Economic Analyses of Families: Existing Research Findings*

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Abstract

This paper provides a literature review on economics of the family. In particular, where decisions of families related to marriage, fertility, labour supply and home production are concerned. First an overview of the theory on these issues is given, followed by a selection of empirical studies. Finally, the review highlights some areas of interest for future research in Australia.

1. Introduction

A great deal of economic analysis focuses on the behaviour of individuals. Less often, it takes into account the extent to which individuals behave as part of families. Yet, the relationship between individual and family behaviour is strong and causative in both directions. A thorough understanding of individual behaviour requires an understanding of the family context in which individuals operate.

In this survey, we aim to establish the theoretical basis for research on the family in economics and give examples of applied research. The main motivation is to review the way in which changing family structure and function is likely to impact on behaviour regarding marriage, childbirth, home production and labour force participation. Families are changing and it is necessary to understand how the changes are likely to influence behaviour and vice versa. Some of the widely reported existing or prospective influences on families are: changes in family composition –the atomisation of the family, that is the trend towards singles and couples without dependents; increases in the average age of the population; falls in fertility and family size; changes in workforce participation of family members and consequent interaction of work and family activities – juggling work and family commitments; changes in the macro economy resulting in changes on the employment market; changes in the influence of traditional institutions such as churches, clubs and organizations; the trend to outsource family functions; and the introduction of labour-saving technology on family functioning.

The changes in family life have significant implications for policy generally. Consider the trend towards sole parenthood. For many sole mothers welfare is needed to replace the income previously provided by a spouse. The increase in the proportion of unmarried men may also bring other social problems upon society. Akerlof (1998, 308) found that unmarried men are less attached to the labour market, more likely to be involved in crime, more likely to use drugs, alcohol and tobacco, and have higher death rates. In short, he found that the breakdown of traditional family life has induced a variety of social problems.

Families are a major force in the production and distribution of goods and services as well as in their consumption. In spite of the primacy of the role of the family in economic activity, formal study of families has been limited (see Becker, 1987). Nevertheless, readings from economic, sociological and psychological literature make important contributions to the discourse about family function.

McDonald (1995) makes the point that families may be defined in different ways and that the definitions may change over time. The common meaning of family is given in dictionaries: in the Oxford Concise Dictionary, Sykes (1983) says families are 'members of a household, parents, children, servants etc', the Macquarie (Delbridge, 1986) says 'parents and their children whether dwelling together or not'. Neither of these definitions is sufficiently precise to be helpful for the purpose of economic analysis, however they do convey an idea of the scope of the family as understood by the population at large.

Statistical definitions of families are narrower but more tractable for analytic purposes. The Australian Bureau of Statistics' definition (ABS, 1995, p29) is: 'a family is two or more people related by blood, registered marriage, adoption, or a de facto relationship who live in the same household'. The ABS identifies three major family types: couple families, one-parent families, and families of related adults'. One or more families may be part of the broader entity of a household. A household is a group of people who usually reside and eat together as a single unit within a dwelling. In general, we shall use the statistical (ABS) definition of family in this paper.

In selecting the material to be covered in this paper, we have been conscious of the need to maintain a tight focus in an otherwise disparate and wide-ranging field. Some areas not covered in the report include the insights from game theory (eg McElroy, 1990) and transaction cost approaches (see Pollak, 1985).

The next section provides some statistical background on families in Australia over the last three decades. In section three, we outline economic theories of the family. The economic theories provide a framework for considering issues in relation to the family. The theory section is followed by a review of the empirical literature in economics, which sometimes draws on this theory though more frequently the theoretical underpinnings are not explicitly stated. In the final section, we aim to expose the main issues without necessarily being able to resolve them and suggest directions of future research.

2. Families in Australia

As we have noted, families are entities within households. The family as an economic and social entity has undergone profound change over the last twenty-five years or so. Changes

have occurred in the structure, size, and workforce distribution of families and increased longevity has led to changes in the age structure of people in families.[1]

2.1 Household types

Table 2.1 shows the percentages of households of different types from 1976 to 2001. The table shows a steady growth in the proportion of lone person households and a concomitant fall in the proportion of families. In 1976 and 1981, group households were not distinguished from other families. The data indicate that the proportion of people living in group households has stabilised at around 4.5 percent since the mid eighties.

