993: p. 192).

Morgan & Wilcox (1992: pp. 153-4) claim that there have been two waves of feminism in northern Europe: in 1928, women gained the franchise; and a second wave of feminism swept Western Europe after 1968.

There are some reasons to believe that India lags behind Britain in terms of attitudes to women's rights. For example, Johanna Lessinger (1989: p. 122) found that women traders in Madras remain dependent on men for buying supplies, and states that

> "in endless ways the structure of patriarchal control and privilege remains intact, since women themselves continue to observe many of the conventions of male-female separation"
>
> (Lessinger, 1989: p. 122).

Kuntal Agarwal (1988: p. 189), referring to money-centred decisions in Indian families, claimed that "Real power is in the hands of husbands irrespective of wife's income, education, and profession". Hilary Standing wrote recently about Calcutta:

> "In contemporary bourgeois marriage as in customary practice and cultural understanding, wives are constructed as economic and legal dependents of the husband, particularly through systems of law and taxation. Trade unions, predominantly male in membership, have also constructed the interests of their members within the ideological parameters of men as breadwinners."
>
> (Standing, 1991: p. 105).

In the USA literature on earnings, several researchers have claimed that husbands earn more if their wives are not employed (Jacobsen & Rayack, 1996: p. 268). However, recent research suggests that this is a result of applying inappropriate regression methods (`ordinary least squares'). Jacobsen and Rayack (1996) used `instrumental variables' to control for the possibility that husbands' and wives' employment is determined simultaneously, and concluded that the true causality is the reverse: that women with rich husbands do less paid work than women with less rich husbands. They even suggest that the observed negative correlation between husbands and wives earnings is a result of "marital matching", in which "men with positive labor-market characteristics pair with women who have less attachment to the labor market" (Jacobsen & Rayack, 1996: p. 272).

PRESERVING THE IMAGE OF HUSBAND-AS-PROVIDER

Many sociologists suggest that both men and women attempt to present an image of their family in which the husband is the main earner, in order to uphold the husband's social status. Describing Calcutta (Eastern India), Hilary Standing wrote

> "Ideologies of family status have meant that the idea of wives and daughters taking up employment and leaving the protection of the family home (and the social control of senior relatives) has been a rather shameful one, reflecting badly on the ability of middle-class men in particular to provide for their dependents"
>
> (Standing, 1991: p. 12).

In households where the husband earns slightly below average, one might expect the husband to value income earned by his wife, because the

household's standard of living will be closer to that of neighbouring households; but several writers have found the opposite:

> "Those men who are denied a sense of occupational success are less likely to view their wives' market work as a gift. Sensitive to their husbands' feelings of failure, some wives respond by not resisting their husband's dominance to "balance" his low self-esteem."
>
> (Pyke, 1994: p. 89).

Interestingly, Statham & Rhoton (1983: p. 87) studied USA households, and concluded that a wife's employment status was unrelated to her husband's attitude to his wife's employment, but that her employment was related to **her assessment of her husband's opinion** on women's employment. Statham & Rhoton suggested that this may indicate women misperceiving their husband's views (or could indicate that men's attitudes to employment of women in general is more important than his views of his own wife's employment): perhaps Statham & Rhoton feel women are oversensitive, and that their husbands are not really hostile to their wives' employment. Other writers, though, see less subtlety in men's opinions on this subject:

> "some men express negative attitudes towards their partner's employment participation. They only tolerate wives' employment providing standards of housework do not decline."
>
> (Smith, 1997: p. 1163).

Yvonne Smith implies that in many cases, men do not "tolerate" their wife's employment - implying that some men (at least) have the power to prevent their wives from taking paid work. Other writers share Smith's view:

> "There are examples from many countries, including the now developed countries in their earlier stages of growth, in which men have refused to allow their women to participate in the labour force, preferring that they remain housewives."
>
> (UN, 1986: p. 20).

Several writers report that many wives of unemployed men are themselves not employed (Smith, 1997: p. 1165). Researchers have sought economic explanations for this, such as the unemployment benefit rules (Dex, Gustafsson, Smith & Callan, 1995: p. 627), or because husband and wife share a similar level of education and face the same local labour market (Smith, 1997: p. 1165). But are there non-economic reasons for low employment levels of wives of unemployed men? Joshi suggests that not wishing to "usurp the role of the former breadwinner" is one reason put forward to explain why many British women married to unemployed men do not take paid work (Joshi, 1984: p. 25); a similar comment is made by Smith (1997: p. 1165).

The empirical evidence on the link between women's employment and marital disruption is not entirely clear. In his study of USA data, Greenstein (1990: p. 673) found a link between wives' employment and marital disruption, but claimed that the direction and nature of this link was not necessarily consistent with much of the sociological literature. If men do prevent their wives from taking employment, then this could be interpreted as `strategic' by the bargaining-based models - husbands may wish to prevent their wives from obtaining economic independence (see section 2.4 above). Alternatively, if men prevent women from taking employment, this might be seen as evidence that the society is `patriarchal', i.e. that role theory is the appropriate explanation (see section 2.5 above).

The idea that wives are under pressure not to take paid work is widely discussed by sociologists. An example is Alfreda Iglehart, who described the position of wives in 1950s USA:

> "The wife who wished to work outside the home probably felt that she should not do so. Friends, neighbors, and husband, as well as prevailing norms, said that she was rejecting her wifely duties by even thinking about taking a job."
>
> "During the fifties, wives' employment was seen as synonymous with the disintegration of the home."
>
> (Iglehart, 1979: p. 13; p. 23).

The relationship between attitudes, a woman's employment, and her husband's income is complicated. Jane Wilkie studied U.S. survey data, and found

> "The lower their income, the more likely men are to disapprove of married women earning money. This relationship is in contrast to actual experience, wherein, as husbands' income decreases, married women's employment increases except at the very lowest levels."
>
> (Wilkie, 1993: p. 276).

If some women remain housewives because of pressure from their husbands, then it is plausible that more educated women may refuse to accept control from their husbands, due to the modernising effect of education on women's values (Khanna & Varghese, 1978: p. 29).

When considering the claim that husbands often prevent their wives from taking paid work, we should also consider the possibility that some (or all) women prefer not to be employed. Elizabeth Roberts claimed that British working-class women are ambivalent to wage-earning work: those employed were proud of their skill, effort, and contribution to the family

budget, but they rarely had ambitions to go on earning all their lives - these women saw giving up employment as a sign of higher social status:

> "Because it was generally (and rightly) presumed that a women only worked if there was an inadequate family income, many skilled men did not like their wives to be seen earning money - it reflected badly on their own status as a breadwinner. **There is no evidence that women questioned this point of view**."
>
> (Roberts, 1984: p. 137; emphasis added).

Referring to rural India, Sharma (1990: p. 594) claimed that households gain prestige if the wife does not take paid work - if so, presumably woman and men both gain from this higher prestige. Some writers claim that a wife's status mainly depends on her husband's job:

> "a woman may obtain status not only from her own paid job, but also, or even exclusively, from the paid job of her partner, whereas a man derives his status predominantly from his own paid job."
>
> (Van der lippe & Siegers, 1994: p. 117).

GEOGRAPHICAL VARIATIONS IN ATTITUDES TO WOMEN'S EMPLOYMENT

Several writers have commented that there are distinct cultural differences within India. It appears that women's employment is more accepted in southern India than in northern India (Khanna & Varghese, 1978: pp. 28-9; Mathur, 1994: p. 488; Miller, 1981: p. 158). These regional differences may be important:

> "In the North [of India], it is observed that even in the lowest strata, men do not allow women to go out for menial jobs as they consider it below their dignity. Even if the family is impoverished, women usually do not go out of their homes to do menial work."
>
> (Khanna & Varghese, 1978: pp. 28-9).

Khanna and Varghese go on to suggest that northern India is richer than the rest of India, and hence there may be fewer households in which poverty forces women into paid work. The above quote might suggest that northern Indian women consider paid work to be beneath them, but this is far from accurate: women in northern India have lower status (within the household) than women in other parts of India (Miller, 1992: p. 175).

In an attempt to distinguish cultural effects from economic forces, Alaka Basu studied migrants from different parts of India who had migrated to slums in north Delhi. The survey asked who was responsible for deciding

on household spending on clothes and other non-food items; Basu (1992) found that 23% of migrants from Uttar Pradesh (north India) had "near-total responsibility", compared with 47% who migrated from Tamil Nadu (south India). It seems difficult to explain such differences in purely `economic' terms: culture appears to have a strong influence.

Various reasons have been put forward to explain this north/south divide in India, including religion (Agarwal, 1997: p. 44). Northern India may have been affected by the impact of Islam, including `*Purdah*', a form of female seclusion (Basu, 1992: p. 256):

> "The term *parda* regions or *parda* zone can be used for the large parts of the subcontinent that include Northern India through Uttar Pradesh, where *parda* practices are taken to be the central elements of social life"
>
> (Marková, 1995: p. 85).

It is not clear that north-south differences in Indian women's freedoms are due to religion - Hinduism (widespread in southern India) is similar to Islam in this respect:

> "It is sometimes asserted that the low ritual status of women in the North is due to six centuries of Muslim rule, but in fact classical Hindu literature makes it clear that a woman's husband is her lord and it is her dharma to serve him."
>
> (Maloney, 1974: p. 290).

Other writers claim that India can be divided into zones according to the language spoken, and that language differences keep cultures within India distinct from each other. The southern cultural group is often referred to as `Dravidian', and the northern culture as `Brahminical' (Miller, 1981: p. 159) or `Aryan' (Dutt & Noble, 1982: p. 1).

> "The linguistic regions possess a certain homogeneity of culture, traits and kinship organization. The common language makes communication easy, sets the limits of marital connections and confines kinship mostly within the language region."
>
> (Karve, 1965: p. 4).

Another explanation for north-south differences is the rice-growing system in southern India which relies heavily on female labour (Lessinger, 1989: p. 108), as opposed to wheat-growing in northwest India (Agarwal, 1997: p. 31).

A different analysis of the north/south differences is in terms of kinship systems and land ownership patterns (Hershman, 1981). Plog, Jolly, Bates & Acocell (1980: p. 364) define kinship as "how different peoples classify

their kin and how these classifications relate to social behavior and social organization". One of the key aspects of kinship is who a person may marry: in north India, marriages within a village are forbidden, and marriages are usually between strangers; whereas in the south of India, marriages are usually between people who were geographically close (Dutt & Noble, 1982: p. 10). Clarence Maloney considers these kinship differences to be important:

> "Because a man and his bride may have known each other as children and may indeed have been playmates, a wife in the south is less likely to be a docile creature thrust as a youngster into an unknown family where she would be expected to revere her husband and defer to all in the household."
>
> (Maloney, 1974: p. 325).

If there is a north-south divide in India, it is not clear where to draw the line (Dutt & Noble, 1982: pp. 1-5). Mathur (1994: p. 488) found a pattern in which female employment is more widespread in southern and western India (relative to the rest of India). Other writers divide India into more than two regions: Tyler (1973) divides India into four zones; and Khanna & Varghese (1978: p. 6) divide India into five zones.

While acknowledging regional variations within India, we should not overemphasise them. Robin Jeffrey (1989: p. 31) comments that women in Kerala (south-west India) have more autonomy than do women in other parts of India, but claims there are limits to these advances: "women may do more things in Kerala than elsewhere in India; but they do not enjoy equality with men." Similarly, there are similarities in kinship between north and south India:

> "cross-cousin marriage, preferred and we might even say prescribed in the South, is forbidden in the North (among Hindus) [...] But this contrast [...] does not take into account the numerous and important features common to both regions"
>
> (Dumont, 1994: p. 91).

Some aspects of household behaviour apply to India as a whole: "women in relation to men are disadvantaged in some degree in all parts of India" (Agarwal, 1997: p. 30); for example,

> "the social construction of appropriate behaviour (the emphasis on soft speech, deference to male elders, etc) operates in some degree everywhere [in India]"
>
> (Agarwal, 1997: p. 44).

The difference between urban and rural areas within India should be borne in mind when interpreting results in this thesis: my Indian samples (1992

and 1997) are both entirely urban (see section 6.3). Khanna & Varghese (1978: p. 176) claim that female employment is more common in rural India than in urban India.

Regarding Britain, I doubt that cultural differences between (for example) north and south England are as strong as they are in India, so dividing the UK sample into regions might not reveal the effects of culture: but we should not assume British people are not influenced by culture, simply because we cannot easily see such effects within Britain.

3.3 TIME SPENT ON HOUSEWORK

Several sociologists and economists have used time-use data to examine household behaviour. One of these is Jonathan Gershuny, a sociologist, who uses an approach developed from neoclassical economics: he emphasises the use of time, and the production of services within the home using time-saving goods. Gershuny claims that in Europe, a long-term trend in household behaviour can be detected since the mid-nineteenth century, in which there is a tendency for more tasks to be carried out within the household as domestic equipment becomes more efficient (Gershuny, 1978: p. 55). Like economists, Gershuny explains household purchasing in terms of a `hierarchy of needs' (Gershuny, 1985: p. 128), which suggests that as a household becomes richer, it is likely to obtain goods to make domestic tasks easier. But Gershuny is using a sociological explanation of household behaviour (Gershuny, 1983: p. 156): he considers that the household division of labour (between husband and wife) is not compatible with economically rational behaviour. Rather, observed hours of work should be explained either in terms of the exploitation of wives by husbands, or in terms of tasks being allocated between husbands and wives according to traditional patterns (Gershuny, 1983: p. 156; Wheelock, 1990: p. 101).

The conventional economic view suggests that there are tasks which the household wishes to be carried out (such as cleaning and cooking) because household members derive utility from the results of such work: a clean home, or a cooked meal, is desirable. However, Juster & Stafford (1991: p. 491) indicate an alternative perspective: that certain tasks, such as childcare, may be pleasant to carry out. This could have important implications for time-saving durables ownership: in principle, a person might decide not to buy a time-saving good because this would reduce time spent on a pleasant activity. I have no evidence on this possibility, but I think it unlikely to be an important influence on durables purchases - the goods studied in this thesis are mainly intended to reduce time spent on tasks such as laundry, which Juster & Stafford (1991: p. 498) describe as `drudge' work: "activity which is valued primarily for its output rather than its inherent satisfaction".

HOUSEWORK BY HUSBANDS

Many researchers have reported a clear division of household labour between women and men, in which most domestic work such as washing, cleaning, & cooking is done by women - in both the UK (James, 1995, pp. 281-2; Gershuny, 1983: p. 153), and India (Khanna & Varghese, 1978: p. 41; Standing, 1991: p. 71). Men do carry out certain types of housework: for example, men are responsible for household repairs and maintenance, at least in the case of Britain (James, 1995, pp. 281-2). In the case of India, men sometimes help with shopping and fetching water (Standing, 1991: p. 75). But where both husband and wife are employed,

> "In the absence of other determining factors, an equal division of home labor should then develop. However, in examining the influence of time availability on the division of housework, researchers have found substantially less than equality in housework in response to equal time invested in paid labor."
> (Hardesty & Bokemeier, 1989: p. 254).

Evidence that housework is not equally divided even where both husband and wife are both employed full-time is provided for Britain by Kiernan (1992: p. 101).

There are many factors to consider (such as the hourly wage-rates of each spouse) in assessing whether or not households divide domestic tasks rationally; the asymmetry may be a result of women having worse bargaining positions, due to women's weaker position in the labour market - so, for example, education is less useful in the labour market to women than it is to men (Hardesty & Bokemeier, 1989: p. 255). Nevertheless, the apparent asymmetry between husband and wife does call into question conventional economic analysis, which assumes rational responses to economic forces. I now turn to some alternative explanations of these asymmetric time-use patterns.

Some researchers have reported links between attitudes and housework. Referring to a USA survey, Hardesty & Bokemeier (1989: p. 264) reported "we find that women's work-role attitudes are significantly and positively related to their husband's contribution to housework". For Britain (at least), there is evidence that attitudes of both men and women are important influences on who does the housework:

> "In situations where domestic division of labour forms a strong facet of the female partner's identity, that is, where she sees it as integral to being a woman, wife and mother, then - on the basis of our evidence - it would seem highly likely that traditional forms of the domestic division of labour will manifest themselves. In contrast, shared forms of the domestic division of labour seem more prevalent within households where *both* partners reject the associations between domestic labour and women's work."
>
> (Gregson & Lowe, 1993: p. 498; emphasis in original).

Van der Lippe & Siegers (1994: p. 117) claim that husbands may be discouraged from doing domestic work if traditional norms are prevalent, because of sanctions resulting from the traditional expectations for male behaviour. The opposite sanctions could apply, however, if a man does little housework in a society with `egalitarian' norms (Van der Lippe & Siegers, 1994: p. 118).

Time-use data from various countries was studied by Gershuny et al (cited in Juster & Stafford, 1991: table 6, p. 499): they report an increase in men's time on housework in the UK between the 1960s and the 1980s. This increase was not straightforward - the amount of men's housework **fell** by 12 minutes between the 1960s and the 1970s, before increasing again by 20 minutes between the 1970s and 1980s. The reported pattern could, of course, be a result of changes in methodology or sampling between surveys, rather than a reversal of a trend. Regarding India, Kuntal Agarwal reported findings from a 1985 survey in Meerut (Uttar Pradesh); Agarwal suggested that housework was traditionally done by women, but that things had changed by 1985 - most husbands now help their wives with domestic tasks, although men's help is only `occasional' for 55% of husbands, and 20% of husbands never did domestic work (Agarwal, 1988: p. 180).

The question of who does housework may be related to other household decisions, such as who controls spending: referring to the USA, it has been claimed that

> "Within this [USA] cultural context, it is not viewed as the responsibility of men to engage in housekeeping tasks associated with the homemaker role. The division of housework is not dependent on resources alone but hinges on the cultural norms that stem from the patriarchal control of such resources."
>
> (Hardesty & Bokemeier, 1989: p. 256).

Here, we can see parallels with the `resources in a cultural context' approach outlined in the previous chapter (section 2.7).

3.4 EFFECTS OF SOCIAL CLASS ON TIME-USE AND DURABLES OWNERSHIP

Most surveys discussed in this thesis attempt to obtain a sample which represents a cross-section of society in a particular geographical area; but some writers report differences within a sample. One of the most widely-discussed differences is social class: Gershuny et al (cited in Bowden & Offer, 1994: p. 734) found that in Britain, time on housework by working-class women fell from just under 500 minutes per day in 1937, to about 450 minutes in 1961; but for middle-class women, it rose from about 250 minutes per day in 1937, to about 450 minutes in 1961. Since then, women of both classes spent less time on housework - falling to 350-375 minutes in 1974/5, but rising again by 1984 (Bowden & Offer, 1994: p. 734).

This thesis assumes that people who do housework (usually women) wish to own time-saving goods. I focus on six durable goods: regarding shopping and food preparation, refrigerators and deep-freezers allow less frequent shopping trips, and one meal may be cooked for consumption on several occasions. Food-processors speed up the process of chopping food. Microwave ovens cook certain types of food more quickly than conventional ovens; and dishwashers reduce time on washing up. Regarding laundry, washing-machines require less work than hand-washing clothes.

For this thesis, I exclude certain durable goods for which ownership data are available in the datasets I study, but which I do not consider to be "time-saving": vacuum-cleaners (which might save time on cleaning, but they may simply provide a higher standard of cleanliness); tumble-driers (which may save time washing and drying clothes, but could simply be bought to avoid having wet clothes around the home for too long); and cookers (other than microwave ovens). It is plausible that women might place a higher priority (than men do) on such goods; but this thesis is about time-saving durables, and theories I test (such as the Becker et al price-of-time hypothesis) might not be relevant to durables which raise cleaning standards, or reduce the amount of wet clothing around the house.

A complication in deciding which durable goods are "time-saving" is the possibility that some goods may be bought as status symbols (`conspicuous consumption'). Referring to India, Hilary Standing wrote

> "In the highest income households, the woman's earnings tend to be seen as providing what are described as `luxuries' - a fridge or television, entertainments, or [..]".
>
> (Standing, 1991: p. 105).

Bowden & Offer do not think that durable goods such as washing machines are bought as status symbols in USA or Britain: "On the whole, household appliances do not have much value for status display" (Bowden & Offer, 1994: p. 733).

Research on the USA by Richard Coleman suggests that social class may be an important influence on durables purchase. Coleman claims that

> "The Lower-Middle Class woman is more single-mindedly concerned with furnishing her home so that it will be "pretty" in a way that suits her and might hopefully win praise from her friends and neighbours. [...] she is quite different from the Upper-Lower wife who is apt to care more about having a full array of expensive, gleaming white appliances in her kitchen"
>
> (Coleman, cited in Britt, 1966: p. 260).

The above study of US society implies that social class is (or at least was) an important influence on consumption. Bhatty suggests that social class is also important in India:

> "Reference has been made in the literature on consumer behaviour to the "standard package" of consumer goods and services. This standard package is associated with a class or group of consumers who have commonalities, not only in the level (range) of income, but who are at the same stage in their family cycle and have similar occupations"
>
> (Bhatty, 1989: p. 43).

Bhatty's comment suggests that in addition to income and number of children (which are usually included in empirical economic work in this field), that we should include "occupation" - by which Bhatty appears to mean social class.

3.5 DO `TIME-SAVING' GOODS REALLY SAVE TIME?

In referring to certain goods as `time-saving', I am aware that others may disagree. Findings from time-use research in several countries suggests that time-saving durables do not greatly reduce the time spent on housework:

> "The hypothesized negative relationship between the ownership of time-saving devices and time spent on housework receives confirmation only for activities related to doing the laundry (Hefferan 1982; Leibowitz 1975). Others find no overall effect (Berk 1985; Robinson 1980), and at least one study reports that every additional appliance results in a slight *increase* in time devoted to household tasks"
>
> (Brines, 1993: p. 336; emphasis in original).

A similar comment was made in the USA context by Vanek: greater availability of washing-machines has led to higher standards of laundry - but the overall time spent may not be lower (Vanek, 1974: p. 120). This curious pattern was described by Gershuny (1983: p. 146) as the "domestic labour paradox": the provision of domestic labour-saving devices such as washing-machines appears to increase the amount of time spent on domestic work. Gershuny explains this in terms of productivity: the availability of domestic machinery makes a person more productive, so it may then be rational for that person to spend more time on domestic work (Gershuny, 1983: p. 146). For the USA and Britain,

> "There is evidence that household appliances had little effect on the time spent in housework. In 1960 American women were spending about as much time as they were in the 1920s. [...] Washing machines did not save time since clothes were washed more often. Vacuum cleaners were used to clean the floors more frequently."
>
> (Bowden & Offer, 1994: pp. 733-4).

Bowden & Offer (1994: p. 734) suggest that standards of house care rose from the 1920s. Evidence such as that discussed by Bowden & Offer (above) does not disprove the claim that durables reduce housework time: we must distinguish between the long-term effects on women in general (who are expected to meet higher standards), and the effect on a particular woman (who faces a particular set of social norms at one place and time). If washing machines lead to clothes being washed more often, then households without washing-machine may feel they also need to increase the amount of time spent on washing, to bring their household up to the new standards. Hence time spent on washing might increase for both washing-machine owners and non-owners; if so, then washing-machines may become even more useful over time, as time-saving devices. Agarwal and Anand consider time-saving

goods to be helpful to women in developed countries such as the UK (implying that such durables are not widely available in the Third World):

> "In the industrialised world, technologies such as vacuum cleaners, dishwashers, washing machines and cooking gadgets have helped to reduce household drudgery"
>
> (Agarwal & Anand, 1982: p. 304).

A similar perception on the value of durable goods (in India) is suggested by Khanna & Varghese (1978: p. 110): "Modern amenities like cooking gas and electrical domestic gadgets make kitchen work less tedious." Similarly, Anuradha Bhoite (1988) reported evidence from the 1973 study `*Problems of employed women in rural areas*', conducted by Poona University in Pune (India):

> "Modern labour saving devices have revolutionized the kitchen in western countries and have proved a real boon to the working wives. [...] to the author's surprise the sample unfolded that not a single woman was using all or some or any one of the modern labour and energy saving tools of home making such as gas ovens, pressure cookers, electric mixer-grinder, washing machine, vacuum cleaner, refrigerators etc."
>
> (Bhoite, 1988: p. 235).

To confirm Bhoite's claim that many Indian households lack time-saving goods, consider evidence from the 1991 Census of India: only 33% of Indian households had a water tap within their home (Nanda, 1994: p. 691).

Bowden & Offer claim that time spent on housework in Britain has declined since the early 1960s, but this decline occurred a long time after most households obtained time-saving durables (Bowden & Offer, 1994: p. 734). Here, Bowden & Offer use circumstantial evidence, which seems unconvincing: for example, washing-machines improved considerably after their initial introduction, so the reduction in time-use might have taken place as a result of buying a more recent washing-machine (a household with only a primitive washing-machine might find it of little help, but such a household would be considered an owner). A reliable assessment might be possible if we had detailed time-use data for a sample of households, together with data on durables ownership and information such as number of children, but such research is beyond the scope of this thesis.

While admitting that there seems little hard evidence, I feel justified in suggesting that the time-saving durables studied in this thesis are likely to save time - or at least are thought to do so, by purchasers. If not, there seems little reason for such items to be purchased.

RAISING HOUSEWORK STANDARDS

The previous few paragraphs suggest that so-called "time-saving" goods may not save much time on housework. Related to this view is the idea that standards of cleanliness have risen over recent decades, and this might suggest a different reason to buy durables such as washing-machines: to raise housework standards (Gershuny & Robinson, 1988: p. 538). For example, a dishwasher might be purchased because it is thought to be more effective than cleaning crockery and utensils by hand; and a washing-machine might be thought more effective than hand-washing. I do not know of any data to test such a view; I can only suggest that this possibility be considered, when assessing empirical results reported in this thesis.

The above claim (by Vanek et al) that rising standards have increased women's housework time, also implies a possible way out for women: by lowering standards, a woman may be able to reduce the time she spends on housework. Bowden & Offer (1994: p. 739) suggest another approach: women could reduce time on housework by working more intensively. These factors may have implications for durable goods consumption, in that they offer alternative ways for women to ease their time pressures. These alternatives are both beyond the scope of this thesis, but they may not offer as much hope as they appear: social norms, and husbands' disapproval, may prevent women from lowering their standards too far. And regarding intensity of effort, the hard work entailed by tasks such as hand-washing clothes are likely to prevent people from completing such tasks quickly.

3.6 ARE TIME-SAVING GOODS A HIGH PRIORITY FOR WOMEN?

If there is a division of labour between men and women, then men and women might be expected to disagree about the priorities for household spending. If each household member places a higher utility on his/her own time than on that of another member, then the observed pattern of time use suggests that women would prefer to buy goods which save time on housework (such as microwave ovens, deep-freezers, and washing-machines), whereas men would be expected to prefer leisure goods (such as video-cassette recorders), and goods which save time on tasks usually carried out by men (such as power tools). However, there are problems in classifying goods as `male' or `female', due to the complex nature of human behaviour. For example, we might expect that a deep-freezer is a `female' good, because it saves time in preparing food and permitting less frequent shopping. This view is supported by Strober & Weinberg's (1980: p. 346) finding that employed-wife households use frozen TV dinners more often, in the case of the lowest income group studied. But Strober & Weinberg found employed-wife households no different to non-employed wives, in the other income groups they studied. This may be because employed women "may be particularly interested in assuring that employment does not interfere with family well-being" (Strober & Weinberg, 1980: p. 346).

Support for the view that some durable goods are preferred by men and others by women, in the case of the UK, is provided by Gallup's 1993 surveys `*Women's attitudes to their lives*' and `*Men's attitudes towards women*' (Gallup, 1994: p. 34; p. 46). These findings (reported in table **3<4>** below) suggest that women place a higher priority on washing-machines, whereas men prefer television sets. According to Martin Zober,

> "Wives generally place less value on having a new car than do their husbands. [...] Furnishing the home, saving money, providing for the children are objectives in the hierarchy of values usually regarded more highly by the wife than the husband."
>
> (Zober, reproduced in Britt, 1966: p. 225).

A similar view is expressed by Pyatt (1964), who divides durable goods into two groups, I and II. Pyatt's group I contains labour-saving items: cooker, washing machine, vacuum cleaner, and refrigerator; Pyatt claims these are "used predominantly by the housewife". Pyatt's group II includes radios, record players, and televisions: these goods "are associated with entertainment and are used by all (non-infant) members of the household" (Pyatt, 1964: p. 30). Gershuny & Miles (1985: pp. 39-40) report evidence

from a study in Brighton (UK), which found time-saving goods such as washing-machines and food-mixers are used far more by women than by men; this was not true of leisure goods such as television and audio systems, which were used about equally by men and women.

The above discussion suggests that a woman would prefer her household to own durable goods which she would (like to) use, whereas a man would prefer goods used by men - primarily leisure or status goods. This view is supported by the evidence shown in table **3<4>** below:

TABLE 3<4>: Priorities of men and women - UK, 1993

Responses to the question *"If you could only have one of these appliances, which one would it be?"*
(source: Gallup, 1994: p. 34, 46).

	WOMEN	MEN
TELEVISION SET	18 %	36 %
RADIO	10 %	17 %
MICROWAVE OVEN	1 %	2 %
WASHING MACHINE	43 %	14 %
TELEPHONE	23 %	18 %
DISHWASHER	3 %	4 %
SOMETHING ELSE /NONE OF THESE	3 %	9 %

Other evidence to support the view of different priorities of men and women is provided by a 1965 study of middle-class USA households for Life magazine, which included a question on whether the "initiator" of a decision to buy a durable good was husband, or wife, or both. It was found that the initiator was wife or husband-and-wife jointly in 89% of cases for refrigerators, compared with 83% for vacuum cleaners and 93.5% for rugs and carpets. The equivalent figure for automobiles, by contrast, was only 39% (Blackwell, Engel & Kollat, 1969: pp. 158-9).

Most of this thesis will focus on the dynamics of decision-making between a man and a woman; but dramatrix **8<9>** (chapter 8) also considers single-adult households, and it supports the claim that single men and women have different priorities, at least in the UK.

RELATIVE PRICES OF SERVANTS AND TIME-SAVING DURABLES

One alternative to buying time-saving goods is to hire servants - such as cooks, cleaners, and childminders. This approach was used in Britain among richer households, but Gershuny & Miles (1985: p. 37) claim that the amount of time spent on domestic work by middle-class women increased between the 1930s and 1960s, because of the "virtual disappearance" of domestic servants; servants were largely replaced by domestic machines, as the price of servants increased (Gershuny, 1978: p. 78). It has been claimed that for the UK in the post-war period, time-saving durables became cheaper in real terms (Joshi, 1985: p. S149), and domestic technology for cooking food and washing clothes improved, leading to an increase in consumption of durable goods (Gershuny, 1978: p. 81). Because of these relative price changes, hiring servants is no longer a cheap way of reducing housework for British households.

For India, relative prices are very different to Britain: it is relatively cheap to hire servants in India. Kalpana Bardhan claimed that

> "At the present stage of economic growth in most South and Southeast Asian cases, the release of middle-class women from menial chores is achieved through servants rather than through gadgets".
>
> (Bardhan, 1989-90, p. 104).

For India specifically, Khanna & Varghese (1978: p. 110) state that "with improved social status, women get the help of servants who decrease the domestic work load"; and Bhoite (1988: p. 235) wrote "One of the solutions for lessening the burden of work in the house of the employed woman is to employ servants". The key difference between India and Britain may be the cost of hiring servants, which is lower in India: "in India we can hire help <u>at a reasonable rate</u>" (Khanna & Varghese, 1978: p. 41; emphasis added), whereas time-saving electric appliances are expensive in India (Khanna & Varghese, 1978: p. 110).

INFERIOR GOODS

It is possible that some of the durable goods studied in this thesis are `inferior goods': if they could afford it, households might prefer to hire servants, or purchase services, rather than own time-saving goods. Hebden & Pickering, describing their research on British data, wrote

> "In other parts of our research we found that some households were increasingly using launderettes in preference to washing machines".
>
> (Hebden & Pickering, 1974: p. 81; emphasis added).

It is difficult to be certain if any of the goods studied in this thesis are `inferior goods', in the UK or in (urban) India: there are many complications, such as the possibility that some households may rent accommodation which includes goods such as washing-machines. One way to assess this question is to look at tables **9<4>** to **9<12a>** (chapter 9); those tables suggest that none of the time-saving durables studied here is an `inferior good'.

3.7 OTHER FACTORS WHICH MIGHT AFFECT DURABLES OWNERSHIP

There are many factors which may be relevant to durables ownership. I do not claim to be able to discuss them all, but this partial list may help researchers who wish to take this research further. Even for this limited list, I can do no more than sketch some of the more widely-discussed claims, due to limitations on the length of this thesis.

EDUCATION

Some writers perceive links between education level and housework: more educated women spend more time on housework than do less-educated women. The opposite applies to men: more educated men do more housework than less-educated men (Brines, 1993: p. 312). If housework is linked to education, it may by egalitarian values which education is thought to give (Hersch & Stratton, 1994: p. 123). But education may have various effects:

> "The more educated a woman is, specially after a certain level of education, the more complicated her married life becomes. She becomes less compromising, more independent in her views, and more preoccupied with intellectual pursuits. This causes frustration in her married life."
>
> (Khanna & Varghese, 1978: p. 31).

ETHNIC DIFFERENCES WITHIN A COUNTRY

The idea that a nation is made up of different `ethnic' groups, and that there are ethnic differences between different countries, is suggested by many sociologists. One definition of ethnicity is

> "the divisions of society into segmented communal groups, the members of which have common descent belief, a sense of distinct identity from the rest of society and institutionalized boundary marking mechanisms that maintain and emphasise their social separation"
>
> (Kurien, 1994: p. 762).

In addition to differences between Britain and India, we should bear in mind that there are differences within any one country. In India, spending in restaurants and on convenience foods was studied by Taplin & Simister (1995: pp. 266-7), who examined four ethnic groups in Bombay and Madras; they concluded that the English and Portuguese ethnic groups spend significantly more on these items than did the Muslim or Hindu groups.

THE EFFECTS OF RELIGION

A number of writers have commented that religious beliefs appear to be correlated with certain aspects of household decision-making. For example,

> "research suggests that in both Catholic and proreligious families, husbands have the major influence on specific purchase decisions. In contrast, in both Jewish and nonreligious families, husbands and wives share equally in most decision making."
>
> (Schiffman & Kanuk, 1994: p. 358).

Other writers have commented on the negative impact of certain religions on women's autonomy: for example, Morgan & Wilcox (1992: p. 159) wrote "The connection between Catholicism and anti-feminism is well documented". The impact of Islam has also been much discussed: Muslim women seem to be less able to take paid work outside the home, due to the `honour and shame' code of conduct in Islam (Standing, 1991: p. 117). Other writers, however, take a more complex view regarding the effects of religion on behaviour:

> "There is a widespread belief that the ideology of Islam is hostile to the labour force [...] although it is obvious that there are some factors in the Muslim Middle East which are resulting in low recorded levels of female labour force participation, it is difficult to disentangle the effects of Islam from other cultural influences [...] the evidence for a direct impact of Islamic attitudes on female labour supply decisions does not appear to be strong."
>
> (Papps, 1992: pp. 606-7).

If religion is an important influence on behaviour, then this suggests that households in India will behave differently to this in the UK: in 1981, it was estimated that about 83% of the Indian population was Hindu, and about 11% Muslim (Gupta, 1992: p. 42), whereas most of the UK population is nominally Christian.

THE CASTE SYSTEM

In the Hindu religion, a person's caste is determined by birth (Chen, 1995: p. 45), and caste has been claimed to be an important influence on behaviour:

> "Three things are absolutely necessary for the understanding of any cultural phenomenon in India. These are: the configuration of the linguistic regions, the institution of caste and the family organization. Each of these three factors is intimately bound up with the other two."
>
> (Karve, 1965: p. 1).

Karve suggests that a caste group can be seen as a form of extended family:

> "Endogamy and distribution over a definite area make caste members related to one another either by ties of blood or by ties of marriage. Therefore caste can be defined as an extended kin group."
>
> (Karve, 1965: p. 5).

Several writers on India claim that women in higher castes face more restrictions on their behaviour than do lower-caste women, and that this restriction is important for the family's status: "the more secluded the woman the higher her household's status or prestige" (Chen, 1995: p. 46). Liddle & Joshi (1986: pp. 90-1) suggest that women in the lowest castes are forced to take paid work (when jobs are available); those in middle-level castes do no paid work, but do unpaid work in the family-owned fields; and high-caste women are entirely economically dependent on men.

EFFECTS OF CHILDREN ON DURABLES OWNERSHIP

Robert Wilkes found a general pattern in consumer spending, linked to the presence of children in the household:

> "expenditures rise with household establishment, then decline with the presence of children in the household, then rebound - generally to a level higher than before the arrival of children - as families grow and mature, and, finally, taper off - sometimes sharply - during the last one or two stages of the life cycle"
>
> (Wilkes, 1995: p. 39).

Wilkes suggests that children increase the workload for parents; but older children may carry out some housework (Hardesty & Bokemeier, 1989: p. 257).

THE EXTENDED FAMILY

Some writers (cited in Warner, Lee & Lee, 1986: pp. 122-3) claim that women in nuclear families may have more power than do women in extended families. This presents a complication in studying Indian households, due to the prevalence of the extended family (Greenfield, 1981: p. 42; Pescatello, 1976: p. 72; Standing, 1992: p. 71). However, in India, there are

> "changes in family composition as a consequence of urbanization [...] `Complex' forms are fragmenting into nuclear families under the impact of modernization"
>
> (Standing, 1991: p. 9).

For this thesis, I refer briefly to results for single-adult households (see dramatrix **8<9>** in chapter 8 below), but the rest of my research is limited to nuclear families, i.e. households containing two adults with or without children: this greatly simplifies the analysis, and makes it possible to create mathematical models such as the one I develop in chapter 5. But the reader should be aware that extended families are more common in India than in Britain, and that my findings do not necessarily apply to extended families. Members of the extended family may influence nuclear families: Khanna & Varghese (1978: pp. 55-6) found that only a third of their sample lived in extended families, but in most Indian homes "there is frequent interaction with relatives outside the nuclear unit". The situation of a household at the time of a survey interview may not be an accurate guide to how widespread extended families are (Ram & Wong, 1994: p. 863).

EFFECTS OF TYPE OF ACCOMMODATION

There are several reasons why the family home may influence the purchase of durable goods. One such reason is that a home may be rented as furnished accommodation: if so, items such as washing-machines may be rented with the accommodation. Such households would be treated as if they own the durable (such as a washing-machine) in *FES* surveys (for the UK): *FES* codebooks refer to `number of washing machines in household' (see Department of Employment, undated). However, information on housing tenure (owned versus renting) is available in *FES* surveys, so it is possible to investigate this issue. The *BHPS* survey (also for the UK) includes a question on whether or not durables such as washing-machines are owned by a household member (question H24b: see Taylor et al, 1996). The *WAS* surveys, used in India, refer to `owning' items such as a washing-machine; but in practice, this might be interpreted by some respondents to include the use of durable goods which are rented with their home. The *WAS* questionnaires are reproduced at the end of the appendix to this thesis; note that interviewers usually translated the questionnaire into a local language, for the sake of the respondent.

Treating those who rent a durable good (with their accommodation) in the same way as those who own such durables, may be appropriate if the family pays rent which includes use of durable goods. However, such rental

arrangements reduce freedom of choice for families: they may find it more difficult to find accommodation to rent if they do not want a washing-machine, for example (presumably access to such durable goods would tend to raise the rent on accommodation). My own analysis of *FES* data (not reported in this thesis due to lack of space) suggests that controlling for `rented' versus `owner-occupied' accommodation has little effect on my conclusions. The *BHPS* dataset offers the opportunity to carry out further analysis on this, but I would not expect it to affect my results significantly - and, of course, excluding non-owners from the sample would tend to reduce the effective sample-size in a dataset.

Another complication is the size of the home (and especially the kitchen): is the kitchen large enough to contain all durables which are wanted? Appliances such as washing-machines, refrigerators, deep-freezers and dishwashers are physically large objects, and some households may be unable to buy all of these because they do not have enough space. It could be argued that a family which can only afford a small home will also be unable to afford time-saving durables, but this argument is not entirely convincing. Some data on the type of home each family lives in is available in *FES* surveys (see section 6.2), such as information on the number of rooms available to the family; but such information does not seem sufficiently detailed to assess whether or not a home is large enough for all appliances the family would like to acquire. This problem should be borne in mind when assessing the findings of this thesis, but I see no reason to suppose that it affects my conclusions significantly.

There is another reason to consider the size of the family home. Studying United States time-use data, Hersch (1991: p. 159) suggests that the number of rooms in a family home affects the amount of time spent on housework by the couple. I presume that having large-sized rooms would have a similar effect. This might suggest that richer families, who can afford larger houses, may have more housework to do, and hence more reason to purchase time-saving goods. I do not attempt to assess that possibility in this thesis.

A further problem is access to electricity. All of the durable goods studied in this thesis normally operate on mains electricity (although some can use alternative energy sources, such as gas-powered refrigerators). A household may be prevented from buying such goods because they have no

connection to mains electricity - this could happen in rural areas of the UK, but it seems more likely to occur in India. However, I do not feel too concerned about this problem. I was informed by the Indian Market Research Bureau (see section 6.3) that many urban Indian households have television sets, and hence (I presume) access to electricity; I do not generalise my urban India findings to rural India. As to the UK, the vast majority of the population live in urban areas; it is possible to isolate which households in *FES* surveys (see section 6.2) do not have access to electricity, but I did not do so (this might be a desirable step for future research, but I doubt it would significantly alter the conclusions).

EFFECTS OF THE STATE OF THE ECONOMY

Household consumption may be influenced by the state of the national economy. In general, spending on consumption (especially on consumer durables) is likely to increase during a time of economic growth (Besley & Levenson, 1996: p. 39). India has had fairly rapid economic growth in recent years (Hunter, 1997: p. 648), so my 1992 and 1997 *WAS* surveys may give a misleading impression; the *FES* data I use for the UK should be more representative, being based on a longer time-period (from 1969 to 1996).

Alessie, Devereux & Weber (1997: p. 55) suggested that access to loans may be an important influence on durable goods purchase, and that easing of British laws requiring purchasers to make a cash deposit may explain the surge in durables purchases in 1983. A different perspective on Britain's recent economic history is that of Attanasio & Weber (1994: p. 1301) who detect rapid growth in consumer spending during the 1980s, and consider the possibilities of this being an effect of easier access to loans, or rising house prices, but they conclude that neither explanation can account for the fall in the UK savings rate between 1986 and 1988.