Table 2.1 Households by type, Australia 1976 to 2001

Household type	1976	1981	1986	1991	1996	2001
One person	15.7	18.0	18.5	19.6	23.1	25.2
Group			4.1	4.5	4.4	4.5
Family	84.3	82.0	77.3	75.7	72.5	70.3
Families without dependents	45.0	44.7	47.4	46.8	49.5	
Couple only	28.0	28.7	30.3	31.4	34.1	
Couple plus non-dependents	11.1	10.0	10.9	9.5	9.0	
Other	5.9	6.0	6.2	5.9	6.4	
Families with dependents	54.9	55.2	52.4	53.2	50.5	
One parent	6.5	8.6	7.8	8.8	9.9	
Two parents	48.4	46.6	44.8	44.4	40.6	

Sources: ABS (2001a)

The table shows the proportion of families without dependents and with dependents. There have been important changes in the composition of families. There has been steady growth in the proportions of families without dependents, rising from around 45 percent in 1976 to nearly 50 percent in 1996. Most of the growth has been in families of couples only and growth there has been partially offset by falls in the proportions of families of couples and non-dependents. Among families with dependents, the growth in the proportion of one-parent families has offset the fall in the proportion of couple families with dependents.

2.2 Family size and fertility

The increase in numbers of persons living alone has led to a fall in the average size of households. In addition there has been a dramatic fall in the average number of children born

[1] Weston et al. (2001) trace many of the same changes as those presented here. They provide a more extensive and discursive commentary and the reader seeking a context for the changes should consult this reference.

to Australian women, in part as a result of increasing childlessness (Evans 2001) and a significant increase in the proportion of children in sole parent families. Table 2.2 shows trends in the fertility rate and the average size of families over the last 25 years. The steady decline in the fertility rate over the 23 years between 1976 and 1999 has led to accompanying falls in the average household and family size. While only two observations are shown for family size the trends are likely to be the same as for households for which a complete set of data are presented.

Table 2.2 Family size, Australia 1976 to 2001

	1976	1981	1986	1991	1996	1999
Female fertility rate	2.06	1.94	1.87	1.86	1.80	1.75
Average family size				3.2	3.1	
Average household size	3.2	3.1	2.7	2.7	2.6	2.6

Sources: ABS (2001a and 2001b)

2.3 Longevity

A third notable development has been the increase in longevity among Australians. In Table 2.3, we present some statistics describing the ageing of the population. The table shows the steady increase in the life expectancy of males and females over the last 25 years. Males in 2001 can expect to live nearly 7 years longer than those in 1976 while females can expect to live 5.4 years longer. The proportion of the male and female populations over the ages of 65 and 85 has increased dramatically primarily as a result of these trends, but also as a result of decreased fertility which means the number of people in the younger age groups decreases.

Table 2.3 Longevity, Australia 1976 to 2001

	1976	1981	1986	1991	1996	1999
Expected age at death, males	69.4	71.4	72.9	74.4	75.5	76.2
Expected age at death, females	76.4	78.4	79.2	80.3	81.3	81.8
Proportion of all males						
Over 65	13.8	14.8	15.9	17.1	18.1	18.6
Over 85	1.0	1.2	1.5	1.8	2.1	2.3
Proportion of all females						
Over 65	19.1	20.2	20.9	21.7	22.3	22.7
Over 85	2.5	2.9	3.3	3.7	4.0	4.2

Sources: ABS (2001b)

2.4 Families and work

There have been important changes in the relationship between families and work. In particular, there has been a growth in couple families in which there are two workers and in working one parent families, and a decrease in families in which there are no workers or just one worker in couple families (see Table 2.4).