DIVISION OF DECISION-MAKING AREAS

A further complication in studying household consumption is that some decisions may be made by one person, but other decisions made by his/her spouse:

> "Studies that have examined both the extent and the nature of husband/wife influence in family decisions have found that such influence is fluid and likely to shift, depending on the specific product or service, the family role structure orientation, and the specific stage in the decision-making process."
>
> (Schiffman & Kanuk, 1994: p. 356).

An example of a division of decision-making is a US study reported by Blackwell, Engel & Kollat (1969: p. 158), who examined which partner initiated a decision to buy certain types of good - they found that 93% of husbands had suggested buying a car, compared with only 39% of wives; whereas for vacuum cleaners, only 36% of husbands had suggested buying, compared with 83% of wives. But Blackwell, Engel & Kollat are referring to an "initiator": we cannot assume that this person decides whether or not to buy the good - indeed, the fact that these researchers discuss concepts such as "initiator" implies that the purchase decision is joint between husband and wife.

An example of a division of responsibilities between husband and wife is from Greek households in 1964: decisions relating to choice of friends and leisure were found to be `masculine', whereas decisions related to child-rearing, and purchase of clothes, furniture, household equipment and budgeting were `feminine' (Safilios-Rothschild, 1967: p. 345). Woolley & Marshall (1994: p. 426) studied 1988 survey data from the Winnipeg area of Canada, and found that food, household supplies, gifts and clothing are female decisions, but insurance is a male decision. Hilary Standing (1991: p. 98) claims that in Calcutta (India), husbands are often responsible for housing costs, whereas women often deal with food, clothing, and daily household expenditure.

There is other empirical evidence that there is a division of decision-making between partners: Engel, Blackwell & Miniard (1993: p. 174) present evidence on the relative influence of husbands and wives, in the form of a triangular diagram - the three vertices being `wife dominant', `joint', and `husband dominant' (this diagram being based on earlier work by Davie and Rigaux: see Engel, Blackwell & Miniard, 1993: p. 176). The diagram indicates that lawn-mowers are generally "husband dominant" decisions, whereas refrigerators, television sets, stereo audio equipment and cars are more "joint" decisions. Schiffman & Kanuk (1994: p. 357) reports that the choice of purchase of a car has remained a predominantly husband-dominated decision since the 1950s (at least).

The question of division of decision-making complicates this thesis: rather than just seeking to know how `powerful' a wife is, we need to know to which dimensions her power extends. In order to keep this thesis within manageable limits, I will focus on the dimension of time-saving durable goods purchase, and ignore other dimensions of wives' power.

3.8 SUMMARY

I now wish to highlight some key elements of this chapter. I have reported evidence that most domestic work is done by women rather than men (in both India and the UK); women have made progress in persuading their husbands to take on a share of domestic work, but the burden still falls mainly on the wife, even when she and her husband are both employed full-time. This may be a result of cultural forces and social norms (which change slowly); but households do not appear to behave according to conventional economic analysis (Hardesty & Bokemeier, 1989: p. 254). Attitudes to roles of men and women may be "mediating factors between resources and the division of household labor", where `resources' refers to attributes each spouse brings to the marriage, such as education and earnings (Hardesty & Bokemeier, 1989: p. 257).

Domestic work is thought by social scientists to be hard work, and unpleasant to carry out; and most (but not all) writers suggest that ownership of time-saving durables can considerably improve the lives of women. It appears from section 3.6 that women do wish to own time-saving durable goods. Indeed, Oakley (1982; p. 171) wrote "it is the washing machine, not the vote, which is the true liberator of women". Yet, several commentators have expressed surprise that many women have few (or no) devices to ease the domestic workload. Why is it that some households own time-saving goods, whereas other households are not? This is the subject of the remainder of this thesis.

The above discussion outlines some of the influences on women's employment. it may be helpful to examine the **causes** of women's employment, if we wish to understand the **effects** of their employment. It is not always easy to distinguish cause from effect:

> "an increase in the value of a mother's time may induce her to enter the labour force and spend less time cooking by using pre-cooked foods and less time on child-care by using nurseries, camps or baby-sitters."
>
> (Becker, 1965: p. 514).

Becker implies that women's employment depends on the price of her time: this complicates the cause and effect model in Becker's work, in which a wife's price-of-time depends on her wage-rate. Most studies discussed in this thesis treat women's employment as `cause', and spending on time-saving goods as `effect'; but I hope to show in chapter 9 that this separation into cause and effect oversimplifies the way households behave.

CHAPTER 4

METHODOLOGY

4.1 INTRODUCTION

This chapter outlines one of the two methodologies used in this thesis: `dramatrix' tables. I do not discuss the other methodology (logit regression) in this chapter, as it is standard in econometrics: the reader is referred to Greene (1990) for details. Both techniques have advantages and disadvantages, which I discuss in this chapter.

Sections 4.2 to 4.5 introduce various alternative methods of studying the ownership levels of several durable goods at once. In section 4.3, I outline the `ordering' technique associated with Ben Fine, which is based on production of dramatrices: this methodology is not widely-used in economics, so I explain in some detail the rationale behind the dramatrix approach. Section 4.4 discusses how to interpret a dramatrix. In section 4.5, I report my own attempts to develop confidence intervals for the `ordering' methodology.

In section 4.6, I suggest that the two methodologies used in this thesis (logit regression, and the `ordering' technique) can be used together, and that these methods complement each other.

4.2 ANALYSIS OF SEVERAL DURABLES AS A GROUP

In principle, regression techniques could be used to consider demand for several durable goods at once. For example, the `Almost Ideal Demand System' (A.I.D.S.) system considers spending on a number of items, and the regression coefficients for all spending items are estimated simultaneously. However, there is a serious problem: the A.I.D.S. methodology assumes that price data are available for the spending categories being studied, but price data are not generally available for individual durable goods. Researchers studying broad classes of spending can often use price indices produced by governments, and an index on `durable household goods' prices is available (CSO, 1994: table 18.7). However, it is more difficult to obtain prices for individual durable goods, and the price of a microwave oven (for example) may fall as a mass market develops. Prices of durable goods often vary widely, due to quality differences, etc: Cramer (cited in Pyatt, 1964: p. 122) reported that prices paid for durable goods are an increasing function of wealth, which is consistent with the idea that richer households buy better quality goods. In addition, durable goods often improve over time due to technological advances, and this is likely to be reflected in prices. Hence, the A.I.D.S. system cannot be applied in this field; `mainstream' economists limit their analysis to the study of one durable at a time. The use of a `social choice' framework is a method of studying ownership of the ownership of a durable good *relative to other durable goods*. Some `social choice' approaches are examined in the remainder of this chapter.

THE POINT CORRELATION MATRIX APPROACH

This subsection assesses one methodology which can be used to estimate the `order of acquisition' of a group of durable goods, based on correlation coefficients. The method is to define a variable for durable good *i* which has a value of one for each household owning good *i*, or zero for non-owning household. This is repeated for another good *j*. The value of the Pearson correlation coefficient between good *i* and good *j* (r_{ij}) is calculated for each pair of durables - this is known as the `point correlation matrix'. The point correlation coefficient approach can be used to assess whether or not an `order of acquisition' is common to most or all members of a population. If the point correlation matrix is a `simplex' matrix, then the population is said to have a general order of

acquisition. A matrix is classified as a `simplex' matrix if it is possible to find a set of numbers $d_1, d_2, \ldots d_k$ such that $r_{ij} = d_i/d_j$ for each i and j (see Paroush, 1965: p. 229).

`PRIORITY PATTERNS' APPROACH

The next methodology studied here was pioneered by Pyatt (1964), and developed by Hebden and Pickering (1974). Pyatt develops a framework to assess the priority patterns of ownership of a set of durable goods. Pyatt's approach is to assess the probability that a household which owns a certain combination of durables will purchase a particular durable (not already owned) from the set. If there are k durable goods under consideration, then Pyatt's approach is to estimate a k by k matrix of probabilities, referred to as **P*** which can be estimated empirically. An element p_{ij} of matrix **P*** is defined by Pyatt as the probability that durable i is the j^{th} durable to be acquired by the household. Note, however, that Hebden and Pickering (who use Pyatt's methodology) disagree about this interpretation of p_{ij} on the grounds that in empirical work, it is possible for p_{ij} to be negative (which is impossible for a probability). Hebden and Pickering (1974, p. 76; 86) suggest that a negative `probability' might be observed because some households discard (or fail to replace) a durable which is thought inferior to an alternative good - for example, a black-and-white television might be thought inferior to a colour television; or a negative `probability' estimate might be due to errors in estimating a coefficient (perhaps due to a small sample).

Pyatt defines the index $E([i])$ (where $[i]$ indicates the i^{th} member of the set of durables under consideration). Pyatt's claim is that small values of $E([i])$ indicates that good $[i]$ has a high priority in the population. In general, $E(i) < E(j)$ implies that good i is given a higher priority than j (Pyatt, 1964: p. 25). Assuming there are k durables under consideration, the definition of $E([i])$ is

$$E([i]) = \sum_{j=1}^{k} (j\ p_{ij}) \qquad \textbf{[4A]}$$

This approach is used empirically both by Pyatt (1964) and by Hebden & Pickering (1974).

A criticism of the above approach developed by Fine (1983: pp. 247-8) is based on the mathematical model underlying the approach. Here, I use $p_{i|j}$ to indicate the probability that a household which owns j goods will buy good i next (confusingly, Fine uses p_{ij} which is different to that used by Pyatt, and Hebden & Pickering). Fine starts with equation **[4A]** above, to find $E(i)$ in terms of $p_{i|j}$ to obtain:

$$E(i) = -\sum_{j=1}^{k-1} (p_{i|j}) + k \qquad \textbf{[4B]}$$

Expanding the summation, we obtain:

$$E(i) = - p_{i|1} - p_{i|2} \quad \ldots \quad - p_{i|k-1} + k \qquad \textbf{[4C]}$$

In the above equation, $p_{i|j}$ is interpreted as the number of households which own j goods including good i, expressed as a proportion of all households owning j durables. Fine denotes the number of households which own j goods including good i by P_{ij} and the number of households which own j durables by n_j so that $p_{i|j} = (P_{ij}/n_j)$. Focusing on the first two terms in equation **[4C]** gives:

$$E(i) = - \frac{P_{i1}}{n_1} - \frac{P_{i2}}{n_2} - \ldots \qquad \textbf{[4D]}$$

Imagine that one household in group n_2 (which does not own good i) now purchases good i, without any other changes taking place in the population. Hence, this household changes from group n_2 to group n_1 so that the size of the first group falls to (n_2-1), whilst the second group increases to (n_1+1). In addition, P_{i1} increases by one, whereas P_{i2} remains the same (because previously, the changing household did not own good i). The value of Pyatt's index becomes

$$E(i) = - \frac{P_{i1}+1}{n_1+1} - \frac{P_{i2}}{n_2-1} - \ldots \qquad \textbf{[4E]}$$

(where all terms other than the first two are unchanged). Note that there is a mistake in Fine (1983: p. 248), in that the second term is given as $(P_{i2}-1)/(n_2-1)$ rather than $(P_{i2})/(n_2-1)$ - but this does not alter the force of Fine's argument. Fine (1983) then asks us to consider whether the value of index $E(i)$ increases or decreases, as a result of one household having bought good i. If n_2 is large and n_1 small, then $E(i)$ might decrease: this would mean that good i could fall in the `order of

acquisition', despite the fact that the ownership of good *i* has increased. This is an undesirable property of the approach pioneered by Pyatt, which Fine refers to as a breach of the `monotonicity' assumption. Note, however, that Fine offers no evidence that this characteristic is likely to be important in empirical work.

The above discussion suggests that Pyatt's approach is not ideal. Another criticism of Pyatt's approach is that it does not provide a rigorous measure of when an observed behaviour pattern is, or is not, an `order of acquisition' which is common in a society (except in the extreme case where all households display the same order, which I have not observed in either UK or urban India survey data). It is possible to use the Guttman coefficient of reproducibility in conjunction with Pyatt's approach, but neither Pyatt (1964) nor Hebden and Pickering (1974) do so.

A third area of criticism of the Pyatt approach is that discussed in Hebden & Pickering (1974): the practical problems of estimating the coefficients. Hebden & Pickering point out that in empirical work (especially in small samples), it may be impossible to estimate some coefficients - if, for example, no household owns more than *(k-2)* of the *k* durables. Hebden & Pickering suggest two alternative methods of giving values to the undefined coefficients (called `extrapolation' and `scaling up'), but report that "Neither method is entirely satisfactory in all situations" (Hebden & Pickering, 1974: p. 93).

4.3 THE `ORDERING' METHODOLOGY: THE DRAMATRIX

I now turn to the second approach used in this thesis (the first being logit regression). This second methodology is associated with the work of Ben Fine, and I refer to it here as the `ordering' method. It is based on the `Borda rule', which is explained below.

THE BORDA RULE APPROACH

Empirical work by Fine et al (1992a to 1992e) is based on the mathematical model developed by Borda, and is described in Fine (1983). The Fine et al approach is in turn based on the `Borda rule', which Fine (1983) claims has a number of "intuitively appealing" properties.

The Borda method is to examine the proportion of a population which owns good i. The most widely-owned durable is given the Borda score of $(k-1)$, where k is the number of durables in the list; the second most widely-owned good in the list is given the Borda score $(k-2)$; and so on. Hence, the least widely-owned good is given a Borda score of zero. When a number of durables are equally widely-owned, the Borda scores are equal: "the points are shared" (Fine, 1983: p. 242). This suggests that if two goods share i^{th} place from a list of k goods, then each good will be given a Borda score of $((k-i) + (k-i-1))/2 = (k-i-½)$. On the other hand, Fine et al (1992a to 1992e) used a slightly different approach: when two (or more) goods are equally widely owned, both goods are given the Borda score $(k-i)$. It is not clear if this difference is important empirically.

4.4 INTERPRETING A DRAMATRIX

In order to help the reader to make sense of the dramatrix evidence I report in this thesis, I include dramatrix **4<1>** below, which is a copy of dramatrix **8<9>** (from chapter 8). For more details of the data used to create this dramatrix, see chapter 6.

DRAMATRIX 4<1> (copy of dramatrix 8<9>, to explain the dramatrix methodology)

	GP1	GP2	GP3
% ownership	*54.6*	*74.0*	*59.4*
REFRIGERATOR	0	0	0
WASHING-MACHINE	-2	0	0
TELEPHONE	0	0	-1
DEEP-FREEZER	-1	0	1
CENTRAL HEATING	3	0	0
VIDEO	0	0	0
FIRST CAR	0	0	-2
MICROWAVE OVEN	0	0	1
TUMBLE-DRIER	-1	0	1
CD-PLAYER	1	0	0
SECOND CAR	-1	0	-1
DISHWASHER	1	0	1
Pop uniformity	977	977	977
Subgroup uniformity	1331	893	1078
Conformity	1440	893	1168
Sample size	**1618**	**18657**	**2612**

VALUES FOR HOUSEHOLD TYPE:
GP1 single man, or male single parent
GP2 couple, with or without children
GP3 single woman, or female single parent

The top line of dramatrix **4<1>** indicates the contents of each column: household groups GP1, GP2, and GP3 are explained at the bottom of the dramatrix. The next row of the dramatrix tells us the average ownership levels of the twelve durable goods, in each of the three household groups.

The main evidence in dramatrix **4<1>** is in the next twelve rows (one row for each durable good). Consider the order of durables: they are arranged from most-frequently owned (REFRIGERATOR) at the top of the table, down to least-frequently owned (DISHWASHER), based on the frequencies of ownership of the entire sample (i.e. all three columns). The middle column of the above dramatrix is for couples (with or without children); each number in this column is a zero, which tells us that there is no difference between the priority of couples and the priority of the whole sample (we should not

read too much into this: it reflects the fact that almost the entire sample consists of couple households). For the right-hand column of dramatrix **4<1>**, the numbers are not all zero: the number on the third row is -1, which tells us that TELEPHONE has a lower priority in households containing a single woman (with or without children). Similarly, the number 1 in the fourth row of the right-hand column tells us that DEEP-FREEZERS are a higher priority in single-woman households. We can use these numbers to reconstruct the original order of priority for each of these three groups, which I report in table **4<2>** below:

TABLE 4<2>: order of priorities in three household types, derived from dramatrix 4<1>

GP1	GP2	GP3
REFRIGERATOR	REFRIGERATOR	REFRIGERATOR
CENTRAL HEATING	WASHING-MACHINE	WASHING-MACHINE
TELEPHONE	TELEPHONE	DEEP-FREEZER
WASHING-MACHINE	DEEP-FREEZER	TELEPHONE
DEEP-FREEZER	CENTRAL HEATING	CENTRAL HEATING
VIDEO	VIDEO	VIDEO
FIRST CAR	FIRST CAR	MICROWAVE OVEN
MICROWAVE OVEN	MICROWAVE OVEN	TUMBLE-DRIER
CD-PLAYER	TUMBLE-DRIER	FIRST CAR
TUMBLE-DRIER	CD-PLAYER	CD-PLAYER
DISHWASHER	SECOND CAR	DISHWASHER
SECOND CAR	DISHWASHER	SECOND CAR

VALUES FOR HOUSEHOLD TYPE:
GP1 single man, or male single parent
GP2 couple, with or without children
GP3 single woman, or female single parent

In a sense, we could interpret dramatrix **4<1>** as a compact method of expressing the information in table **4<2>**. We can see in table **4<2>** that second cars are less frequently owned (i.e. are a lower priority) in both the single-man and single-woman households, which is unsurprising: a couple would have more use for a second car than would a single adult. But table **4<2>** also tells us that a first car is a lower priority for single-woman households, relative to the other two columns of table **4<2>**. Chapter 8 includes more details on interpreting the above dramatrix.

In this thesis, I do not consider the evidence of the uniformity and conformity figures (at the bottom of a dramatrix), but these figures can be used to assess the extent to which a group of households share a common order of priorities, as indicated in the next section.

4.5 HOW CLOSELY DO INDIVIDUALS CONFORM TO `SOCIAL NORMS'?

Imagine all members of a population were asked which durable goods they own, out of a list of (**n**) durables. We would expect some members of the group to own more durable goods than other group members (depending on income, life-cycle stage, etc), which makes comparison of members more complicated. One solution to this is to use the methodology pioneered by Fine et al (1992a to 1992e), in which the frequency of ownership of durables by one group is compared with that of another group. The population is divided into subgroups; for each subgroup, we consider which is the most frequently-owned durable, which the next-most-frequently owned, and so on. In this way, we assign an `order of acquisition' of the **n** durable goods, on the grounds that if the subgroup has distinctive `social norms' of durable goods ownership, then each individual in the group will tend to purchase durables in the same order - this order represents the priorities of members of the group. Differences in a subgroup's `order of acquisition' are presented in a `dramatrix' (see Fine & Simister, 1995: p. 1056), as outlined in the previous section.

The evidence for a `social norm' for a subgroup appears to be stronger if we find that a subgroup has a very different `order of acquisition' to the population as a whole. We also wish to know, however, the extent to which different members of this subgroup share a common order of acquisition with each other. One aspect of the Fine et al methodology is that it attempts to explore how consistent are the members of a group: for example, it is possible to assess the extent to which all members of the working class share a set of social norms (Fine et al, 1993: pp. 130-3). This is assessed by the `***uniformity***' measure, which is defined as follows. For a group of people, we consider the `ranking' of durable goods, from a list of durables for which we have data on ownership. The frequency of ownership of the (**n**) durable goods is sorted, so that the most-frequently-owned durable is called the first durable; the second-most-frequently-owned durable is called the second durable; the third-most-frequently-owned durable is called the third durable, etc. This order is known as the `ranking' of the whole population. In order to assess how similar or different these group members are to each other, we consider one person in the group, and compare his/her order with this rank order. If the first person owns **P** durables, then the rank order offers a prediction of which **P** durables this person is likely to own. This person might own one, or two, or up to **P** of the **P** durables predicted; the <u>actual</u> number of

`predicted' durables owned by this person is called **A**. If the first person owns three durables from a list of five durables, then the value of **A** cannot be zero: the lowest ("worst") possible value of **A** is one, because the group ranking predicts which three durables will be owned, and there must be an overlap between the actual durables owned, and the predicted ownership. The lowest possible value of **A** (which depends on **P**) is known as **W**.

The above discussion considers only the first member of the group; but the logic can be generalised to other members of the group. For the i^{th} group member, I refer to **P** as $\mathbf{P}_i$; **A** as $\mathbf{A}_i$; and **W** as $\mathbf{W}_i$. Then, we can form an index, known as the *uniformity* measure:

$$uniformity = \sum_{i=1}^{i=n} \left(\frac{A_i - P_i}{W_i - P_i} \right)$$

The higher the value of the *uniformity* measure, the more consistent is the order of acquisition of durables among members of this subgroup. When considering various subgroups, Fine uses the term *subgroup uniformity* to describe how consistent is the behaviour of each subgroup (measured in the same way as *uniformity*). Fine et al (1992a to 1992e) also use the term *conformity*, which considers how closely a subgroup *conforms* to the order of acquisition of the whole group. The *conformity* measure is defined in the same way as *uniformity*, except that the rank order of the whole population is used to assess the behaviour of each subgroup.

MONTE-CARLO TESTING OF FINE'S `UNIFORMITY' MEASURE

It would be helpful to know if any observed `*uniformity*' figure is higher, or lower, than we would expect; in this way, we are able to assess whether or not the observed pattern of ownership is random, or if there is a tendency for different households to acquire durable goods in the same order. If we find a tendency for different households to own the same durables, this suggests that there are "social norms" in society. In order to assess this, `Monte-Carlo' techniques were used: due to the complex mathematics required to derive the theoretical distribution of `*uniformity*', it is difficult to predict the distribution of the

`uniformity' measure. For comparability with *GHS* 1989/90 data[3], a set of thirteen random numbers were generated using computer routines from the Numerical Algorithms Group (NAG) library (each with value zero or one), with probabilities equal to those shown in the *GHS* 1989/90 dataset below. The random data were generated as follows:

(1) In *GHS* 1989/90, 93.19% of respondents owned a television set. I created a random variable to represent television ownership, set to one (with probability .9319) or zero (with probability 1 -.9319 = .0681). The next random variable created represented the next most widely-owned durable, with a probability of .8648 of equalling one; for the third random variable, the probability of equalling one was .8606; and so on, until thirteen random values were generated.

(2) Process (1) was repeated 10623 times (this sample size was chosen for comparability with *GHS* 1989/90 data). This produced a set of random data, consisting of 13 columns and 10623 rows of numbers (each number zero or one); this was saved as a file.

(3) The random data were analyzed using the methodology developed by Fine & Simister (1995: pp. 1054-5), to find the population *uniformity* of this random data. This estimate of the *uniformity* was written to a second file, called `distrib'.

(4) Steps 1 to 3 were repeated, and the answer written to the `distrib' results file, a total of 3,000 times.

The processes (1) to (4) above produced a large `distrib' file, containing 3000 values of the population *uniformity*. The data in the `distrib' file were analyzed using SPSS, to find the mean value of the *uniformity* figure; this was found to be 1.557, so the above figure for *GHS* 1989/90 (0.0947) appears to be surprisingly low. We can also use the random data to carry out a test for statistical significance: to test the hypothesis that the *uniformity* is lower than would be expected for *GHS* 1989/90, the distribution of (random) *uniformity* estimates in the `distrib' file was divided into percentiles. It was found that 99% of the *uniformity* estimates were above 1.5320, which confirms this hypothesis. Hence we can be confident (at the 99% confidence level) that the *GHS* 1989 *uniformity* figure is lower than expected, which supports the claim by Fine et al (1993) that there are "norms" of durable goods ownership.

[3] At the time of carrying out the Monte Carlo experiments, I intended to use *GHS* data for this thesis; I subsequently discovered that *FES* data would allow me to observe a longer time-span, so I use *FES* (not *GHS*) data for the rest of this thesis. I created random data to be comparable with *GHS* 1989/90 data, because this was the latest *GHS* dataset available at that time.

The above technique was also used to assess movements of subgroups relative to the larger group. Using the steps (1) to (4) above (to be comparable with *GHS* 1989/90), data to simulate durable goods ownership were generated artificially. A random number was generated, with a value equal to either 0 (with probability 0.5) or 1 (with probability 0.5); this random number was used to subdivide the artificially-generated sample into two equal-sized subgroups, and the order of acquisition of both subgroups was calculated. This was compared with the order for the whole group, and a table of relative movements was generated (in the same way as is done with *GHS* data: see below). The resulting table was then comparable with a `dramatrix' table for *GHS* 1989/90 data in which there were two equally-sized subgroups. I consider the evidence from the random data to be quite clear: there were no instances in this random data for which either subgroup had a different order of acquisition to the whole group. This indicates that for a two-column table with equal numbers of people in each column, any deviation of a subgroup`s order from that of the whole group is statistically significant (at the 99% level). Unfortunately, it is not clear how far we can generalise this finding: there may be a case for extending this research, so we can apply statistical significance tests more widely.

THE GUTTMAN COEFFICIENT OF REPRODUCIBILITY

Some researchers using `order of acquisition' methods have used the Guttman `Coefficient of Reproducibility' index, known as *Rep.* (see Paroush, 1965: p. 228), although it is not used in most such studies (e.g. Hebden & Pickering, 1974). The Guttman index is defined as

$$Rep. = 1 - \frac{\sum_{i=1}^{i=I} (N_i S_i)}{k \sum_{i=1}^{i=I} (N_i)} \qquad \textbf{[4H]}$$

where each household containing i goods is compared with the most frequently-owned i goods, and S_i is the number of deviations from the set i where a `deviation' is defined as the minimum number of changes required in the most popular order of acquisition in order to make it match the ownership observed in one household; this number of deviations is summed

over all households. N_i is the number of consumers in set *i*. Note that the *Rep.* measure is equivalent to the conformity measure in the Fine et al approach (Fine & Simister, 1995: p. 1054); I report the conformity figure for all dramatrices presented in this thesis.

GROUPS OF DURABLES: INFORMATION FOR DIFFERENT YEARS

The problem of which durables to include, and for which years, has a different effect on dramatrices to regression analysis. We only need data on one durable in a given year to be able to carry out regression analysis; but the dramatrix approach requires us to compare a **group** of durables. In creating a dramatrix from data for different years, it is necessary to choose a group of durables for which data are available for each chosen year. When deciding which durables to include in the group, there is a trade-off between studying more durables (which may reveal more differences in priorities), versus using more years' data (which should increase the reliability of results by increasing the sample-size, but may require a durable to be dropped from the group because it was not included in a survey in one year). In order to simplify comparisons between regression and dramatrix results, I use the same year-groups for dramatrices as I do for regression (see section 6.4).

4.6 SUMMARY: TWO COMPLEMENTARY METHODOLOGIES

This chapter has examined alternative approaches to studying ownership of household durable goods. Many economists study each durable good separately, to examine the effects of several variables on ownership of a particular durable good (often using logit/probit regression). This approach is founded on well-developed statistical theory, and it is relatively straightforward to assess whether or not a regression coefficient is statistically significant. There are, however, drawbacks with this approach: it is generally agreed that it is important to control for household incomes in such analysis, but it is difficult to do so in practice (see, for example, discussion of the `Permanent Income Hypothesis' in section 2.2 above).

There are a number of alternatives to studying one durable good in isolation. By examining ownership of a set of durable goods within a population, we are able to assess the priorities of the population: which good is generally bought first, which second, and so on. There are different methods of determining the `order of acquisition': this chapter has examined three such methods, namely Pyatt's `Priority Patterns'; the point correlation approach; and the Borda rule, used by Fine et al (1992a to 1992e). All of these approaches share a common weakness: there is no universally accepted method of assessing the extent to which a population holds a common order of acquisition. Various attempts have been made, several of which have been examined above (such as Guttman's `Coefficient of Reproducibility'; the simplex test applied to a point-correlation matrix; and the `uniformity' measure reported in Fine & Simister (1995). Each of these measures has been used in empirical work.

The logit/probit approach used by Piachaud and others (see section 8.3) allows the researcher to assess the statistical significance of each coefficient; hence, it is possible to report whether or not a variable appears to influence the ownership of a durable good. But approaches which consider a number of durables simultaneously help us to isolate the effects of income on durables ownership. This chapter has discussed problems with the alternative approaches. In particular, the study of one durable in isolation requires the researcher to control for difference in household income, which is difficult in practice: this is a particular problem for the study of the effects of women's employment (which will tend to raise a household's income). The use of `order of acquisition' methods not based

on the Borda rule have been criticised by Fine (1983) on the grounds that they can have undesirable properties.

There are advantages to the `ordering' technique, in avoiding some practical problems of regression: in particular, the question of which control variables to include in the regression equation. Several of the problems with regression (such as simultaneous equations bias and endogeneity) do not apply to the `ordering' technique of Fine et al. In regression estimates discussed below, I examine the sign and size of the coefficient on women's employment, after controlling for certain `relevant' variables; but which control variables should be included? In a sense, the ordering approach is intrinsically controlling for total household income, because it examines the **priorities** of types of households, and makes differences in household priorities apparent.

The remainder of this thesis uses both logit regression, and the Fine et al approach (reporting dramatrices, and utilising the Borda rule). This chapter has demonstrated that the Borda rule approach has advantages over alternative approaches; the fact that the dramatrix approach has been used empirically by previous researchers to study the effects of women's employment (Fine et al, 1992a to 1992e) suggests that it may be a promising method for the topic of this thesis.

PROBLEMS COMMON TO BOTH METHODOLOGIES

The above comments suggest that regression and the `ordering' methodology complement each other. However, the reader should be aware that some problems apply to both methodologies. For example, consider the timing of survey data-collection: survey data indicate the ownership of durable goods at the time of interview, but a durable may have been bought years' earlier:

> "a woman's current employment status should not be confused with her status at the time in which the durable was purchased (often many years prior to the survey)".
>
> (Oropesa, 1993: p. 575).

This argument suggests that we should study non-durables rather than durable goods; but these, too, have problems - for example, higher expenditure might be associated with higher quality (such as conspicuous

consumption) rather than a greater priority for time-saving. In principle, *BHPS* panel data could be used for this purpose, in that it indicates if a household bought a durable good in the last year; but in practice, limiting the *BHPS* sample to new purchasers would reduce the sample-size too much to be reliable. I follow most previous research, in assuming that this problem can be ignored in practice.

CHAPTER 5

MATHEMATICAL MODEL

5.1 OVERVIEW

This chapter develops a mathematical model of household behaviour, as the basis for subsequent empirical work. As with any economic model, there is a trade-off between developing a more complicated model (which may reflect reality more accurately) and keeping the mathematics relatively simple. A complex model may distract us from practical issues, such as whether or not the model can be used to make predictions. And, as in any model, unrealistic assumptions may lead to misleading results.

This model analyses a two-adult household; each household is assumed to be a married couple, with or without children. The couple is currently a heterosexual couple who are married or cohabiting; but there is a possibility that the couple may divorce/separate at any time in the future, which would lead to the two adults living separately from each other.

5.2 STAGES OF DECISION-MAKING

Like many models in this field (such as Barnett, 1979: p. 542, and Chiuri & Simmons, 1997: p. 381), this model assumes that households make decisions in two stages:

> **stage I**:
> the couple chooses how many children to have, and also how much paid work each will do (taking into account factors such as the availability of paid work, and local wage-rates). Husband and wife also decide on a system to allocate domestic work, as explained below.
>
> **stage II**:
> In the light of the above decisions, the household divides its available income into three categories:
> "Basics" such as food and rent, B;
> "Time-saving" goods and services, S;
> "Luxury" goods and services, L.

This model does not attempt to examine **stage I**: these decisions are assumed to be exogenous to this model. It would be easy to criticise this assumption of exogeneity: for example, it has been claimed that women's domestic work commitments often prevent them taking paid work (Gershuny & Robinson, 1988: p. 537). This restriction is needed to produce a model which can be solved - modelling **stage II** alone is complicated, as can be seen below. I do not suggest that there need be any delay between **stage I** and **stage II**: but when a household is deciding how to allocate money between "time-saving" goods and "luxury" goods, it will take factors such as the number of children as pre-determined (note that this may include making allowances for children which the couple intend to have in the future).

Household spending is limited by the budget constraint, which can be written as

$$B + S + L = E \qquad \textbf{[5A]}$$

where E is the combined weekly net earnings of husband and wife; it is assumed that unearned income is insignificant. It is also assumed that households cannot save or borrow. Spending on leisure is a "public good" within the household, in that leisure spending increases utility for all household members: this seems reasonable for goods such as television sets, but is a rather severe restriction for non-durables (for example, it implies that no household member goes on holiday without every other member of the household being present, or having a holiday of equal cost).

The decision for the household at **stage II** is how to choose the optimal level of time-saving goods and services *S*: such spending will tend to increase the utility of both adults, by giving more free time *F* which is divided between husband and wife. Because of limited income, each household faces a trade-off between spending more on time-saving goods (to obtain more free time), or spending more on "luxury" goods *L*. If a simple linear utility function were used, then households would spend all available money (after spending on "basics") on either "luxuries" or "time-saving" goods, depending on the relative values of luxury goods and leisure time - but my analysis of survey data in both the UK and India suggest that this is not a realistic assumption: a more plausible model would predict that each household will buy some "luxuries" and some "time-saving" goods. This property will follow if the utility function has the property of `diminishing marginal returns', in that the rate at which utility increases from each extra unit received tends to decline as more of that item is obtained: for example, the first hour of leisure time is valued highly, whereas each subsequent hour of leisure is of less value to the person. Hence the utility function of a household member used here is based on logarithms, as follows:

$$U = a + b.Ln(\text{free time}) + c.Ln(\text{spending on luxuries}) \qquad \textbf{[5B]}$$

In the utility function **[5B]** above, *a* and *b* and *c* are constants, and *Ln()* indicates natural logarithm (written as $LOG_e()$ by some writers). This logarithmic utility function has diminishing marginal returns to both time and luxury goods: this can be shown formally by considering the first (partial) derivative of *U* with respect to free time:

UTILITY PROVIDED BY ANOTHER HOUR OF LEISURE TIME:

$$\frac{\partial U}{\partial\ (free\ time)} = \frac{b}{free\ time} \qquad \textbf{[5C]}$$

The above equation indicates that as free time increases, the marginal utility from each extra hour declines. A similar analysis applies to the marginal utility of "luxuries" spending. Using this utility function, household spending will normally be greater than zero for both leisure and "luxuries"; indeed, this desirable property is a necessary assumption with this utility function, because the logarithm of zero is not defined. Hence it is also necessary to assume that the household income is (at least slightly) above the level needed to provide the "basics". It should be

noted that this "basic" expenditure is unknown; I assume it is constant for each household with a given number of children, but some writers have suggested that perceptions of what is "necessary" is influenced by cultural pressures: for example,

> "A poverty line is necessarily defined in relation to social conventions and the contemporary living standards of a particular society, and in this way somebody in the United States may be adjudged poor even though he has a higher income than the average person in India."
>
> (Atkinson, 1975: p. 186).

For this thesis, I do not need to measure the household's expenditures on "basics" or "luxuries", as will be explained below. Nevertheless, the reader should be aware that classifying goods as "time-saving" or not "time-saving" is also open to dispute: for example, Piachaud (1982) appears to analyze car ownership as a time-saving good, when others might consider a car to be mainly bought as a status good.

5.3 PAID WORK, UNPAID WORK, AND LEISURE

Housework, in this model, refers to time spent on all unpaid tasks which are needed to maintain the household - such as cooking, cleaning, and (where applicable) childcare. I use D to represent the number of hours of unpaid domestic work (per week) by husband and wife combined. P_h and P_w represent the number of hours of paid work, per week, carried out by husband and wife respectively. I use M to represent the maximum time available to each person in a week: it is the number of hours in a week (168) minus the number of hours needed for that person's survival (sleep, eating, and so on). This model is restricted to two-adult households, in order to simplify the analysis: households containing two parents with their offspring would be included if the offspring are aged under 16, but at 16 or older the children may earn a significant fraction of household income (and hence might be expected to influence household expenditure patterns). Hence, $2M$ is the time equivalent to total income in the budget constraint: the total amount of paid and unpaid work, and leisure, for husband and wife combined, must be limited as follows:

$$M + M = P_h + P_w + D + F_h + F_w$$

And the above equation tells us the total amount of leisure time for husband and wife combined:

$$F_h + F_w = 2M - P_h - P_w - D \qquad \textbf{[5D]}$$

In order to develop a testable model, I must make assumptions about how housework and leisure are allocated between husband and wife. It seems plausible that the amount of domestic work done by each partner is influenced by the amount of paid work each one does: for example, in the Indian context, it has been claimed that

> "households attempt to equalize substantially the internal distribution of work effort among their members [..] a model that analyzes time allocation decisions only at the individual level will yield misleading results since it fails to capture the intrahousehold distributional responses that seem to be extremely important."
>
> (Behrman & Deolalikar, 1993: p. 419).

There is evidence (from several countries) that in most households, wives do more housework than husbands, but that most husbands do some paid work - see Gershuny (1983, p. 153), Gershuny et al (1986, p. 29), James (1995, pp. 281-2), and Wheelock (1990: p. 101) for the UK; and for India, see

Agarwal (1988, p. 180), Khanna & Varghese (1978: p. 41), and Ramu (1987: p. 913). There is also evidence that when a wife obtains paid work, she tends to cut down the time she spends on housework, and husbands tend to do more domestic work - see Kiernan (1992: p. 103) for the UK; and Khanna & Varghese (1978: p. 41), and Ramu (1987: p. 913), for India. The same pattern has also been reported for other countries - see Williams & Donath (1994: p. 439) for Australia; Hessing (1994: p. 629) for Canada; and Brines (1993: pp. 312-3) and Manke et al (1994: p. 657) for the USA. However, it should be noted that some writers, including Wheelock (1990: p. 101) for the UK, suggest that husbands do <u>not</u> usually increase their domestic work if their wife takes paid employment. I suggest that this apparent contradiction in the evidence may be because the increase in husbands' housework resulting from wives' employment is small (this comment has been made by several of the writers referred to in this paragraph), and hence may not be detected in small-scale studies such as the sociological studies considered by Wheelock (1990, p. 101). To summarise, this model assumes that husband and wife share domestic tasks, taking into account the amount of paid work each one does, so that the husband always receives part (but not all) of the leisure time available to the couple.

I adopt a simple model, which could explain why husbands take on more domestic work when their wives take paid work: I assume that husband and wife see the total amount of leisure time (F) available to both of them as a resource, which they share - but they may not share it equally. To allow the possibility of inequality between husband and wife, I assume that the husband receives a constant fraction θ of free time, for every household; hence the amount of free time for the wife will be a fraction $(1-\theta)$ of the total leisure time available to the couple. Using equation **[5D]** above, the amounts of free time available to the husband and wife are given by:

$$\text{HUSBAND:} \quad F_h = \theta (F_h + F_w) = \theta (2M - P_h - P_w - D) \qquad \textbf{[5E]}$$

$$\text{WIFE:} \quad F_w = (1-\theta)(2M - P_h - P_w - D)$$

Note that the fraction θ might be modelled as an outcome of bargaining between husband and wife; but I assume here that it is the same for every household.

5.4 NASH BARGAINING

This model is intended to predict the level of spending on time-saving goods/services in a household. Like most of the economic models explored in this thesis, I base the model on the assumption of `rational' economic behaviour: in particular, on the idea that husband and wife have conflict of interest, in that each wishes to have more leisure time and leisure spending for themself. Like many such models, I base this on analysis of the `marriage surplus' (the sum of benefits to husband and wife from being married: see section 2.4 above). The distribution of this surplus is the central difference between different models of household behaviour: in Becker's model, the allocation of the `marriage surplus' is divided between husband and wife according to the `marriage market' (see section 2.3). In this chapter, I adopt the Nash bargaining approach, which is often used in `bargaining' models (outlined in Manser & Brown, 1980: p. 38; Canning, 1992: p. 878; and Ermisch, 1993, p. 356); in many cases, "the Nash model provides a natural framework for analyzing the joint decisions of household formation and intrahousehold allocations" (McElroy, 1990: p. 577). However, the reader should be aware that assuming Nash bargaining may prevent us from understanding the way households bargain in practice. For example, the Nash bargaining assumption assumes that any two married couples with identical demographic and income situations would always arrive at the same `bargain'. The Nash approach is not the only solution which has been used in this research field: for example, the Lindahl solution is described in Chiuri & Simmons (1997). However, there are reasons why Nash bargaining is so widely adopted in economic bargaining models: David Canning claims that if both players are `rational' (playing the best replies to their partner's choices), and have `complete' algorithms (their thought-processes can react to every situation they may face), then the game will always produce a Nash equilibrium (Canning, 1992: p. 877). I will return to this issue in the conclusion to this chapter.