Table 2.4 Families and work, Australia 1976 to 2001

Household type	1991	1996	2000
Couple families with children under 15			
Two adults working	51.8	54.5	56.3
One adult working	40.1	37.6	36.2
No adult working	8.1	7.9	7.5
One parent families with			
One adult working	43.2	42.7	47.3
No adult working	56.8	57.3	52.7

Sources: ABS (2001c)

However, Table 2.4 does not allow for variation in labour demand as a result of the business cycle. When corrected for these effects, a number of commentators have noted the emerging polarisation of families into the work rich and the work poor (see Dawkins, Gregg and Scutella, 2002 and Burbidge and Sheehan, 2001). Over the last thirty years, the characterisation of families has changed markedly. In the immediate post-war period families typically had one breadwinner, usually male, who worked a 40-hour week supporting a dependent spouse who was not in the workforce, and two or more dependent children. Families of today are more diverse. Table 2.5 shows the changes in labour force participation among males and females over the last 20 years. Male participation has fallen from 77 percent to 72 percent while over the same time female participation has risen from 45 percent to 55 percent.

Table 2.5 Participation rates, Australia November 1981 to 2001 (a)

gender	1981	1986	1991	1996	2001
Males	77.0	75.0	73.4	73.0	72.4
Females	44.8	48.6	51.5	53.6	55.3
Persons	60.7	61.6	62.5	63.1	63.7

Sources: ABS (2001c)
Note: (a) persons of workforce age (15 to 64)

Another feature has been the increase in average hours of work of some families. Wooden (2001, Table 1), echoing Evans (1996), notes that in the period from 1975 to 1995 the proportion of the employed workforce in August each year, working 45 or more hours increased from around 20 to 28 percent. Since 1995 the level of hours has remained constant. Wooden and Loundes (2002) confirm this trend using data drawn from surveys in all months of the year.

2.5 Marriage and divorce

There have been profound changes in attitudes to marriage and divorce over the past thirty years. In Table 2.6 we show trends in marriage and divorce. The crude marriage rate fell steadily from 9.2 persons per 1000 resident population to 6.0 per 1000 in 1999. Part of this fall is due to changes in the age structure such that the proportion of people of marriageable age (broadly speaking those aged 20 plus) fell as a proportion of all residents, a part is due to falls in the extent to which individuals formalise partnering by getting married and to the delay in partnering, and the remainder reflect changes in the rate of partnering. There are only two observations for the shares of de facto relationships among couples, which suggest an increase in the proportion of de facto couples. Without detailed knowledge of the components it is not possible to describe trends in partnering, but research indicates substantial differences in the social and economic consequences of marriage and "living together" with many de facto couples more closely resembling the single than the married population (Waite and Gallagher 2000: Chapter 3). The age-specific marriage rate indicates the number of people who marry in the year per 1000 of those unmarried over all marriageable ages. Sharp declines in the age specific marriage rate for both males and females indicate a decline in either the formalisation of partnering or in the extent of partnering.

Table 2.6 Trends in marriage and divorce, Australia, 1971 to 1999

	1971	1976	1981	1986	1991	1996	1999
Average age at first marriage							
males		23.8*	24.4	25.6	26.7	27.6	28.2
females		21.4*	22.1	23.5	24.5	25.7	26.4
Crude marriage rate (per 1000)	9.2	7.9	7.6	7.2	6.6	5.8	6.0
Age specific marriage rate (per 1000)							
Males, all ages		62.9	55.5	47.6	41.7	35.2	34.8
Females, all ages		61.1	52.6	45.8	39.6	32.9	32.8
De facto couple families as percent of all couple families					8.2	10.1	
Median duration of marriage		7.4*	7.5	7.6	7.4	7.6	7.9
Crude divorce rate (per 1000)	1.0	4.5	2.8	2.5	2.6	2.9	2.8

Source: ABS (2001b); Notes entries marked with asterisk refer to 1977

The final row in the table shows the crude divorce rate, the number of divorces per 1000 adult resident population. This rose sharply from 1 to 4.5 in the period 1971 to 1976 when the legal reasons for bringing about divorce were dramatically eased. After the initial surge, which reflected pent-up demand, the rate stabilised at between 2.5 to 2.8 per 1000. The rates from 1981 to 1999 imply relatively constant median duration of marriages shown in the row above.