The Nash solution to such "games" uses the concept of a `reservation utility', which is the outcome if the two `players' cannot agree to a solution. In the case of this model, the reservation utility is defined as the expected level of utility of each spouse after a divorce (the preferences of children are ignored in this model). Under the Nash bargaining model, it is assumed that households maximise the Nash function **N** defined as

$$\mathbf{N} = [U_h - U_h'].[U_w - U_w''] \qquad \textbf{[5F]}$$

where U_h and U_w are the levels of utility experienced by husband and wife within the marriage; and the equivalent utilities if a divorce occurs are denoted by U_h' and U_w'' respectively. The Nash analysis of bargaining behaviour assumes that each household maximises the above function N, by choosing the optimal level of spending on time-saving goods/services S and on leisure goods/services L (spending on these two are linked by the budget constraint). The utility function outlined in equation **[5B]** above can now be simplified by removing the a term, because this enters in both U_h and U_h' and hence will cancel out (and likewise for U_w and U_w''). This gives:

$$U = b.Ln(\text{free time}) + c.Ln(\text{spending on luxuries})$$

so $$U_h = b.Ln(\theta(2M - P_h - P_w - D)) + c.Ln(L) \qquad \textbf{[5G]}$$

5.5 TIME-SAVING EXPENDITURE

This model assumes that the total time spent on domestic work (by husband and wife combined) will fall by a constant number of hours (t) for each £1 spent on time-saving goods and services - the simplest model we could adopt. Hence the total leisure time available to the couple will increase by tS hours per week, which must be included in the above utility function. Clearly, the time spent completing domestic tasks cannot be negative, so we must assume that S does not exceed (D/t) for any household. From equation **[5G]**, the husband's utility function becomes:

$$U_h = b.Ln(\theta(2M - P_h - P_w - (D - tS))) + c.Ln(L)$$

and we can now substitute S in terms of L from the budget constraint in equation **[5A]** above:

$$S = E - B - L$$

This gives the value of the husband's utility function as:

$$U_h = b.Ln(\theta(2M - P_h - P_w - D + t[E - B - L])) + c.Ln(L)$$

so $$U_h = b.Ln(\theta(2M - P_h - P_w - D + t[E - B] - tL)) + c.Ln(L)$$

to simplify the algebra, I combine several exogenous variables into one (unknown) factor τ as follows:

$$\tau = 2M - P_h - P_w - D + t[E - B]$$

so the husband's utility level is given by

$$U_h = b.Ln(\theta(\tau - tL)) + c.Ln(L)$$

$$= b.Ln(\theta) + b.Ln(\tau - tL) + c.Ln(L) \qquad \textbf{[5H]}$$

Similarly, the wife's utility function (whilst married) is given by

$$U_w = b.Ln(1-\theta) + b.Ln(\tau - tL) + c.Ln(L) \qquad \textbf{[5I]}$$

The expressions for husband's and wife's utilities in equations **[5H]** and **[5I]** above can be substituted into equation **[5F]** above; hence the Nash function **N** is given by

$$\mathbf{N} = [b.Ln(\theta) + b.Ln(\tau - tL) + c.Ln(L) - U_h'].[b.Ln(1-\theta) + b.Ln(\tau - tL) + c.Ln(L) - U_w'']$$

Separating the terms in L from the terms which are exogenous to the model, this becomes:

$$\mathbf{N} = [b.Ln(\tau - tL) + c.Ln(L) + b.Ln(\theta) - U_h'].[b.Ln(\tau - tL) + c.Ln(L) + b.Ln(1-\theta) - U_w''] \qquad \textbf{[5J]}$$

Now focusing on the common factor $[b.Ln(\tau - tL) + c.Ln(L)]$ and multiplying the first bracket by the second, leads to:

$$\begin{aligned}\mathbf{N} = \; & [b.Ln(\tau - tL) + c.Ln(L)]^2 \\ & + [b.Ln(\tau - tL) + c.Ln(L)].[b.Ln(\theta) - U_h' + b.Ln(1-\theta) - U_w''] \\ & + [b.Ln(\theta) - U_h'].[b.Ln(1-\theta) - U_w'']\end{aligned}$$

The second line can be simplified by the substitution

$$\mu = [b.Ln(\theta) - U_h' + b.Ln(1-\theta) - U_w''] \qquad \textbf{[5K]}$$

to produce

$$\begin{aligned}\mathbf{N} = \; & [b.Ln(\tau - tL) + c.Ln(L)]^2 \\ & + [b.Ln(\tau - tL) + c.Ln(L)]\,\mu \\ & + [b.Ln(\theta) - U_h'].[b.Ln(1-\theta) - U_w''] \qquad \textbf{[5L]}\end{aligned}$$

This equation for **N** can now be optimised by differentiation. The only factor over which the couple have immediate control is spending on leisure goods L (spending more on L must be at the expense of spending on time-saving items). Note that several terms in equation **[5L]** may vary from one household to another (e.g. expected utility after divorce, U_h' and U_w''); but such terms can be treated as constants in this optimisation, because they are assumed here to be exogenous to a household's decision on how much to spend on luxury goods (L). Differentiating **N** with respect to L gives:

$$\frac{d\mathbf{N}}{dL} = 2[b.Ln(\tau - tL) + c.Ln(L)]\,\frac{d[b.Ln(\tau - tL) + c.Ln(L)]}{dL} + \mu\,\frac{d[b.Ln(\tau - tL) + c.Ln(L)]}{dL}$$

So regrouping terms, we obtain

$$\frac{d\mathbf{N}}{dL} = \frac{d[b.Ln(\tau - tL) + c.Ln(L)]}{dL}\{2[b.Ln(\tau - tL) + c.Ln(L)] + \mu\}$$

$$\frac{d\mathbf{N}}{dL} = [b(-t)/(\tau - tL) + c/L]\{2[b.Ln(\tau - tL) + c.Ln(L)] + \mu\}$$

$$\frac{d\mathbf{N}}{dL} = \left[\frac{-bt}{(\tau - tL)} + \frac{c}{L}\right].\{2[b.Ln(\tau - tL) + c.Ln(L)] + \mu\} \qquad \textbf{[5M]}$$

Expanding the second term in the above expression for (d**N**/dL) gives us

$$\{2[b.Ln(\tau-tL)+c.Ln(L)]+\mu\}$$
$$=\{2[b.Ln(\tau-tL)+c.Ln(L)] +[b.Ln(\theta)-U_h'+b.Ln(1-\theta)-U_w"]\}$$
$$=\{ [b.Ln(\tau-tL)+c.Ln(L)] +[b.Ln(\theta)-U_h'+[b.Ln(\tau-tL)+c.Ln(L)]+b.Ln(1-\theta)-U_w"]\}$$
$$= U_h - U_h' + U_w - U_w" \qquad \textbf{[5N]}$$

from equations **[5H]** and **[5I]** above. If this were zero, it would indicate that the total marriage surplus for husband and wife is zero - or, in other words, that the couple are indifferent whether they remain married or get divorced. This is a special case, which I do not attempt to model here: it seems unlikely that a household will remain in this situation for long, since factors such as incomes and the presence of children vary over time. The value of **[5N]** cannot be negative in this model, or the household will divorce immediately. Hence, I will assume that the second term of equation **[5M]** is strictly positive. So the optimal value of L, at which (d**N**/dL) is zero, occurs when the first term in equation **[5M]** is zero, i.e.

$$0 = \left[\frac{-bt}{(\tau-tL)} + \frac{c}{L} \right] \qquad \textbf{[5P]}$$

hence $bt/(\tau-tL) = c/L$ so $btL = \tau c - ctL$

and $L(bt+ct) = \tau c$ and $L = \tau c/(b+c)t$

which, combined with the definition of τ before equation **[5H]** above, gives

$$L = \frac{c}{(b+c)t} \{2M - P_h - P_w - D + t[E - B]\} \qquad \textbf{[5Q]}$$

In order to check that this is the <u>maximum</u> value (as opposed to the minimum or point of inflection), we must look at the second derivative of **N**:

$$\frac{d^2\mathbf{N}}{dL^2} = \frac{d}{dL}\left[\frac{-bt}{(\tau-tL)}+\frac{c}{L}\right].\{2[b.Ln(\tau-tL)+c.Ln(L)]+\mu\}$$
$$=\left[\frac{-bt}{(\tau-tL)}+\frac{c}{L}\right].2\left[\frac{-bt}{(\tau-tL)}+\frac{c}{L}\right] +(-bt4^2/(\tau-tL)^2 -c/L^2)\{2[b.Ln(\tau-tL)+c.Ln(L)]+\mu\} \qquad \textbf{[5R]}$$

The optimal value of L must be where the (partial) derivative of **N** with respect to L is zero, provided that the second-order (partial) derivative of **N** with respect to L is negative for that value of L. At the value of

L given by equation **[5Q]**, the bracket $[-bt/(\tau-tL) +c/L]$ is zero, so the first term of equation **[5R]** must be zero. The second term of equation **[5R]** must be negative, because the final term in $\{\}$ brackets is strictly positive, as explained after equation **[5N]**; and $(-bt^2/(\tau-tL)^2 -c/L^2)$ must be negative (assuming that b and c are both positive). Hence the maximum value of **N** must be obtained when L is as shown in equation **[5Q]**.

Using the budget constraint in equation **[5A]**, we can obtain an expression for time-saving goods expenditure S as follows:

$$S = E - B - L$$

$$S = E - B - \frac{c}{(b+c)t}\{2M - P_h - P_w - D + t[E - B]\}$$

so
$$S = (P_h + P_w)\left[\frac{c}{(b+c)t}\right] + (E-B)\left[\frac{b}{(b+c)}\right] + \frac{Dc}{(b+c)t} - \frac{2Mc}{(b+c)t} \qquad \textbf{[5S]}$$

This suggests that spending on time-saving goods (S) will tend to increase if total household earnings (E) rises, or if either husband or wife do more hours of paid work per week. In fact, this model predicts that one more hour of employment of the husband should have the same effect as one more hour of the wife, because of the way P_h and P_w enter the first term of **[5S]**. I refer to this as the hypothesis of `symmetry', and I assess it briefly in section 8.6 below.

It is unclear how the number of children in the household would influence S, because children would influence both the cost of basic spending (B), and the amount of domestic work (D) - the amount of housework to be done increases if there are more children, or younger children, in the household (Van der Lippe & Siegers, 1994: pp. 120-1).

5.6 APPLYING THE MODEL

In this mathematical model, husband and wife are assumed to divide leisure time between themselves, in such a way that the husband gets a fraction θ of the couple's available leisure-time. Because of the assumption of Nash bargaining, combined with a log-linear functional form for the utility function, this fraction does not influence the optimal level of spending on time-saving goods. This model suggests that such spending will be a linear function of the number of hours of paid work by husband and wife combined - spending patterns should be unaffected by whether the husband, wife, or both are employed (unless wage-rates are different, in which case total household earning E will be affected: see equation **[5S]** above). Total household earnings may influence spending on time-saving goods: the second term of equation **[5S]** increases as E rises. Similarly, the number of children in the household may influence S, but the direction is unclear.

SUMMARY

The mathematical model developed in this chapter is based on the idea that time is scarce, and that both husband and wife do some housework (although the housework is not divided evenly between them). Each partner would like to obtain more leisure time, by buying time-saving durable goods; but the household budget is limited, and time-saving goods can only be bought at the expense of "luxury" goods (such as leisure goods). It is assumed that husband and wife bargain with each other, to try to persuade their partner to accept the individual's preferred spending pattern; and that the outcome of this bargaining is a Nash equilibrium, i.e. the outcome which maximises the product of the level of utility of the two partners.

The key point of this model is that an extra hour of paid work by the husband should increase spending on time-saving goods to the same extent as an extra hour's employment for the wife: this is in contrast to the work of Piachaud (1982) and others, who assume durable goods ownership is affected by wife's employment but not by husband's employment. This mathematical model (in conjunction with the regression methodology outlined in chapter 4) will be used in table **8<8>** (chapter 8) of this thesis.

CHAPTER 6

SOURCES OF DATA USED IN THIS THESIS

6.1 INTRODUCTION

This chapter outlines the survey datasets used in this thesis, and suggests a number of datasets which may be of interest to other researchers in this field; I comment on the advantages and disadvantages of each survey. I divide datasets into UK and India, and discuss surveys in alphabetical order (within each country). The list of survey datasets in this chapter is not exhaustive; many hundreds of surveys on households and individuals have been deposited at the ESRC Data Archive (University of Essex, UK), and many of these include information on ownership of household durable goods. I discuss only the datasets which I have considered using for this thesis.

Unless indicated otherwise, the surveys below contain information on all household members (although information is sometimes obtained by proxy from a different member of the household, if one household member cannot be interviewed: for example, for the *GHS*, see OPCS, 1994: p. 149). Information is collected by face-to-face interview (often supplemented by a written self-completion questionnaire), except where noted below.

Data from the UK government surveys are Crown Copyright; these data are used by permission of the Office for National Statistics. Other surveys are also protected by copyright. For all of these surveys, researchers must obtain permission via the Data Archive at the University of Essex.

6.2 DATASETS AVAILABLE - UK

There are a number of alternative sources of data in Britain, many of which have been collected by the UK government. In recent years, there have been attempts to harmonise UK government-commissioned surveys, to improve comparability between surveys - this appears to include a standard list of durable goods (Government Statistical Service, 1996: pp. 58-59).

Similar methods of selecting samples are used by *FES, FRS, GHS,* and *LFS* (UK government surveys), and by *BHPS* (financed by the UK government, but managed by the ESRC Research Centre on Micro-social Change); due to space limitations, I outline here only the sampling method used by the General Household Survey (*GHS*). The *GHS* is designed to provide a representative sample of the population of Great Britain living in private households (OPCS, 1992: p. 1). The households interviewed in *GHS* surveys were chosen at random using a two-stage, stratified, sampling method. The first stage of the sampling method before 1984 was to choose a number of electoral wards at random: electoral wards in Britain were first `stratified', according to the percentage of homes in the ward which are owned by the local authority, and by the proportion of heads-of-household who were in socioeconomic groups 1-5 or 13 (OPCS, 1994: p. 148). The second stage of the sampling method (having chosen a number of wards) is to select individual households at random from the electoral register. From 1984, the *GHS* sampling method was changed to use postcode sectors rather than wards as the Primary Sampling Unit, and to use the `Postcode Address File' instead of the electoral register for the second stage (OPCS, 1994: p. 148). In summary, the UK government-commissioned surveys discussed here provide a sample which is representative of the population of Britain (*BHPS*) or the UK (*FES*).

BRITISH HOUSEHOLD PANEL SURVEY (BHPS):

The *BHPS* is a sample of non-institutional households in Britain (not UK - *BHPS* does not include Northern Ireland); geographical coverage is limited to England, Wales, and Scotland south of the Caledonian canal. The sample was obtained using the small user file of the Postcode Address File (Laurie, Rose, Whelan & Williams, 1993: p. 6). The *BHPS* is a `panel study': a number of households were initially selected at random, with a view to re-interviewing each chosen household every year. Fieldwork for

the *BHPS* began in 1991-2. The target sample-size for *BHPS* is 5,000 households (Taylor, 1996). The *BHPS* does yet allow us to observe long-term trends: at the time of writing, data for five waves (one wave per year) are available to the academic community. The *BHPS* has good coverage of durable goods, and includes questions on household financial management and attitudes. Because *BHPS* is a panel study, it would be inappropriate to use more than one wave of data as if they were independent samples: this would double-count households, and give a misleading impression of consistency. For this reason, I use only data from the first wave of *BHPS*. Further information on *BHPS* is available in machine-readable documents obtainable from the Data Archive (Taylor, 1996).

BRITISH SOCIAL ATTITUDES (BSA):

The *BSA* surveys are a set of annual surveys, produced by SCPR (Social and Community Planning Research): *BSA* began in 1983. These surveys interview around 4,000 people per year, randomly selected from all over the UK (see Jowell et al, 1987). Since 1986, the respondents were asked questions about `household allocative systems' (see section 2.8). However, these surveys do not include information on durable goods ownership, or give details about incomes of individuals or households.

EUROBAROMETER SURVEYS (EB):

The Eurobarometer series of surveys have been sponsored by the Commission of the European Community/European Union. The first study in this series was in 1973 (this is the `European Community Study', but is often referred to as *EB0*). Eurobarometers have been carried out at least twice per year since 1975; over fifty Eurobarometer surveys are available to the academic community. A Eurobarometer interviews about a thousand people in each country which is (at the time) a member of the European Community/European Union; recent Eurobarometer surveys also include samples from Finland and Norway. At least four Eurobarometer surveys asked respondents about durable goods ownership: *EB17* in 1982; *EB22* in 1984; *EB26* in 1986; and *EB28* in 1987. Eurobarometers only interview one person per household, and have rather limited information on incomes, but do include many attitude questions. Eurobarometers may be used to compare European countries.

FAMILY EXPENDITURE SURVEY (FES):

The *FES* surveys are annual surveys, which cover the whole of the UK (in contrast to *GHS*, which excludes Northern Ireland). The *FES* began in 1961, but it only includes information on durable goods from 1968; the first **time-saving** durables were only included from 1969 (CSO, 1993: p. 7). Note, however, that *FES* includes washing-machines and refrigerators in 1964 (CSO, 1993: p. 7) - but *FES* surveys between 1964 and 1966 inclusive are not available at MIDAS (perhaps because the data are stored in an unconventional format).

Each *FES* survey includes around 7,000 households (CSO, 1995: p. 21), and there is very detailed information on incomes, including earnings from a second job, and information on incomes before and after tax (CSO, 1995: p. 21). Until 1993, *FES* included fewer durable goods than *GHS*, but now contains more than *GHS* (*FES* includes refrigerators, which were dropped from *GHS* in 1985). Most *FES* surveys include information on whether or not each household member has a bank account.

We are advised to bear sampling error and the effects of non-response in mind when interpreting *FES* (and other survey) data, but "so far as checks can be made these effects seem to be fairly slight" (Department of Employment, 1971: p. 19).

For the earlier *FES* surveys, fieldwork for each survey was carried out during one calender year. However, since 1994, *FES* fieldwork has been based on the financial year (April to March), rather than the calender year; this follows the practice for *GHS*, which changed to fiscal years in 1988 (OPCS, 1992: p. 1). So, although each *FES* survey refers to a twelve-month period, recent *FES* surveys are referred to as (for example) *FES* 1994/5, rather than *FES* 1994.

More information on *FES* survey datasets can be found in the *FES* annual reports, such as Department of Employment (1978); and also in machine-readable codebook files (obtainable via the UK Data Archive) such as Department of Employment (undated).

FAMILY RESOURCES SURVEYS (FRS)

The *FRS* is a relatively recent survey. At the time of writing, data from this source are available to researchers for two fiscal years, which does not help us to place results in historical perspective. Both of the *FRS* surveys include a similar list of durables to *BHPS*, and to recent *FES* and *GHS* surveys; the main advantage of *FRS* is that it has a slightly larger sample-size (around 15,000 households per year) than the *BHPS*, *FES*, and *GHS* surveys.

GENERAL HOUSEHOLD SURVEYS (GHS):

The *GHS* has been carried out each year since 1971, but only data from 1973 have been made available to the academic community at MIDAS. *GHS* surveys attempt to interview each household member aged 16 or over (OPCS, 1994); where a person cannot be interviewed, information on the person is sought from another member of the same household. The *GHS* interviews around ten thousand households per year (slightly more in the earlier years). In terms of including data for a number of durables for many years, *GHS* has the best coverage of durable goods ownership of any survey I know (with the possible exception of *NRS* below): for most years, there are more durables included in *GHS* than for the equivalent year of *FES* data.

The *GHS* sample (since 1971) has been extended to include an extra sample of households in Scotland, which doubles the size of the *GHS* sample there: this extra sample is known as the `Scottish Supplementary Sample'. However, since 1978, this supplementary sample was only asked a shortened version of the *GHS* questionnaire (OPCS, 1994: p. 148).

There are a number of problems in the *GHS* data, such as:

> "Fridge freezers were attributed to both `refrigerator' and `deep freezer' in 1979 and 1980, but were excluded from deep freezers in 1978"
>
> (OPCS, 1982: p. 47).

This problem appears to be a mistake by *GHS* interviewers. I have found other problems with *GHS* data: all data on women's income are missing in households with children for *GHS* 1979; and all cases of total household income, or wife's gross earnings, are missing for *GHS* 1982 & 1983.

THE LABOUR FORCE SURVEY (LFS):

The *LFS* is a continuous survey of residents of private households in the UK, which began in 1973 (Harrop & Plewis, 1995: p. 93): it was conducted in alternate years until 1983, and then annually until 1991, and is now quarterly. The *LFS* has a much larger sample-size than any other UK government survey discussed in this thesis (Harrop & Plewis, 1995: p. 93). The method of obtaining the *LFS* sample has changed over the years: it was based on local authority wards until 1981, but is now based on the `postcode address file' (Harrop & Plewis, 1995: pp. 93-4).

NATIONAL READERSHIP SURVEYS (NRS):

The *NRS* were originally carried out by the British Market Research Bureau Ltd. (for some years), and Research Services Ltd. (for later years - see Fine et al, 1992f: p. 1). The *NRS* surveys began in 1956, and provide information on very large samples - much larger than the sample-size used by the *GHS*; and the *NRS* surveys provide information on more durable goods than any of other survey I know of. However, the *NRS* includes less than the *FES* on socio-demographic information for respondent households. Another drawback with the use of the *NRS* is that the sample is based on respondents to a questionnaire mailed to randomly-chosen individuals. Such mail-based surveys typically suffer from relatively poor response rates, and hence there is a danger that those respondents who **do** respond may not be representative of the wider population. A further weakness of the *NRS* for this research is that the data collected are obtained from only one person in each household, unlike *FES* surveys (which attempt to interview all adults in the selected households). This may be important when examining issues such as women's employment, since it is desirable to know the earnings of both husband and wife in a household being studied.

SOCIAL CHANGE AND ECONOMIC LIFE INITIATIVE (SCELI):

The *SCELI* is a one-off survey which was carried out in six areas of Britain in 1986/7 (Vogler, 1989: p. 3). Three separate surveys are included in *SCELI*: a work attitudes/history survey (sample-size 6110); a household/community survey (sample-size 1816 households); and an employers' survey (sample-size 1308 employers) (Gallie, 1991). Only one of

these three could be relevant to this thesis: the household/community survey, which has good coverage of durable goods (Gallie, 1991: p. 63), and includes information on household financial management (Vogler & Pahl, 1993: p. 76). The *SCELI* sample is based on six towns (Aberdeen, Coventry, Kirkaldy, Northampton, Rochdale and Swindon); it might be argued that these six areas are not representative of Britain as a whole.

CHOOSING THE MAIN DATA SOURCE FOR THE UK

For UK data for this thesis, I chose to focus mainly on *FES* data in preference to the other surveys discussed above. The reason for this decision is that the *FES* provides the longest series of information on durable goods and explanatory variables relevant to this thesis (the *FES* began in 1961, but I use data from 1969: see above). However, it should be noted that each of the other surveys discussed above have some advantages over the *FES*: for example, the *GHS* includes more durable goods than *FES* between 1973 and 1992; and *NRS* surveys began earlier than *FES*. I use data from all *FES* surveys currently available, apart from 1961 to 1963, which do not contain information on time-saving durables ownership. Hence, my main UK sample is data from *FES* surveys of 1969 up to 1995/6 inclusive: the latest UK data I have refers to the first quarter of 1996.

In addition to *FES* data, I use *BHPS* for data on household financial management, which are not included in *FES*.

I must add a note on the quality of UK data available. Having commissioned my own surveys in India, I am struck by the extremely high quality of data collected by the various agencies: OPCS, the UK government Department of Employment, and the ESRC Research Centre on Micro-social Change. Surveys such as the *BHPS, FES, GHS* and *LFS* offer a combination of large sample-sizes, large amounts of information on each household/person surveyed, and the opportunity to observe long-term trends. The fact that information is provided on each household member adds greatly to the usefulness of the data. I suspect that Britain has the best data of any country in the world for research such as this thesis.

6.3 DATASETS AVAILABLE - INDIA

In India, it appears that there are fewer large-scale surveys than in Britain; and of the survey datasets which do exist, several are not made available to academics. Because so little information is available, I also refer to an international survey (*WVS*), which could shed some light on India.

CENSUS OF INDIA:

The Census of India is carried out every ten years by the Indian government. This is a very large sample, but unfortunately does not appear to cover durable goods. It has information on details such as method of fuel used for cooking, type of house, access to water, and toilet facilities. In response to my letter, I received a written reply from the Office of the Registrar General (Data dissemination wing) of the Government of India, informing me that census information is available to the academic community on computer diskette - but the data appear to be aggregated to district level, and hence would be of little help in a project like this thesis which studies individual households.

NATIONAL SAMPLE SURVEY (NSS):

The Indian government studies consumption patterns every five years, using the *NSS*; the findings are published in the Indian government's regular journal Sarvekshana, but the data are not generally made available to the academic community (at least outside India). The *NSS* covers expenditure on, rather than ownership of, durable goods. Nevertheless, this would be an excellent source of information, being based on extremely large sample-sizes, and representative of India as a whole - including both urban and rural samples.

WORK, ATTITUDES AND SPENDING (WAS):

When I began the research for this thesis, I was keen to compare Britain with a `Third World' country in order to understand the process of economic development. It was clear that I could obtain access to a variety of excellent datasets for Britain (see section 6.2), but there seemed little household-level data available for any Third World country. I concluded that if I was to study households in the Third World, I would need to obtain the data myself. I was assisted in this by financial help from my brother and sister-in-law (Graham Simister and Ceiri Roberts), to whom I am grateful. I was also advised by various academics in the UK, including Jan Pahl, and several employees working on the *British Household Panel Study* (based at the University of Essex).

I chose the name `*WAS*' to refer to two surveys I commissioned for this thesis; the fieldwork for these surveys was carried out in 1992 and 1997. Both *WAS* surveys were carried out by the Indian Market Research Bureau Ltd.; I am grateful to IMRB for advice on questionnaire design, and I took their advice on how to select a random sample. The 1992 survey studied 2,654 households, of which half were in Bombay and half in Madras; the 1997 survey included 1,003 households, divided evenly between Bombay, Madras, Delhi and Calcutta. In 1992, the households were chosen at random from the electoral register; eleven other households in the same immediate vicinity were also interviewed - this `clustering' helps to cut travel costs, and is widely used in UK surveys (Durant, 1978: p. 42.12). Only one person was interviewed in each household. For the 1992 survey, roughly half the respondents were female. For the 1997 sample, however, the small sample-size meant that certain modifications to the sampling method were made: the sample was adjusted to satisfy quotas on the education-level and social class of the chief wage earner (reflecting the number in each social class in these four cities); two-thirds of the selected respondents were female; and the sample was restricted to married respondents. I deposited the 1992 dataset at the UK Data Archive (University of Essex) as SN:3290, and I will soon deposit the 1997 dataset. I reproduce copies of both *WAS* questionnaires at the end of the appendix to this thesis: note that I re-typed them, to fit onto A4-sized paper (foolscap-sized paper was used for the original questaionnaires).

I did not seek a rural survey of India, on grounds of cost: I was advised by IMRB that this would be several times more expensive than a survey near

one of their fieldwork centres (in the five largest Indian cities) due to the large travel costs. Note also that fieldwork in rural India presents other difficulties: Anker, Khan & Gupta claimed that private interviews are impossible in rural India, due to social customs and taboos; a friend or relative of the respondent would normally be present at an interview, which is believed (by many researchers) to distort a respondent's answers (Anker, Khan & Gupta, 1988: p. 10; p. 65).

The *WAS* questionnaire used several questions from the first wave of the *British Household Panel Study* (see above); I am grateful to the *BHPS*, because I was able to take advantage of their selection and field-testing of questions. However, I must emphasise that *WAS* is not comparable with *BHPS* in several respects. *WAS* only asked a couple of dozen questions, because of my limited budget - whereas the *BHPS* survey includes several hundred questions in each wave. The *BHPS* survey is also better in that all adult members are interviewed in each chosen household, whereas the *WAS* survey only interviewed one person per household. The *BHPS* sample-size is far larger than *WAS*. And *BHPS* is a panel study, interviewing the same households each year; whereas *WAS* is only two surveys (five years apart), with separate cross-section samples (the 1992 *WAS* households were not re-interviewed in 1997). Add to this the fact that *BHPS* is a representative of Britain as a whole (whereas *WAS* is limited to urban areas, and restricted to two cities in 1992 and four cities in 1997), and we can see that *BHPS* is a much more impressive dataset. Nevertheless, I feel that *WAS* may be useful for researchers wishing to compare Britain with India - simply because there is so little alternative data on variables such as household allocative systems.

WORLD VALUES SURVEY (WVS):

The *WVS* is an occasional survey, which covers many countries; there are currently two waves available to the academic community (1980-1 and 1990), of which only the second wave includes India (both *WVS* waves include Britain). The *WVS* surveys contain no information on durable goods ownership, and have very limited information on incomes; but *WVS* does contain a large number of attitude questions, which may be useful to compare different cultures.

DATA SOURCES CHOSEN FOR INDIA

For India, I used my own *WAS* survey data, for both 1992 and 1997. Although the sample-sizes are much smaller than the UK datasets, I consider them to be sufficiently large for regression analysis. Most previous research on household financial management in India has been based on much smaller sample-sizes: for example, Standing (1991) was based on a sample of 114 households.

6.4 PRACTICAL PROBLEMS WITH THE DATA

I discuss, in this section, a number of the complications with carrying out empirical work on this topic. Most of my decisions (in facing these problems) are unlikely to be controversial, but I report them to help the reader assess the most appropriate choices for future research.

USING HOUSEHOLD INCOME AS A CONTROL VARIABLE

One of the most widely-discussed theories in the economics of consumption is the theory of `Engel curves' (see, for example, Klein, 1974: p. 376), which assumes that there is a link between income and expenditure: the fraction of income spent on any one good or service tends to follow a particular pattern as income rises. Bonus (1973: p. 668) refers to `quasi-Engel curves' in the case of durable goods, because the dependent variable is zero or one. All studies of durable goods ownership discussed in this thesis include total household income as a control variable; but the best mathematical form of the Engel curve to use is not clear (Klein, 1974: p. 376). Blundell & Meghir (1986: p. 6) suggest using **log** of income (rather than income) as an explanatory variable; this is not the only form used - for example, Blundell, Pashardes & Weber (1993: p. 572) suggest that the square of log of income (or higher powers) can be added.

HOUSEHOLD EQUIVALENCE SCALES

The level of the household income appears to be extremely important as a determinant of household durables ownership (see chapter 9); and this may make it more difficult to assess the effects of other variables. For example, to assess whether or not women's employment is associated with increased ownership of household durables, the level of total household income should be controlled for; but this may be complicated by a number of factors, such as the travel expenses incurred by working-wife households (Rubin, Riney & Molina, 1990: p. 43; Strober & Weinberg, 1980: p. 340).

If two households with the same net income have different compositions (for example, a two-person household and a family of five), then the standard of living may be very different. The aim of a `household equivalence scale' is to control for different household circumstances, taking account

of the number and ages of household members (DSS, 1993). Using this approach, researchers hope to be able to use income data on households of different types, in order be able to compare their standards of living. In practice, this is very difficult to achieve, and researchers disagree about the details on how to compare households with different compositions:

> "There are many different equivalence scales in existence. Scales have been estimated using a wide range of different methodologies in a number of countries. All the methods for deriving equivalence scales, however, have weaknesses of one form or another. As a result, there is no consensus on the best method for estimating scales and no single set of scale values commands general acceptance."
>
> (DSS, 1993: p. 125).

In addition to the above problems with controlling for income, the `Permanent Income hypothesis' suggests that even when comparing two households with the same demographic characteristics (such as number of children), there may be reason to question conventional logit/probit approaches to studying consumption. For example, the share of household income earned by the wife might influence how far the household's income was perceived to be "permanent" or "transitory" - a wife's earnings might be regarded as "transitory" income, if she expected to leave employment for childbirth (see section 2.1). Friedman argues that

> "A common method of analyzing the factors affecting consumption is to "hold income constant" while studying the effect of other variables. Income, it is argued, is the major factor affecting expenditures, so, unless its influence is first eliminated, the effect of other variables will be swamped. In this method, "income" is almost invariably taken to be what we have called "measured income" for a particular year [...] If the [Permanent Income Hypothesis] is accepted, it is clear that these methods do not hold income constant in a sense that is meaningful for the determination of consumption behavior. What they hold constant is a mixture of income in such a sense - our permanent component - and accidental additions to or subtractions from current receipts that play little or no role in determining consumption behavior. And the particular mixture is likely to be related to the other variables being studied in a systematic way. Instead of eliminating the influence of income, these methods simply disguise its influence; it shows up as if it were the effect of other variables."
>
> (Friedman, 1957: p. 85).

Having noted the above comments, I ignore them in chapters 7 and 8: I have discovered a fundamental problem with all empirical research in this field (see chapter 9), which I consider more serious than Friedman's concerns. Nevertheless, Friedman's comments suggest that the results I report in chapters 7 and 8 are unreliable.

STUDYING GROSS or NET INCOME

Previous researchers have disagreed on whether to use gross (before tax) or net (after tax) income. Layard, Barton & Zabalza (1980: p. 65) used gross income to study British women's labour force participation, because "the gross wage is also the marginal wage for three-quarters of all women". However, for several surveys, only data on net earnings are available, including *WAS*, and several years of *FES*. I use net rather than gross earnings for all *FES* surveys, for consistency over time; and I have no choice for the other two surveys - I use net earnings for *WAS*; but the only total household income variable available for *BHPS* is **gross** income.

GROUPING DATA FROM DIFFERENT YEARS

There is some evidence that data from different years should be kept separate. Megan Partch studied purchases of a group of durable goods in the USA in both 1970 and 1977; her reported results suggest that the employment of the wife of head of household was statistically significant in 1970, but not in 1977 (Partch, 1984: pp. 501-2). A second piece of evidence is specifically on the ownership of microwave ovens: Oropesa's (1993) study of U.S. households between 1978 and 1989 found that high-income households with pre-school children (ages 2-5) and teenagers (13-17) were apparently highly likely to purchase microwaves in 1982-3; but recent years saw the disappearance of the effect of women's employment on microwaves purchase (Oropesa, 1993: pp. 575, 577). Oropesa (1993: p. 570) suggested that changes over time of the influence of women's employment might be a result of falling prices of microwave ovens, or linked to the question of which households are the first to purchase a new good[4]. There are other complications with grouping data from different years together: for example, Attanasio & Weber (1994: p. 1301) report that the UK savings ratio fell sharply between 1986 and 1988; they discuss two theories to explain this fall: a result of a massive increase in house prices, or due to increases in perceived permanent income. In both theories, access to credit is important in permitting households to spend more than their income. A similar comment is made in the Indian context by Cameron & Golby (1991: p. 79).

[4] The question of which households are "innovators" is discussed in the diffusion literature (see section 2.6).

Another reason to study different years separately is that the proportion of women in employment has grown in recent decades, in both UK (Levine, 1993: p. 667) and India (Standing, 1991: p. 7), which may affect spending:

> "A problem common to all studies is the fact that the increase in the proportion of working wives and the greatly changed economic conditions, which have occurred since the 1972-3 data were collected, may have altered the factors influencing family consumption expenditures."
>
> (Foster, 1988: p. 17).

This issue of which households are the first to buy a new type of product is central to the `diffusion' literature, which was discussed in section 2.6 above. For example, Bonus (1973: p. 669) divides major household durables into three types, depending on the rate at which ownership of the durable increased over time: refrigerators and vacuum cleaners were classified as "*type-two*", whereas washing machines were classified as "*type-three*" (ownership grew according to a logistic curve).

Several durables are included in *FES* surveys for some years but not others. Presenting data for groups of years separately permits us to take account of possible long-term trends in coefficients; aggregating the data might conceal valuable insights. The question of which durables to include, and which years, has a different effect on dramatrices to regression analysis. We only need data on one durable in a given year to be able to carry out regression analysis; but the dramatrix approach requires us to compare a **group** of durables (see section 4.3): in creating a dramatrix from data for different years, it is necessary to choose a group of durables which are all available for each chosen year. When deciding which durables to include in the group, there is a trade-off between studying more durables (which may reveal more differences in priorities), versus using more years' data (which should increase the reliability of results).

Despite the above drawbacks, I chose to combine several years of *FES* data into regression estimates. By merging data from different years, I greatly increased the sample-size: larger sample-sizes makes *FES* regression estimates in this thesis more reliable. I have sought a compromise between a desire for greater sample-size (to make each coefficient estimate more reliable), and a wish to allow time-trends to be seen (by reporting several coefficients). Future research may group *FES* surveys into more, or less groups depending on the aims of their research.

6.5 CONTROLLING FOR INFLATION

For the *FES* and *BHPS* datasets, I corrected for inflation by dividing all income variables by the UK "earnings deflator" estimated by the UK government (series GIEDAU, obtained from the on-line `*search_cso*' system at MIDAS on 18/8/1997). One alternative to the earnings deflator would be the Retail Price Index (RPI). A more specific index of durable goods prices, series CBAEAU (RPI: durables) is available from CSO for 1974-86, and series CHBYAU (RPI: durables) is available for 1987 onwards; but even together, these two series do not cover the entire period of *FES* data used in this thesis (*FES* survey data for 1969 onwards are used in this thesis - see chapter 6). Although RPI and `RPI: durables' are useful measures, they do not fully capture price changes of any one durable good; the price of one durable may rise faster, or slower, than that of other durables. For this thesis, I consider the most appropriate means to convert incomes is an `income deflator'. All UK variables I use are at 1996 prices.

For India, I was unable to find an `income deflator' measure, or any inflation figure as recent as 1997. Hence, I used the 1995 India inflation figure of 8.5% per year (Hunter, 1997: p. 648), as if this inflation-rate continued for the entire period between 1992 & 1997. I found that this adjustment produced a very similar average income in 1997 to that obtained in my 1992 survey. Hence, all Indian variables I use are at 1997 prices, as opposed to 1996 prices for the UK.

The above corrections for inflation were applied to total household income, and (for chapter 7) to hourly wage-rate; hence, regression results for different years can be compared. Note that when considering monetary variables (such as wage-rates), the UK coefficients are not directly comparable with urban India coefficients in the same table: UK figures are in £s per week (at 1996 prices), whereas urban Indian figures are in Rupees per month (at 1997 prices). I was unable to find an appropriate exchange-rate to compare the different currencies: if possible, a `purchasing power parity' exchange-rate should be used. For this thesis, however, I am mainly concerned with the sign and statistical significance of the coefficients - none of the conventional economic theories studied in this thesis seem adequate to explain the observed patterns I report in chapter 9.

6.6 RESTRICTING THE SAMPLE

I adopted David Piachaud's 1982 paper as the starting-point for my own empirical research in this thesis. Piachaud (and this thesis) use `logit' regression - the standard technique in econometrics for dealing with a dependent variable which equals zero or one - see Greene (1990). Piachaud (1982: p. 472) restricted the 1977 *FES* sample, to households which satisfied all of the following four criteria:

{1} households containing only one household;

{2} households containing a head of household & spouse (with or without children);

{3} households containing husbands aged under 65;

{4} family incomes between 100% and 300% of the supplementary benefit level.

Piachaud's restriction {2} might include cohabiters (often referred to as "common-law" spouse). The 1995/6 *FES* questionnaire explicitly refers to "partner/spouse/cohabitee" of household head as one category (CSO, 1995: p. 6); the equivalent for *FES* questionnaires in earlier years, such as *FES* 1977 used by Piachaud, is simply labelled "Wife or husband" of household head, but there is no separate category for cohabiters (Department of Employment, undated, coding frame 20; Department of Employment, 1978; Kemsley, Redpath & Holmes, 1980). I conclude that Piachaud's sample includes both legally married and cohabiting couples, and I follow Piachaud in including cohabiting couples in my sample. In this thesis, I use the word "wife" to mean `wife or female partner', and "husband" as shorthand for `husband or male partner'. Homosexual couples are beyond the scope of this thesis: I am interested in the interactions between husband and wife. I restrict the sample to households containing one (heterosexual) couple.

Bourguignon, Browning, Chiappori & Lechene (1991) interpret household goods as `assignable' or `non-assignable'. I assume in this thesis that time-saving durables are `assignable' to women, on the grounds that women do most housework: for example, a washing-machine is likely to be used more by wives than by husbands (Kiernan, 1992: p. 102). It may be desirable to remove from the analysis the few households where men do most or all of the housework, where this is known. Such time-use data are not available in *FES* surveys; I do not remove households from the sample where the husband does housework from *BHPS* or *WAS* surveys, because these sample-sizes are already small. Future research would benefit from large sample-sizes, provided this does not mean dropping questions on factors such as time-use.

6.7 REGIONAL VARIATIONS WITHIN INDIA

Several writers report strong regional differences within India (e.g. Dyson & Moore, 1983: p. 35). For India, I experimented with adding to all my regression equations a dummy variable `CITY': in the 1992 survey, this equalled one for Bombay respondents, or zero for Madras respondents. For the 1997 survey, I used a different variable - equal to zero for Bombay/Madras, or one for Delhi/Calcutta. I concluded that these dummy variables had little effect in practice - the four cities seem to display similar behaviour patterns, with the exception of "wet grinder" (for grinding wheat grains to make flour, as an alternative to a mortar-and-pestle): this durable showed marked regional variation - perhaps due to north-south differences in cuisine - so "wet grinders" are not studied in this thesis. Having experimented in this way, I feel justified in reporting my results based on 1992 Bombay/Madras survey data as representative of what I call `urban india'. Note, however, that there <u>are</u> marked differences between Indian cities - for example, average incomes in Bombay are higher than those in Madras: my claim is not that Bombay and Madras (for example) are identical, but that women's employment has similar effects in the two cities (as far as I can tell).

I do not think that the variations within the UK are as important as those within India; I follow previous research on the UK (examined in this thesis), in not including such a regional dummy variable.

6.8 ACCESSING AND PROCESSING THE DATA

All of my data-processing was carried out using the cs6400 unix computer at Manchester University (the national UK academic computing facility), except for initial processing of my own *WAS* datasets. The *BHPS* and *FES* datasets (and also *FRS, GHS* and *LFS*) are made available to the academic community via the UK Data Archive, at the University of Essex. After obtaining permission from the Data Archive, these five UK datasets can be accessed on-line via `Manchester Information Datasets and Associated Services' (MIDAS), at Manchester University: I found the on-line access at MIDAS greatly simplifies access to data, and I recommend this method to other researchers.

I processed the survey data (for UK and India) in nine steps, which I refer to here as steps **(A)** to **(I)**:

(A) obtaining a subset of data: The UK (*BHPS* and *FES*) datasets are provided in the form of SIR files, and the Indian (*WAS*) data as SPSS files. I wrote a Pascal program to identify which variables are available in which survey, and to write SIR and SPSS commands to extract the chosen variables. This Pascal program has been made available to registered users of *BHPS* and *FES* (and also *FRS* and *GHS*) at MIDAS: it is known as `gbd' (more information on gbd is available from MIDAS). After using gbd, I had three data files stored in SPSS (one for each of *BHPS, FES* and *WAS*). This information consisted of some household information specific to one household member.

(B) processing data on individuals: I produced SPSS files to read in the above data subsets. These SPSS programs carried out a number of tasks: calculating derived variables, ensuring that missing data were dealt with consistently, and copying information on husband to that of the wife. This stage was needed for *FES* and *BHPS*, but not for *WAS* data.

(C) writing a datafile for dramatrix tables: To prepare for the next step, I wrote a SPSS program to limit the data to households containing no more than two adults, and make certain corrections to the data, such as correcting for inflation (see section 6.5). The SPSS program then writes a file of `ASCII' data. This file had a common format for all three datasets (*BHPS, FES* and *WAS*), including the durables studied, followed by variables for use in the dramatrices.

**(D) producing `dramatrix' tables:** The next stage used the `nrs5m' computer program, written in FORTRAN by Nigel Foster (Economics Department, Birkbeck College). Before running nrs5m, I prepared a ".in" file for each dataset (a file containing the list of durable goods and socio-economic variables). The nrs5m program carries out various tasks,

including sorting durables into order of ownership for each group of households (calculating the most frequently-owned durable, then the next most frequently-owned durable, and so on: see section 4.3).

(E) selecting information on wives: For *BHPS* and *FES* datasets, I limited the sample to wives of head of household; because of step **(B)** above, this also included information on each woman's husband/partner. The SPSS program to do this also wrote the data to an ASCII data file ready for Limdep. Each of the three data files (*BHPS, FES* and *WAS*) used a consistent format, which is similar - but not identical - to step **(C)** above.

(F) splitting the datasets into year groups: In order to simplify producing tables showing different groups of years (such as table **8<1>**), I wrote a Pascal program to split the *FES* and *WAS* data files into different year-groups, for step **(G)** below.

(G) carrying out regression: I used the Limdep program on the cs6400 computer (version `limdep10', which can analyze larger datasets) to carry out logit regressions. Note that a different file is needed for each year, as Limdep must know the number of observations to read in from the data file.

(H) Placing regression estimates into a table: Because Limdep produces rather detailed output (such as the convergence criteria in each iteration step), I wrote a Pascal program to process the results file produced by Limdep and create the tables used in this thesis (such as table **8<1>**).

(I) producing `crosstab' tables: I used SPSS to create various tables, such as table **9<1>** in chapter 9.

The data-processing task for this thesis was very complicated; I have summarised briefly the steps I used to process the data, but I am unable to give full details due to the word-limit on this thesis. Future researchers may find the `gbd' program I wrote helpful in selecting a subset of variables.

6.9 SUMMARY

This chapter has examined sources of data on household durable goods ownership. There are many alternative sources of data on household durable goods in the UK, some of which have been discussed in this chapter. The *FES* was chosen as the best overall dataset because of its value for observing long-term trends, supplemented by *BHPS* for information on household financial management. For India, I use my own *WAS* datasets for 1992 and 1997.

CHAPTER 7

`UNITARY' MODELS: THE PRICE OF TIME

7.1 INTRODUCTION

This chapter attempts to test the approaches known as `unitary' models, as outlined in sections 2.2 and 2.3 above. The most widely-used models within the unitary framework are the `consensus' view associated with Samuelson, and `altruist' approach associated with Becker: see Pollak (1985: p. 598). These models are based on the assumption that households behave `rationally', so that they maximise a household utility function. This assumption has been described as the standard approach in microeconomics until the 1980s (Lundberg & Pollak, 1996: pp. 141-2).

The basic assumption of `unitary' models is that a household behaves as if it had a single utility function: this suggests that household members do not expend time and energy in conflict with each other over household decisions. There are various reasons why such (apparently harmonious) behaviour might take place: one possibility is that a household may be harmonious, as a result of mutual agreement by all household members on all decisions (Apps, Killingsworth & Rees, 1996a: p. 1), but this seems unlikely in view of the large numbers of decisions taken by households. Another reason for apparent agreement is if one or more members of the household behave `altruistically', i.e. they "care" for each other (see section 2.4). However, the `unitary' models need not rely on such pleasant behaviour: another possible reason why a household may appear to follow a unique set of values is that one household member may be powerful enough to impose his/her wishes on other members of the household. The `unitary' models do not normally seek to test how the household utility function is arrived at, but take it as their starting-point for empirical work.

In addition to various theoretical reasons why households might maximise one utility function, some economists may be forced to use this assumption due to lack of data on each individual household member:

> "the approach has been criticised for ignoring or abstracting from the individual decision-taking of family members [...] the limitations of the empirical work stem rather from the attempt to estimate labour supply parameters on data sets [..] providing information only on market hours of work and household consumption of market goods. A characteristic feature of these data sets is that two types of important information are missing: information on inputs and outputs to domestic production and information on *individual* consumptions of pure leisure and of domestic and market goods."
> (Apps, Killingsworth & Rees, 1996a: pp. 1-2; emphasis in original).

Apps, Killingsworth & Rees (1996a: p. 2) argue that because we generally do not have data on individual consumption, we cannot estimate the behaviour of individuals within the household unless we make arbitrary assumptions about individual preferences, and/or select a particular form of utility function (in which case the functional form may strongly affect empirical results).

I investigate one aspect of the `new home economics' approach associated with Gary Becker: his "price-of-time" hypothesis. Studying the effect of wives' wages seems an appropriate test of the `price-of-time' hypothesis:

> "Becker's contribution to the "new" theory of consumption was his emphasis on time allocation and on the wage rate as the alternative cost of time used in household production".
> (Sandmo, 1993: p. 14).

I consider that in testing the price-of-time hypothesis, I am in effect testing the `unitary' model used by neoclassical economists. If it can be demonstrated that households do not take account of the value of each household member's time, then I feel we can reject the `unitary' model, because this would prove that households do not behave rationally (as the `unitary' model assumes).

Gary Becker's price-of-time hypothesis is outlined in section 2.3; in the next section, I consider some of the practical details of testing the price-of-time hypothesis.

7.2 SPECIFYING THE PRICE-OF-TIME HYPOTHESIS

According to several neoclassical economists (especially Gary Becker: see Ermisch, 1993), a `rational' household would take account of the amount of paid work carried out, and the price of time, for each household member when deciding on consumption spending (Ghez & Becker, 1975; Van der Lippe & Siegers, 1994: pp. 119-20). In particular, some writers have discussed the importance of the price of a woman's time as an influence on household spending; this is referred to as the "female cost-of-time" hypothesis by Willis (1987). In this view, a household is more likely to buy goods and services which save the wife's time if the `price' of her time is high:

> "Households' willingness to spend extra money on time-saving technologies or services partly reflects <u>their valuation</u> of the housewife's own time. As women's participation in the labour force increases, their time becomes scarce and potentially of greater monetary value."
> (Bereano, Bose & Arnold, 1985: pp. 174-5; emphasis added).

Gary Becker indicates that most housework is done by wives (see Becker, 1981, chapter 2); if one family buys a washing-machine whereas another does not, this would be explained in terms of the hourly wage-rate of the wives (who are normally responsible for laundry: see Kiernan, 1992: p. 102). It is possible that the value of each household member's time might be constantly renegotiated between household members, in the light of pressures such as the health of children in the household. However, to test the price-of-time hypothesis, we need a specific estimate of this value of time.

Different methods of estimating the wife's price-of-time have been used by previous researchers. We might use her hourly wage: if a woman is employed at a high wage-rate, then it appears rational for her household to buy time-saving goods (for example, she may be able to obtain more paid work if she can reduce her time spent on domestic tasks). However, what is the price of time of a non-employed woman? We could exclude non-employed women from our sample, but this would produce sample-selection bias (a subsample of employed women would not be an unbiased sample of all women). Human capital theory suggests that we can estimate the wage she would expect to obtain, using information such as her education level. In this approach, a sample of employed women is used to estimate the expected wage for a given level of education (other variables such as age are usually added); it is assumed that a non-employed wife with the same education level would expect to receive the same wage-rate, so this

estimated wage is used in place of the actual hourly wage (Kalleberg & Rosenfeld, 1990: p. 343). When researchers use this approach, they often use the Heckman procedure to correct for sample-selection bias, typically by using the inverse Mills ratio (see, for example, Wong & Levine, 1992: p. 96). There are other problems: many datasets have too little information to predict an expected wage-rate for a non-employed wife reliably (Blundell & Walker, 1982: p. 353).

Alternatively, we could estimate the price of a non-employed woman's time in terms of the "input substitute" method (Apps, Killingsworth & Rees, 1996b: p. 18), in which each hour of the wife's domestic work is valued at the market rate for that activity - this requires us to know wages for childminders, cooks and cleaners etc, as well as detailed time-use data. An example of this is referred to by Bonke (1992: p. 286) as the `market employment housekeeper cost' method, in which the "wage rate" for non-employed wives is set to the market wage rate for paid housekeepers.

Reuben Gronau (1970: p. 10) used a model in which "the price of time equals the sum of the marginal wage rate and the money equivalent of the marginal utility of work"; but by 1973, he had adopted a different model:

> "The price of time changes over the life cycle. For some periods, when the woman works, it equals the marginal wage rate, and for other periods, when the woman stays out of the labor force, it exceeds the wage rate."
>
> (Gronau, 1973: p. S172).

Another view of the value of a wife's time was put forward by Willis, who suggested that the wife's price-of-time depends on her husband's wage-rate:

> "When a wife does not take market work, I (1974) showed that the shadow value of her time, and hence the marginal cost of children, is an increasing function of husband's income and when women do participate in the market, the cost of time is determined by her (marginal) wage rate"
>
> (Willis, 1987: p. 69).

All of the above methods (for estimating a price-of-time for non-employed women) have drawbacks; but there is a further complication. Gary Becker and others developed a `reservation wage' model, in which women take paid employment if they are offered a wage above a critical level, or do not take paid work if they cannot find employment at a wage-rate above this level (Nakamura & Nakamura, 1992: p. 6). This critical wage-rate depends on a number of factors such as the cost of childcare, and the distance travelled to work. If a wife chooses not to accept paid work, then her

true price of time (her `reservation wage') must be higher than that obtainable in the labour market (estimated by human capital theory). Hence, the price of time would be higher than her expected wage:

> "According to traditional labor-supply theory, the value of time in the home always depends on the individual's work status. If the individual works, the value of time w* is equal to the wage, and if she does not work, w* exceeds the wage."
> (Grossbard-Shechtman, 1995: p. 105).

On the other hand, if a wife seeks employment but cannot obtain it (perhaps due to local unemployment), then the price of her time may be lower than human capital theory predicts. In summary, the true price-of-time could be higher, or lower, than that indicated by human capital theory; in fact, the price-of-time estimate from human capital theory models is the one value which a non-employed wife's time cannot possibly be!

In view of the above controversies about estimating the price-of-time for a non-employed woman, I avoid the problem by limiting the sample to employed women. in this thesis, the wife's wage-rate is calculated by dividing her total net earnings (including second jobs and overtime payments) by the number of hours of paid work she does; this estimates the average, not the marginal, wage-rate. By limiting the sample to employed women, I create another problem: my sample is unrepresentative of the whole population, and hence my results would be biased if they were generalised from employed-wife households to all households (Kalleberg & Rosenfeld, 1990: p. 343).

7.3 PREVIOUS EMPIRICAL WORK

Stafford & Duncan (1980: cited in Dornbusch & Strober, 1988, p. 171) test Becker's model, limiting their study to households containing employed women. Stafford & Duncan found no significant relationship between wives' hourly wages and ownership of several time-saving durables, which seems convincing evidence against Becker's view. Research by Laura Sanchez (1993) into the effects of women's employment on husband's participation in housework found no significant link, but she did find that low-paid wives got more help from husbands than did not-employed wives:

> "This tentative finding does suggest that families with upper-wage wives might have been replacing the demand for husbands' housework with commodities or domestic help"
>
> (Sanchez, 1993: p. 445).

Some research, however, contradicts this rejection of the price-of-time theory. Bryant (1988: p. 38) claims that previous research suffered from three problems:

- the dependent variable should be the stream of services obtained from owning a durable good, not the ownership of it;
- most studies used inappropriate estimation techniques, and excluded variables which economic theory considers relevant;
- previous work used as the explanatory variable wife's employment, rather than the price of her time.

After correcting for these problems, Bryant came to the opposite conclusion to previous work: he claimed that women's employment <u>is</u> associated with ownership of durable goods. A similar finding (for microwaves only) is reported by Oropesa (1993). Hence, previous research has not entirely rejected Becker's model.

If we accept Becker's view that the price of (women's) time is central to the make-or-buy decision, it appears that (at least in India) women's time is often valued little: Lewenhak (1988: p. 139) illustrates this by the example of rice-milling in New Delhi, in 1986 - many women milled rice by hand, although it could be done by machine at a cost of only 13 Paise per Kilogram (100 paise equals one Rupee; the Indian Rupee was equivalent to around 2 UK pence). Lewenhak's comment suggests that we could use household spending patterns to estimate the "price" put on a wife's time by her household; but for such analysis, it would be better to consider regular expenditures (rather than a one-off durable good purchase), so this approach is beyond the scope of this thesis.

The regression equation I use in this section, **[7A]** below, was adapted from that used by Piachaud (1982) (shown as equation **[8A]** in chapter 8):

$$\frac{X}{(1-X)} = \alpha_0 + \alpha_1 Y + \alpha_2 K + \alpha_3 W_w + \alpha_4 A$$

where X = *probability of ownership*
Y = log *of* (*family income*)
K = log *of* (*number of children*)
W_w = log *of* (*wife's hourly wage-rate*)
A = *dummy*: *household head at least* 30

[7A]

More details of the logit regression method are given in chapter 4. The results of this regression are shown in tables **7<1>** to **7<12>** below: they use *FES* and *WAS* data, in each year for which data are available (see chapter 6 for details).

7.4 NEW EMPIRICAL RESULTS

Table **7<1>** below is restricted to employed-wife households where the husband is below retirement age: I do not attempt to estimate the wage of non-employed women, for reasons given in section 7.2 above.

TABLE 7<1> Becker's price-of-time hypothesis: WASHING-MACHINE OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	LOG OF WIFE's WAGE-RATE	SAMPLE SIZE	ODDS RATIO	LOG OF WIFE's WAGE-RATE	SAMPLE SIZE	ODDS RATIO
1969-74	0.078	8953	3.0			
1975-80	0.128	10822	7.4			
1981-86	0.255`	10259	19.2			
1987-92	0.419`	10004	46.0			
1993-	-0.092	4378	94.2	0.764	74	11.3

In order to highlight the essential coefficients for this thesis, I only report coefficients for the wife's employment in the empirical chapters, i.e. coefficient α_3 in equation **[7A]** above; the coefficients for the other variables in equation **[7A]** are reported in appendix (for table **7<1>**, this is appendix section **A7<1>**). Coefficients which are statistically significant at the 95% confidence level are indicated by ` and those significant at 99% indicated by " (immediately after a significant coefficient). In table **7<1>** above, four of the five UK coefficients are positive, and two are statistically significant; and the urban India coefficient is positive but not statistically significant. This table appears to offer some support the price-of-time hypothesis (which predicts positive coefficients); but other evidence (below) casts doubt on this support.

Tables **7<1>** to **7<12>** report the `odds ratio' - a widely-used measure of the success (or otherwise) of a logit regression, which is an alternative to the `R-squared' measure of goodness-of-fit often used with OLS regression. As a general guide, an `odds ratio' of 1 would indicate that there were as many unsuccessful predictions as successful ones, and hence the model is not a great help in forecasting which households will buy a durable good (an equally successful prediction could be obtained by flipping a coin!); but that a model with a higher `odds ratio' is more successful. In principle, the odds ratio could rise to infinity (if every prediction was

successful), but this did not occur in any of the regressions reported in this thesis. The reader should bear in mind that the odds ratio is measuring the combined predictive power of **all** variables in equation **[7A]**; hence a high value of the `odds ratio' does not necessarily indicate that women's employment is a good predictor of who owns the durable good. The odds ratio is very high in the last row of table **7<1>** in the UK, for example, because over 99% of UK households of households own a refrigerator by this time.

Table **7<1>** may appear to support the Becker hypothesis, in that nearly all of the coefficients are positive. However, the next table casts doubt on the price-of-time hypothesis. I use an identical equation to **[7A]**, but replace wife's wage by husband's wage - which requires me to exclude non-employed husbands (as opposed to non-employed wives). I obtain the results shown in table **7<2>** below.

TABLE 7<2> Husband's hourly wage-rate: WASHING-MACHINE OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	LOG OF HUSBAND's WAGE-RATE	SAMPLE SIZE	ODDS RATIO	LOG OF HUSBAND's WAGE-RATE	SAMPLE SIZE	ODDS RATIO
1969-74	0.619"	17039	3.4			
1975-80	0.628"	17107	7.9			
1981-86	0.435"	14553	18.9			
1987-92	0.409`	12121	42.6			
1993-	0.494	4914	90.0	0.183	463	8.9

Becker's theory clearly predicts that it is the wife's wage, not the husband's wage, which is relevant to the price-of-time (see section 2.3). Because most coefficients for <u>both</u> husband's and wife's wage-rate are positive (and often statistically significant) in tables **7<1>** and **7<2>**, it seems plausible that we are really observing the effects of household income - the results in appendix sections **A7<1>** and **A7<2>** indicate that total household income is highly significant in all years, and wage-rates will tend to be correlated with household income (especially if there is only one earner in the household). This means that we cannot easily separate the price-of-time effects from the effects of household income. An alternative interpretation of the link between higher male wages and washing-machine ownership is in terms of social class: I return to this

(and other) interpretations of my results in chapter 9. But my conclusion is that the Becker et al price-of-time hypothesis performs poorly in explaining washing-machine ownership.

I now consider other durable time-saving goods, beginning with dishwashers. This durable good was not included in either of my *WAS* surveys, and for *FES* surveys is only included in recent years. I retain the format of tables **7<1>** and **7<2>**, because (as becomes more clear in chapter 8) I consider it vital to see my results in time context.

TABLE 7<3> Becker's price-of-time hypothesis: DISHWASHER OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	LOG OF WIFE's WAGE-RATE	SAMPLE SIZE	ODDS RATIO	LOG OF WIFE's WAGE-RATE	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92						
1993-	0.400"	4378	2.8			

The above table **7<3>** suggests some support for the price-of-time hypothesis, in that the coefficient on wife's wage is positive and statistically significant. However, husband's wage-rate is also statistically significant (at the 1% level) in explaining dishwasher ownership, as shown in table **7<4>** below:

TABLE 7<4> Husband's hourly wage-rate: DISHWASHER OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	LOG OF HUSBAND's WAGE-RATE	SAMPLE SIZE	ODDS RATIO	LOG OF HUSBAND's WAGE-RATE	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92						
1993-	0.385"	4914	3.1			

Overall, I consider the above evidence on the effects of higher wage-rates on dishwasher ownership to be unclear - it does not offer strong support for, or rejection of, the price-of-time hypothesis. This link between women's wages and dishwasher ownership may be related to social class - evidence from the 1990 UK *NRS* survey suggests that dishwashers are higher priorities for social classes `A' and `B' than for other social classes, in the classification used by *NRS* (Fine et al, 1992a: pp. 10-12); and people in higher social classes are likely to earn higher wages.

I now turn to food-processors. These are not included in *BHPS* or *FES*, although other UK surveys (including *SCELI*) do include them. The results for urban India are shown in tables **7<5>** and **7<6>** below.

TABLE 7<5> Becker's price-of-time hypothesis: FOOD-PROCESSOR OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	LOG OF WIFE's WAGE-RATE	SAMPLE SIZE	ODDS RATIO	LOG OF WIFE's WAGE-RATE	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92						
1993-				0.697	74	13.8

Tables **7<5>** above, and **7<6>** below, are based on very limited sample-sizes; hence, the coefficients in these two tables are unreliable, because so few women in the *WAS* 1997 sample were employed. Both wife's and husband's wage-rates appear positively associated with ownership; but whereas husband's wage-rate is statistically significant, wife's wage-rate is not. I consider this to be evidence against the price-of-time hypothesis, although it is rather unconvincing due to the small sample-size in *WAS* 1997.

TABLE 7<6> Husband's hourly wage-rate: FOOD-PROCESSOR OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	LOG OF HUSBAND's WAGE-RATE	SAMPLE SIZE	ODDS RATIO	LOG OF HUSBAND's WAGE-RATE	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92						
1993-				0.556`	463	2.7

Next, I focus on ownership of microwave ovens. These reduce the time spent cooking, because they speed up cooking time compared with conventional ovens, for certain foods.

TABLE 7<7> Becker's price-of-time hypothesis: MICROWAVE OVEN OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	LOG OF WIFE's WAGE-RATE	SAMPLE SIZE	ODDS RATIO	LOG OF WIFE's WAGE-RATE	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92						
1993-	-0.115	4378	5.2			

Table **7<7>** above has no coefficient for wife's wage-rate in urban India, even though microwave oven ownership was included in the 1997 *WAS* survey. The coefficient could not be estimated due to the small sample-size: of the almost 500 households which met the sample restrictions I use (see section 6.6), only eight households owned a microwave, and (in these eight) only one wife was employed - and wage data was missing even for this one employed wife! This problem did not apply to any other table in this thesis, being a combination of the very low ownership levels of microwave ovens in India, and the small proportion of Indian women who are employed; but it does highlight the need to obtain large sample-sizes, where possible.

TABLE 7<8> Husband's hourly wage-rate: MICROWAVE OVEN OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	LOG OF HUSBAND's WAGE-RATE	SAMPLE SIZE	ODDS RATIO	LOG OF HUSBAND's WAGE-RATE	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92						
1993-	-0.019	4914	4.9	0.342	463	56.9

The above results for microwave ovens offer an apparent rejection of the price-of-time hypothesis, because the coefficient on wife's wage-rate for the UK in table **7<7>** is negative. Note, however, that this coefficient is not statistically significant, and hence is not a persuasive rejection of the price-of-time hypothesis.

As a further check on the two previous tables, I now assess if the results are sensitive to the exact form of the regression I used. I take one year (1994) and one country (UK: *FES* data), and change the regression specification - I use the number of children, rather than the LOG of number of children, as an explanatory variable. The results are shown below:

$$\frac{p_i}{1 - p_i} = -2.17` - 0.03\ W_w + 0.68''Y - 0.05\ N$$

where

P_i *is the probability of owning a microwave oven*
W_w *is wife's wage* (£*s per hour*)
Y *is* log *of net household income* (£*s per week*)
N *is the number of children*
` *indicates a coefficient significant at* 5%
" *indicates a coefficient significant at* 1%

[7B]

Equation **[7B]** above indicates that the coefficient on wife's wage is negative, but is not statistically significant: this is the same finding as for table **7<7>** above (and can be compared with the results in appendix **A7<7>**, as well as with table **7<7>** above).

I now report equation **[7C]**, a similar regression to equation **[7B]**, but this time referring to husband's wage-rate (rather than wife's wage-rate).

$$\frac{p_i}{1 - p_i} = -1.03 + 0.002\, W_h + 0.44''Y - 0.06\, N$$

where

P_i *is the probability of owning a microwave oven* **[7C]**
W_h *is husband's wage* (£*s per hour*)
Y *is* log *of net household income* (£*s per week*)
N *is the number of children*
" *indicates a coefficient significant at* 1%

Hence, equation **[7C]** is an alternative specification to that used to create table **7<8>** above. Equation **[7C]** indicates that the husband's wage-rate has a positive, but statistically insignificant, effect on microwave oven ownership. In table **7<8>**, the coefficient was negative; but both **[7C]** and **7<8>** indicate that the coefficient for the husband's wage-rate is very close to zero.

To summarise equations **[7B]** and **[7C]** above, they suggest that using logarithms for the number of children (as was done for tables **7<1>** to **7<12>** in this chapter) had little effect on the overall findings: my results are not very sensitive to this change in regression specification.

I now turn to refrigerator ownership, which may save time in shopping, because it allows foods such as milk to be stored for longer (and hence less frequent shopping trips are required). A refrigerator could also store cooked food, to allow several meals to be cooked at once (assuming food can be reheated, or eaten cold).

TABLE 7<9> Becker's price-of-time hypothesis: REFRIGERATOR OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	LOG OF WIFE's WAGE-RATE	SAMPLE SIZE	ODDS RATIO	LOG OF WIFE's WAGE-RATE	SAMPLE SIZE	ODDS RATIO
1969-74	0.515"	8953	5.2			
1975-80	0.748"	10822	37.4			
1981-86	0.388	10259	127.2			
1987-92	0.610	10004	243.0			
1993-	0.187	4378	363.8	1.269	74	7.2

All coefficients in table **7<9>** are positive, and the first two in the UK are statistically significant; for later years in the UK, the lack of statistical significance may be due to the very high ownership rates of refrigerators. The urban India result is not statistically significant, perhaps due to the small sample-sizes (husband's and wife's earnings were not included in the larger 1992 sample).

TABLE 7<10> Husband's hourly wage-rate: REFRIGERATOR OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	LOG OF HUSBAND's WAGE-RATE	SAMPLE SIZE	ODDS RATIO	LOG OF HUSBAND's WAGE-RATE	SAMPLE SIZE	ODDS RATIO
1969-74	0.649"	17039	4.3			
1975-80	0.674"	17107	26.5			
1981-86	0.466	14553	105.2			
1987-92	0.703`	12121	211.6			
1993-	-0.387	4914	233.0	0.497	463	3.6

Table **7<10>** shows a similar pattern to table **7<9>**, except for a negative coefficient at the bottom of table **7<10>**: I consider this negative result to be spurious (a result of the fact that there are so few UK households in 1993-96 who do not own a refrigerator). But the general pattern is that husband's wage-rate is at least as important as wife's wage-rate: there are three statistically significant coefficients in table **7<10>**, but only two in table **7<9>**. Again, this casts doubt on the price-of-time hypothesis.

I now turn to ownership of deep-freezers, which can save time in shopping and cooking in the same way as do refrigerators. I was advised by IMRB in 1992 that deep-freezers were very rarely owned in India (even in cities), so this durable was not included in my *WAS* surveys; however, given India's rapid economic growth in recent years, deep-freezers may be worth including in similar surveys in the future.

TABLE 7<11> Becker's price-of-time hypothesis: DEEP-FREEZER OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	LOG OF WIFE's WAGE-RATE	SAMPLE SIZE	ODDS RATIO	LOG OF WIFE's WAGE-RATE	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80	0.143	3556	1.8			
1981-86	0.307"	10259	3.6			
1987-92	0.130	10004	12.6			
1993-	0.082	4378	26.5			

It appears that there is only a weak link between wife's wage-rates and ownership of deep-freezers (only one of the four coefficients in table **7<11>** is statistically significant), and that husband's wage appears to be positively related to deep-freezer ownership (although none of the coefficients for husband's wage-rate are statistically significant: see table **7<12>** below). Again, this seems to offer little support to the price-of-time hypothesis.

TABLE 7<12> Hourly wage-rate of the husband: DEEP-FREEZER OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	LOG OF HUSBAND's WAGE-RATE	SAMPLE SIZE	ODDS RATIO	LOG OF HUSBAND's WAGE-RATE	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80	0.097	5408	1.8			
1981-86	0.109	14553	3.3			
1987-92	0.185	12121	12.1			
1993-	0.281	4914	27.1			

Tables **7<1>** to **7<12>** above, overall, offer little support to the `unitary' school: work by Gary Becker and others suggests that the price of a woman's time will be higher if she is employed at high wages, and hence time-saving durables should be more widely-owned by households containing high-earning wives.

FURTHER REGRESSION TESTS OF THE PRICE-OF-TIME HYPOTHESIS

Tables **7<1>** to **7<12>** above cast doubt on Becker's price-of-time hypothesis, which predicts that employed-wife households are more likely to own time-saving durables if the wife's wage-rate is higher. The wife's wage-rate seemed less important than husband's wage-rate, in predicting ownership of time-saving durables. As a further test, I now present the results of a regression which includes both husband's and wife's wage-rates: this requires the sample to be limited to households in which husband & wife are both employed. I consider microwave oven ownership, using UK (*FES*) data for (calender year) 1994, excluding households in which the husband is over retirement age; the resulting sample is 832 households. I do not take logarithms of any variables in this regression equation, except for total household income. The results of this regression are shown in equation **[7D]** below.

$$\frac{p_i}{1 - p_i} = -2.35 + 0.03 W_h - 0.01 W_w + 0.67 Y - 0.11 N$$

where

P_i *is the probability of owning a microwave oven* **[7D**

W_h *is husband's wage* (£*s per hour*)

W_w *is wife's wage* (£*s per hour*)

Y *is* log *of net household income* (£*s per week*)

N *is the number of children*

None of the coefficients in equation **[7D]** are statistically significant; so it is not convincing evidence for, or against, Becker's hypothesis. But the coefficient on wife's wage-rate is negative, whereas Becker's model predicts it should be positive; so confidence in Becker's model is decreased by equation **[7D]** - the change of specification used in equation **[7D]** did not alter the impression from previous tables in this chapter - which (I claim) cast doubt on Becker's price-of-time hypothesis. I do not report similar results for other durable goods, or for India, for reasons of space.

DRAMATRIX EVIDENCE ON THE PRICE-OF-TIME HYPOTHESIS

I now turn to the dramatrix approach, which is an alternative methodology to the above logit regression (see section 4.3). Dramatrix **7<15>** below shows the priorities of households grouped according to the wife's wages. Dramatrix **7<15>** can be compared with regression results in tables **7<1>**, **7<3>**, **7<5>**, **7<7>**, **7<9>** and **7<11>** above; however, unlike those regression results, non-employed women are included (as the left-most column). Note that in dramatrix **7<15>**, UK wages were converted to 1996 prices (see section 6.5) before grouping data from *FES* 1993, 1994/95, and 1995/96 surveys to form the above dramatrix. This time-period (1993-6) corresponds to the last line of tables **7<1>** to **7<12>** above.

DRAMATRIX 7<15>
PRIORITIES AT DIFFERENT WIFE'S WAGE-RATES, UK (*FES*), 1993-6

	GP1	GP2	GP3	GP4	GP5
% ownership	*68.7*	*75.3*	*76.3*	*80.3*	*84.2*
REFRIGERATOR	0	0	0	0	0
WASHING-MACHINE	0	0	0	0	0
TELEPHONE	0	1	0	0	0
DEEP-FREEZER	0	2	0	0	0
CENTRAL HEATING	0	-2	-2	-2	-1
VIDEO	0	1	1	1	-1
FIRST CAR	0	2	1	1	2
MICROWAVE OVEN	0	0	0	0	0
TUMBLE-DRIER	0	0	0	0	0
CD-PLAYER	0	0	0	0	0
SECOND CAR	-1	0	0	0	0
DISHWASHER	1	0	0	0	0
Pop uniformity	977	977	977	977	977
Subgroup uniformity	878	827	813	863	1041
Conformity	883	930	851	897	1056
Sample size	**4761**	**98**	**1746**	**1629**	**1076**

VALUES FOR WIFE HOURLY WAGE:
GP1 not employed
GP2 0 to 2 pounds per hour
GP3 2 to 4 pounds per hour
GP4 4 to 6 pounds per hour
GP5 over 6 pounds per hour

The UK households with the highest-paid wives do not place time-saving durables at a higher priority than do the other households; in fact, the opposite is true - households with the lowest wife's wage-rate place deep-freezers at a higher priority. This appears to reject the `unitary' model of Becker et al, on the importance of the wife's price of time: for women with low wages, there is less incentive to spend money (on deep-freezers)

to save time. Hence dramatrix **7<15>** (like the regression results earlier in this section) does not support the price-of-time hypothesis.

I do not report dramatrices for other time-periods in the UK, due to limitations on thesis length: none of these offers much support to the price-of-time hypothesis (several of the earlier time-periods also show a tendency for freezers to be higher priorities in households where the wife's wage is low). I do not report an equivalent dramatrix for India, as there are too few households in 1997, and wife's earnings are not included in the 1992 *WAS* survey.

7.5 SUMMARY: DO HOUSEHOLDS TAKE ACCOUNT OF THE `PRICE OF TIME'?

This research is built on the assumption that most housework is done by women, rather than men. Applying the price-of-time hypothesis, we would expect households in which the wife has a high wage-rate to own more time-saving goods. This hypothesis receives little support in this chapter: although some of the coefficients for wife's wage are positive and significant (as predicted), most coefficients were not statistically significant, and husband's wage-rate was found to be a better predictor of ownership, contrary to Becker's model (in chapter 3, I confirm Becker's assumption that most housework is done by women, not men).

People with high wage-rates tend to be in rich households; an association between wage-rates and durables ownership may reflect interdependence of wage-rates and earnings, rather than support for the price-of-time hypothesis. This may explain the fact that some coefficients reported in this chapter are positive and statistically significant. Overall, I find little support for Gary Becker's view.

For half the tables in this chapter, I have considered the effects of wife's wage-rates, using a subset of data: those households where the wife is employed. In order to give a representative picture of the whole population (of UK or urban India), we could use the Heckman procedure - including a weighting factor which measures the probability that a woman is employed (Wong & Levine, 1992: p. 96). However, the preceding results suggest there would be little justification for doing so: no evidence based partly on the behaviour of non-employed-wife households (for whom the `price of time' is unclear) would override the findings based on employed-wife households (for which Becker's model gives clear, but generally incorrect, predictions). I do not feel any need to use Heckman's methods as a further test of Becker's model.

Becker's price-of-time model has now been abandoned by most economists (see chapter 2), and this chapter does not offer much support for Becker's view. But Gary Becker's work outlines how a `rational' household should behave. The evidence I report in chapter 9 may partly explain the apparently poor performance of the price-of-time hypothesis. The next chapter considers a popular alternative to Becker's view: bargaining models.

CHAPTER 8

TESTING `BARGAINING' MODELS

8.1 INTRODUCTION

The previous chapter tested (and rejected) the "unitary" models of household behaviour, in which a household behaves as if it maximised a single utility function. Because the unitary model has now been rejected by many empirical researchers (see section 7.3), many writers have attempted to provide alternative theories - most of these are based on game theory, and are often referred to as `collective' models; in this thesis, I call them `bargaining' models.

Bargaining models are outlined in section 2.4 above. In bargaining models, each household member attempts to influence the spending patterns of the household; the outcome of this bargaining is influenced by the resources (such as earnings) of each household member (MacPhail and Bowles, 1989; Haddad and Reardon, 1993; Haddad and Hoddinott, 1994). In this approach, when a household considers buying a durable good, each household member considers the advantages to him/herself. A woman's earnings (per year, rather than per hour) are thought to be central to her ability to bargain successfully to obtain her choice of household spending priorities (MacPhail & Bowles, 1989: pp. 62-3). Each partner's current earnings are an indication of their likely earnings (and hence utility) after divorce, which is central to several game theory models. Phipps & Burton (1995), considering various game-theory models, focus on womens' earnings relative to those of their husbands. Browning, Bourguignon, Chiappori & Lechene (1994: p. 1067) consider the effects of the level of wife's wages relative to the level of total household income.

Referring to intra-household differences in food consumption in India, Nancy Folbre wrote

> "Unless and until inequalities within the family can be systematically linked to differences in bargaining power, it can be argued that they represent voluntary choices, collective decisions, or simple cultural prejudices. In this respect the empirical record can only be described as weak."
>
> (Folbre, 1986: p. 24).

Folbre appears unimpressed by the empirical record of `bargaining' models, but other researchers have been more positive. For example, Browning, Bourguignon, Chiappori & Lechene (1994) claimed to find support for one such `bargaining' model. This chapter offers new evidence on this debate.

8.2 PREVIOUS TESTS OF `BARGAINING' MODELS

Numerous studies have tested the `unitary' approach, on many aspects of household behaviour. The general picture which emerges from empirical work is that the unitary model is found to be unsuccessful:

> "a substantial body of evidence rejects Becker's unitary approach to modelling household behaviour on both theoretical and empirical grounds"
>
> (Phipps & Burton, 1995: p. 178).

Several writers have tested the claim of `income pooling' (incomes of different household members are treated as equivalent) implicit in unitary models, and "A large number of recent empirical studies have rejected pooling" (Lundberg & Pollak, 1996: p. 144). This empirical evidence on the unitary model refers to various aspects of household behaviour; I now turn to the specific topic of this thesis: durable goods ownership.

EMPIRICAL PROBLEMS

To understand the problems of testing the bargaining model against the unitary model, consider this comment:

> "Tests of the hypothesis that, with prices and wage rates held constant, only the sum of husband's income and wife's income affects the demand for goods and the allocation of time are conceptually simple. However, the implementation of such tests has been hampered by difficulty in finding data on income from sources that are exogenous to the demands and allocations being analyzed."
>
> (Lundberg, Pollak & Wales, 1997: p. 464).

We could use unearned income (rather than earnings) to test the `pooling' hypothesis, but this too has problems: for example, interest-payments are endogenous because wealth is a result of previous saving, which in turn depends on previous labour supply (Lundberg, Pollak & Wales, 1997: p. 465).

A simple model of household spending is a linear model, in which each household member's level of consumption is proportional to his/her own income - this is the basis for research (using a Cobb-Douglas production function) by Apps, Killingsworth & Rees (1996b: p. 16). A more complex model is developed by Bourguignon, Browning, Chiappori & Lechene (1991: p. 22), using equation **[8A]** below:

$$C = aY + \frac{b}{2}Y^2 + cy_f + dy_m + \frac{e}{2}y_f^2 + \frac{f}{2}y_m^2 + gy_m y_f + z\beta$$

where Y = *household income*
y_f = *female adult's income*
y_m = *male adult's income*
z = *socio-demographic variables*

[8A]

The above equation has five coefficients related to the **relative** earnings of household members: *c, d, e, f,* and *g*. These five coefficients could be individually tested, for each category of spending studied - if any one coefficient was statistically significant, we might infer that relative earnings does influence spending. But at the 5% significance level, we would expect one coefficient in twenty to be statistically significant even with random data; it is possible that we would find a statistically significant effect in one of the five coefficients - even if no such effect really existed. The Bourguignon et al paper reduces this risk, by a joint test that coefficients *c, d, e, f,* and *g* are <u>all</u> zero, in all regression equations simultaneously. This approach reduces the risk of spurious results, because they use only one test rather than five. Because the joint test was rejected, Bourguignon et al conclude that the five coefficients are not all zero, and hence the relative earnings of each household member **does** influence household spending for the French dataset they use. However, the joint test (of five coefficients) has problems: we cannot tell which coefficient(s) are having most impact on the joint test, or what type of impact. For example, it is possible that two-earner households behave very differently to single-earner households (due, for example, to greater childcare costs); if so, then coefficient *g* above might be very different to zero, and the joint test could indicate that relative earnings are (jointly) a significant influence on spending. Even more serious is the question of the **sign** of the coefficient: the joint test on the coefficients would be significant if women's earnings <u>reduced</u> spending on goods such as women's clothing, but this would not be compatible with the `bargaining' theory. Bourguignon al wrote that

> "the paper indicates a very simple way of testing Chiappori's `cooperative or `sharing rule' approach. [..] This suggests, more generally, that testing `collective' models of household behavior may not be as difficult a task as it was suggested in some occasions"
> (Bourguignon, Browning, Chiappori & Lechene, 1991: p. 24).

The joint test used by Bourguignon may be a reasonable way of testing Chiappori's `sharing rule' hypothesis, which claims that the relative earnings of each household member influences household spending (their view is in opposition to work by Samuelson & Becker, in which relative earnings are thought to be irrelevant because the household behaves as if it had a single joint utility function: see Chiappori, 1992: p. 2). But the test used by Bourguignon et al is **not** an adequate test of the `bargaining' hypothesis discussed in this chapter, in which a woman's earnings give her more power over household spending. In a more recent paper (Browning, Bourguignon, Chiappori, & Lechene, 1994: p. 1081), the same writers present a different method of testing the effects of relative earnings; but, again, they use a joint test which does not allow us to focus on the significance (or otherwise) of the coefficient for women's earnings. Their approach is not entirely clear:

> "we may expect that an increase in the relative income of one person increases his or her share of total expenditure on private goods [...] Note the "may" here. We do not have any model to this effect and it is not necessarily true in general. This will certainly be the case if there are unobservable (to the econometrician) factors at play in the bargaining".
> (Browning, Bourguignon, Chiappori & Lechene, 1994: p.1080 & footnote 9).

It is conventional in economics to present a hypothesis - that a phenomenon will have a particular effect - with the qualification `*ceteris paribus*' ("all other things being equal"). There is always a danger of unobserved factors influencing the results of empirical research. But when Browning et al wrote that they "do not have any model" to predict that an increase in a person's relative earnings will raise his/her personal consumption, their model seems too vague to be helpful. Most writers in the `bargaining' (game theory) school discussed in this section <u>do</u> have a model of this: for example, MacPhail and Bowles (1989) wrote

> "The bargaining approach has a number of variants which differ in the complexity and realism of their models of the household. One of the variants is the neo-classical game-theoretic approach to marriage. [...] an increase in women's employment opportunities, for example, would enable women to bargain for a solution to the game which is more favourable to them."
> (MacPhail & Bowles, 1989: p. 62).

Many game-theory models of household spending patterns focus on the effects of women's earnings on household spending; to assess such a model, we would check both the significance level, and the sign, of the coefficient

which measures the effect of women's earnings on household spending. If we find evidence to support such a model, then we would also confirm the ideas of Browning et al that relative earnings influence household spending (Browning, Bourguignon, Chiappori, & Lechene, 1994: p. 1081). But this link does not hold in reverse: support for Browning et al's very general hypothesis is not, in itself, sufficient to support the view that a woman's earnings give her more power. For example, if evidence were found that a woman's employment decreased her personal consumption, this would confirm Browning et al's hypothesis, but reject the `bargaining' model used in this chapter.

PREVIOUS EVIDENCE ON `BARGAINING' MODELS

For time-saving goods, it may be expected that women will place a higher priority on a durable good such as a washing-machine, on the grounds that such a good will save their time on housework: this prediction follows from several different theoretical perspectives in economics and sociology. Has this prediction been supported by empirical work? Several previous studies use paid work by housewives, as a predictor of whether or not her household will buy time-saving durable goods. These studies typically use the wife's hours of employment, or a dummy variable for wife's employment (equal to one if the wife is employed, or zero otherwise), as a measure of the wife's labour force participation (see section 8.3). Consider the following comments on the effect of women's employment on durables ownership:

> "In summary, most studies found that the employment status of the wife did not have a significant impact on the purchase or ownership of durables, while income and life cycle did."
> (Soberon-Ferrer & Dardis, 1991: p. 386).

> "Existing studies found no relationship between wife's employment and expenditure on time-saving durables once the effects of income and other factors are taken into account."
> (Foster, 1988: p. 16).

> "The relationship between wives' employment and household consumption expenditures, particularly of durables, has received considerable attention. [...] Wife's employment was found to have no influence on expenditures for appliances or other durables when income differences were accounted for"
> (Rubin, Riney & Molina, 1990: p. 44).