2.6 Future developments in families

Many of the trends noted above are likely to continue into the future. The fall in fertility, the increasing independence of women, the increased expected age of life and changes in social attitudes are likely to lead to further change in the structure and nature of families. Families will continue to become smaller if current low fertility continues, reducing family size (McDonald and Kippen, 1999). The trend, in recent times, towards increasing labour force participation of married women and a reduction in participation of men is also likely to continue.

3. A theory of families

In his discussion of 'family' in the Palgrave dictionary of Economics, Gary Becker (Becker, 1987) notes that families have been a major force in the production and distribution of goods and services in all civilisations of recorded history. However they have been far less prominent in economic analyses that seek to explain the production and distribution of goods and services. While noting their importance, the early great writers in economics (Smith, Mill and Marshall among others) made little more than casual remarks about the operation of families. However during the last thirty years, dating from Becker's first contributions (for example, Becker, 1965, 1973) economists have begun to analyse family behaviour in a systematic way.

The economic approach is to identify the utility derived by the people who make up a family, to note the resources available to them and the constraints under which they operate, and to utilise the logic embedded in constrained optimisation to reveal a model of behaviour.[2] The usefulness of the approach is determined by how well the model explains the observed behaviour of families.

The economic approach is limited only by the extent to which behaviour conforms to rationality, the extent to which concepts and values can be monetised to enable measurement in a common space, and the imagination of the researcher. Nevertheless if concepts and values, for instance altruism, cannot be easily monetised, then the economic approach will need to be supplemented by paradigms from other disciplines. The most straightforward

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[2] In constrained optimisation, it is postulated that economic agents (families) will take actions (make choices in the utilisation of time, the selection of consumption goods and services, and in the deployment of resources to work and home production) to maximise utility. At the point of maximum utility it must be true that utility cannot be increased by changing the choice of consumption goods, services, home production and leisure. At this point the ratio of marginal utility to price is equal for all commodities (see Varian, 1992 p 331).

approach is to undertake analysis using a conventional economic model but interpret the results in the light of the effects of the concept not included.

Economists have studied families attempting to answer questions such as how economic reasons influence decisions concerning marriage, the number of children and the distribution of work and home duties within families. While non-economic[3] reasons play a large role in these decisions, economic influences may nevertheless explain a major part of observed behaviour. Evidence of this relevance can be inferred, for example, from the fact that highly educated men and/or men on high earnings seem more likely to be married, or from the fact that the marriage rate and the birth rate dropped during the recession years in the 1930's (Vamplew, 1987, pp. 42 and 51).

In Folbre's (1996) collection of papers on the economics of families, theoretical articles are divided according to their approach. Two main theoretical streams can be distinguished in the literature on family formation and family decision making processes, the neoclassical approach[4] and the institutional or feminist approach (making use of bargaining power models).

3.1 The neoclassical approach

In the first stream, based on neoclassical utility maximization, it is assumed that the household is a single decision-making unit where an altruistic head of the family controls the common resources in such a way that household utility is maximized. A simple neoclassical model for the household utility can be written:

$$\begin{aligned} &\text{maximise } U(l_m, l_f, c) \\ &\text{subject to } c = w_m h_m + w_f h_f + y, \\ &\qquad T = h_m + l_m \text{ and} \\ &\qquad T = h_f + l_f \ , \\ &\text{or combining the above three constraints,} \\ &\text{subject to } \ c + w_m l_m + w_f l_f = w_m T + w_f T + y = y_{full}. \end{aligned} \tag{3.1}$$

where:

l_m and l_f is the time spent in leisure (or more accurately time spent in leisure and/or home production) by husband and wife;

[3] In this context, non-economic means anything that cannot be explained by economics.
[4] In the literature the stream of research emanating from the neo-classical approach has often been called the new home economics.

c is the total consumption by the household (in practice mostly assumed equal to total income);

h_m and h_f is the time spent in work in the labour market by husband and wife;

w_m and w_f is the market wage of the husband and wife;

y is the unearned income available to the household;

T is the total time available; and

y_{full} is full income comprising the total value of time and other income.