Other research which found no relationship between women's employment and durables ownership, controlling for factors such as total household income, includes Strober (1977); Strober & Weinberg (1980) and Weinberg & Winer (1983). But a few researchers, including Bryant (1988) and Oropesa (1993), found that women's employment **does** increase spending/ownership of time-saving durables. It is possible that the findings of Bryant (1988) and Oropesa (1993) were different to other studies because of a time-trend: they are both relatively recent studies, and I have found a trend in the UK, in which women's employment appeared to have a negative effect on durables ownership in the 1970s, but which became positive from the mid-1980s to (at least) the mid-1990s - see section 8.7 below. Nevertheless, the overwhelming majority of previous research has found no significant link between women's employment and durable goods ownership; this seems to reject both the (Becker et al) price-of-time hypothesis, and the bargaining models examined in this thesis.

8.3 WIFE'S HOURS OF PAID EMPLOYMENT

Many writers have commented that a woman's employment increases her power (relative to her husband), especially over money matters (Spitze, 1988: p. 602). According to the most widely-used economic theories, women's employment is thought to be an important influence on durable goods ownership:

> "both the joint utility [associated with Becker] and bargaining approaches identify employment as a key determinant of the intra-household distribution of welfare".
>
> (MacPhail & Bowles, 1989: p. 63).

In this chapter, I wish to assess the performance of `bargaining' models, relative to the price-of-time hypothesis (which is based on `unitary' models, studied in chapter 7). Several writers consider that testing bargaining models against unitary models is equivalent to a test of `income pooling': a household with a single utility function pools income from all sources before deciding expenditure; whereas if incomes are not pooled, a wife's earnings increase her bargaining power. But there are problems with studying the wife's relative earnings:

> "Income pooling implies a restriction on family demand functions that appears simple to test: if family members pool their income and allocate the total to maximise a single objective function, then only total income will affect demands. [...] A test of the pooling hypothesis requires a measure of husband's and wife's relative control over resources. Relative earnings would seem to be an attractive candidate for this measure [...] The difficulty with this approach is that earnings are clearly endogenous with respect to household time allocation decisions [...] If we think of earned income as the product of hours worked and a fixed market wage, then the first factor, hours worked, is a standard choice variable in models of household behavior and is determined simultaneously with the expenditure patterns the pooling test examines."
>
> (Lundberg & Pollak, 1996: pp. 144-5).

One `solution' to the simultaneity problem, according to many economists, is to use the wife's <u>hours</u> of paid work (rather than her earnings) as the explanatory variable. Consider the logic of this argument: we cannot use a wife's earnings to explain consumption patterns, because her employment is determined simultaneously with spending (on time-saving goods); so instead, we use her work hours. But this is no solution: the wife's hours in paid work are **more** closely linked to time-allocation than her earnings. The suggestion (in the above quote from Lundberg & Pollak) that hourly wages are "fixed" seems implausible - cleaners do not earn the same wage-rate as barristers; but if wage-rates were constant, weekly wages would

be proportional to hours of paid work, so using wife's hours would be no less endogenous than wife's earnings. In other words, if wage-rates are constant, hours employed are as endogenous as wife's earnings; and if wage-rates vary (as they do, in both Britain and India) then hours employed is **worse** than earnings as regards endogeneity. My criticisms in this paragraph are not directed at Lundberg & Pollak, who (in my view) correctly report the methodology of most empirical economists in this field. Many economists do not even attempt to justify using wife's hours of work: for example, consider the work of David Piachaud - his only explanation for using wife's work hours is

> "Rather than relate this to the man's and woman's income it is considered first in relation to the woman's hours of work"
> (Piachaud, 1982: p. 477).

Despite the above quote, Piachaud did not test any other model for durable goods; yet after reporting findings based on wife's paid work <u>hours</u>, he feels able to apply them to <u>incomes</u>:

> "there are only very limited indications that combined expenditure on particular items bears a different relationship to the man's than to the woman's income."
> (Piachaud, 1982: p. 477).

There seems no justification for treating work hours as synonymous with income, as Piachaud appears to do; and using hours does not solve the simultaneity problem. Yet the use of wife's hours of paid work is relatively widespread in this field, despite the fact it is not an appropriate test for any of the main economic theories (Bryant, 1988: p. 39). I suspect that wife's hours is often used because (arguably) this measure discriminates between the `unitary' and `bargaining' models. In testing competing theories, we must use methods which can assess which theory is true and which false. Suppose we found that spending on time-saving goods is associated with higher wife's earnings (controlling for total household income); a `game-theory' economist might interpret this as evidence that high-earning wives have more power over spending; but a `new home economist' might argue that wives with high weekly earnings are those with high wage-rates (assuming little variation in paid hours), and claim that the evidence supports the price-of-time hypothesis. But using wife's hours of paid work (rather than earnings) as the explanatory variable, if paid hours affect spending, this is evidence in favour of bargaining models which does not support the `price of time' hypothesis. So for this chapter, I follow much previous research in using wife's hours of paid employment as the key variable to test bargaining models.

SHOULD WE USE A DUMMY VARIABLE TO MEASURE WIFE'S EMPLOYMENT?

Several researchers have studied the number of hours per week of paid work by women, such as Browning & Meghir (1991); Foster (1988); Piachaud (1982); Strober (1977); and Weinberg & Winer (1983). However, some researchers used a dummy variable (wife is employed, or wife not employed) on durable goods ownership - see, for example, Strober & Weinberg (1980); this approach would treat a woman who works for one hour per week the same as a full-time employed woman, which seems inappropriate; work by Browning & Meghir (1991: p. 942) claimed that studying employment status, rather than hours worked, led to a bias which was often significant. If a woman's employment **status** strongly influences household spending (independent of the extent of her employment), then this effect should be picked up by regressions including the number of hours of paid employment. Empirically, hours of paid employment seems more closely related (than employment/non-employment status) to household spending:

> "Existing research indicates that the extent of a wife's participation in the labour force is a more important determinant of expenditure than the fact of employment or non-employment"
>
> (Foster, 1988: p. 19).

We could use a dummy variable, equal to one if the wife is employed or zero otherwise, rather than the wife's hours of employment; but if so, should part-time-employed women be included with full-time-employed women, or with housewives? Regarding who does the domestic work, there is evidence for Britain (from *BSA* data) that men only help with domestic tasks if their wives are employed full-time:

> "Although we might have expected women who work part-time to fall midway between women in full-time work and the homemakers, it turns out that they are much closer to the homemakers. [...] However, in one important area of domestic life, the organisation of household finances, women in part-time and full-time employment are equally likely to play a part (in contrast to women who do not have a paid job, who are much less likely to play a part in financial matters)."
>
> (Kiernan, 1992: p. 103).

I cannot justify grouping part-time-employed women with either full-time-employed women or with housewives; hence, I use the wife's hours of employment, rather than a dummy variable.

This task of deciding how to measure women's employment is further complicated because there may be costs such as travel costs associated with employment (e.g. Rubin, Riney & Molina, 1990: p. 43; Strober & Weinberg,

1980: p. 340); if so, an employed-wife household may face more difficult financial problems than a similar household with the same total income.

REGRESSION SPECIFICATION

The regression specifications adopted in this thesis are all modified from that used by Piachaud (1982): his is one of the simplest versions discussed in the literature review (chapter 2), but nevertheless has powerful implications for this field of economics - Piachaud's results (like results of other researchers) suggest that economic theories in this field have been completely unsuccessful. Piachaud studied the ownership of three durables: washing-machine; refrigerator; and car (Piachaud estimated three separate regression equations - one for each durable). Piachaud found that employed-wife households were not more likely to own to these `time-saving' durables, controlling for household income; this contradicts the predictions of bargaining models, and is difficult to reconcile with the price-of-time approach.

Because each dependent variable is either zero (durable not owned) or one (durable is owned), Piachaud used logit regression, as shown in equation **[8B]** below:

$$\frac{X}{(1-X)} = \alpha_0 + \alpha_1 Y + \alpha_2 K + \alpha_3 H_w + \alpha_4 A$$

where X = *probability of ownership*
Y = *family income*
K = *number of children*
H_w = *wife's paid hours per week*
A = *dummy: household head at least* 30

[8B]

Piachaud restricted the 1977 *FES* data, as indicated in section 6.6 of this thesis. Unlike most empirical researchers studied in this thesis, Piachaud did not use log of household income; this may explain his fourth sample restriction, in which he considered only households with incomes between 100% and 300% of the supplementary benefit level applicable to that family:

> "Since the analysis is restricted to a limited range of incomes, some of the most serious defects of a linear system are mitigated"
>
> (Piachaud, 1982: p. 475).

However, Smith (1991: p. 20) commented that Piachaud's sample restriction would exclude a substantial proportion of couples where the wife was

employed full-time; this suggests that Piachaud's income restriction may distort results by `sample-selection bias'. Hence, for this thesis, I do not use Piachaud's fourth income restriction; and I use the **log** of most variables (including household income), to avoid problems of a linear system referred to by Piachaud. Hence, the regression equation used in this chapter is that indicated by equation **[8C]** below:

$$\frac{X}{(1-X)} = \alpha_0 + \alpha_1 Y + \alpha_2 K + \alpha_3 H_w + \alpha_4 A$$

where X = *probability of owning durable*
Y = log *of* (*family income*)
K = log *of* (*number of children*)
H_w = log *of* (*wife's paid hours per week*)
A = *dummy*: *household head at least* 30

[8C]

I limit the sample to two-adult (heterosexual couple) households, where the husband is under 65 years old.

8.4 MY OWN RESULTS: DO EMPLOYED WOMEN OWN TIME-SAVING DURABLES?

I report the key regression coefficient (the wife's hours of paid work per week) in tables **8<1>** to **8<6>** below; I report all coefficients (not only wife's employment) in the appendix. The reader should note that I regard the findings shown in all tables **8<1>** to **8<6>** inclusive to be meaningless, for reasons I explain in chapter 9; nevertheless, they are based on the methodology used by Piachaud (1982), which is broadly typical of much economic research in this field. The first table (**8<1>** below) examines the effects of wife's employment on washing-machine ownership.

TABLE 8<1> **Specification based on that of Piachaud: WASHING-MACHINE OWNERSHIP**

	UK (*FES*)			URBAN INDIA		
	LOG OF WIFE's PAID WORK (hours/week)	SAMPLE SIZE	ODDS RATIO	LOG OF WIFE's PAID WORK (hours/week)	SAMPLE SIZE	ODDS RATIO
1969-74	-0.104"	19536	3.4			
1975-80	-0.094"	19753	7.5			
1981-86	-0.007	18798	16.3			
1987-92	0.052	16677	34.1	-0.139	944	9.9
1993-	0.073	7185	63.7	0.033	470	9.0

Consider the effects of wife's employment on washing-machine ownership, in the UK, from table **8<1>** above. For the years 1969-74 combined, the coefficient is -0.104 (the " symbol indicates that this coefficient is statistically significant at the 1% level); but the coefficient is 0.073 for the period 1993-96 (this coefficient is not statistically significant). In other words, the coefficient is significantly negative in the earlier years, but later became positive. Wife's employment increased the chance of her household owning a washing-machine in recent years, which supports a bargaining perspective; but in the earlier years, wife's employment made washing-machine ownership less likely, which is incompatible with all bargaining hypotheses discussed in this thesis. I return to this time-trend at the end of this chapter, and elsewhere in the thesis. The results for urban India in table **8<1>** are not statistically significant, and I do not consider the sample-sizes or time-scale sufficient to assess whether or not there is a time-trend in India (as there appears to be in the UK). My interpretation of table **8<1>** is that it rejects bargaining models: no bargaining hypothesis I know of can explain why wife's employment should

reduce ownership of time-saving durables (as happened in the earlier years of table **8<1>** above).

TABLE 8<2> Specification based on that of Piachaud: DISHWASHER OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	LOG OF WIFE's PAID WORK (hours/week)	SAMPLE SIZE	ODDS RATIO	LOG OF WIFE's PAID WORK (hours/week)	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92						
1993-	-0.124"	7185	3.0			

There is no coefficient for urban India in table **8<2>**, because dishwashers were not included in the *WAS* surveys. Table **8<2>** is not helpful in assessing the existence of a time-trend, as seen in table **8<1>**, because earlier *FES* surveys did not include dishwasher ownership. The only coefficient shown (1993-96, for the UK) is significantly negative; this appears to reject the bargaining models discussed in section 2.4, but given the contradictory findings in table **8<1>**, I do not consider table **8<2>** an entirely convincing rejection of bargaining models.

TABLE 8<3> Specification based on that of Piachaud: FOOD-PROCESSOR OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	LOG OF WIFE's PAID WORK (hours/week)	SAMPLE SIZE	ODDS RATIO	LOG OF WIFE's PAID WORK (hours/week)	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92				-0.090	944	4.0
1993-				-0.327"	470	2.6

Table **8<3>** above considers the effect of wife's employment on food-processor ownership: this durable is not included in either *FES* or *BHPS* surveys. The urban India results reject the bargaining models, in that wife's employment appears to reduce the likelihood of food-processor

ownership (the coefficient is statistically significant at 1% in the *WAS* 1997 survey).

TABLE 8<4> Specification based on that of Piachaud: MICROWAVE OVEN OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	LOG OF WIFE's PAID WORK (hours/week)	SAMPLE SIZE	ODDS RATIO	LOG OF WIFE's PAID WORK (hours/week)	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92						
1993-	0.086"	7185	4.2	-3.481	470	57.8

The above results for microwave ovens in table **8<4>** are not consistent between the UK (a positive coefficient) and urban India (a negative coefficient); the UK results are more convincing, being based on a larger sample-size, and because the UK coefficient is statistically significant (whereas the urban India result is not). Hence, table **8<4>** suggests some support for a bargaining view; however, it is not very persuasive support for bargaining models, because of the negative coefficient for urban India.

As a check on table **8<4>**, I now assess if the results are sensitive to the exact form of the regression I used. I take one year (1994) and one country (UK), and change the regression specification: I use the number of children, rather than the LOG of number of children, as an explanatory variable, on UK (*FES*) data for calender year 1994. The results are:

$$\frac{p_i}{1 - p_i} = -1.09 + 0.01 H_w + 0.42" Y + 0.05 A - 0.04 N$$

where **[8D]**

P_i = *probability of owning a microwave oven*
H_w = *wife's paid work* (*hours per week*)
Y = log *of net household income* (£*s per week*)
N *is the number of children in the household*
" *indicates a coefficient significant at* 1%

Equation **[8D]** above indicates that the coefficient on wife's hours of work is positive, but not statistically significant; this is neither a clear

confirmation, nor a clear rejection, of the bargaining model (which would predict a significantly positive coefficient). This weakens the case suggested by table **8<4>** (which showed a statistically significant positive coefficient for the UK); but we must be aware that the sample-size is rather small in equation **[8D]** (only 1,773 households), and hence we should place more trust in table **8<4>** (which combines data for several years of *FES* data) than in equation **[8D]**.

I now report a third alternative specification for table **8<4>** above, reported in equation **[8E]** below. Again, I use UK (*FES*) data for 1994. In this specification, I use the wife's net earnings as a fraction of total net household income (in a few households, the wife's earnings were apparently more than total household income - perhaps due to errors in the data collection; I exclude these households from the analysis). This gave an index (indicated by *R*) which varied from zero (wife has no earnings) up to about 0.9999 (virtually all household income is earned by the wife). The sample excludes households in which the husband is aged over 65.

$$\frac{p_i}{1 - p_i} = -1.31` + 0.06\,R + 0.49"Y - 0.05\,N$$

where

is the probability of owning a microwave oven **[8E]**
is wife's earnings as a fraction of household income
is log *of net household income* (£*s per week*)
is the number of children in the household
indicates a coefficient significant at 5%
indicates a coefficient significant at 1%

Equation **[8E]** above confirms my previous findings. The new index (*R*) is not statistically significant, and hence it does not offer support to a bargaining (game theory) model: but it is the predicted sign (i.e. positive), so it does not reject a bargaining hypothesis convincingly. The non-significance of the coefficient may be due to the small sample-size in equation **[8E]** (only 1,765 households). I do not report similar results for India, or for other durables, for reasons of space.

The UK section of table **8<4>** above appeared to support a bargaining model; however, equations **[8D]** and **[8E]** weaken this evidence, because neither **[8D]** or **[8E]** (using two alternative specifications) offer statistically

significant support for a bargaining hypothesis. Hence, table **8<4>** appears to be (at best) very weak support for a bargaining model.

TABLE 8<5> Specification based on that of Piachaud: REFRIGERATOR OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	LOG OF WIFE's PAID WORK (hours/week)	SAMPLE SIZE	ODDS RATIO	LOG OF WIFE's PAID WORK (hours/week)	SAMPLE SIZE	ODDS RATIO
1969-74	-0.093"	19536	4.2			
1975-80	0.013	19753	23.9			
1981-86	0.059	18798	85.2			
1987-92	0.132	16677	150.6	-0.166	944	5.9
1993-	0.247`	7185	210.3	-0.363"	470	3.9

Table **8<5>** is perhaps the clearest example of all tables in this thesis, of the need to place results in time context (at least for the UK). Like table **8<1>**, there seems to be a time-trend in table **8<5>**, in that the UK coefficients change from negative to positive; and in table **8<5>**, both the earliest and latest UK coefficients are statistically significant, so there is strong evidence of a trend from negative to positive coefficients. There is insufficient evidence on urban India to assess whether or not there is a time-trend there also. Table **8<5>** does not clearly support or reject bargaining models.

TABLE 8<6> Specification based on that of Piachaud: DEEP-FREEZER OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	LOG OF WIFE's PAID WORK (hours/week)	SAMPLE SIZE	ODDS RATIO	LOG OF WIFE's PAID WORK (hours/week)	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80	-0.063"	6288	1.8			
1981-86	-0.043"	18798	3.1			
1987-92	0.019	16677	10.2			
1993-	-0.000	7185	22.8			

Table **8<6>**, based on deep-freezer ownership, offers fairly persuasive evidence against bargaining models. Of the four coefficients, three are negative; two of these coefficients are statistically significant - both

negative. Unfortunately, deep-freezers were not included in either of my *WAS* (India) surveys. The time-trend apparent in tables **8<1>** and **8<5>** is not so clear in table **8<6>**.

Tables **8<1>** to **8<6>** above report evidence on six time-saving durable goods, and appear to cast doubt on bargaining models reviewed in section 2.4 above. I now turn to dramatrix evidence, which incorporates ownership of several durables at once.

8.5 DRAMATRIX EVIDENCE ON EMPLOYED-WIFE HOUSEHOLDS' PRIORITIES

Before we rush to reject conventional economic theories, we must consider the possibility that the above regression evidence is flawed: the regression process may in some way conceal the true patterns. For an alternative form of assessment to regression, I now turn to the `priority ordering' approach of Fine et al, as outlined in section 4.3 above: this approach uses a `dramatrix' to indicate which durables are given higher priorities by different types of households.

For Britain, I chose to report a dramatrix based on data from *FES* surveys from 1993 to 1995/6 inclusive; this is dramatrix **8<7>** below.

DRAMATRIX 8<7>
WIFE's HOURS OF PAID WORK: UK (*FES*) 1993 to 1995/6

	GP1	GP2	GP3	GP4	GP5	GP6
% ownership	*68.7*	*77.5*	*79.2*	*79.5*	*79.9*	*84.4*
REFRIGERATOR	0	0	0	0	0	0
WASHING-MACHINE	0	0	0	0	0	0
TELEPHONE	0	0	0	0	0	0
DEEP-FREEZER	0	0	0	0	0	0
CENTRAL HEATING	0	-2	-2	-2	-2	-2
VIDEO	0	1	1	1	1	0
FIRST CAR	0	1	1	1	1	3
MICROWAVE OVEN	0	0	0	0	0	0
TUMBLE-DRIER	0	0	0	0	-1	-1
CD-PLAYER	0	0	0	0	1	1
SECOND CAR	-1	0	0	0	0	0
DISHWASHER	1	0	0	0	0	0
Pop uniformity	977	977	977	977	977	977
Subgroup uniformity	877	841	783	873	931	1054
Conformity	882	888	816	903	959	1105
Sample size	**4757**	**536**	**1213**	**765**	**1795**	**240**

VALUES FOR WIFE HOURS:

GP1	not employed
GP2	1 to 10 hours per week
GP3	11 to 20 hours per week
GP4	21 to 30 hours per week
GP5	31 to 40 hours per week
GP6	41 or more hours per week

Dramatrix **8<7>** above does not offer much support to the hypothesis that employed-wife households are more likely to buy time-saving durables. If a wife's employment increases her bargaining-power (as bargaining models suggest), we would expect to see time-saving durables placed at a higher priority on the right-hand-side of dramatrix **8<7>** above - but we do not observe this. The only time-saving durable showing any variation in the

above dramatrix is dishwashers, which are a lower priority for employed-wife households. I do not report dramatrices for other *FES* years - they are no more convincing than was dramatrix **8<7>** in terms of support for bargaining models. I do not present an equivalent dramatrix to **8<7>** for urban India, because of the limited coverage of durables in 1992 (only six, of which five are `time-saving'), and the small sample-size in 1997.

In summary, then, dramatrix evidence has not changed the implications of regression analysis: that bargaining models have not been successful in explaining household durables ownership. However, it is possible that Piachaud's regression specification (equation **[8B]**, modified to equation **[8C]** for my regression results) was inappropriate in some way. I now proceed to consider a possible development of Piachaud's analysis.

8.6 CONTROLLING FOR HUSBAND'S HOURS OF PAID WORK

The above tables **8<1>** to **8<6>** were based on the widely-used approach of studying the effects of the wife's hours of paid work on durables ownership. I now turn to an alternative model.

In chapter 5, I developed a mathematical model of household behaviour. This model was intended to build on the work of Piachaud, and hence emphasised the number of hours of paid employment of wives; the final equation **[5S]** in that chapter has some parallels with the regression equation **[8C]**, which was tested in the first half of this chapter. But equation **[5S]** includes the husband's hours of paid work, in addition to those of the wife: this is a result of the assumption that a husband does some domestic work (although perhaps much less than his wife). It is possible that Piachaud's omission of husband's hours of employment might explain why the empirical findings of the first half of this chapter (and of Piachaud himself) do not conform to the predictions of mainstream economic theories. The next equation adds an extra term to equation **[8C]**, and drops the dummy variable for husband's age (which I see no reason to include), to form the following regression equation:

$$\frac{X}{(1-X)} = \alpha_0 + \alpha_1 Y + \alpha_2 K + \alpha_3 H_w + \alpha_4 H_h$$

where
X = *probability of ownership*
Y = log *of* (*family income*)
K = log *of* (*number of children*)
H_w = log *of* (*wife's paid hours per week*)
H_h = log *of* (*husband's paid hours per week*)

[8F]

In table **8<8>**, I report estimates based on the above regression equation **[8F]**. I indicate two coefficients (husband's and wife's hours of employment) in table **8<8>**, whereas I only showed one coefficient (wife's hours of employment) in tables **8<1>** to **8<6>**. Full regression results are included in appendix section **A8<8>**.

TABLE 8<8> Paid work (hours/week) by husband and wife: WASHING-MACHINE OWNERSHIP

	UK (*FES*)				URBAN INDIA			
	LOG OF HUSBANDs PAID HOURS	LOG OF WIFE's PAID HOURS	SAMPLE SIZE	ODDS RATIO	LOG OF HUSBANDs PAID HOURS	LOG OF WIFE's PAID HOURS	SAMPLE SIZE	ODDS RATIO
1969-74	-0.047"	-0.104"	19536	3.4				
1975-80	0.012	-0.097"	19753	7.5				
1981-86	0.022	-0.021	18798	16.2				
1987-92	0.028	0.038	16677	34.1	-0.159	-0.135	942	10.0
1993-	0.018	0.053	7185	63.7	0.006	0.036	470	9.0

In the above table, there are three aspects I wish to emphasise. Firstly, just over half of the coefficients for the husband's hours of employment are **positive** - whereas just over half of the coefficients for wife's employment are **negative**; this suggests that husbands' employment tends to increase ownership of washing-machines, but wife's employment tends to reduce it. This claim is not very convincing, as most of the coefficients are not statistically significant; but I feel that results in table **8<8>** justify inclusion of the husband's employment in regression analysis in this thesis, which in turn justifies my mathematical model in chapter 5. A comparison of the `odds ratio' (goodness of fit) measure between table **8<1>** and table **8<8>**, however, suggests that this new variable (husband's paid hours) adds little to the overall explanatory power of the equation.

A second issue regarding table **8<8>** is the `symmetry' prediction I made in chapter 5. The mathematical model in chapter 5 implies that an extra hour of paid work by the husband should have exactly the same effect on consumption of time-saving goods as would an extra paid hour for the wife (see equation **[5S]**): this `symmetry' between husband and wife is an effect of the Nash bargaining model adopted (although chapter 5 did not assume that husband and wife do equal amounts of domestic work). This `symmetry' implies that coefficient $\alpha_3$ should equal coefficient $\alpha_4$ in equation **[8F]** above, and hence that the husband's and wife's coefficients in table **8<8>** should be the same, for the same country and time-period. Table **8<8>** does not offer convincing support for `symmetry': for *FES* 1975-80 (UK), for example, the coefficients for husband and wife are of opposite sign; but in five of the seven husband's coefficients in table **8<8>**, the husband's coefficient has the same sign as the wife's coefficient.

The third point to observe in table **8<8>** is the wife's employment coefficient: as for table **8<1>**, the UK results appear to display a general trend of negative coefficients in the earlier years, changing to positive coefficients in the later years. The fact that this trend is still visible (after adding husband's employment to the regression) suggests that the apparent trend in tables **8<1>** and **8<5>** is not simply spurious.

As a further test, I now present the results of another regression including both husband's and wife's hours of paid work: equation **[8G]**. This regression equation is identical to **[8D]** above, except that I add husband's hours of work: hence, it differs slightly from the regression equation **[8F]** used to create table **8<8>** above - equation **[8F]** uses log of number of children, whereas equation **[8G]** results includes number of children <u>without</u> using logs. Equation **[8G]** is only used for UK (*FES*) data for (calender year) 1994. The results are shown below.

$$\frac{p_i}{1-p_i} = -1.07 - 0.0001H_h + 0.01H_w + 0.43"Y - 0.04N$$

where

P_i *is the probability of owning a microwave oven*
H_h *is husband's paid work (hours per week)*
H_w *is wife's paid work (hours per week)*
Y *is* log *of net household income (£s per week)*
N *is the number of children*
" *indicates a coefficient significant at* 1%

[8G]

In equation **[8G]** above, neither the husband's nor the wife's coefficient is statistically significant; hence, equation **[8G]** does not confirm the claim (by game theorists) that wife's employment increases her bargaining-power. However, the wife's employment coefficient is of the predicted sign, and hence cannot be presented as convincing evidence against the bargaining hypothesis. I do not report an equivalent set of results to equation **[8G]** for India, or for other durable goods, for reasons of space.

Table **8<8>** refers to washing-machine ownership, and equation **[8G]** to microwave ovens; neither offers much support for bargaining models.
I do not present information like **8<8>** or **[8G]** for the other durables, because my main focus in this thesis is on wives' (rather than husbands') employment. However, I do report table **8<9>** below: this is the only table in this thesis which reports findings related to single-person households (apart from the copy of table **8<9>**, in section 4.4). The central column

of table **8<9>** shows the preferences of two-adult households: this column corresponds to the UK data used in the last row of tables such as **8<1>**. I wish to concentrate on the left and right-column columns (labelled GP1 and GP3): they can be used to assess whether or not men and women have different preferences (note that both GP1 and GP3 columns include single-parent households, so childrens' preferences may also have an influence).

DRAMATRIX 8<9>
PRIORITIES FOR SINGLE-PERSON HOUSEHOLDS: UK (*FES*) 1993-6

	GP1	GP2	GP3
% ownership	*54.6*	*74.0*	*59.4*
REFRIGERATOR	0	0	0
WASHING-MACHINE	-2	0	0
TELEPHONE	0	0	-1
DEEP-FREEZER	-1	0	1
CENTRAL HEATING	3	0	0
VIDEO	0	0	0
FIRST CAR	0	0	-2
MICROWAVE OVEN	0	0	1
TUMBLE-DRIER	-1	0	1
CD-PLAYER	1	0	0
SECOND CAR	-1	0	-1
DISHWASHER	1	0	1
Pop uniformity	977	977	977
Subgroup uniformity	1331	893	1078
Conformity	1440	893	1168
Sample size	**1618**	**18657**	**2612**

VALUES FOR HOUSEHOLD TYPE:
GP1 single man, or male single parent
GP2 couple, with or without children
GP3 single woman, or female single parent

Dramatrix **8<9>** suggests that washing-machines, deep-freezers, and microwave ovens are all higher priorities among women than among men, which suggests that women have greater interest than men in owning time-saving durables. The evidence from the GP3 column (single-woman/single mother) suggests that women do value time-saving durables highly; and hence that in bargaining models of couple households, women would choose to buy time-saving durables if they could. Yet the regression evidence of tables **8<1>** to **8<6>** did not offer much support to such a pattern.

I do not report dramatrices like **8<9>** for earlier *FES* years, because they are similar to **8<9>**; and I do not report equivalent tables for urban India, because the 1992 *WAS* survey included too few durables, and the 1997 survey was restricted to married respondents.

8.7 IS THERE A TIME-TREND IN PREVIOUS EMPIRICAL RESEARCH?

In section 8.2, I reported previous empirical research testing `bargaining' models; I emphasised that there were contradictory findings from different researchers. In seeking to explain these contradictions, I noted that the two articles supporting bargaining models (Bryant, 1988 and Oropesa, 1993) are both relatively recent, whereas the majority of previous research were earlier than this, and rejected bargaining models. It is possible that the two more recent articles were picking up the effect shown by positive coefficients in the bottom few rows of tables **8<1>** and **8<5>** above, which appeared to support a `bargaining' model; whereas the rejection of bargaining models by earlier empirical researchers such as Strober (1977), Strober & Weinberg (1980), Piachaud (1982), and Weinberg & Winer (1983), were picking up the negative effects seen in the top few rows of tables **8<1>** and **8<5>** above. It is difficult to assess this view, because some of these articles were based on UK data, but others on U.S. data; and their empirical methods varied. It might be possible to use U.S. data for several years, to create equivalents of tables **8<1>**, **8<5>** and **8<6>**; but this is beyond the scope of this thesis (which is limited to UK and India). This might be a promising line for future research.

8.8 SUMMARY: INTERPRETING THE ABOVE EVIDENCE

Tables **8<1>** to **8<6>** above help us to place the findings of Piachaud (1982) in perspective. Piachaud based his empirical work on *FES* 1977; he found wife's employment tended to reduce the probability of her household owning refrigerators or washing-machine. My results are generally consistent with Piachaud's findings: of the ten coefficients in tables **8<1>** to **8<6>** which are statistically significant, eight are significantly negative and only two are significantly positive. Hence overall, I can confirm Piachaud's conclusion that

> "the expected result - that those doing more paid work would possess more labour-saving aids - was not confirmed."
>
> (Piachaud, 1982: p. 481).

In addition, there appears to be a trend in the UK results from negative coefficients (in earlier years) to positive coefficients (in later years), at least in tables **8<1>** and **8<5>** above. I discuss this apparent trend in section 8.7 below. The overall impression from my empirical work, I suggest, is that mainstream economic theories outlined in chapter 2 are weak in explaining the observed behaviour. The remainder of this thesis attempts to shed light on the apparently poor performance of these economic theories.

Empirical results reported above in table **8<8>** suggest that husband's hours of paid work are about as important as wife's employment, in influencing ownership of time-saving durables. But table **8<8>** suggests that including husband's employment is not, in itself, sufficient to reconcile most previous results with the predictions of the economic theories examined in chapter 2. In the following chapter, I discuss links between women's employment and men's employment, which may shed light on the rather confusing empirical evidence.

CHAPTER 9

`NON-LINEAR' EFFECTS OF WOMEN'S EMPLOYMENT

9.1 INTRODUCTION

The previous two chapters used conventional economic methods (regression) together with a less widely-used method (the `ordering' technique) to test two approaches to the analysis of the effects of wives' employment on time-saving durables ownership. Neither of these approaches (the price-of-time hypothesis, in chapter 7; and `bargaining' models, in chapter 8) proved very successful in explaining my findings for the UK and urban India.

In this chapter, I bring together two other types of evidence, which will further reduce any faith the reader may have in either price-of-time or bargaining approaches. The first type of evidence, in section 9.2, indicates that there are complex interactions between the earnings of a husband and wife: these do not seem to be explained by either the price-of-time or bargaining models.

The following section, 9.3, takes a different tack: rather than using regression, I report the percentage ownership in groups of households divided into different income-bands. Within each band, I study the effects of wife's employment, and find inconsistent effects: the effect of a wife's employment depends on her household's income level. Sections 9.4 to 9.6 attempt to make sense of the patterns observed in this chapter.

I conclude from the evidence of this chapter that previous researchers' empirical evidence is flawed; and that (based on evidence in section 9.3) there seems little reason to accept either the price-of-time or bargaining models.

9.2 INTERACTIONS BETWEEN HUSBAND'S AND WIFE'S EMPLOYMENT

Many writers have discussed the effects on household behaviour of wife's earnings - both for the UK (Dex, 1985: p. 184; Yeandle, 1984: p. 165), and for India (Shukla, 1987: p. 628). All of the approaches discussed in chapter 2 predict that increases in women's earnings will tend to lead to increased ownership of durable goods, all other things being equal; the remainder of this section presents new empirical evidence on this issue.

CROSS-TABULATING HUSBAND'S AND WIFE'S EARNINGS

In my assessment, most previous economic research on household consumption appears to assume that the wife's earnings are independent of those of her husband. Is this assumption justified?

In order to understand links between husband's employment and wife's employment, I created tables **9<1>**, **9<2>** and **9<3>** below, which group households according to husband's and wife's earnings, with each partner's earnings split into eight bands. This type of table is known in SPSS as a `crosstab' (cross-tabulation). Each crosstab indicates the number of households in each group: for example, in **9<1>**, there are 1,612 households in which neither husband nor wife earn anything (the bottom-left corner of crosstab), which represent households relying entirely on unearned income such as unemployment benefits. For all crosstabs (**9<1>** to **9<3>**), I use the same sample restrictions as for regressions (see section 6.6): I study households containing a married or cohabiting couple (and no other adults), in which the husband is under 65 years old. To permit comparisons over time, I convert UK earnings for each year to 1996 prices, and Indian earnings to 1997 prices (see section 6.5).

Crosstab **9<1>** is based on UK (*FES*) data, for the period 1969-74: this is the same time-period as the first row in tables **8<1>** to **8<6>** of chapter 8.

CROSSTAB 9<1> HUSBAND'S and WIFE'S EARNINGS: UK (*FES*), 1969-74

WIFE'S NET EARNINGS
(£s per week, 1996 prices)

	0	1-100	101-200	201-300	301-400	401-500	501-600	601-700	over 700
700 +									
601-700									
501-600			1	1				1	
401-500			1	1					
301-400	3		1	1	5				
201-300	11	1	18	30	13	6			1
101-200	156	38	1210	564	96	17	5	2	3
1-100	675	220	4201	1450	187	36	16	6	7
0	1612	241	5178	2693	539	152	68	31	39

HUSBAND'S NET EARNINGS *(£s per week, 1996 prices)*

If the husband's earning were independent of wife's earning, and both were normally distributed, we would expect most households to be clustered around the centre of crosstab **9<1>**; because women's average earnings are lower than those of men, we would expect most households to be below the centre of the crosstab. The observed pattern in crosstab **9<1>** shows three aspects which I consider to be surprising:

{i} The shaded cells indicate where a husband's income is approximately equal to that of his wife. There are relatively few households above this line; of the few which are, almost all are where the husband is not employed (the leftmost column).

{ii} In households where husbands are unemployed or on low income (the left-hand-side of crosstab **9<1>**), most wives are not employed.

{iii} Among households with richer husbands (the right-hand-side of crosstab **9<1>**), surprisingly few women are employed.

The above crosstab **9<1>** suggests that husband's and wives' earnings are <u>not</u> independent of each other. Consider the third column from the left (representing husbands earning £101 to £200 per week at 1996 prices): there are 10,610 of which only 5,178 wives are non-earners (49%). Compare this with the rightmost column of the crosstab: out of the 50 households in this column, there are 39 in which the wife is not earning (78%). Relatively few wives are employed among the four columns on the right - I discuss this further below.

The above findings surprised me, in indicating complex links between husband's and wife's earnings. I would not have investigated such links, if it were not for my attempts to understand why household financial management (associated with Jan Pahl) seemed to explain household durable goods ownership (see chapter 10). However, I am not the first to suggest that wife's and husband's earnings are interrelated:

> "Spouses' wage rates tend to be positively correlated (because of assortative mating) but a wife's labour supply tends to be negatively correlated with her husband's income"
>
> (Winegarden, 1987: p. 224).

I discuss links between husband's and wife's employment in sections 3.2 above.

I now turn to a similar crosstab, which is based on more recent UK data. Crosstab **9<2>** is based on *FES* data for 1993-6: this is the same time-period as the last row in tables **8<1>** to **8<6>** in chapter 8.

CROSSTAB 9<2> HUSBAND'S and WIFE'S EARNINGS: UK (*FES*), 1993-6

WIFE'S NET EARNINGS
(£s per week, 1996 prices)

	0	1-100	101-200	201-300	301-400	401-500	501-600	601-700	over 700
700 +	2	1					1		
601-700									2
501-600	3		1	1	3	4	1		1
401-500	8	1	5	2	2	9	4	1	2
301-400	29		11	39	29	19	7	2	3
201-300	132	8	84	198	160	41	19	5	6
101-200	335	31	396	596	218	70	18	13	14
1-100	472	48	417	569	221	96	27	5	11
0	1261	80	388	508	281	120	53	40	51

HUSBAND'S NET EARNINGS *(£s per week, 1996 prices)*

Crosstab **9<2>** is similar to **9<1>** in several respects: for example, there are relatively few households above the shaded diagonal line. The key difference I wish to emphasise is the right-hand columns: among households with rich husbands, there are now more women employed. In the rightmost column of **9<1>**, for example, there are only 57% (51 out of 90) non-employed wives compared with 78% in **9<2>**. I think this difference might be

important, because it may explain the apparent trend discussed in section 8.7 above: I have observed that the richest households tend to own time-saving durables, regardless of the wife's employment status (see section 9.3); so there may be a spurious link between durables ownership and the employment status of wives of rich husbands. This issue might be settled by further research in this field.

Tables **9<1>** and **9<2>** refer to the earliest and latest groups of years in tables such as **8<1>**; I do not report crosstabs like **9<1>** and **9<2>** for the intervening years: these are rather similar to each other, and indicate a gradual increase in the fraction of wives with rich husbands who are employed. I now report an equivalent crosstabulation for India. Unfortunately, the 1992 survey did not ask for individual earnings data, so I am forced to rely on the 1997 survey; because of the small sample-size, I simplified the crosstab: rather than eight rows and columns (in crosstabs **9<1>** and **9<2>**), crosstab **9<3>** has only five rows and columns.

CROSSTAB 9<3> **HUSBAND'S AND WIFE'S EARNINGS: urban India, 1997**

WIFE'S NET EARNINGS
(Rupees per month)

	0	1-2000	2001-4000	4001-6000	6001 or more
6001 or more				1	3
4001 - 6000			1	2	4
2001 - 4000			7	3	1
1 - 2000	2	36	14	1	2
0		152	162	39	40

HUSBAND'S NET EARNINGS *(Rupees per month)*

At a casual glance, crosstab **9<3>** looks similar to both **9<1>** and **9<2>** - for example, there are very few households above the shaded diagonal line. But my view is that **9<3>** is more similar to **9<1>** than to **9<2>**: most of the employed women in **9<3>** have middle-earning husbands, and wives of richer husbands are rarely employed. In other words, urban Indian households in 1997 seem more like UK in the early 1970s than like contemporary UK.

In my view, the above patterns suggest that certain types of employment pattern are more acceptable for women, in both the UK and urban India: for example, it is rare for a wife to earn more than her husband. It is possible that a husband's employment is dependent on his wife's earnings, but I suggest that if a wife does earn more than her husband, it is easier for her to reduce her earnings (such as by taking part-time employment) than for her husband to earn more. If such patterns do exist, it is unclear what determines which combinations of husband's earnings and wife's earnings are `acceptable': is the pressure (to fit into the pattern) from inside, or outside, the household? Some writers suggest that society forces individuals to behave in socially "appropriate" ways:

> "Norms regarding appropriate marital or parental behavior for men and women may be powerful in their ability to channel the behavior of marital partners to one equilibrium among many - raising the question of how such norms develop and are maintained."
>
> (Lundberg & Pollak, 1996: p. 156).

Julie Nelson (1994: p. 128) suggested that in many upper-class households in the USA, there is a trade-off between husband and wife, in which the husband agrees to give his wife a high standard of living in return for `affiliation', by which Nelson appears to mean obedience and other forms of affection. Nelson's observation may explain why employment is so unusual among wives of rich husbands. Analysis of social class is popular among sociologists, but more rare within economics.

It is possible that employment is low among wives of low-earning husbands, in order to maintain the husband's self-esteem:

> "wives whose husbands are not good providers often submit to their husbands' dominance because they feel guilty for contributing to their husbands' sense of failure. Hochschild (1989) found that wives whose husbands are underemployed, less ambitious, or earned less than their wives do not press their husbands to do more housework to establish a "balance". Rather, they attempt to soothe their husbands' threatened male ego, and they bolster their husband's sense of self-worth."
>
> (Lim, 1977: pp. 34-5).

Such complications (i.e. complex links between husband's and wife's employment patterns) make the task of the economists much more difficult. In trying to explain wives' employment patterns, it seems that we must consider complex behaviour, such as a wife's attempts to avoid undermining her husband's self-esteem. I return to this problem in chapter 10.

9.3 DOES WOMEN'S EMPLOYMENT INCREASE DURABLES OWNERSHIP?

I now turn to what is perhaps the central finding of this thesis. I have found that ownership of time-saving durables, in both the UK and urban India, displays a completely unexpected pattern: a form of non-linear relationship. All previous research in this field (that I am aware of) assumes that wife's employment will tend to increase ownership of time-saving durables, although this prediction has rarely been confirmed empirically. But my own research (below) indicates that women's employment does increase durables ownership in poorer households, but reduces ownership in richer households. If my claim is correct, then this makes all previous research in this field (including my own, in this and the previous chapter) meaningless.