The model maximises the utility of the family where the utility is a function of the amount of leisure of the husband and wife and the total amount of consumption of the family. The level of utility that can be reached is constrained by the amount of income and the amount of time (T), available to the household. The amount of total income depends on unearned income (y) and on the wage rates of husband and wife (w_m and w_f). Total consumption is equal to the sum of earnings of the family through wages ($w_m h_m$ and $w_f h_f$) or unearned income (rent, interest and business income). Time available to husband and wife is divided into work time and leisure time.

In this model, time not spent in leisure is spent working and a labour supply model may be derived with unearned income, wages and tastes (or preferences) as its arguments. An increase in unearned income, all else equal, increases the demand for all normal goods including leisure, inducing the individual to consume more leisure and work fewer hours. An increase in wages, ceteris paribus, has an ambiguous effect on work hours due to two opposing effects. On the one hand the wage increase is like an increase in unearned income and tends to lower work hours. However the increase in wages also raises the opportunity cost of not working, and induces the individual to reduce leisure. The resulting effects depend on the strength of these two opposing effects. Taste for consumption and leisure is represented by the parameters of the model, which are estimated from data.

3.1.1 The role of an altruistic head in a single decision-making household

Becker (1981a) shows how, in the neo-classical framework, altruistic behaviour by the breadwinner of a family can make the whole family work together as a utility maximizing unit, even if the beneficiaries of the altruist are selfish and envious of the other beneficiaries. The altruist is assumed to know the utility function and consumption of each of the beneficiaries. If any beneficiary is made worse off by the selfish behaviour of another family

member, the altruist will redistribute contributions to even out the standard of living but in aggregate everyone will be a little worse off. The selfish behaviour of the other family member will be more than countered and he or she will be worse off. In this way there is an incentive for all family members to consider the interests of all other family members. The crucial assumption that brings about this state of affairs is the power of the altruistic breadwinner to redistribute income to change the shares among beneficiaries.

3.1.2 Explaining home production

The simple model explains the total household consumption and the amounts of work and leisure time of the husband and wife. However, much leisure time is engaged in home duties that are better conceived as inputs to a home-production function. An augmented model incorporating home production provides a richer basis for explaining the choice of hours of work for husband and wife.

Extending the above utility maximization (1) to include home-production results in:

$$\begin{aligned} &\text{maximise } U(l_m, l_f, c_{mg}, c_{hg}) \\ &\text{subject to } c_{mg} + c_i = w_m h_m + w_f h_f + y, \\ &\qquad c_{hg} = g(c_i, hp_m, hp_f), \\ &\qquad T = h_m + l_m + hp_m \text{ and} \\ &\qquad T = h_f + l_f + hp_f. \end{aligned} \tag{3.2}$$

where c_{hg} is consumption of home-produced goods by the household;

c_{mg} is consumption of market goods by the household;

c_i is consumption of intermediary goods by the household;

$g(.)$ is the home-production function; and

hp_m, hp_f is the time spent in home production by husband and wife respectively.

In addition to the time and budget constraint of the simple model, there is a production function g, which describes how much c_{hg} a household can produce with a given amount of intermediary goods and time of husband and wife spent in home production. The time constraint makes clear that spending time in home production means less time can be spent on leisure and/or labour supply. Less time in labour supply means that less income is available to buy market goods. The higher the wage rate the higher is the opportunity cost of home production. However, if home-produced goods are valued higher than market goods, then even at high wage rates, time for home production may be set aside.

3.1.3 Explaining specialisation

In marriage, one person often specializes in home production while the other specializes in labour market production. This is done for the same reasons that people specialize in certain labour market activities: higher returns can be obtained by specializing in one activity and output of one kind can then be traded for output of another kind. Becker (1965) points out that if one member of the family is extremely efficient in the labour market, it pays for the family as a whole to free up this person as much as possible for labour market activities while other members focus on home-production activities[5]. A rational choice is for the person with the highest home-production skills and the lowest market wage to specialize in home production. This specialization within marriage then tends to reinforce differences in skills and earning potential that are present at the start of the marriage (Becker, 1985).