I demonstrate the non-linear effect of women's employment in the form of tables. I divide households into income-bands, according to total net household income - including earnings of both husband and wife, in addition to non-earned income (the next set of tables are not directly comparable with crosstabs **9<1>** to **9<3>**, which are based on husband's and wife's earnings rather than household income). Note that all incomes have been converted to constant prices: 1996 prices for UK, and 1997 prices for urban India (see section 6.5). I do not attempt to compare UK incomes with urban Indian incomes, because it is difficult to obtain the most appropriate exchange-rate (the Purchasing-Power-Parity exchange rate between UK £s and India Rupees for 1996 or 1997 would be desirable, but I have been unable to find it). I use five income-bands for the UK *FES* data, but only three for urban India due to the much smaller sample-sizes in my *WAS* India surveys.

For tables **9<4>** to **9<12a>** below, I combine data from different years in order to obtain large sample-sizes. I restrict the samples (for both the UK and urban india) to households containing a married or cohabiting couple (and no other adults), in which the husband is under 65 years old. Note that sample-sizes vary between different durables in the same country, because different years of *FES* and *WAS* ask about different lists of durable goods. Following the style of tables in chapter 8, I place UK tables on the left-hand side of the page, and urban India on the right, to remind the reader to which country the data refer. I report ownership levels (for both the UK and the urban India) rounded to the nearest whole number, for clarity - except where two percentages on the same row are identical when

rounded to the nearest whole number, in which case I report averages to one decimal place.

TABLE 9<4> OWNERSHIP OF WASHING-MACHINES
by household income & wife's employment: UK (*FES*)

	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED
£1 - £100 per week	**78%** (1635 cases)	**87%** (215 cases)
£101 - £200 per week	**83%** (12914 cases)	**81%** (4332 cases)
£201 - £300 per week	**91%** (12646 cases)	**87%** (15184 cases)
£301 - £400 per week	**95%** (5368 cases)	**92%** (12627 cases)
over £400 per week	**97%** (4855 cases)	**96%** (12173 cases)

Table **9<4>** combines *FES* data from all available years (1969 to 1996) to obtain large sample-sizes, and hence should be reliable. The question I wish to ask is: does a wife being employed increase the likelihood of her household owning a washing-machine? The answer would appear to be yes and no: `yes' for the poorest households, and `no' for the richer households. In the top row of table **9<4>**, employed wives are more likely than non-employed wives to own a washing-machine, which seems compatible with bargaining models (claiming a wife's employment gives her more bargaining-power). But this is reversed in the following four rows of table **9<4>**: employed wives are <u>less</u> likely to own a washing-machine (for a given household income level). It is true that a wife's employment may take her household to a higher income, hence increasing her likelihood of owning the durable; but the bargaining models outlined in section 2.4 claim that employed wives are more likely to own durables even controlling for total household income. Table **9<4>** suggests that the bargaining models discussed in this thesis are not adequate to explain this observed behaviour.

Table **9<4>** may be affected by numerous other variables: for example, it may be distorted by effects of rising real incomes between 1969 and 1996. I now report a slightly different table, which I number **9<4a>** to indicate that it is similar to table **9<4>**. Table **9<4a>** differs from table **9<4>** in two respects. Firstly, table **9<4a>** uses data from two time periods: the earliest and latest years for which *FES* data on washing-machines are

available, excluding data between these periods. I describe the later period as 1995-96, but the 1996 data is for the first quarter of 1996 only. There are only three years of data available for dishwashers and microwave ovens (see tables **9<6a>** and **9<8a>**), and I split these three years into two groups. To be consistent, I use the same final period (i.e. 1995 and first quarter 1996) for all tables **9<4a>**, **9<6a>**, **9<8a>**, **9<10a>**, and **9<12a>**. Hence, table **9<4a>** has more columns than table **9<4>**. The second difference between the two tables is that table **9<4a>** divides households into income deciles (based on net household income) to give ten equal-sized groups, rather than the five income groups in table **9<4>**; so there are more rows in table **9<4a>** than in table **9<4>**. The greater number of rows and columns show more detail than table **9<4>**, but there is a cost: there are fewer cases in each cell of table **9<4a>**, and hence more risk of spurious results.

TABLE 9<4a> **OWNERSHIP OF WASHING-MACHINES**
by income decile & wife's work: UK

GROUP (based on household income):	**1969-70**		**1995-96**	
	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED
poorest 10%	**58%** (533 cases)	**64%** (85 cases)	**95%** (241 cases)	**93%** (57 cases)
2nd decile	**73%** (501 cases)	**62%** (118 cases)	**97%** (201 cases)	**98%** (98 cases)
3rd decile	**77%** (430 cases)	**64%** (188 cases)	**100%** (140 cases)	**98%** (159 cases)
4th decile	**76%** (398 cases)	**68%** (220 cases)	**100%** (111 cases)	**98%** (188 cases)
5th decile	**79%** (340 cases)	**68%** (279 cases)	**100%** (102 cases)	**99%** (196 cases)
6th decile	**79%** (318 cases)	**71%** (301 cases)	**100%** (85 cases)	**99%** (214 cases)
7th decile	**86%** (273 cases)	**72%** (345 cases)	**99%** (72 cases)	**100%** (227 cases)
8th decile	**85%** (255 cases)	**74%** (364 cases)	**100%** (72 cases)	**99.7%** (227 cases)
9th decile	**84%** (213 cases)	**75%** (406 cases)	**98%** (58 cases)	**100%** (241 cases)
richest 10%	**88%** (305 cases)	**79%** (313 cases)	**100%** (83 cases)	**99%** (215 cases)

The above table **9<4a>** confirms the general pattern of table **9<4>**, but with reservations. Consider the 1969-70 column of **9<4a>**: in the first row (the poorest decile), employed-wife households are more likely to own a washing-machine than non-employed-wife households; and the opposite pattern is observed for all other rows of the same column. This is exactly the same pattern as was observed in table **9<4>**: I call this a `non-linear' effect of wife's employment on durables ownership. This pattern is not so clear for the 1995-96 columns of table **9<4a>**, but these columns are rather unreliable because ownership was close to 100% in each decile. Overall, table **9<4a>** does not reject the idea of a "non-linear" pattern I claim to see in table **9<4>**.

I now turn to the equivalent table for urban India, table **9<5>**:

TABLE 9<5> OWNERSHIP OF WASHING-MACHINES
by household income & wife's employment: urban India

	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED
1 - 2000 Rupees per month	**0.2%** (420 cases)	**0.0%** (48 cases)
2001 - 4000 Rupees per month	**5%** (517 cases)	**2%** (49 cases)
over 4000 Rupees per month	**29%** (305 cases)	**44%** (75 cases)

The relatively small sample-sizes in the *WAS* surveys, combined with the low ownership rates among poorer Indian households, mean that we cannot be very confident about the figures in table **9<5>**. I report ownership levels on the top row to one decimal place (rather than rounded to the nearest whole number), in order to distinguish between ownership levels on the top row; but the reader should note that the small sample-sizes make these figures of questionable reliability. There appears to be a non-linear effect of wife's employment, but in the opposite way to that seen in table **9<4>**: wife's employment apparently decreases washing-machine ownership among the poorest and middle-income households, but increases the likelihood of ownership among richer households. I discuss these issues in section 9.4 below, but I now examine equivalent tables for other time-saving durables.

TABLE 9<6> OWNERSHIP OF DISHWASHERS
by household income & wife's employment: UK (*FES*)

	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED
£1 - £100 per week	**12%** (171 cases)	**22%** (36 cases)
£101 - £200 per week	**12%** (678 cases)	**12%** (242 cases)
£201 - £300 per week	**15%** (724 cases)	**16%** (771 cases)
£301 - £400 per week	**32%** (529 cases)	**21%** (1185 cases)
over £400 per week	**60%** (705 cases)	**43%** (2144 cases)

Table **9<6>** above refers to dishwasher ownership; it uses all available *FES* data (from 1993 to 1996). Table **9<6>** shows the same `non-linear' effect of wife's employment on ownership as the two preceding tables for the UK. The general pattern is that in the poorest households, the wife's employment tends to increase dishwasher-ownership; whereas in richer households, wife's employment make dishwasher ownership less likely. I now turn to a different version of this table, which I call **9<6a>**: this differs from table **9<6>** in the same way as table **9<4a>** differs from table **9<4>**.

TABLE 9<6a> **OWNERSHIP OF DISHWASHERS**
by income decile & wife's work: UK

GROUP (based on household income):	**1993-94**		**1995-96**	
	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED
poorest 10%	**11%** (333 cases)	**12%** (86 cases)	**12%** (241 cases)	**18%** (57 cases)
2nd decile	**10.8%** (259 cases)	**11.2%** (161 cases)	**20%** (201 cases)	**17%** (98 cases)
3rd decile	**13%** (213 cases)	**15%** (207 cases)	**13%** (140 cases)	**16%** (159 cases)
4th decile	**25%** (163 cases)	**14%** (257 cases)	**25%** (111 cases)	**24%** (188 cases)
5th decile	**24%** (124 cases)	**15%** (296 cases)	**34%** (102 cases)	**20%** (196 cases)
6th decile	**27%** (124 cases)	**23%** (296 cases)	**36%** (85 cases)	**28%** (214 cases)
7th decile	**44%** (105 cases)	**25%** (315 cases)	**49%** (72 cases)	**30%** (227 cases)
8th decile	**54%** (92 cases)	**32%** (328 cases)	**46%** (72 cases)	**39%** (227 cases)
9th decile	**58%** (93 cases)	**45%** (327 cases)	**57%** (58 cases)	**48%** (241 cases)
richest 10%	**82%** (136 cases)	**67%** (283 cases)	**78%** (83 cases)	**66%** (215 cases)

Both time-periods in table **9<6a>** suggest a similar pattern to table **9<6>**: in the poorest three deciles, employed-wife households are more likely (than non-employed-wife households) to own a dishwasher; whereas the opposite is true for the remaining (non-poor) households. The only exception to this is the second decile, for 1995-96. Overall, table **9<6a>** confirms the pattern in tables **9<4>**, **9<4a>** and **9<6>**. There is no equivalent table for urban India, because dishwashers were not included in the 1992 or 1997 surveys.

I now turn to the following durable good, food-processors. This item was not included in any year of either *FES* or *BHPS* surveys, so the next table (**9<7>** below) refers to urban India. Table **9<7>** does not indicate the `non-linear' effect visible in tables **9<4>** to **9<6a>**; but there is no comfort here for bargaining theorists. The game-theory models discussed in section 2.4 would all predict employed women gain power from their earnings; but

for all three rows of table **9<7>**, employed-wife households are less likely to own food-processors. Food-processors appear different to the other five durables (in tables **9<4>** to **9<6a>**, and **9<8>** to **9<12a>**) in not showing a tendency for wife's employment to increase ownership in any income group. I am unable to explain why food-processors should be different; but in view of the small sample-sizes in the Indian surveys, I would not place too much confidence in table **9<7>**.

TABLE 9<7> OWNERSHIP OF FOOD-PROCESSORS
by household income & wife's employment: urban India

	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED
1 - 2000 Rupees per month	**11.2%** (420 cases)	**4.2%** (48 cases)
2001 - 4000 Rupees per month	**41.0%** (517 cases)	**20.4%** (49 cases)
over 4000 Rupees per month	**82.3%** (305 cases)	**80.0%** (75 cases)

Next, I consider ownership of microwave ovens - this evidence is reported in tables **9<8>** and **9<8a>** for the UK, and **9<9>** for urban India. Table **9<8>** does not display the `non-linear' relationship between wife's employment and durables ownership seen in most tables in this section.

TABLE 9<8> OWNERSHIP OF MICROWAVE OVENS
by household income & wife's employment: UK (*FES*)

	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED
£1 - £100 per week	**64%** (171 cases)	**69%** (36 cases)
£101 - £200 per week	**66%** (678 cases)	**74%** (242 cases)
£201 - £300 per week	**77%** (724 cases)	**79%** (771 cases)
£301 - £400 per week	**85%** (529 cases)	**84%** (1185 cases)
over £400 per week	**80%** (705 cases)	**87%** (2144 cases)

I now offer a slightly more detailed view of the above information. Table **9<8a>** splits the time-period into two, hence adding two extra columns; and

it divides the five income-bands into ten deciles, thus adding more rows. Hence, table **9<8a>** has the same structure as tables **9<4a>** and **9<6a>** above.

TABLE 9<8a> **OWNERSHIP OF MICROWAVE OVENS**
by income decile & wife's work: UK

GROUP (based on household income):	**1993-94**		**1995-96**	
	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED
poorest 10%	**61%** (333 cases)	**77%** (86 cases)	**71%** (241 cases)	**67%** (57 cases)
2nd decile	**66%** (259 cases)	**73%** (161 cases)	**74%** (201 cases)	**82%** (98 cases)
3rd decile	**77%** (213 cases)	**80%** (207 cases)	**77%** (140 cases)	**82%** (159 cases)
4th decile	**80%** (163 cases)	**77%** (257 cases)	**86%** (111 cases)	**82%** (188 cases)
5th decile	**80%** (124 cases)	**83%** (296 cases)	**79%** (102 cases)	**88%** (196 cases)
6th decile	**90%** (124 cases)	**82%** (296 cases)	**88%** (85 cases)	**87%** (214 cases)
7th decile	**78%** (105 cases)	**85%** (315 cases)	**82%** (72 cases)	**87%** (227 cases)
8th decile	**79%** (92 cases)	**85%** (328 cases)	**79%** (72 cases)	**90%** (227 cases)
9th decile	**83%** (93 cases)	**86%** (327 cases)	**84%** (58 cases)	**88%** (241 cases)
richest 10%	**79%** (136 cases)	**86%** (283 cases)	**83%** (83 cases)	**88%** (215 cases)

It is difficult to interpret table **9<8a>**: there is no clear pattern of ownership in which employed-wife households differ from non-employed-wife households. It could be argued that employed-wife households are more likely to own microwave ovens; but the opposite applies to the fourth and sixth deciles, for both 1993-94 and 1995-96 (this may simply be a coincidence, or could indicate a complex relationship). And considering data on India, table **9<9>** below suggests that wives' employment reduces the likelihood of owning a microwave oven. Overall, then, this empirical evidence for the UK and India does not show any clear pattern between wife's employment and microwave oven ownership. Tables **9<8>**, **9<8a>** and **9<9>** do not demonstrate the `non-linear' relationship seen in other tables (in this section); but nor do they offer strong support to the claim that

employed-wife households are more likely to own microwave ovens, as claimed by virtually all of the economists discussed in chapter 2.

TABLE 9<9> OWNERSHIP OF MICROWAVE OVENS
by household income & wife's employment: urban India

	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED
1 - 2000 Rupees per month	**0.0%** (143 cases)	**0.0%** (26 cases)
2001 - 4000 Rupees per month	**1%** (163 cases)	**0%** (25 cases)
over 4000 Rupees per month	**8%** (84 cases)	**0%** (29 cases)

I now turn to the next durable good: refrigerators, shown in table **9<10>** below (for the UK). Table **9<10>** does not display the `non-linear' relationship seen in previous tables for the UK; but well over 90% of the richer households own a refrigerator, so we are studying a fairly small number of non-owners - this may leave us open to the risk of spurious results.

TABLE 9<10> OWNERSHIP OF REFRIGERATORS
by household income & wife's employment: UK (*FES*)

	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED
£1 - £100 per week	**85%** (1635 cases)	**88%** (215 cases)
£101 - £200 per week	**86%** (12914 cases)	**88%** (4332 cases)
£201 - £300 per week	**93%** (12646 cases)	**94%** (15184 cases)
£301 - £400 per week	**97%** (5368 cases)	**98%** (12627 cases)
over £400 per week	**99.1%** (4855 cases)	**99.4%** (12173 cases)

I now present table **9<10a>**, which differs from **9<10>** in the same way as table **9<4a>** differs from table **9<4>** above. Table **9<10a>** helps with the problem of high ownership levels in table **9<10>**, by separating the data for 1969-70 (the first two years in which refrigerator ownership was included in the *FES*). We can see the same `non-linear' pattern as in many previous

tables (from **9<4>** onwards): in the 1969-70 column of table **9<10a>**, the ownership level is higher for employed-wife households in the poorest decile, but lower for almost all other deciles (the exception to this is the 8th decile, where employed-wife and non-employed-wife households own about the same proportion). I consider that the 1995-96 columns of table **9<10a>** are unreliable, because almost all cells are close to 100% ownership. Overall, then, table **9<10a>** seems to support the `non-linear' pattern in most previous tables in this section.

TABLE 9<10a> OWNERSHIP OF REFRIGERATORS
by income decile & wife's work: UK

GROUP (based on household income):	1969-70		1995-96	
	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED
poorest 10%	**47%** (533 cases)	**52%** (85 cases)	**98%** (241 cases)	**100%** (57 cases)
2nd decile	**55%** (501 cases)	**53%** (118 cases)	**100.0%** (201 cases)	**100.0%** (98 cases)
3rd decile	**66%** (430 cases)	**58%** (188 cases)	**99%** (140 cases)	**100%** (159 cases)
4th decile	**69%** (398 cases)	**65%** (220 cases)	**99.1%** (111 cases)	**99.5%** (188 cases)
5th decile	**71%** (340 cases)	**68%** (279 cases)	**99.0%** (102 cases)	**99.5%** (196 cases)
6th decile	**76%** (318 cases)	**70%** (301 cases)	**99%** (85 cases)	**100%** (214 cases)
7th decile	**79%** (273 cases)	**76%** (345 cases)	**100%** (72 cases)	**99.6%** (227 cases)
8th decile	**83.5%** (255 cases)	**84.1%** (364 cases)	**97%** (72 cases)	**99%** (227 cases)
9th decile	**92%** (213 cases)	**85%** (406 cases)	**100.0%** (58 cases)	**100.0%** (241 cases)
richest 10%	**96%** (305 cases)	**93%** (313 cases)	**100.0%** (83 cases)	**100.0%** (215 cases)

Table **9<11>**, below, refers to India: is does not show a very clear pattern. The top two rows suggest a tendency for wife's employment to reduce the likelihood of owning a refrigerator, but the predicted pattern (wife's employment increasing ownership) is shown in the bottom row. Hence table **9<11>** displays a `non-linear' effect of women's employment, which is the reverse of that seen in several UK tables (including **9<10a>**); note

that table **9<11>** shows a similar pattern to another table based on urban India data, i.e. table **9<5>** above.

TABLE 9<11> OWNERSHIP OF REFRIGERATORS
by household income & wife's employment: urban India

	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED
1 - 2000 Rupees per month	**2.4%** (420 cases)	**2.1%** (48 cases)
2001 - 4000 Rupees per month	**23%** (517 cases)	**10%** (49 cases)
over 4000 Rupees per month	**68%** (305 cases)	**71%** (75 cases)

The final durable good considered here is deep-freezer ownership: this is in table **9<12>** for the UK, but there is no equivalent table for urban India (deep-freezers were not included in either *WAS* survey). For the UK, table **9<12>** shows a fairly clear `non-linear' effect, in which wife's employment tends to increase deep-freezer ownership for the top two rows (poorer households), but reduces ownership for the bottom three rows (richer households).

TABLE 9<12> OWNERSHIP OF DEEP-FREEZERS
by household income & wife's employment: UK (*FES*)

	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED
£1 - £100 per week	**61%** (1060 cases)	**76%** (147 cases)
£101 - £200 per week	**64%** (5962 cases)	**69%** (2005 cases)
£201 - £300 per week	**79%** (6445 cases)	**76%** (7467 cases)
£301 - £400 per week	**89%** (3484 cases)	**86%** (8386 cases)
over £400 per week	**95%** (3686 cases)	**93%** (10304 cases)

Table **9<12a>** below is a more detailed version of table **9<12>**: table **9<12a>** is modified from table **9<12>**, in the same way as table **9<4a>** is modified from **9<4>**. Consider, first, the 1979-80 columns of table **9<12a>**: these are the earliest two years for which *FES* data are available on deep-freezers. These two columns show that a wife's employment tends to

increase deep freezer ownership, except for the poorest decile of households - in which wife's employment apparently **reduce** the likelihood of ownership. A similar pattern is visible for 1995-96, except that now the wife's employment reduces the likelihood of ownership in the three poorest deciles, rather than just one decile. There are two deciles which do not fit this pattern (the 6th and 9th deciles of 1995-96), but here ownership differs little between employed and non-employed wife households (and are close to 100%). Overall, then, deep-freezers appear to show a `non-linear' ownership pattern like those of other durables in this section (referring to the UK, and with the exception of microwave ovens).

TABLE 9<12a> OWNERSHIP OF DEEP-FREEZERS by income decile & wife's work: UK

GROUP (based on household income):	**1979-80**		**1995-96**	
	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED	WIFE IS NOT EMPLOYED	WIFE IS EMPLOYED
poorest 10%	**38%** (522 cases)	**44%** (106 cases)	**87%** (241 cases)	**91%** (57 cases)
2nd decile	**49%** (437 cases)	**47%** (192 cases)	**94%** (201 cases)	**96%** (98 cases)
3rd decile	**53%** (363 cases)	**52%** (266 cases)	**91%** (140 cases)	**95%** (159 cases)
4th decile	**58%** (298 cases)	**54%** (331 cases)	**95%** (111 cases)	**94%** (188 cases)
5th decile	**63%** (255 cases)	**56%** (374 cases)	**99%** (102 cases)	**98%** (196 cases)
6th decile	**65%** (206 cases)	**62%** (423 cases)	**95%** (85 cases)	**96%** (214 cases)
7th decile	**71%** (173 cases)	**66%** (456 cases)	**99%** (72 cases)	**97%** (227 cases)
8th decile	**70%** (152 cases)	**69%** (477 cases)	**97%** (72 cases)	**96%** (227 cases)
9th decile	**85%** (144 cases)	**74%** (485 cases)	**96.6%** (58 cases)	**96.7%** (241 cases)
richest 10%	**85%** (182 cases)	**80%** (446 cases)	**100%** (83 cases)	**97%** (215 cases)

To summarise section 9.3, I wish to emphasise three points. Firstly, many tables in this section suggest a `non-linear' relationship: women's employment appears to have the opposite effect in the poorest households to its effect in the non-poor households. By "poorest", I am referring to the lowest one, or two, or three deciles - depending on which durable (and which year) is being studied. Secondly, this `non-linear' pattern is quite different in the UK and in India. The pattern is much less clear for India than for the UK: this may be a result of the relatively small sample-sizes in the India surveys. But if anything, the Indian pattern seems to be the opposite of that seen for the UK. The UK tables suggest that wives' employment tends to increase durables ownership for poorer households, but reduce the probability of ownership among richer households. In India (tables **9<5>** and **9<11>**), on the other hand, wife's employment appears to reduce durables ownership among poorer households, but increase ownership among richer households. And thirdly, this pattern does not seem to apply to microwave ovens (in either India or the UK). In the following sections, I discuss these findings further.

9.4 DO THE EFFECTS OF WOMEN'S EMPLOYMENT VARY WITH HOUSEHOLD INCOME?

I now ask the reader to step back from the details of ownership levels, to see the bigger picture: I feel that we should not pay too much attention to small differences in ownership levels, especially where ownership is close to 0% or close to 100%, because of the danger of spurious results. Consider the following tables from UK data: **9<4a>**, **9<6a>**, **9<10a>** and **9<12a>**. These all show fairly clear `non-linear' effects, in which a wife's employment tends to reduce ownership levels in most income-bands (i.e. all but the poorest one or two or three deciles). This is contrary to predictions of `bargaining' models, in which a wife's employment is predicted to raise ownership of time-saving durables in all households. The other UK table in this set, **9<8a>**, refers to microwave ovens; this might be thought to support `bargaining' models, because wife's employment **does** seem to increase microwave oven ownership. However, table **9<8a>** does little to inspire faith in bargaining models, because the fourth and sixth deciles show the opposite effect. Hence, these five UK tables together seem to reject `bargaining' models.

Tables **9<4a>**, **9<6a>**, **9<8a>**, **9<10a>** and **9<12a>** allow us to study changes in ownership patterns in the UK over time (by comparing different columns). In practice, however, the 1995-96 data are not very helpful because ownership levels are close to 100% in 1995-96 for most of these tables: so differences between employed-wife and non-employed-wife households are small, and may be overwhelmed by spurious effects of small sample-sizes.

Turning now to the four tables for urban India, tables **9<7>** and **9<9>** both show a pattern in which richer households are less likely to own the durable if the wife is employed, which is the opposite effect of women's employment to that predicted by bargaining models. Tables **9<5>** and **9<11>** are `non-linear', but in the opposite way to the UK tables: in tables **9<5>** and **9<11>**, we see the wife's employment increasing ownership in the poorer households and decreasing ownership in the richer households. My opinion is that the urban India sample-sizes here are too small to be reliable: it is plausible, for example, that future research will find all four durables show decreased ownership with wife's employment. But I feel that these four tables using urban India data are sufficient to reject the bargaining model claim that wife's employment increases durable goods ownership.

9.5 INTERPRETATIONS OF EVIDENCE FROM OWNERSHIP LEVELS

In my view, tables **9<4>** to **9<12a>** (even without my evidence in chapters 7 and 8) would be fairly convincing evidence to discard all previous research I know of, on the subject of the effects of wife's employment on durables ownership. In both the `price-of-time' hypothesis (tested in chapter 7) and `bargaining' models (tested in chapter 8), economists assumed that women's employment will tend to lead to increased ownership of time-saving durables, and some evidence supported this view (such as Bryant, 1988, and Oropesa, 1993: see chapter 8). But the evidence in section 9.2 above indicates that wife's employment and husband's employment are intertwined, as if by a set of unwritten rules controlling household behaviour. Worse still (for the economist), these "rules" appear to change: I found that in the UK for 1969-74, women with rich husbands were rarely employed; but by 1993-6, many wives with rich husbands were employed. This change could be a result of changes in `social norms', or it might be an effect of economic changes such as increases in wages for women due to `equal opportunities' legislation.

An explanation of the fact that among richer households, non-employed-wife families are more likely to own time-saving durables was put forward by David Piachaud:

> "perhaps those women at home all day have a higher preference for consumer durables and, in the absence of their own incomes, sufficient influence over their husbands to obtain them."
> (Piachaud, 1982: p. 481; emphasis added).

Here, Piachaud suggests that women have influence over their husbands, and that a wife's influence does not (entirely) depend on her earnings. This seems to be a rejection of both the price-of-time hypothesis and of conventional bargaining models, but Piachaud's (1982) article does not offer sufficient detail to form a testable hypothesis.

Section 9.3 considered evidence that there was a `non-linear' effect of wife's employment on durables ownership: that for poor households, women's employment increased durables ownership, whereas women's employment had the opposite effect among richer households. One possible interpretation of this is that husbands prefer their wives not to be employed, and the richer husbands can afford to buy durables wanted by the wife. This type of viewpoint is suggested by Julie Nelson, who brings in the concept of social class:

> "In marital compromises one may observe deals being struck which trade one factor for another, sometimes to extremes. 'I will take care of all your material needs, as long as you pledge me obedience' goes the trade of living standards for agency freedom between the upper-class husband and his wife, in some traditions. Or, since actual and current arrangements are more complex than implied by that one cultural image, one might see living standards and agency freedom offered in place of affiliation: 'Here's the checkbook, now don't bother me.'"
>
> (Nelson, 1994: p. 128; emphasis added).

Julie Nelson's ideas may be a promising line for future research, but her 1994 and 1995 articles are not in themselves sufficiently detailed to offer a testable model. It may be very difficult for social scientists to make progress in explaining cultural forces (such as the class-based behaviour in Nelson's quote): Ahlander and Bahr suggest that because we live in households, we cannot see them objectively:

> "Today's scholars have no trouble seeing Victorian ideals as gendered, socially constructed notions of reality. Yet somehow the possibility that contemporary ideas are also socially constructed, that the current images of housework held by researchers and theorists are perhaps no more objective than the Victorian view, has escaped us. Family scholars point to the absurdities and ethnocentricities of the past, but many of us seem incapable of recognizing the possibility that our own definitions are also social inventions, faddish and subculture-bound."
>
> (Ahlander & Bahr, 1995: p. 61).

The above ideas of Nelson and Piachaud are possible directions for economics, given the empirical rejection experienced by mainstream economic theories. A third direction is `household allocative systems', associated with Jan Pahl: this is the subject of the following chapter.

SHOULD WE REJECT THE `PRICE-OF-TIME' AND `BARGAINING' MODELS?

My findings (in this chapter, and in chapters 7 and 8) are not the first to reject conventional economic theories. It would be interesting if this thesis could destroy all economic research in this field which has been done over the last few decades, but this is impossible: this thesis is too late to kill the `price-of-time' or `bargaining' models, because (in my view) they have already been rejected by decades of empirical evidence. Previous researchers have been careful to phrase their criticisms carefully, perhaps fearful that a theory might be later reinstated - consider, for example, the following comment:

> "In our previous research [...] we found that wives' labor force behaviour was neither a significant determinant of families' purchase decisions (whether a particular time-saving durable was purchased) nor of families' expenditure decisions (if an item was purchased, how much was spent). **In view of the contrary hypotheses advanced both in the popular and academic press [..] the empirical results were considered surprising**."
>
> (Strober & Weinberg, 1980: p. 339; emphasis added).

In a recent working paper, Alderman, Chiappori & Haddad (1994) suggest that it is time to "shift the burden of proof" away from models based on a single household utility function, of the type pioneered by Samuelson and Becker (see chapter 2). It appears that most economists agree that we should reject the `unitary' model. My own findings (reported in this thesis) offer further evidence against the price-of-time hypothesis.

In addition to rejecting unitary models, I also report evidence against bargaining models. The `bargaining' approach has not yet been so widely rejected, but there does not seem to be any economic model which has been accepted by economists as a group:

> "Until very recently, the standard of the [economics] profession for both theoretical and empirical analysis was a "common preference" model of the family, which assumes that family members act as though they are maximising a single utility function. [...] A current snapshot of family economics would show the traditional framework under siege on both theoretical and empirical fronts. [...] However, no new theoretical framework has gained general acceptance as a replacement for common preference models, and empirical studies have concentrated on debunking old models rather than on discriminating among new ones."
>
> (Lundberg & Pollak, 1996: pp. 139-40).

Lundberg & Pollak's imply that the "common preference" models (which I refer to as the `price-of-time' hypothesis) have been rejected; and that no new theory has been accepted by the economics profession - each new model has been found inadequate in some way. This does not prove that bargaining models will never be successful. But the fact that economists have developed bargaining models for several decades without any being found to be acceptable, suggests that bargaining may be inappropriate to explain household behaviour.

9.6 SUMMARY

All of the versions of `bargaining' models discussed in this thesis predict that women's employment should lead to greater spending on goods which improve women's welfare (MacPhail & Bowles, 1991: p. 63). Like `unitary' models, it appears that `bargaining' models are unsuccessful in explaining household behaviour. The reader may consider the evidence I present in chapter 8 to be inconclusive - neither clearly supporting, nor clearly rejecting, a `bargaining' model of household behaviour; and because there are so many game-theory models of household spending (some of which are discussed in section 2.4), some writers in the `bargaining' school could argue that their model had been mis-represented (for example, because I omitted a variable they consider relevant). But the evidence in section 9.3 of this chapter is more difficult to dismiss. In particular, the idea that wife's employment may have the opposite effect in richer households to its effect in poorer households seems impossible to fit into any bargaining model I know of. If a wife's employment increases her power, then it would be expected to do so at different household income levels. I conclude that the performance of bargaining approaches is weak in explaining household durable goods ownership.

In section 9.2, I suggested that most previous economic research into consumption assumes that husband's and wife's earnings are independent of each other. But section 9.2 discussed three behaviour patterns (labelled {i}, {ii} and {iii}) which cast doubt on this assumption - none of these three patterns has been discussed by any game theory economist, as far as I am aware. If the `bargaining' economists have failed to notice (let alone explain) these three patterns of household behaviour, how much confidence can we have in their theories?[5]

I have no explanation of household behaviour which could fill the vacuum left by the collapse of conventional economic theories. However, I suggest a possible way forward, in chapter 10.

[5] In defence of other economists, I used a `bargaining' approach myself for over six years, while working on this thesis; I would never have noticed these patterns, if it were not for my attempts to explain the success of Jan Pahl's ideas - see chapter 10.

CHAPTER 10

HOUSEHOLD ALLOCATIVE SYSTEMS

10.1 INTRODUCTION: MONEY AND POWER

In my view, empirical findings by previous researchers and myself (reported in chapter 7) reject theories of the `new home economics' school of thought: the price of a woman's time does not appear to lead to greater ownership of the time-saving durables studied, controlling for total household income. And results in chapters 8 and 9 seem to reject the `bargaining' (game theory) approach. However, both theories have been under considerable pressure from empirical research before this thesis, and (arguably) my research may do no more than confirm earlier empirical findings.

This chapter is an attempt to fill the gap left by the collapse of conventional economic analysis of households. For at least some of the economists and sociologists studied in this chapter, rejecting the `price-of-time' and `bargaining' models does not necessarily require us to abandon the assumption of `rational' behaviour by individuals.

This chapter looks at `Household Allocative Systems', which may be an important issue in understanding patterns of durable goods ownership. This area has been studied relatively little by economists, perhaps because suitable quantitative data were not available until fairly recently - the *BHPS* and *WAS* data sets were not made available to the academic community until 1994, although a few other survey data sets such as *SCELI* (see chapter 6) were available slightly earlier.

10.2 APPLICATION OF `HOUSEHOLD ALLOCATIVE SYSTEMS' MODELS

The term `Household Allocative Systems' was explained in section 2.8. In this literature, writers investigate who determines expenditure within a household: husband, or wife, or both husband and wife (jointly or independently). Most of these writers have made a distinction between management and control of money: `management' means arranging day-to-day household purchases; whereas `control' means deciding how the money should be allocated, and making major financial decisions (see, for example, Woolley & Marshall, 1994).

There has been relatively little work on `household allocative systems' in India. Most of the research on household allocative systems which has taken place used small samples - for example, Ursula Sharma (1980) studied 28 households in Shimla (north west India); in her study of Calcutta, Standing (1991) studied 114 households. Kampala Ram reports a study of a fishing village in south India, and concluded that women control all household financial management (Ram, 1989: p. 140): but she does not suggest that this applies to the whole of India. This chapter uses data from the *WAS* surveys (outlined in section 6.3).

Previous work on `household allocative systems' divided households into categories, depending on how money is controlled within the household. One example is Jan Pahl's four-way classification (Pahl, 1980: pp. 316-327):

> `**whole wage' system:** the husband hands over the entire wage-packet to his wife, and she returns some of it as his personal spending money.
>
> `**allowance' system:** the husband gives his wife/partner an allowance to pay for household expenses, and keeps the rest of his wage.
>
> `**pooling' system:** husband and wife pool their incomes and pay household expenses from the common pool.
>
> `**individual management' system:** husband and wife have separate incomes and each is responsible for certain areas of household spending.

Pahl's four-way system of classification is not the only system which has been used in the literature on household allocative systems: for example, Vogler and Pahl used **six** categories: `female whole-wage', `female pool', `male whole wage', `housekeeping allowance', `male pool' and `joint pool' systems (Vogler & Pahl, 1993).

A different view is suggested by Kuntal Agarwal (1988: p. 189), reporting on a 1985 study of 100 employed (middle-class) wives in Meerut, a city in Uttar Pradesh. For **money-centred** decisions, Agarwal found that "Real power is in the hands of husbands irrespective of wife's income, education and profession". Only 65% of wives were even consulted by their husbands on financial decisions; the remaining 35% of wives were not consulted. But for household decisions related to **children** (rather than money), Kuntal Agarwal found that wives with high earnings relative to their husband's earnings had more power than lower-earning wives (Agarwal, 1988: p. 188).

In chapter 3, I suggested that (in recent decades) there has been a trend of rising female employment in many countries. Some writers perceive a trend in household financial management: Zelizer wrote that in the USA,

> "Changes in gender relations influenced the method of allocation of married women's money. As women's consumer role expanded at the beginning of the 20th century, the traditional "dole" or asking method became not only inefficient, but also inappropriate in increasingly egalitarian marriages. The allowance, a more definite and regular housekeeping income, was praised as a more equitable method of allocation, but then in turn condemned by home-efficiency experts of the 1920's and 1930's as an unsatisfactory payment for modern wives. The joint account emerged as the new cultural ideal."
>
> (Zelizer, 1994: p. 141).

This chapter will test the importance of day-to-day financial management on purchase of `time-saving' durable goods.

10.3 PROBLEMS OF MEASUREMENT

Using Household Allocative Systems creates difficulties in measurement. Household Allocative Systems are difficult to measure in large-scale surveys, although several writers suggest that this is possible (for example, questions on household allocative systems are included in the *BSA* and *SCELI* surveys - see section 6.2). Another problem is the difference between `control', `management', and `budgeting' within the household (see Morris, 1989: p. 450). When respondents answer questions on Household Allocative Systems (especially as part of a large-scale questionnaire-based survey), they may reply by explaining who carries out day-to-day spending decisions such as during shopping. This may seem less important to economic behaviour than are major long-term decisions, such as on the type of lifestyle the household will have. Hence, their answer is difficult to interpret. In recent years, several research groups (such as the *BHPS*) have linked a question on Household Allocative System with a second question on who makes the final decision on major purchases in the household. It is not clear when replies to this second question should be used, instead of information on the Household Allocative System used by the household; I return to this problem below.

Early studies of Household Allocative Systems were based on small-scale studies and on a qualitative research methodology. Such studies typically used unstructured or semi-structured interviewing. An example is Pahl's study of 102 married couples with at least one child (Pahl, 1984). Early studies of Household Allocative System did not use random sampling to select a representative group of respondents: they typically used the `snowball' technique - beginning with a few respondents (often contacted via friends or colleagues), the interviewers asked each interviewee if they knew of any other people who might be prepared to be interviewed on such issues as financial management. In this way, a sample (typically of around one hundred interviews) was built up. This technique has been used outside Britain - such as Sharma's (1986) study of Shimla, India. Clearly, we cannot be sure that the `snowball' technique will provide a representative sample of the geographical area covered by the survey. Morris (1989: p. 452) suggests that studies of household allocative systems are usually small-scale local studies, so the findings cannot be generalised.

Until fairly recently, it was thought by a number of social scientists that intimate financial matters - including Household Allocative Systems - could

only be discussed in the context of a relatively unstructured interview, which made large-scale or systematic analysis impossible (see for example Morris, 1989: p. 452). However, from the late 1980s, questions on Household Allocative System have been included in several large-scale (questionnaire-based) studies such as *BHPS*, *SCELI* and *BSA* (see section 6.2 for details). Such datasets are useful for economic analysis, because they allows us to control for the effects of various variables using regression.

Jan Pahl (1983: p. 251; and 1980: p. 322) claims that the allocative system adopted by a particular household depends on several types of factors, including the household income level; the sources of the household's income (e.g. whether or not the household receives state benefits, & the number of earners); and "social norms" - the occupational, regional, and ethnic culture in which the household is situated.

Lydia Morris (1989: pp. 452-455) used a different classification system to Jan Pahl - Morris's system consists of four categories: the `whole wage' system; the `allowance' system; `joint' financial management; and `independent' financial management. She reported the following findings about the types of household which tend to adopt each Household Allocative System:

* the first three of these Household Allocative Systems (`whole wage' system; `allowance' system; and `joint' management) are most common in single-earner households;

* whole-wage systems are associated with men in low-paid jobs, and households dependent on state benefits;

* allowance systems are associated with incomes above the minimum, and/or with rising incomes;

* shared financial management is associated with higher incomes;

* independent financial management is associated with households in which husband and wife earn similar incomes;

* for households containing offspring in employment, higher-paid children (especially offspring who receive bonus payments) are likely to pay `board'; whereas whole-wage systems are associated with lower-paid offspring.

Sharon Witherspoon (1988: p. 187) claimed that, according to data from the 1987 *BSA* survey, women with full-time employment had more access to household money; she appears to mean that women were more likely to report

that the Household Allocative System used by their household was wife-managed or jointly managed by husband and wife, if the wife was employed full-time.

Peggy Stamp's study of 18 women who were the main earner in their household found that none used the `allowance' system - although this system has been found to be fairly popular in other studies of British households (Stamp, 1985: p. 551). This suggests that women's share of household income is an important influence on the Allocative System adopted, but I feel that we should be cautious in generalising from such a small sample. Gail Wilson (1987: p. 37) claimed that the Household Allocative System adopted by a household is most strongly influenced by the household's income level, but she also reports finding that a number of other forces are also influential.

Empirical research on the *SCELI* dataset, by Carolyn Vogler (1989: pp. 22-32) and by Vogler & Pahl (1993: p. 90), indicates that the level of household income, the employment position of both spouses, their ages, and social class all influence the choice of Household Allocative System. In addition, attitudes (especially `sexist' attitudes among men) are important in determining the type of Household Allocative System adopted by a household. Carolyn Vogler's analysis suggested that the Household Allocative System used by a respondent's household was strongly correlated with the Household Allocative System used by the respondent's parents (when the respondent was young). The Household Allocative System used was also strongly related to the husband's education level, and to the respondent's age cohort. Information may give power to one household member: for example, Jan Pahl (1980: p. 317) claims that household members do not have perfect information on other household members - wives are often ignorant of their husband's earnings (contrary to the assumption of perfect knowledge, which is used by Gary Becker and several other neoclassical economists).

Pahl and Morris both argue that the system of intra-household resource allocation adopted by a household can have significant effects on employment of household members:

- women are likely to seek paid work when their household uses an `allowance' system, and where the allowance is inadequate (Pahl, 1980: p. 334; Morris, 1989: pp. 456-7);
- men have less incentive to do overtime if the household uses an allowance system (Pahl, 1983: p. 243; Morris, 1989: pp. 453-7);
- men are more likely to bargain for increases in overtime pay than in basic pay, if their household operates an `allowance' system (Pahl, 1980: p. 320);
- men and/or women are more likely to seek paid work to pay for the husband's social expenses, if a `whole-wage' system is operating in their household (Morris, 1989: p. 456);
- an `independent' financial management system may affect motivations to earn (Morris, 1989: p. 457);
- men are more likely to seek paid work in an allowance system with a fixed allowance (Morris, 1989: pp. 453-457).

Pahl claims that earning money generally gives a household member more power within a household (1980: p. 330), but Jephcott found that women's power may be **reduced** when they take paid work (Pahl, 1980: p. 322). An individual's power within the household may be influenced by the allocative system adopted by the household (Pahl, 1980: pp. 334-5). Catherine Hakim (1987: p. 181) reports in her analysis of the `*National Homeworking Survey*' that responses to questions about why a wife does paid work are structured partly by the system of money management used in her household.

There appears to be little or no direct evidence on the effect of Household Allocative Systems on ownership of household durable goods, or on spending patterns - there are as yet few datasets with information on both Household Allocative Systems and on spending/durables ownership. To assess the impact of Household Allocative Systems on household behaviour, previous work has relied on small-scale studies (data on Household Allocative Systems has not been available for large-scale surveys which include data on spending or durable goods ownership). This means that we cannot distinguish between the effects of the Household Allocative System the household adopts, and other forces (such as income) which influence the household's behaviour.

The use of Household Allocative Systems to analyze **all** households is questionable. It appears from the evidence in Pahl (1985) discussed above that Household Allocative Systems may be helpful (and were designed for use) in explaining household behaviour in certain rather unusual types of household - specifically, households containing violent husbands/male partners; but these are not `typical' households. We cannot generalise from evidence obtained from small-scale studies of Household Allocative Systems such as Jan Pahl's study - her sample is not representative of households in general. Morris (1989: p. 452) claims that most studies of Household Allocative System are small-scale local studies, so their findings cannot be applied to households in general. Household Allocative Systems are unhelpful in understanding household behaviour in certain types of household (such as single-adult households).

Like most writers in the sociological tradition, Pahl does not build a mathematical model to predict the behaviour of households; hence, it is not clear exactly how to test her ideas. In order to assess Pahl's view, this chapter studies the apparent effects of `household allocative systems' on household behaviour. If Pahl is correct, this might reveal aspects of the wife's power over the household which are difficult to measure in any other way.

10.4 DATA ON HOUSEHOLD ALLOCATIVE SYSTEMS

The best source of information on household allocative systems that I am aware of, is the British *BHPS* survey (see section 6.2). In this chapter, wave one of *BHPS* (carried out in 1992) is used: this included more questions on `household allocative systems' than any other wave of *BHPS* so far. There are several questions in *BHPS* on household allocative systems: wave 1 included four questions on this topic (numbers **{F28}** to **{F31}** below refer to the *BHPS* questionnaire):

> **{F28}** Who looks after household money? (single-wage, allowance, or shared household finances).
>
> **{F29}** Who has the final say in big financial decisions?
>
> **{F30}** Who pays regular household bills?
>
> **{F31}** Who handles everyday household spending?

Both of the *WAS* surveys (1992 and 1997) contained two simple measures of `household allocative systems': respondents were asked about the day-to-day management, and about the final control over large financial decisions. I study here just three of the possible answers (for both day-to-day household management, and final control): husband-managed; wife-managed; and husband/wife jointly (the other possible answers were `independent management' or `other'; but there were few such households in the *WAS* datasets, so they were removed).

It would be possible to include all four of the *BHPS* financial arrangement variables, and both of those in *WAS*, in regression analyses (to assess their impacts on durable goods ownership); but this would produce many tables of regression results. I found empirically that the variable most closely linked to ownership of time-saving durable goods is **{F31}**: this was the only statistically significant coefficient, in a regression of the form of equation **[10A]** below (i.e. controlling for factors such as total household income), in both the UK and urban India. This seems a surprising result: purchase of a durable good such as a washing-machine is a large financial decision, so question **{F29}** seems more relevant to this thesis than question **{F31}**. I return to this issue in section 10.9 below.

Hence, tables in the remainder of this chapter refer to day-to-day management only; analysis based on the other four questions are not included here, for reasons of space. I now report the precise wording of the questions used in Britain and India, for comparison:

TABLE 10<1>: QUESTIONS MEASURING FINANCIAL MANAGEMENT

UK (*BHPS*)	**Bombay/Madras** (*WAS*)
{F31} Who is responsible for handling your everyday household spending? I mean things like food, household necessities and other items of general housekeeping? MAINLY YOU MAINLY HUSBAND/WIFE/PARTNER JOINTLY WITH HUSBAND/WIFE/PARTNER	**{Q3}** Which of these is closest to the way your household organises money? HUSBAND USUALLY LOOKS AFTER HOUSEHOLD MONEY WIFE USUALLY LOOKS AFTER HOUSEHOLD MONEY HUSBAND AND WIFE MANAGE MONEY TOGETHER

Table **10<1>** compares the question wordings used by *BHPS* and *WAS*: they are clearly not identical (even after taking account of the sex of the respondent for *BHPS*). This problem is made more complicated by the fact that a number of languages are used in India, and the question was translated from the basic questionnaire in English, to the respondent's own language. Nevertheless, for this thesis, I will ignore the differences in wording between *BHPS* and *WAS* surveys, and treat the questions as similar. A further problem is that in any survey, respondents may report their household finances as `jointly' managed, even if they are not, because of social norms which suggest that all marriages **should** be built on equality between partners: such norms have been reported in both the UK (Brannen & Wilson, 1987: p. 10) and in India (Ehrenfels, 1956; p. 197; Standing, 1991: p. 101). I am unable to correct for such problems, but further research may shed more light on such issues.

Another complication is that the *BHPS* survey attempts to interview all adults in chosen households, so we usually have the view of both husband and wife on questions **{F28}** to **{F31}**; in practice, I found that husband and wife usually agreed on these five questions, and I decided to use the husband's opinion rather than that of the wife. This issue does not arise in the *WAS* data, because only one respondent per household was interviewed in urban India (some male, others female respondents).

For both *BHPS* and *WAS*, I convert the above financial management variable to an index, which varies between zero for `husband-managed' finances, through 0.5 for `joint-managed', up to 1 for `wife-managed' finances.

10.5 SPECIFICATION OF THE REGRESSION MODEL

The regression method used in this chapter, like those in chapters 7 and 8 above, is based loosely on the work of David Piachaud (1982). The aim of this chapter is to assess if women gain power as a result of managing the household's day-to-day finances. Like Piachaud, I use a logit regression model, because the dependent variable (durable good ownership) is either zero or one. This produced the following regression equation:

$$\frac{X}{(1-X)} = \alpha_0 + \alpha_1 Y + \alpha_2 K + \alpha_3 M$$

where X = *probability of ownership* **[10A]**
Y = log *of* (*family income*)
K = log *of* (*number of children*)
M = *who manages household finances*?

I follow Piachaud's (1982) sample restrictions, except for his rejection of households earning less than one, or more than three, times as much as the Supplementary Benefit level for their household composition, for reasons explained in section 6.6 above. This means that the sample is limited to married/cohabiting households, containing exactly two adults (with or without children), and in which the husband is under 65 years old.

10.6 NEW EMPIRICAL RESULTS

This chapter offers evidence in the form of logit regressions. The regression estimates (using equation **[10A]**) are reported in the following tables.

TABLE 10<2> Who manages household money (husband, wife, or joint): WASHING-MACHINE OWNERSHIP

	BRITAIN (*BHPS*)			URBAN INDIA		
	WHO MANAGES MONEY IN HOUSEHOLD?	SAMPLE SIZE	ODDS RATIO	WHO MANAGES MONEY IN HOUSEHOLD?	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92	0.942"	1801	27.6	0.552	937	9.6
1993-				0.799	465	8.7

The above table suggests support for the ideas of Jan Pahl et al, who claim that the system of financial management adopted by a household may reveal information on the power structures within households. All three coefficients in table **10<2>** are of the expected sign, which suggests that washing-machine ownership is more frequent in households where the wife has some (or complete) say in day-to-day management of the household's finances. Only one of the three coefficients is statistically significant (that for the Britain), but this may be a result of the small sample-sizes I obtained in urban India.

TABLE 10<3> Who manages household money (husband, wife, or joint): DISHWASHER OWNERSHIP

	BRITAIN (*BHPS*)			URBAN INDIA		
	WHO MANAGES MONEY IN HOUSEHOLD?	SAMPLE SIZE	ODDS RATIO	WHO MANAGES MONEY IN HOUSEHOLD?	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92	0.582"	1802	4.0			
1993-						

Table **10<3>** refers to dishwasher ownership; this durable good was not included in either of the *WAS* (urban India) surveys. The only information we have is for *BHPS* (Britain), where the coefficient is of the expected sign and is statistically significant (at the 1% level). This again suggests that women who manage household finances (solely, or jointly) are more powerful than women whose husbands manage finances.

TABLE 10<4> Who manages household money (husband, wife, or joint): FOOD-PROCESSOR OWNERSHIP

	BRITAIN (*BHPS*)			URBAN INDIA		
	WHO MANAGES MONEY IN HOUSEHOLD?	SAMPLE SIZE	ODDS RATIO	WHO MANAGES MONEY IN HOUSEHOLD?	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92				1.055"	937	4.3
1993-				0.292	465	2.7

Table **10<4>**, on food-processor ownership, confirms the impression of the two previous tables. Food-processors were not included in the *BHPS* survey, but the *WAS* evidence shows the predicted sign of coefficient; one of the two urban India coefficients is statistically significant.

TABLE 10<5> Who manages household money (husband, wife, or joint): MICROWAVE OVEN OWNERSHIP

	BRITAIN (*BHPS*)			URBAN INDIA		
	WHO MANAGES MONEY IN HOUSEHOLD?	SAMPLE SIZE	ODDS RATIO	WHO MANAGES MONEY IN HOUSEHOLD?	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92	0.427"	1802	2.3			
1993-				1.575	465	57.1

Table **10<5>** refers to microwave oven ownership. Again, we see the expected (positive) sign on coefficients; one of the two coefficients (that for Britain) is statistically significant at the 1% level.

TABLE 10<6> Who manages household money (husband, wife, or joint): REFRIGERATOR OWNERSHIP

	BRITAIN (*BHPS*)			URBAN INDIA		
	WHO MANAGES MONEY IN HOUSEHOLD?	SAMPLE SIZE	ODDS RATIO	WHO MANAGES MONEY IN HOUSEHOLD?	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92				0.749"	937	5.5
1993-				0.931"	465	3.6

TABLE 10<7> Who manages household money (husband, wife, or joint): DEEP-FREEZER OWNERSHIP

	BRITAIN (*BHPS*)			URBAN INDIA		
	WHO MANAGES MONEY IN HOUSEHOLD?	SAMPLE SIZE	ODDS RATIO	WHO MANAGES MONEY IN HOUSEHOLD?	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92	0.497	1802	12.7			
1993-						

Tables **10<6>** and **10<7>** complete the evidence on financial management, for refrigerators and deep-freezers. The *BHPS* survey did not include refrigerator ownership, and neither of the *WAS* surveys included deep-freezer ownership; but the information we do have suggests support for the Pahl et al view - that financial management gives a woman influence over household decisions: all three coefficients in tables **10<6>** and **10<7>** are positive, and two of them are statistically significant (at the 1% level).

My opinion of the above results is that the evidence is fairly convincing. There are eleven coefficients in the above tables **10<2>** to **10<7>** inclusive; all eleven coefficients are positive, and six of these eleven are statistically significant at the 1% level. In view of the fairly small sample-sizes available, I consider this evidence to be surprisingly unequivocal.

I experimented with adding wife's earnings (as a fraction of household income) to the regression equation **[10A]** above, to assess whether or not financial management was a proxy for wife's earning-power. I found that husband-managed households were still statistically different from wife/joint-managed households in their ownership patterns, even after controlling for wife's (relative) earnings. I do not report these extra results here, due to word-length limitations.

I now turn to a different way of obtaining insights into household finances: the possession of bank-accounts. This approach may help us to extend the available evidence considerably.

10.7 BANK ACCOUNTS AS A PROXY FOR FINANCIAL MANAGEMENT

For many datasets (such as *FES*), information on household financial management is not available. I consider this to be regrettable, for two reasons: firstly, surveys such as *FES* and *GHS* have larger sample-sizes than do *BHPS* or *WAS* surveys (see section 6.2); and in general, larger samples will tend to give us more reliable results. The second advantage of using a survey such as *FES* is that it allows us to assess whether or not there is a time-trend, as was seen in chapter 8 for wife's hours of paid work. I hope that more surveys in future will include questions on financial management. But even using existing *FES* surveys, it is possible to obtain some picture of household financial practices: I do this using the evidence on whether or not an individual has a bank account, which is included in several (but not all) *FES* surveys. In some *FES* surveys, information is provided on whether or not a household has a bank account; I ignore this, because I do not feel a woman gains any power over household finances if only her husband has access to this account. I only use the *FES* surveys which ask each (adult) member if he/she has a bank account: for these, I classify households into either `wife has a bank account' or `wife does not have a bank account'. Note that an account could be her own, or a joint account with her husband; and I include savings accounts, in addition to current accounts. I included a question on whether or not the respondent has a bank account in the 1997 *WAS* survey; but (due to cost limitations) only one person in each household was interviewed in the *WAS* surveys. Hence, I restrict the urban Indian sample to female respondents in the next set of six durables, so the sample-sizes are small.

The regression equation I use to study the effects of a wife having a bank account is shown as equation **[10B]** below (it is very similar to equation **[10A]** above, which was used for financial management).

$$\frac{X}{(1-X)} = \alpha_0 + \alpha_1 Y + \alpha_2 K + \alpha_3 B$$

where X = *probability of ownership* **[10B]**
Y = log *of* (*family income*)
K = log *of* (*number of children*)
B = 1 *if wife has a bank account, otherwise* 0

I now report the empirical evidence on the effects of the wife having a bank-account on durables ownership (for *FES* and *WAS* surveys), in tables **10<8>** to **10<13>** below. I do not make specific comments on any one durable good, but make an overall assessment on the six tables as a whole.

TABLE 10<8> Effect of wife having a bank account: WASHING-MACHINE OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	WIFE HAS A BANK ACCOUNT	SAMPLE SIZE	ODDS RATIO	WIFE HAS A BANK ACCOUNT	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86	0.845"	2937	21.1			
1987-92	0.911"	16677	34.1			
1993-	0.426`	7185	63.7	-0.285	331	9.3

TABLE 10<9> Effect of wife having a bank account: DISH-WASHER OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	WIFE HAS A BANK ACCOUNT	SAMPLE SIZE	ODDS RATIO	WIFE HAS A BANK ACCOUNT	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92						
1993-	0.290"	7185	2.9			

TABLE 10<10> Effect of wife having a bank account: FOOD-PROCESSOR OWNERSHIP

	UK (*FES*)			URBAN INDIA		
	WIFE HAS A BANK ACCOUNT	SAMPLE SIZE	ODDS RATIO	WIFE HAS A BANK ACCOUNT	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92						
1993-				0.341	331	2.3

TABLE 10<11> **Effect of wife having a bank account: MICROWAVE OVEN OWNERSHIP**

	UK (*FES*)			URBAN INDIA		
	WIFE HAS A BANK ACCOUNT	SAMPLE SIZE	ODDS RATIO	WIFE HAS A BANK ACCOUNT	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86						
1987-92						
1993-	0.010	7185	4.2	0.108	331	46.3

TABLE 10<12> **Effect of wife having a bank account: REFRIGERATOR OWNERSHIP**

	UK (*FES*)			URBAN INDIA		
	WIFE HAS A BANK ACCOUNT	SAMPLE SIZE	ODDS RATIO	WIFE HAS A BANK ACCOUNT	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86	0.373	2937	107.8			
1987-92	0.847"	16677	150.6			
1993-	1.454"	7185	210.3	0.958"	331	4.0

TABLE 10<13> **Effect of wife having a bank account: DEEP-FREEZER OWNERSHIP**

	UK (*FES*)			URBAN INDIA		
	WIFE HAS A BANK ACCOUNT	SAMPLE SIZE	ODDS RATIO	WIFE HAS A BANK ACCOUNT	SAMPLE SIZE	ODDS RATIO
1969-74						
1975-80						
1981-86	0.535"	2937	4.9			
1987-92	0.493"	16677	10.2			
1993-	0.637"	7185	22.8			

The above tables **10<8>** to **10<13>** inclusive offer support to the idea (put forward by Jan Pahl and others) that financial management reveals

information on the `black box' of the household. I use possession (by the wife) of a bank-account as a proxy for wife having day-to-day involvement with managing the household's finances; and I feel that the evidence of these latest six tables justifies my study of wives' bank accounts. Fourteen of the fifteen coefficients in tables **10<8>** to **10<13>** (considering both *FES* and *WAS*) are positive; the other (negative) coefficient is not statistically significant, and it may be spurious. Ten of these fourteen positive coefficients are statistically significant, which suggests that this may be a promising line for future research. One of the more encouraging aspects of this set of six tables is that there does not seem to be a time-trend (which I observed in chapter 8): tables **10<8>**, **10<12>** and **10<13>** above indicate UK results based on *FES* surveys from the early 1980s to the mid-1990s, and none of these three tables show a very obvious time-trend.

In summary, I feel that studying whether or not the wife has a bank-account may shed light on the domestic arrangements of households, and I feel that the findings of tables **10<8>** to **10<13>** give us confidence that tables **10<2>** to **10<7>** are not purely spurious. It appears that day-to-day financial management is important, and is a useful predictor of time-saving durables ownership.

10.8 LINKS BETWEEN `HOUSEHOLD ALLOCATIVE SYSTEMS' AND OTHER FACTORS

Results presented in this chapter suggest that economists can use household allocative systems to explore household spending patterns. This raises the question `what determines the household allocative system adopted by a household?' Several researchers have attempted to answer this question; for example, Vogler and Pahl studied *SCELI* (UK) data, and reported that

> "The strongest influences on the housekeeping allowance system, however, were social class, employment status, the ages of the couple and the husband's education, socialisation and attitudes"
>
> (Vogler & Pahl, 1993: p. 90).

In the Indian context, Hilary Standing (1991) claimed that women generally have little real power over financial decisions, even if they manage the household's common fund. However, my results cast doubt on Standing's claim, at least in the context of urban India: the evidence in this chapter suggests that if a wife manages household money, she does tend to have more influence over household spending on durables (than does a wife whose husband manages the household finances).

Using this perspective, we might suspect that the wife-managed-finances variable is really indicating a link between household behaviour and attitudes of household members. This might be because wives who manage the household finances tend to be those women who have `feminist' values; or because husbands who accept the idea of their wives having a measure of power over domestic finances are relatively `modern' in their attitudes. Several such attitude variables are available in both the *BHPS* (UK) and *WAS* (Bombay/Madras) datasets; I experimented with this idea, by assessing whether or not there was a direct link between `feminist' values and ownership of time-saving durable goods. To my surprise, I did not find such a link. I also tested the possibility that households in which women carried out day-to-day household financial management had more `feminist' or `modern' attitudes; again, no such link was apparent. However, it is possible that the precise wording of the questions used in the *BHPS* and *WAS* surveys did not successfully capture the appropriate aspects of the respondents' attitudes, or that the wrong attitude questions were asked in *BHPS* and *WAS* surveys.

FINANCIAL MANAGEMENT AND SOCIAL CLASS

In many households, neither husband nor wife have a bank account: this may be partly due to class the effects of social class. Sinha & Prabha (1988: p. 206) report a study of employed women in Bihar (India), which found only 8% of blue-collar workers had a bank account in their own name, compared with 31% of white-collar workers. But regarding managing the household finances, the reverse pattern was observed: 86% of blue-collar women always maintain the household account, compared with only 52% of white-collar women. Note that these figures should not be generalised to the whole of India: there are regional variations in the extent to which women deal with household finances (Whyte & Whyte, 1982: p. 181). Nevertheless, they suggest that financial management may be a proxy for social class.

SHOPPING AND FINANCIAL MANAGEMENT

Using *WAS* 1997 data, I observed a link between who does the shopping, and who handles the household finances (unfortunately, shopping was not included in the 1992 *WAS* survey). When I studied the average time spent shopping by husbands, I observed the following pattern:

TABLE 10<14> Time spent shopping by husband (hours per week) by financial management, urban India (1997)

SYSTEM OF FINANCIAL MANAGEMENT USED	MEAN	STANDARD DEVIATION	NUMBER OF CASES
husband-managed	3.70	5.26	292
joint-managed	3.66	5.15	99
wife-managed	1.85	3.20	74

I do not report an equivalent British table to the above table **10<14>** for urban India: although *BHPS* includes a question on who does the shopping, it is a different type of question to that in *WAS* 1997. I feel that table **10<14>** above is sufficient to establish a link between who does the shopping, and who manages the finances.

10.9 SUMMARY: THE IMPORTANCE OF `HOUSEHOLD ALLOCATIVE SYSTEMS'

The evidence of the regression results (in tables **10<2>** to **10<13>** above) indicates that household allocative systems offer economists extra explanatory power. Even after controlling for wife's employment, the extra variable (husband-managed versus wife/joint-managed) was statistically significant in most of the regression equations. The evidence in this thesis on the influence of day-to-day financial management is far stronger than for either the `price-of-time' or `bargaining' models I tested in chapters 7 and 8. Where women manage their household's finances, they appear to have more power over their household's spending patterns.

One question arising from this thesis is why financial management is (apparently) linked to durable ownership patterns. It is possible that women's management of household money directly affects spending patterns, perhaps by giving women confidence in handling money. Alternatively, financial management may be revealing another effect which would otherwise be invisible - in Jan Pahl's terminology, household financial management may be a "tracer" of the impact of the factors which reveals patterns which are otherwise overlooked.

In section 2.8, I discussed the possibility of interpreting the empirical impact of household allocative systems from a game theory perspective. However, this is not the only possible interpretation. Referring to the psychology-based theories in section 2.6, women who manage household finances might be seen as `dominant', and hence likely to control other aspects of the household such as durable goods purchase. However, this view seems to be weakened by my findings (not reported in this thesis, due to the word limit) that the variable `who has the final say in big financial decisions?' was not closely linked to the ownership of time-saving durable goods. This appears surprising: a durable good such as a washing-machine is expensive (costing several hundred pounds in the UK; I found that a washing-machine in India cost around 16,000 Rupees in 1992), so I expect such purchases to be seen as "large financial decisions". One possible explanation is that women who carry out the household's day-to-day financial management may be better informed about the household income, which could be interpreted as support for a principal/agent model (see section 2.4). I found a strong link between the person who does the day-to-day financial management in the household, and the person who does most of the household shopping (see table **10<14>**). But purchase of a good such as a washing-machine is highly visible, and is certain to be noticed by the

husbands (items such as washing-machines are normally permanently connected to water and electricity supplies, and their installation may require a kitchen to be redesigned). My discussion of principal/agent models (in section 2.4) suggests that a woman's power as an `agent' would not extend as far as the purchase of a time-saving durable good of the type studied in this thesis. Further research is needed on this.

A central finding of this chapter is that it supports the claims of Jan Pahl and others (see section 2.8), on the value of financial management to reveal the inner workings of households. This view is not shared by all sociologists: for example, Barrett & McIntosh (1982: p. 69) discussed financial management systems, but wrote that "In practise, the decision-making power lies with the one who brings in the sole or major income." Yet tables **10<2>** to **10<13>** suggest that day-to-day financial management <u>is</u> important: the wife's financial management does seem to be associated with greater ownership of time-saving durables. Hence, if the ability of a wife to buy time-saving goods is a dimension of her power, then day-to-day financial management is an indicator of a wife's power - perhaps more so than her income, in view of the findings in chapters 7 and 8.

It has been argued that we need a deeper understanding of interactions between family members: in the Indian context, for example,

> "The instruments needed have to be sensitive, innovative, and enormously perceptive. A case in point is the new fashion of appending questions on decision-making in the family or control over income. Superficial questions like `who decides' cannot reveal the subtle processes at work. Reported decisions after all, merely reflect prior social imperatives. What is decision-making for different classes of women? For a poor woman struggling to keep body and soul together, it is a meaningless term. In a severely circumscribed life, what are the options?"
>
> (Raj, 1988: p. 893).

Regarding the inclusion of questions on day-to-day finances into surveys, I feel that studying `household allocative systems' is a relatively recent idea (the earliest large-scale survey I know of which included this was *SCELI*, in 1986/7). I accept that classifying households as `husband' or as `wife/joint' financial management is a very simple system, which misses much of the subtle detail; but by showing this variable to be a significant influence on household spending (ownership patterns), I hope to make a case for other economists to develop this line of research.

CHAPTER 11

CONCLUSIONS

11.1 WHAT IS ORIGINAL ABOUT THIS THESIS?

This thesis has discussed previous empirical work, and found reason to question the standard economic theories. My own evidence in chapters 7 to 9 implies offers little or no support to these theories.

My claims to originality in this thesis are as follows: firstly, I used data from many different surveys, to make perhaps the most thorough test ever of conventional economic theories of the effects of wife's employment on time-saving durables ownership. I was unable to obtain appropriate data on India, so I commissioned two surveys; my two datasets may be the only data for India in existence with which the theories examined in this thesis can be tested. My findings do not support either the price-of-time or bargaining hypotheses. I found a previously unsuspected time-trend among regression coefficients (see chapter 8).

Using crosstabulations, I found that wives' employment seems to increase durables ownership among poorer households, but that it has the opposite effect in richer households. This casts doubt on previous empirical tests of `bargaining' versus `unitary' models: neither model explains this behaviour, and attempts to test the theories will have produced meaningless results.

Finally, I claim originality in applying insights of `household allocative systems': I show that economic models can be improved by using information on whether or not the wife is involved with day-to-day household financial management. My use of bank accounts as a proxy for financial management is, as far as I am aware, unique. I found a pattern in both Britain and urban India, over a long time-period, that a household is more likely to own time-saving durable goods if the wife manages the household finances.

11.2 THE IMPORTANCE OF `TIME-SAVING' DURABLES

The above comments suggest that we should be concerned for the state of current theories on the microeconomics of demand. Time-saving durable goods is not the only topic which has been analyzed by the `unitary' and `bargaining' approaches (Ermisch, 1993, p. 367); these economic theories may be more successful in other areas of household behaviour (which are beyond the scope of this thesis). But the weakness of these theories seems more serious because we are failing to understand a phenomenon which has important impacts on people's lives, especially in the Third World. In the UK, many labour-saving goods are widely owned; Oakley (1982: p. 171) claimed that "it is the washing-machine, not the vote, that is the true liberator of women". In India, however, such time-saving durables are much less widely-owned, as is shown in tables **9<4>** to **9<12a>** above. In the context of Calcutta (India), Standing wrote

> "The poor material condition of much of the housing and the lack of time and work-saving devices have major implications for women's domestic workloads"
>
> (Standing, 1991: p. 31).

This thesis claims that women's employment is not a good predictor of which households own durables, despite the predictions of most economic theories. Women's employment increases household incomes, so in this sense, women's employment **does** significantly increase ownership of time-saving durables; but does an extra £1 (or 1 Rupee) of wife's earnings have more impact than an extra £1 (or 1 Rupee) of husband's earnings, on the likelihood of a household owning time-saving durables? The answer, according to chapter 9, is that it depends on household income: a wife's employment in a poor household has a different effect to a wife's employment in a rich household. But in general, the husband's income seems more closely linked than the wife's income to time-saving durable goods ownership (see chapter 7).

11.3 HAVE PREVIOUS THEORIES FAILED?

Many economists have criticised conventional economic analysis in the field of household consumption, but appear to bury their criticisms - perhaps concerned that further research may prove their criticisms unfounded. David Piachaud (1982) was more direct than most, in his summing up of previous theoretical and empirical work: discussing his own findings, which tested a model based on `new home economics', he wrote

> "In the case of consumer durables [...] the expected result - that those doing more paid work would possess more labour-saving aids - was not confirmed. [...] Over-simplified models of intra-familial behaviour are worse than useless".
>
> (Piachaud, 1982: pp. 481-2).

I agree with Piachaud that we should not retain useless theories. The evidence I report in chapter 9 gives further weight to Piachaud's implicit criticism of conventional economic theories (both `unitary' and `collective' models - see below).

THE `UNITARY' MODEL

Several writers have suggested that the `unitary' approach (built on the assumption that the household behaves as if there is a single utility function) is the standard economic approach to studying household behaviour: see, for example, Phipps & Burton (1995: p. 178). Rosenzweig & Schultz (1982: p. 813) argued that the existence of a family utility function is "A central working assumption underlying the economic literature on household behaviour". And Rosen (1993: p. 28) goes further: "Becker's work on the economics of the household and on demography are the most important applications of economic analysis to nonmarket behaviour". But the empirical results reported in chapter 7 do not support such a `unitary' model. I could be argued that the `unitary' framework has now been discredited:

> "Common preference models of the family have proven to be too limited a framework for the analysis of household behavior"
>
> (Lundberg & Pollak, 1996: p. 154).

However, I feel that I must add a comment on Becker's contributions. Shoshana Grossbard-Shechtman wrote

> "One can only speculate as to the reasons why empirical studies distinguishing between the effects of male and female income on consumption and fertility have preferred to justify such distinctions based on a Nash-bargained household model rather than on Becker's theory of marriage. [...] Justice was served when Becker received a Nobel prize that was long overdue. Justice will be served even better when due recognition is given to valuable aspects of Becker's contribution which have been ignored by most of the economics profession."
>
> (Grossbard-Shechtman, 1995: p. 110).

I disagree with the above suggestion that the economics profession has conspired against Becker. The evidence in chapter 7 confirms the findings of a large number of previous studies, which found Becker's model to be weak in explaining empirical results; but I think Gary Becker provided a much-needed boost to this area of economics - by spelling out predictions of how a `rational' household with a single utility function should behave, Becker gave us a testable model. Households do not appear to behave as predicted; so perhaps economists need to develop a better theory.

THE `BARGAINING' APPROACH

As a reaction to the lack of success of `unitary' models in empirical work, many economists have turned to bargaining models (including game theory). In this approach, each household member tries to get his/her preferences accepted in household decisions. The evidence in chapter 8 suggests little support for this view; and further empirical results in chapter 9 suggest that household behaviour does not conform to any bargaining model discussed in chapter 2. This confirms the picture in recent empirical work, in which no bargaining model has been found to be acceptable (see section 9.5).

One possible explanation is that bargaining models can explain the behaviour of some households, but not others. Consider the following discussion of discrimination against girls:

> "there is a body of literature that describes the effect of *scale* on intra-household inequality [...] it poses the hypothesis that for a given set of economic opportunities for men and women, the extent of intra-household inequality will decrease with the overall welfare level of the household. The bargaining approach states that as the size of the cake to be bargained over increases, bargaining becomes less important and households can afford to invest equally in all household members."
>
> (Haddad & Reardon, 1993: pp. 262-3; emphasis in original).

The above analysis was not referring to durables ownership, or even bargaining between husband and wife; but it suggests that conventional bargaining models do not apply to the richest households, because both husband and wife can reach a level of well-being they find acceptable - if so, then dislike of disharmony associated with bargaining may outweigh any advantage which each partner might obtain from achieving a preferred spending pattern. To take a simple example, in a middle-income household, husband and wife may disagree over whether to buy a washing-machine or a video-cassette recorder; but in a rich household, they may be able to buy both, so there is less need for conflict. This analogy suggests that the poorest households also may have little reason for disagreement, as a poor household cannot afford either washing-machine or video-cassette recorder. Haddad & Reardon (1993: p. 265) suggest that there are both theoretical and empirical reasons to expect an inverse-u pattern: that inequality within households initially increases as household income rises, but later declines again in the richer households.

IS IT TIME TO REJECT PREVIOUS THEORIES?

My results cast doubt on the `new home economics' model associated with Gary Becker. Like many previous empirical articles referred to in this thesis, I tested - and did not support - the new home economics theory. This thesis studied time-saving durable goods, and I am not qualified to assess the success or otherwise of new home economics in other fields. But I agree with Alderman, Chiappori & Haddad (1994), who claimed it is "time to shift the burden of proof": if any economists wish to defend the `new home economics', let them provide empirical evidence.

Bargaining models are more diverse than the `new home economics'; this means that it is difficult to imagine how they could all be rejected. Nevertheless, I feel that no bargaining model discussed in this thesis is adequate to explain the behaviour patterns I have reported in the UK and urban India.

11.4 DO ECONOMISTS NEED HELP FROM OTHER DISCIPLINES?

This thesis has confirmed previous claims on the apparently poor performance of economic theory on this area. Perhaps this had led other social scientists to become disillusioned with economics:

> "Conventional economics now seems less useful than once it did. [...] Its focus of concern may be seen as too narrow, so that it rigidly addresses a confined range of variables."
>
> (Gershuny & Miles, 1985: p. 24).

Julie Nelson argues that economists should go beyond the traditional economic assumption that humans are rational utility-maximisers (`homo economicus'), to develop a more accurate understanding of human behaviour:

> "*Homo economicus* may not be a good description of women, but neither is he a good description of men. [...] What is needed is a conception of *human* behavior that can encompass both autonomy and dependence, individuation and relation, reason and emotion"
>
> (Nelson, 1995: p. 136; emphasis in original).

Samuel Cameron is another writer who hopes that economists will learn from sociologists: "family bargaining is a subject requiring sociological treatment" (Cameron, 1985: p. 43). Other economists agree that we need better models of what humans are, if we wish to predict human behaviour:

> "The mental models that the mind creates and the institutions that individuals create are both essential to the way human beings structure their environment in their interactions with it. An understanding of how such models evolve and the relationship between them is the single most important step that research in the social sciences can make to replace the black box of the `rationality' assumption used in economics and rational choice models."
>
> (Denzau & North, 1994: p. 5).

> "It is easy to convince most economists that economic analysis would greatly enrich all other academic disciplines, but economists are surprisingly reluctant to believe that reading anthropology, biology, history, psychology or sociology is important for doing good economic analysis."
>
> (Bergstrom, 1996: p. 1904).

Some economists seem unwilling to change their approach: Robert Lucas (cited in Nelson, 1995: p. 137) claimed that rational choice modelling provides the only `engine of truth' we have in economics. Could economists use insights from sociology, without abandoning the assumption (basic to neoclassical economics) that humans are `rational'? Hilary Standing claimed that

> "Styles of management and their implications for decision making are thus quite varied and do not correlate straightforwardly with demographic, life-cycle and income effects. There is a critical area of ideological mediation which also explains why the entry of women into waged employment does not automatically mean an enhancement either in women's share of household income resources or in their decision-making capacity in relation to those resources."
>
> (Standing, 1991: p. 100).

In the above comment, Standing's view suggests that economists do not yet have models which could explain the effects of women's employment, because the concept of `ideological mediation' is not part of any model which relies on the assumption of economic rationality (as most economic analysis does). Yet Standing's comments above appear to be inconsistent with her subsequent claim in the same book, that a household's income and life-cycle stage (together with the conceptualization and management of household income) permit us to understand household spending:

> "Three intersecting variables largely determine what happens to women's wages; the form in which household income is conceptualized and managed, the income level of the household and the stage in the life cycle of the woman earner."
>
> (Standing, 1991: p. 101).

This suggests that economists might combine information on financial management with data normally included in economic models (such as household income, and demographic variables such as the number of children). I consider this comment by Standing to be supported by the empirical evidence reported in this thesis. Studying who handles money in the household is associated with the work of Jan Pahl (a sociologist); but it makes no sense for economists to refuse to study a topic simply because sociologists studied it first. Money (and who controls it) must surely be within the remit of economics.

I feel that there is a future for economists to delve further into the `black box' of the household, by studying relatively visible factors such as financial management: in the words of Jan Pahl, the household's system of arranging money is a `tracer', which reveals patterns of power and deference within households (Pahl, 1983: p. 251). Research by Jan Pahl and others is a useful pointer; because of the work of pioneers such as Jan Pahl, several large-scale surveys such as the *BHPS* now include questions on household financial management. The challenge for economists is to apply the scientific methods of econometrics to the often imprecise ideas of sociology.

A number of writers have advocated stronger links between economics and sociology, including Van der Lippe & Siegers:

> "the relative autonomy of the distinguished research traditions, i.e. role theory, exchange theory and new home economics, has led to an inadequate understanding of the division of labour."
>
> (Van der Lippe & Siegers, 1994: p. 133).

This thesis implies that economists have much to learn before we can claim to understand household behaviour. However, I agree with Julie Nelson's claim that

> "overthrowing a model of autonomous choice only to end up with, for example, a model of pure social determinism would lead to no great improvement."
>
> (Nelson, 1995: p. 137).

In their comparison of economics and sociology, England & McCreary wrote:

> "Economists have had virtually nothing to say about the greater marital power of husbands and wives. Manser and Brown (1979) have analyzed bargaining between spouses, but they stay within economists' assumption that interpersonal utility comparisons are meaningless, and thus never conclude that husbands have more power than wives, since this would imply that he gets more of what he wants than she does."
>
> (England & McCreary, 1987: p. 160).

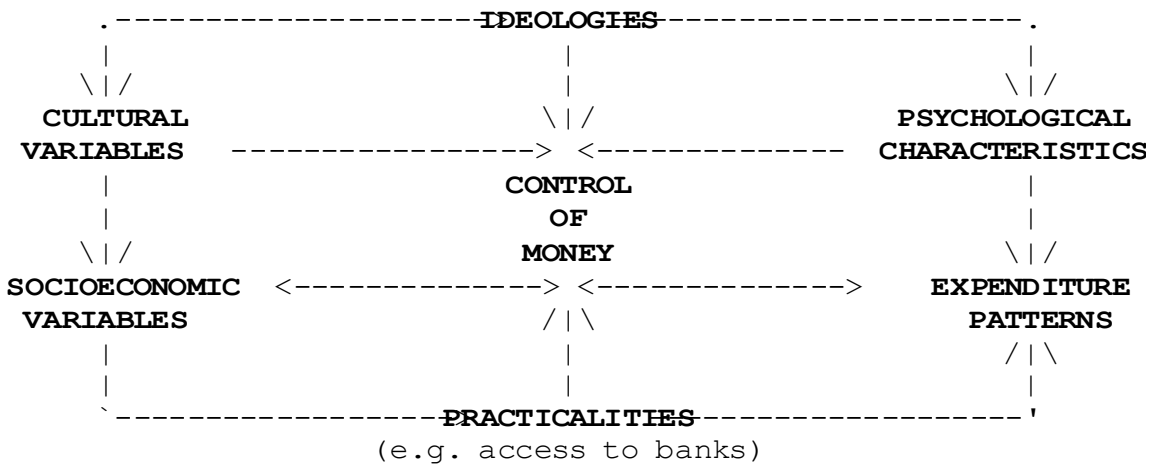
In my opinion, England & McCreary misrepresent economics: economic bargaining models are about the struggle for power between husband and wife. Nevertheless, I agree that economists could go further, and being able to assess how much each spouse obtains from the bargaining process would be desirable. There seems general agreement that utility levels cannot be measured (Diewert, 1974: p. 501), but this need not prevent economists from examining and (hopefully) explaining household behaviour.

Robert Pollak suggests that economists could learn from other disciplines:

> "the analysis of simultaneous equilibrium in *n*-markets is also partial in that it treats as exogenous "non-economic" variables such as institutions and practices, norms and gender roles, preferences and values. These variables, it is often asserted, belong to other disciplines. But life, unlike universities, is not compartmentalized along the lines of academic disciplines."
>
> (Pollak, 1994: p. 150).

In order to place conventional economic analysis in context, I reproduce below Jan Pahl's diagram showing links between different aspects of household behaviour below (Pahl, 1989: p. 122); I refer to this as my figure **11<1>**.

FIGURE 11<1>: Jan Pahl's overview of household behaviour



An equivalent economic diagram would contain only two of Jan Pahl's seven factors, with an arrow in one direction: from SOCIOECONOMIC VARIABLES to EXPENDITURE PATTERNS. This suggests that economics is narrow in scope: most economists do not discuss what Pahl calls CULTURAL VARIABLES, or IDEOLOGIES, or PSYCHOLOGICAL CHARACTERISTICS, or CONTROL OF MONEY, or PRACTICALITIES. But I wish to make clear that as an economist, I resent the implication in much sociological writing, that economists can only cope with childishly simple models, whereas sociologists can understand the complex realities of human behaviour. I feel that economic analysis (with its emphasis on mathematical precision, testable hypotheses, and explicit mathematical models) is a suitable approach to social science. If we rely on sociologists, we may never fully understand human behaviour, but just have a mass of separate observations which we cannot generalise.

ARE ECONOMIC MODELS OVER-COMPLICATED?

Perhaps a preference for mathematical models (popular in economics) may be holding us back from understanding the nuances of human behaviour:

> "With game-theoretic models, empirical researchers face substantial trade-offs between adhering to the theory and developing an estimable model."
>
> (Reiss, 1996: p. 425).

Certainly, the development of my own mathematical model (chapter 5) was strongly determined by the need to develop a functional form which was

differentiable, in order to be able to "solve" the model (and hence make predictions from it) - this may partly explain why my model was so unsuccessful. Consider the following (but not too carefully!):

> "Existence of a Nash equilibrium essentially follows from continuity and quasi-concavity of utility, compactness and convexity of the feasible set. Uniqueness of the Nash equilibrium requires further restrictions on the individual marginal propensities to consume. The Jacobian of the system of equations defining Nash equilibrium never vanishes so long as there is no dependence between the marginal propensities to consume the public good"
>
> (Chiuri & Simmons, 1997: p. 382, footnote 6).

Models such as that by Chiuri & Simmons suggest that a wife's employment will tend to increase her power; but evidence in chapter 9 (of this thesis) suggests that this is only true in poorer households, and that the opposite is true at higher income-levels. No amount of sophisticated mathematics will make up for unrealistic assumptions; a simpler, but successful, model would be preferable to a sophisticated but unsuccessful one.

11.5 DIRECTIONS FOR FUTURE RESEARCH

It could be argued that we have a long way to go before we can claim to understand the dynamics of household spending decisions. I cannot tell if new home economics, or bargaining models, can be reformulated to provide explanations of household durables ownership which will satisfy empirical researchers. It seems possible that economics will gradually adopt new methods, as yet unknown. I suggest two possible new directions, which might prove to be promising: household financial management; and improving our models of interactions between husband and wife.

HOUSEHOLD FINANCIAL MANAGEMENT

Shirley Dex, writing in 1985, seemed unconvinced about the value of studying household allocative systems:

> "Women have been drawn into the labour market at the same time that manufacturing production has wanted to sell more domestic durable goods like washing machines. Women's employment provides a rationale for the purchase of such goods and also gives women more control over the household resources with which to purchase these domestic goods. If working women were found to spend their income on such consumer durables, this argument would gain some support. Pahl (1983) has recently opened up the issue of the allocation of money within the household, but the detail of our present knowledge is insufficient to know what women's income is spent on."
>
> (Dex, 1985; pp. 184-5).

Durable goods ownership may be influenced by how `patriarchal' each household is (in this context, patriarchal refers to the relative power of husband and wife over household decisions): in more patriarchal households, we might expect ownership of leisure goods to be given a higher priority, whereas in less patriarchal households, time-saving durables would tend to be a higher priority. Female financial management seems to be associated with greater time-saving durables ownership, and hence is an indicator of something; it is possible that this `something' could be patriarchy. However, I am not convinced that female financial management is simply a proxy for patriarchy, because I was unable to find a significant link between `feminist' attitudes and time-saving durables ownership (those tables are not reported in this thesis, for reasons of space).

It has been suggested that financial management does not fit easily into the sphere of economics:

> "Work by sociologists on family budgeting suggests considerable heterogeneity among families in money management practices [...] Economists, however, are unlikely to find money management especially interesting as outcome variables or appropriate as explanatory variables."
>
> (Lundberg & Pollak, 1996: p. 155).

It should be noted, though, that Jan Pahl (perhaps the key pioneer in the field of financial management) does not advocate studying financial management as either an explanatory or an outcome variable, but as an intermediary variable (Pahl, 1983: p. 251). Until we find the factors which determine a household's choice of financial management, it seems reasonable to use financial management as a proxy for a more fundamental (but as yet unknown) cause.

In assessing work on `unitary' models and `collective' models of household behaviour (which were described in chapter 2), it has been claimed that

> "The main empirical questions are whether household or only individual preferences exist; whether allocations within the household are efficient; **what transfers are made within the family and what mechanisms are in place to allow the transfers.** [...] Testing whether households are in Nash or Lindahl equilibrium [...] would require data on specific transfers within the family."
>
> (Chiuri & Simmons, 1997: p. 385; emphasis added).

It appears that economists are now moving towards studying the internal dynamics of household finances; I hope this thesis will encourage that tendency.

IMPROVING OUR MODELS OF HUMAN INTERACTION

In seeking to understand human behaviour, economists have developed theories which assume each person (or household) maximises utility. This simplifying assumption allows economists to develop sophisticated mathematical models, but sociologists see human motivation as being more complicated. For example, Karen Pyke (1994) studied people who re-married after divorce, using Hochschild & Machung's concept of an `economy of gratitude'; she concluded that men may prefer their wives to be unemployed:

> "husbands value their wives' family work and their choice to stay home [...] a woman's choice to remain out of the labor force may be reflective of her power, rather than false consciousness or nonegalitarian orientation"
>
> (Pyke, 1994: p. 89).

This suggests that a woman may gain her husband's gratitude by not taking paid work; yet in the same paragraph, Pyke appears to say the opposite: "wives are grateful to their husbands for enabling them not to work for pay" (Pyke, 1994: p. 89).

Karen Pyke considers that individual households may interpret a resource (such as the wife's earnings) differently, depending on their circumstances: men with less successful careers may feel threatened if their wife earns a high income (Pyke, 1994: p. 89). In Pyke's view, we cannot simply assume that a higher-earning wife has more power than a nearby wife who earns less - power depends on "symbolic and gendered meanings" attached to them by husband and wife. This might explain the fact that for high-income households, women's employment may reduce the likelihood of owning time-saving durables (see section 9.3).

Pyke claimed that where a man is less successful in his career, he may restore some of his own self-worth by dominating his wife. In one couple she studied, the wife had high earnings, and this led to tension between spouses - but the husband coped better when he took a leadership position in their church, because he could interpret himself as the spiritual head (but not the financial head) of his family (Pyke, 1994: p. 88). Such detailed insights into feelings and meanings could give sociologists a chance to develop very sophisticated theories of household behaviour; yet sociologists seem unable (or unwilling) to make mathematical models or testable hypotheses. My view is that sociologists cannot `see the wood for the trees': in focusing on minute details, sociologists are unable to distinguish the important influences from those which are trivial: for example, Hilary Standing wrote about women in Calcutta:

> "If `autonomy', defined in a narrow sense, implies control over money [...] women in the sample vary widely in the degree of control which they exercise in this sense, regardless of whether they actually manage household funds. Nor can the degree of control be read off straightforwardly from the class and demographic characteristics of the household. The ideological mediation of the marriage contract, together with complex configurations of household circumstances <u>prevent broad generalizations</u>."
>
> (Standing, 1991: p. 108; emphasis added).

Perhaps economists in this field have oversimplified their views of human motivation too far - Becker et al offer sophisticated mathematical models, but these models seem weak in their ability to predict or explain actual household behaviour. Perhaps a middle way between economics and sociology would be desirable. Notburga Ott wrote:

> "Certainly, there are factors in the family - in particular of an affective nature - which can hardly be explained by rationality [...] However, this should not lead us to deny rational behaviour in the family as such. If affections do not crowd out all rational behavior, we should observe some systematical reactions which can be described by an economic model."
>
> (Ott, 1992: p. 196).

Finally, I suggest a comment which may point the way forward for economists in this research area:

> "We are far from a unified model of marriage, divorce and marital behavior, but a model of distribution within marriage that recognizes the independent agency of men and women within marriage is a prerequisite to a unified model."
>
> (Lundberg & Pollak, 1996: p. 156).

I feel that the pioneering work of Jan Pahl and others in the sphere of `household allocative systems' research give economists a useful way forward; this is especially welcome at a time when economic models (both `unitary' and `bargaining') seem to be disappointing in their abilities to explain observed behaviour. I am hopeful that future collaboration between economists and sociologists will prove beneficial.

APPENDIX

FULL REGRESSION RESULTS

This appendix reports the set of coefficients for each regression reported in chapters 7, 8, and 10 of the main text. To help the reader compare this appendix with tables in the main text, I divide this appendix into sections, with one section for each regression table in the main text. Appendix sections are numbered appropriately: for example, **appendix section A7<1>** below corresponds to table **7<1>** (table **7<1>** is in chapter 7). Sample-sizes, and the `odds ratio' goodness-of-fit test, are shown in the tables in chapters 7 to 10; I do not repeat them here, to save space.

As in the main text, the " symbol indicates that the coefficient is significant at the 1% level, and ` indicates significant at the 5% level (based on a T-test). The following symbols have been used in the appendix:

for durable good x, $\text{LOGIT}(x) = \dfrac{\text{probability(x is owned)}}{1 - \text{probability(x is owned)}}$

Y is log of (household income: net for *FES* & *WAS*, gross for *BHPS*).

K is log of (number of children in the household).

A is a dummy equal to 1 if husband is over 30, otherwise zero.

H_w is log of (wife's paid employment: hours per week).

H_h is log of (husband's paid employment: hours per week).

W_w is log of (wife's wage: £s per hour in UK, Rupees/hour in India).

W_h is log of (husband's wage: £s/hour in UK, Rupees/hour in India).

M is equal to 0 if the husband manages household finances,
or 0.5 if finances are managed jointly by husband and wife,
or 1 if household finances are managed by the wife.

B is a dummy variable, equal to one if the wife has a bank account (individual, or joint with another household member); or zero otherwise.

At the end of this appendix, I include the questionnaires used in the 1992 and 1997 surveys in India (retyped by myself). The actual questionnaires used a slightly larger paper-size, and hence were slightly easier to read.

APPENDIX A7<1>

Becker's price-of-time hypothesis: WASHING-MACHINES

UK (*FES*):

FES 1969-74:
LOGIT(WASHMACH)= - 2.11" + 0.08 W_w + 0.48" Y + 0.88" K

FES 1975-80:
LOGIT(WASHMACH)= - 3.44" + 0.13 W_w + 0.87" Y + 0.94" K

FES 1981-86:
LOGIT(WASHMACH)= - 2.67" + 0.25` W_w + 0.84" Y + 1.15" K

FES 1987-92:
LOGIT(WASHMACH)= - 2.17" + 0.42` W_w + 0.85" Y + 1.11" K

FES 1993-96:
LOGIT(WASHMACH)= - 2.87 - 0.09 W_w + 1.19" Y + 1.52" K

URBAN INDIA:

WAS 1997:
LOGIT(WASHMACH)= -37.67" + 0.76 W_w + 3.65" Y + 1.62 K

==========

APPENDIX A7<2>

Husband's hourly wage-rate: WASHING-MACHINES

UK (*FES*):

FES 1969-74:
LOGIT(WASHMACH)= -1.44" + 0.62" W_h + 0.25" Y + 0.74" K

FES 1975-80:
LOGIT(WASHMACH)= -2.32" + 0.63" W_h + 0.56" Y + 0.79" K

FES 1981-86:
LOGIT(WASHMACH)= -3.74" + 0.43" W_h + 0.98" Y + 1.00" K

FES 1987-92:
LOGIT(WASHMACH)= -2.42" + 0.41` W_h + 0.87" Y + 0.81" K

FES 1993-96:
LOGIT(WASHMACH)= -3.03` + 0.49 W_h + 1.05" Y + 1.22" K

URBAN INDIA:

WAS 1997:
LOGIT(WASHMACH)= -19.84" + 0.18 W_h + 2.18" Y - 0.99" K

APPENDIX A7<3>

Becker's price-of-time hypothesis: DISHWASHERS

UK (*FES*):

FES 1993-96:

LOGIT(DISHWASHER)= -11.27" + 0.40" W_w + 1.58" Y + 0.41" K

==========

APPENDIX A7<4>

Husband's hourly wage-rate: DISHWASHERS

UK (*FES*):

FES 1993-96:

LOGIT(DISHWASHER)= -14.39" + 0.38" W_h + 2.07" Y + 0.45" K

==========

APPENDIX A7<5>

Becker's price-of-time hypothesis: FOOD-PROCESSORS

URBAN INDIA:

WAS 1997:

LOGIT(FOODPROC)= -31.24" + 0.70 W_w + 3.35" Y - 0.92 K

==========

APPENDIX A7<6>

Husband's hourly wage-rate: FOOD-PROCESSORS

URBAN INDIA:

WAS 1997:

LOGIT(FOODPROC)= - 8.13" + 0.56` $W_h$ + 0.77" Y - 0.54` K

==========

APPENDIX A7<7>

Becker's price-of-time hypothesis: MICROWAVE OVENS

UK (*FES*):

FES 1993-96:

LOGIT(MICROWAVE)= - 1.90" - 0.12 W_w + 0.61" Y + 0.18` K

APPENDIX A7<8>

Husband's hourly wage-rate: MICROWAVE OVENS

UK (*FES*):

FES 1993-96:

LOGIT(MICROWAVE)= - 1.66" - 0.02 W_h + 0.54" Y + 0.10 K

URBAN INDIA:

WAS 1997:

LOGIT(MICROWAVE)= -14.65" + 0.34 W_h + 1.21 Y - 0.92 K

==========

APPENDIX A7<9>

Becker's price-of-time hypothesis: REFRIGERATORS

UK (*FES*):

FES 1969-74:

LOGIT(FRIDGE) = - 9.28" + 0.52" W_w + 1.90" Y - 0.13` K

FES 1975-80:

LOGIT(FRIDGE) = - 7.68" + 0.75" W_w + 1.92" Y - 0.03 K

FES 1981-86:

LOGIT(FRIDGE) = 0.28 + 0.39 W_w + 0.73` Y - 0.06 K

FES 1987-92:

LOGIT(FRIDGE) = 0.06 + 0.61 W_w + 0.79` Y - 0.01 K

FES 1993-96:

LOGIT(FRIDGE) = 6.23 + 0.19 W_w - 0.12 Y + 0.21 K

URBAN INDIA:

WAS 1997:

LOGIT(FRIDGE) = -22.53" + 1.27 W_w + 2.01" Y - 0.26 K

APPENDIX A7<10>

Husband's hourly wage-rate: REFRIGERATORS

UK (*FES*):

FES 1969-74:
LOGIT(FRIDGE) = - 9.19" + 0.65" W_h + 1.84" Y - 0.31" K

FES 1975-80:
LOGIT(FRIDGE) = - 9.16" + 0.67" W_h + 2.18" Y - 0.24" K

FES 1981-86:
LOGIT(FRIDGE) = - 2.13 + 0.47 W_h + 1.11" Y - 0.17 K

FES 1987-92:
LOGIT(FRIDGE) = 2.05 + 0.70` $W_h$ + 0.41` Y - 0.37 K

FES 1993-96:
LOGIT(FRIDGE) = - 1.49 - 0.39 W_h + 1.27" Y + 0.26 K

URBAN INDIA:

WAS 1997:
LOGIT(FRIDGE) = -15.55" + 0.50 W_h + 1.64" Y - 0.24 K

==========

APPENDIX A7<11>

Becker's price-of-time hypothesis: DEEP-FREEZERS

UK (*FES*):

FES 1975-80:
LOGIT(FREEZER) = -6.99" + 0.14 W_w + 1.29" Y + 0.17" K

FES 1981-86:
LOGIT(FREEZER) = -6.54" + 0.31" W_w + 1.29" Y + 0.17" K

FES 1987-92:
LOGIT(FREEZER) = -2.45" + 0.13 W_w + 0.76" Y + 0.65" K

FES 1993-96:
LOGIT(FREEZER) = -0.35 + 0.08 W_w + 0.56" Y + 0.41" K

APPENDIX A7<12>

Hourly wage-rate of the husband: DEEP-FREEZERS

UK (*FES*):

FES 1975-80:
LOGIT(FREEZER) = -8.13" + 0.10 W_h + 1.50" Y + 0.10 K

FES 1981-86:
LOGIT(FREEZER) = -8.03" + 0.11 W_h + 1.59" Y + 0.11" K

FES 1987-92:
LOGIT(FREEZER) = -3.80" + 0.19 W_h + 0.97" Y + 0.52" K

FES 1993-96:
LOGIT(FREEZER) = -0.82 + 0.28 W_h + 0.55" Y + 0.63" K

==========

APPENDIX A8<1>

Specification based on that of Piachaud: WASHING-MACHINES

UK (*FES*):

FES 1969-74:
LOGIT(WASHMACH)= - 3.44" + 0.74" Y + 0.68" K + 0.49" A - 0.10" H_w

FES 1975-80:
LOGIT(WASHMACH)= - 3.52" + 0.94" Y + 0.75" K + 0.20" A - 0.09" H_w

FES 1981-86:
LOGIT(WASHMACH)= - 3.33" + 0.99" Y + 0.72" K + 0.37" A - 0.01 H_w

FES 1987-92:
LOGIT(WASHMACH)= - 2.34" + 0.92" Y + 0.58" K + 0.34" A + 0.05 H_w

FES 1993-96:
LOGIT(WASHMACH)= - 1.90" + 0.90" Y + 1.00" K + 0.53` A + 0.07 H_w

---

URBAN INDIA:

WAS 1992:
LOGIT(WASHMACH)= -33.58" + 3.71" Y - 0.52 K + 1.02 A - 0.14 H_w

WAS 1997:
LOGIT(WASHMACH)= -20.45" + 2.30" Y - 1.10" K + 0.57 A + 0.03 H_w

APPENDIX A8<2>
Specification based on that of Piachaud: DISHWASHERS

UK (*FES*):

FES 1993-96:

LOGIT(DISHWASHER)= -11.74" + 1.67" Y + 0.16" K + 1.22" A - 0.12" H_w

==========

APPENDIX A8<3>
Specification based on that of Piachaud: FOOD-PROCESSORS

URBAN INDIA:

WAS 1992:

LOGIT(FOODPROC)= -27.61" + 3.48" Y - 0.76" K + 0.33 A - 0.09 H_w

WAS 1997:

LOGIT(FOODPROC)= -11.18" + 1.42" Y - 0.50` K + 0.22 A - 0.33" H_w

==========

APPENDIX A8<4>
Specification based on that of Piachaud: MICROWAVE OVENS

UK (*FES*):

FES 1993-96:

LOGIT(MICROWAVE)= - 1.55" + 0.47" Y + 0.11` K + 0.05 A + 0.09" H_w

---

URBAN INDIA:

WAS 1997:

LOGIT(MICROWAVE)= -30.36 + 1.99" Y - 0.82 K + 10.96 A - 3.48 H_w

APPENDIX A8<5>

Specification based on that of Piachaud: REFRIGERATORS

UK (*FES*):

FES 1969-74:
LOGIT(FRIDGE) = - 9.41" + 2.01" Y - 0.34" K + 0.46" A - 0.09" H_w

FES 1975-80:
LOGIT(FRIDGE) = - 6.10" + 1.71" Y - 0.23" K + 0.38" A + 0.01 H_w

FES 1981-86:
LOGIT(FRIDGE) = - 0.67 + 0.88" Y - 0.24 K + 0.49" A + 0.06 H_w

FES 1987-92:
LOGIT(FRIDGE) = - 0.06 + 0.85" Y - 0.12 K + 0.21 A + 0.13 H_w

FES 1993-96:
LOGIT(FRIDGE) = 1.81 + 0.50` Y + 0.09 K + 0.30 A + 0.25` H_w

URBAN INDIA:

WAS 1992:
LOGIT(FRIDGE) = -36.43" + 4.35" Y - 1.02" K + 0.96` A - 0.17 H_w

WAS 1997:
LOGIT(FRIDGE) = -18.34" + 2.24" Y - 0.17 K + 0.08 A - 0.36" H_w

==========

APPENDIX A8<6>

Specification based on that of Piachaud: DEEP-FREEZERS

UK (*FES*):

FES 1975-80:
LOGIT(FREEZER) = -7.72" + 1.45" Y + 0.02 K + 0.33" A - 0.06" H_w

FES 1981-86:
LOGIT(FREEZER) = -7.25" + 1.44" Y - 0.04 K + 0.57" A - 0.04" H_w

FES 1987-92:
LOGIT(FREEZER) = -3.71" + 0.94" Y + 0.37" K + 0.53" A + 0.02 H_w

FES 1993-96:
LOGIT(FREEZER) = -1.51" + 0.71" Y + 0.47" K + 0.37` A - 0.00 H_w

APPENDIX A8<8>
Paid work (hours/week) by husband & wife: WASHING-MACHINES

UK (*FES*):

FES 1969-74:
LOGIT(WASHMACH)= - 3.12" + 0.78" Y + 0.68" K - 0.05" H_h - 0.10" H_w

FES 1975-80:
LOGIT(WASHMACH)= - 3.35" + 0.93" Y + 0.75" K + 0.01 H_h - 0.10" H_w

FES 1981-86:
LOGIT(WASHMACH)= - 3.04" + 0.98" Y + 0.70" K + 0.02 H_h - 0.02 H_w

FES 1987-92:
LOGIT(WASHMACH)= - 2.02" + 0.90" Y + 0.54" K + 0.03 H_h + 0.04 H_w

FES 1993-96:
LOGIT(WASHMACH)= - 1.42` + 0.90" Y + 0.96" K + 0.02 H_h + 0.05 H_w

---

URBAN INDIA:

WAS 1992:
LOGIT(WASHMACH)= -32.95" + 3.80" Y - 0.31 K - 0.16 H_h - 0.13 H_w

WAS 1997:
LOGIT(WASHMACH)= -20.28" + 2.33" Y - 1.02" K + 0.01 H_h + 0.04 H_w

==========

APPENDIX A10<2>
Who manages money (husband/joint/wife): WASHING-MACHINES

BRITAIN (*BHPS*):

BHPS 1992:
LOGIT(WASHMACH)= - 3.24" + 0.94" M + 0.97" Y + 0.75" K

URBAN INDIA:

WAS 1992:
LOGIT(WASHMACH)= -31.88" + 0.55 M + 3.57" Y - 0.36 K

WAS 1997:
LOGIT(WASHMACH)= -20.25" + 0.80 M + 2.31" Y - 1.15" K

APPENDIX A10<3>
Who manages money (husband/joint/wife): DISHWASHERS

BRITAIN (*BHPS*):

BHPS 1992:
LOGIT(DISHWASHER)= -10.64" + 0.58" M + 1.43" Y + 0.58" K

==========

APPENDIX A10<4>
Who manages money (husband/joint/wife): FOOD-PROCESSORS

URBAN INDIA:

WAS 1992:
LOGIT(FOODPROC)= -27.69" + 1.05" M + 3.49" Y - 0.76" K

WAS 1997:
LOGIT(FOODPROC)= -10.28" + 0.29 M + 1.31" Y - 0.61" K

==========

APPENDIX A10<5>
Who manages money (husband/joint/wife): MICROWAVE OVENS

BRITAIN (*BHPS*):

BHPS 1992:
LOGIT(MICROWAVE)= - 3.12" + 0.43" M + 0.62" Y + 0.09 K

URBAN INDIA:

WAS 1997:
LOGIT(MICROWAVE)= -15.26" + 1.57 M + 1.41" Y - 1.21 K

==========

APPENDIX A10<6>
Who manages money (husband/joint/wife): REFRIGERATORS

URBAN INDIA:

WAS 1992:
LOGIT(FRIDGE) = -34.84" + 0.75" M + 4.22" Y - 0.95" K

WAS 1997:
LOGIT(FRIDGE) = -17.17" + 0.93" M + 2.08" Y - 0.41 K

APPENDIX A10<7>
Who manages money (husband/joint/wife): DEEP-FREEZERS

BRITAIN (*BHPS*):

BHPS 1992:
LOGIT(FREEZER) = - 1.68` + 0.50 M + 0.61" Y + 0.79" K

==========

APPENDIX A10<8>
Effect of wife having a bank account: WASHING-MACHINES

UK (*FES*):

FES 1981-86:
LOGIT(WASHMACH)= - 1.24 + 0.85" B + 0.63" Y + 0.54" K

FES 1987-92:
LOGIT(WASHMACH)= - 1.85" + 0.91" B + 0.79" Y + 0.67" K

FES 1993-96:
LOGIT(WASHMACH)= - 1.59` + 0.43` B + 0.91" Y + 1.00" K

URBAN INDIA:

WAS 1997:
LOGIT(WASHMACH)= -19.25" - 0.29 B + 2.24" Y - 1.24" K

==========

APPENDIX A10<9>
Effect of wife having a bank account: DISHWASHERS

UK (*FES*):

FES 1993-96:
LOGIT(DISHWASHER)= -10.30" + 0.29" B + 1.53" Y + 0.29" K

==========

APPENDIX A10<10>
Effect of wife having a bank account: FOOD-PROCESSORS

URBAN INDIA:

WAS 1997:
LOGIT(FOODPROC)= -9.57" + 0.34 B + 1.20" Y - 0.54` K

APPENDIX A10<11>

Effect of wife having a bank account: MICROWAVE OVENS

UK (*FES*):

FES 1993-96:
LOGIT(MICROWAVE)= - 1.85" + 0.01 B + 0.56" Y + 0.08 K

URBAN INDIA:

WAS 1997:
LOGIT(MICROWAVE)= -15.50" + 0.11 B + 1.50` Y - 0.90 K

==========

APPENDIX A10<12>

Effect of wife having a bank account: REFRIGERATORS

UK (*FES*):

FES 1981-86:
LOGIT(FRIDGE) = - 0.18 + 0.37 B + 0.90" Y - 0.45 K

FES 1987-92:
LOGIT(FRIDGE) = - 0.11 + 0.85" B + 0.83" Y - 0.07 K

FES 1993-96:
LOGIT(FRIDGE) = 1.70 + 1.45" B + 0.52` Y + 0.18 K

URBAN INDIA:

WAS 1997:
LOGIT(FRIDGE) = -15.24" + 0.96" B + 1.82" Y - 0.36 K

==========

APPENDIX A10<13>

Effect of wife having a bank account: DEEP-FREEZERS

UK (*FES*):

FES 1981-86:
LOGIT(FREEZER) = -4.28" + 0.54" B + 0.95" Y + 0.34" K

FES 1987-92:
LOGIT(FREEZER) = -3.19" + 0.49" B + 0.87" Y + 0.42" K

FES 1993-96:
LOGIT(FREEZER) = -1.02` + 0.64" B + 0.62" Y + 0.55" K

Copy of the 1992 questionnaire, re-typed by John Simister

SERIAL No |_|_|_|_|

STUDY OF HOUSEHOLD SPENDING PATTERNS

NAME OF RESPONDENT: .....
ADDRESS: .....
..... TEL. NO.: .....
NAME OF INTERVIEWER: ..... DATE OF INTERVIEW: .....
NAME OF SUPERVISOR: ..... SIGNATURE: .....
ACCOMPANIED: ..... BACKCHECKED: ..... SCRUTINISED: .....

****

Good ..... I am from Indian Market Research Bureau. We do market surveys on consumer products and services. Currently, we are doing one such survey. In this regard, we would like to ask you a few questions. Could you spare about 5 minutes to answer them? THANK YOU.

****

<1> Who lives in this household?
COLLECT DATA AS PER THE RECORDING FORMAT

Sl. NO.	name of person	relationship to the respondent	sex (m/f)	age	education (use code)	occupation (use code)
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

EDUCATION

ILLITERATE	1
PRIMARY	2
SECONDARY BUT NOT SSC	3
SSC	4
COLLEGE, BUT NOT GRADUATE	5
GRADUATE AND ABOVE	6
NOT DISCLOSED	7

OCCUPATION

UNSKILLED WORKER	1
SKILLED WORKER	2
PETTY TRADER	3
SHOP OWNER	4
BUSINESS(WO)MAN/INDUSTRIALIST	5
SELF-EMPLOYED PROFESSIONAL	6
CLERICAL/SALESPERSON	7
SUPERVISORY LEVEL	8
OFFICER/EXECUTIVE	9
HOUSEWIFE	10
STUDENT	11
RETIRED	12
UNEMPLOYED (EMPLOYED BEFORE)	13
UNEMPLOYED (NEVER EMPLOYED)	14
NOT DISCLOSED	15

<1B> **IF HOUSEWIFE, ASK:** Did you ever work in the past? [] YES
[] NO

IF YES: Why did you stop working?
[] STOPPED AFTER HAVING BABY
[] OTHER REASONS

<2> Where were you born?
PLACE OF BIRTH: .....
NEAREST TOWN: .....
DISTRICT: .....
STATE: .....

<3> **(SHOW CARD 1)**
Which of these is nearest to the way your household organises money?
[] HUSBAND USUALLY LOOKS AFTER HOUSEHOLD MONEY
[] WIFE USUALLY LOOKS AFTER HOUSEHOLD MONEY
[] HUSBAND AND WIFE MANAGE MONEY TOGETHER
[] HUSBAND AND WIFE KEEP MONEY SEPARATELY
[] OTHER: .....

<4A> In your household, who has the final say in big financial decisions?

<4B> Who should have the final say in big financial decisions in households?

	4A	4B
HUSBAND	[]	[]
WIFE	[]	[]
HUSBAND AND WIFE JOINTLY	[]	[]
OTHERS	[]	[]

<5> I would now like to ask you a few questions about you and your spouse.

	HUSBAND	WIFE
a: time spent per week on paid work (hours)	__ __	__ __.
b: time spent per day on cooking and cleaning utensils (hours)	__ __	__ __.
c: time spent per day on washing clothes/cleaning the house (hours)	__ __	__ __.
d: money spent per week in hotel /restaurant, for yourself (Rupees)	_____	_____.

<6> I would like to ask you a few questions about the household expenditure:

	(Rupees per month)
(a) for eating out with family in hotels/outside	|__|__|__|__|
(b) rice, wheat, dal, etc	|__|__|__|__|
(c) cooking oil	|__|__|__|__|
(d) coffee/tea/milk food drinks	|__|__|__|__|
(e) masala/spices, & instant noodles/foods/mixes	|__|__|__|__|
(f) other provisions	|__|__|__|__|
(g) milk and dairy products	|__|__|__|__|
(h) vegetables and fruit	|__|__|__|__|
(i) meat, fish and meat products	|__|__|__|__|
(j) bread, jam, sauces, etc	|__|__|__|__|
(k) biscuits, chocolate, toffees	|__|__|__|__|
(l) sweets and snacks bought	|__|__|__|__|
(m) ice-creams	|__|__|__|__|
(n) gas/kerosene	|__|__|__|__|
(o) electricity	|__|__|__|__|
(p) house rent/maintenance	|__|__|__|__|
(q) servant/maid	|__|__|__|__|
(r) laundry	|__|__|__|__|
	__ __ __ __.
(s) loan repayment, if any	|__|__|__|__|
(t) average total monthly expenses (above+other)	__ __ __ __ __. |__|__|__|__|__|
<7A> Savings per month	__ __ __ __ __. |__|__|__|__|__|

<7B> **IF SAVED, ASK:** what do you save for? .....

<8> Monthly household income	__ __ __ __ __. |__|__|__|__|__|

<8A> **(SHOW CARD 2)** Do you agree or disagree that a woman will be happier if she goes out to work?

<8B> Do you agree or disagree that her family will be happier if she goes out to work?

	8A	8B
AGREE STRONGLY	[]	[]
AGREE SOMEWHAT	[]	[]
NEITHER AGREE NOR DISAGREE	[]	[]
DISAGREE SOMEWHAT	[]	[]
DISAGREE STRONGLY	[]	[]

<9> Who mostly looks after the children in this household?

HUSBAND	[]
WIFE	[]
BOTH HUSBAND AND WIFE	[]
OTHER:	[]

<10> **(SHOW CARD 3)** Imagine a married couple on a low income, with three children old enough to go to school. Should the wife do a paid job?

WIFE OUGHT TO DO PAID JOB	[]
WIFE OUGHT TO STAY AT HOME	[]
WIFE SHOULD CHOOSE WHETHER OR NOT TO DO PAID WORK	[]
OTHER:	[]

<11> **(SHOW CARD 3)** What about a couple with a child too young to go to school: should the wife do a paid job?

WIFE OUGHT TO DO PAID JOB	[]
WIFE OUGHT TO STAY AT HOME	[]
WIFE SHOULD CHOOSE WHETHER OR NOT TO DO PAID WORK	[]
OTHER:	[]

<12> **(SHOW CARD 2)** Do you agree or disagree that it is a husband's job to earn money, and a wife's job to look after the home and family?

AGREE STRONGLY	[]
AGREE SOMEWHAT	[]
NEITHER AGREE NOR DISAGREE	[]
DISAGREE SOMEWHAT	[]
DISAGREE STRONGLY	[]

<13> **(SHOW CARD 4)** Which of these is sufficient grounds for divorce?
TICK ALL THAT APPLY:
[] TOO MUCH DRINKING
[] BEING VIOLENT
[] BEING CONSISTENTLY UNFAITHFUL

<14> What is your religion?

HINDU	[]
MUSLIM	[]
CHRISTIAN	[]
OTHER:	

<15> **(SHOW CARD 5)** Please tell me your caste from this card.

BRAHMIN	[]
OTHER FORWARD CASTE	[]
BACKWARD CASTE	[]
SCHEDULED CASTE/SCHEDULED TRIBE	[]

<16> Do you own:

[] 'MIXIE' (FOOD PROCESSOR)
[] WET GRINDER (FOR GRINDING FLOUR etc)
[] REFRIGERATOR
[] WASHING MACHINE
[] VACUUM CLEANER

----------**THANK YOU**----------

WHO WAS PRESENT DURING THE INTERVIEW?

[] RESPONDENT ONLY
[] HUSBAND/WIFE ALSO PRESENT
[] OTHER ADULT(S) PRESENT
[] CHILD(REN) PRESENT

IS THE RESPONDENT A ...

STREET DWELLER	[]
SLUM DWELLER	[]
NEITHER	[]

Copy of the 1997 India questionnaire, re-typed by John Simister

IMRB/BOMBAY PROJECT SPENDING **Centre:** Madras 1
JN/21634 Bombay 2
Delhi 3
Name of respondent: ..... Calcutta 4
Address: ..... Tel. no.: .....
Interviewer's name:.....|___|___| Date of interview:|__|__||__|__||__|__|

Accompanied		**Back-checked**	**P**	**T**	**Scrutinised**	
TL	1	TL	1	5	TL	1
EIC	2	EIC	2	6	EIC	2
OFE	3	OFE	3	7	OFE	3
FM	4	FM	4	8	FM	4

Signature:TL/EIC/OFE/FM Signature:TL/EIC/OFE/FM Signature:TL/EIC/OFE/FM
_____ _____ _____

Good.... I am from Indian Market Research Bureau. We do market surveys on consumer products and services. Currently, we are doing one such survey. In this regard, we would like to ask you a few questions. Could you spare about 10 minutes to answer them?

ASK TO SPEAK TO CHIEF WAGE EARNER OR SPOUSE

Q1a Could you please tell me if any member of your family works for ...

Market Research Agency	1	**TERMINATE**
Advertising Agency	2	**TERMINATE**
None of these	3	**CONTINUE**

Q1b We wish to conduct this survey among married persons. Could you please tell me if you are married?

Yes	1	**CONTINUE**
No	2	**TERMINATE**

Q1c What is the highest level to which the Chief Wage Earner (i.e. the person making highest contribution to household budget) has studied?

Q1d What is his occupation? (If retired, what was his occupation before retirement?) SEC: |___|___|

OCCUPATION	Illiterate	School up to 4 yrs	School 5-9 yrs	SSC / HSC	college but not graduate	Graduate /P.Grad: **general**	Graduate /P.Grad: **profesnl**
Unskilled	E2	E2	E1	D	D	D	D
Skilled worker	E2	E1	D	C	C	B2	B2
Petty trader	E2	D	D	C	C	B2	B2
Shop owner	D	D	C	B2	B1	A2	A2
Businessmen: * no employees	D	C	B2	B1	A2	A2	A1
*1-9 employees	C	B2	B2	B1	A2	A1	A1
*10+ employees	B1	B1	A2	A2	A1	A1	A1
self-employed professional	D	D	D	B2	B1	A2	A1
clerical/sales	D	D	D	C	B2	B1	B1
supervisory level	D	D	C	C	B2	B1	A2
officer/exec: junior	C	C	C	B2	B1	A2	A2
officer/exec: middle/senior	B1	B1	B1	B1	A2	A1	A1

Q2a I would like to know some details regarding the members of this household. Could you please give me the names of all the members living in this house? How is **(READ NAME OF MEMBER)** related to you? What is his/her age? Up to what level has he/she studied? What is his/her occupation?

	FIRST NAME OF PERSON	RELATION-SHIP TO RESPONDENT	SEX male=1 fem =2	AGE (if less than 1 year, put 0)	EDUCATION use code	OCCUPATION (use code)
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

CODE	RELATION TO R
1	respondent
2	husband/wife
3	grandparent
4	parent
5	brother/sister
6	son/daughter
7	grandchild
8	related to spouse
9	other

CODE	EDUCATION
1	illiterate
2	school upto 4 yrs
3	school 5-9 years
4	SSC/HSC
5	some college, but not graduate
6	grad/postgraduate -general
7	grad/postgraduate -professional
8	not disclosed

CODE	OCCUPATION
01	unskilled worker
02	skilled worker
03	petty trader
04	shop owner
05	businesman/industrialist
06	self-employed profesionl
07	clerical/salesperson
08	supervisory level
09	officer/executive:junior
10	officer/exec: mid/senior
11	housewife
12	student
13	retired
14	unemployd:employd before
15	unemployd:never employed
16	not disclosed

Q2b Within India, which state or Union territory were you born in?

CODE	INDIAN STATE	CODE	INDIAN STATE	CODE	INDIAN STATE
01	Andaman & Nicobar	12	Himachal Pradesh	23	Orissa
02	Andhra Pradesh	13	Jammu & Kashmir	24	Pondicherry
03	Arunchal Pradesh	14	Karnataka	25	Punjab
04	Assam	15	Kerala	26	Rajasthan
05	Bihar	16	Lakshadweep	27	Sikkim
06	Chandigarh	17	Madhya Pradesh	28	Tamil Nadu
07	Dadra & Nagar Haveli	18	Maharashtra	29	Tripura
08	Delhi	19	Manipur	30	Uttar Pradesh
09	Goa, Daman & Diu	20	Meghalaya	31	West Bengal
10	Gujarat	21	Mizoram	32	Outside India
11	Haryana	22	Nagaland		

Q2c Were you born in a village/small town or in a city? ___

VILLAGE/TOWN	1	
CITY	2	

Q3 Which of these is nearest to the way your household organises money?

SHOW CARD `A'

HUSBAND USUALLY LOOKS AFTER HOUSEHOLD MONEY	1	
WIFE USUALLY LOOKS AFTER HOUSEHOLD MONEY	2	___
HUSBAND AND WIFE MANAGE MONEY TOGETHER	3	| |
HUSBAND AND WIFE KEEP MONEY SEPARATELY	4	|___|
OTHER:	5	
DON'T KNOW/CAN'T SAY	6	

Q4a Who makes the important financial decisions in your household? ___ ___

Q4b Who in your opinion should make the final | | |
decision in financial matters of the household? |___|___|

SHOW CARD `B'

	Q4a	Q4b
HUSBAND	1	1
WIFE	2	2
HUSBAND & WIFE TOGETHER	3	3
PARENTS	4	4
OTHERS (please specify):	5	5
DON'T KNOW/CAN'T SAY	6	6

Q5 I would like to ask a few questions about you and your spouse. How much time do you spend per week, on:

		HUSBAND	WIFE
5a paid work	(hours per week)	:	:
5b preparing/cooking food	(hours per week)	:	:
5c shopping for food	(hours per week)	:	:
5d cleaning clothes	(hours per week)	:	:
5e making/mending clothes	(hours per week)	:	:
5f cleaning the house	(hours per week)	:	:
5g minding children	(hours per week)	:	:
5h leisure	(hours per week)	:	:

Q6a **SHOW CARD `C'**

How much do you usually earn, per month (after income tax)?
How much does your spouse usually earn, per month (after income tax)?
What is your total monthly household income after income tax?

	Husband	**Wife**	**MHI**
LESS THAN Rs. 2,000	1	1	1
Rs. 2,001 - Rs. 4,000	2	2	2
Rs. 4,001 - Rs. 6,000	3	3	3
Rs. 6,001 - Rs. 8,000	4	4	4
Rs. 8,001 - Rs.10,000	5	5	5
Rs.10,001 - Rs.15,000	6	6	6
Rs.15,001 +	7	7	7
Not specified	8	8	8

Q6b. What percentage of your monthly household income do you save every month? |~~~|~~~|

Q7 How much do you usually spend in a month on the following (Rupees)?

7a	Rice, wheat, dal, etc
7b	Cooking oil
7c	Milk & dairy products, milk food drinks
7d	Vegetables and fruit
7e	Meat, fish and meat products
7f	Bread, jam, sauces, etc
7g	Instant noodles/foods/mixes
7h	Cigarettes, alcohol, pan, etc
7i	Clothes & footwear (including repairs)
7j	For eating out in hotels/outside
7k	Snacks bought (from street stalls, etc)
7l	Gas/kerosene
7m	Electricity
7n	House rent/maintenance
7o	Servant/maid/child-minder
7p	Laundry service/dhobi
7q	Loan repayment, if any

Q8a Do you own any of the following? **CODE `1' IF OWNED, `2' IF NOT OWNED**

`MIXIE' FOOD-PROCESSOR	1	2
WET-GRINDER	1	2
MICROWAVE OVEN	1	2
REFRIGERATOR	1	2
WASHING MACHINE	1	2
TELEVISION	1	2
Is there a water tap in your home?	1	2
Do you have a bank account of your own/with your spouse?	1	2

Q9 Please tell me whether a wife should work outside the home full time, part time or not at all in each of the cases mentioned below.

SINGLE CODE FOR EACH ROW

		FULL-TIME	PART-TIME	NOT AT ALL	DK/CS
9a	..after marrying and before having children	1	2	3	4
9b	..when there is a child under school age	1	2	3	4
9c	..after the youngest child starts school	1	2	3	4

Q10 **SHOW CARD `C'** Please read the phrases on this card, I will read out some statements to you. Could you tell me the extent to which you agree or disagree with these statements with the help of this card.

AGREE STRONGLY	1
AGREE SOMEWHAT	2
NEITHER AGREE NOR DISAGREE	3
DISAGREE SOMEWHAT	4
DISAGREE STRONGLY	5

10a	"I am always short of time"	
10b	"I prefer meals which can be prepared quickly"	
10c	"Convenience foods like instant noodles can save time on cooking"	
10d	"A wife should always obey her husband"	
10e	"It is a husband's job to earn money, and a wife's job to look after the home and family"	
10f	Would your spouse agree or disagree with the statement "It is a husband's job to earn money, and a wife's job to look after the home and family"	

Q11. Which religion do you belong to?

HINDU	1	
MUSLIM	2	___
SIKH	3	| |
ROMAN CATHOLIC	4	|___|
CHRISTIAN (PROTESTANT)	5	
OTHER:	6	

Q12. I will read out some statements to you. Do you think that --------- **(MENTION STATEMENT)** is sufficient reason for divorce? **REPEAT FOR ALL THE STATEMENTS.**

	YES	NO
Too much drinking		
Being violent		
Being consistently unfaithful		

THANK & TERMINATE

THIS PART IS NOT TO BE ASKED TO THE RESPONDENT

Q13. APART FROM THE PERSON YOU INTERVIEWED, WHO WAS PRESENT DURING THE INTERVIEW?

Husband/wife present	
Other adult(s) present	
Child(ren) present	

Q14. WHAT LANGUAGE WAS USED IN THE INTERVIEW? (Please pick one code)

English	1
Hindi	2
Marathi	3
Bengali	4
Tamil	5
OTHER:	6

CARD A

HUSBAND USUALLY LOOKS AFTER HOUSEHOLD MONEY	1
WIFE USUALLY LOOKS AFTER HOUSEHOLD MONEY	2
HUSBAND AND WIFE MANAGE MONEY TOGETHER	3
HUSBAND AND WIFE KEEP MONEY SEPARATELY	4
OTHER:	5
DON'T KNOW/CAN'T SAY	6

CARD B

HUSBAND	1
WIFE	2
HUSBAND & WIFE TOGETHER	3
PARENTS	4
OTHERS (please specify):	5
DON'T KNOW/CAN'T SAY	6

CARD C

LESS THAN Rs. 2,000	1
Rs. 2,001 - Rs. 4,000	2
Rs. 4,001 - Rs. 6,000	3
Rs. 6,001 - Rs. 8,000	4
Rs. 8,001 - Rs.10,000	5
Rs.10,001 - Rs.15,000	6
Rs.15,001 +	7
Not specified	8

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