Wales and Woodland (1977) explicitly model the time spent on home production in a neoclassical utility framework. They derive a simultaneous model of three demand equations (one for the husband and wife's leisure, and one for consumption), conditional on the time spent on housework, and two housework equations, which depend on consumption. In this study, the fact that the price of consumption depends on the housework time is ignored. Compared to a model not accounting for home production this leads to different predicted labour supply behaviour in response to wage changes. The hours of housework equations are consistent with cost minimizing behaviour, in that the person with the lowest wage rate spends most time doing housework. This effect is insignificant though. As income increases families without children spend less time on housework. No such effect is evident for families with children.

3.1.4 Explaining changes in gender roles and effects on participation

Becker (1981b) argues that changes in gender roles are occurring, with an increase in the male contribution to housework[6]. As the traditionally female responsibility for the housework and care for children shifts to men, more time and energy becomes available for market

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[5] This is obvious from (3.2) - because $c_{mg}+c_i$ can be higher if the person with the highest wage rate works the maximum hours in the market.

[6] This trend is less visible in Australia, where women are still mainly responsible for housekeeping tasks and childcare, even though female labour market participation has increased considerably over the past decades (Bittman, 1998). In addition, there does not seem to be a relationship between the hours in the paid labour force of women and their husband's contribution to unpaid work at home. Bittman and Matheson (1996) further show that there is a lag in the reaction of men to their wife's labour force participation, so their time in unpaid work increases over time. However, even four years after their wife's entry in the labour market, men only contribute slightly over 20 percent of total time in unpaid work.

activities by women. This increases their earnings and decreases job segregation by gender. Although as women focus more on the labour market and less on housework, Becker maintains that a division in labour in married households may still be beneficial if specialized household and market human capital remain important. However, if the primary responsibility for housework ceases to lie with women, then the labour division would no longer be automatically linked to gender.

Becker (1985) also developed a model for individuals' allocations of energy to different activities. He argues that because housework is more energy intensive than leisure and other household activities, married women spend less energy (or effort) per hour of market work than married men (assuming that, as with total time, the total stock of energy available per week is limited). Total energy is different for different people and reflects individual health, ambition and motivation. It also changes as a result of endogenous forces like expenditure of time and goods, such as, sleep or a healthy diet. This could explain why even if married women are working the same hours as men, their investment in human capital may be less and their earnings remain behind that of men. According to this theory, women are also likely to select jobs that are less demanding, leaving more energy for home production, resulting in job segregation by gender.

3.1.5 Explaining family formation

The assumption underlying the neo-classical approach is that marriage only occurs if both prospective members of a couple expect to be better off (measured by the utility level they may attain) after marriage than before. In Becker's (1973, 1987) words, marriage is said to take place in a 'market' that assigns men and women to each other or to remain single until better opportunities come along. The theory of assignments in efficient markets explains positive assortative mating by complementarity (reinforcing the effect of similar traits). In all societies couples tend to be of similar family background and religion, and are positively assorted by education, height, age and many other variables. Wage rates and traits that are close substitutes in household production tend to be negatively correlated, since that maximises the gain from the division of labour in the household. Another more prosaic factor, independent of an individual's characteristics, is undoubtedly the economies of scale and scope that arise when individuals partner.

However, the theory does not explain why particular individuals choose each other. While assortative mating and other psychological and anthropological theories[7] have been developed to explain partnering and components of these theories have been included in neo-classical modelling, economic theory cannot be expected to explain marriage fully.

3.1.6 Explaining divorce

While the model has modest success in explaining why and with whom partnering occurs it can go some way to explain divorce. Divorce has increased markedly over the last 50 years or so, and now about 30 percent of marriages end in divorce as can be seen from the trends described in Section 2. Why has this occurred?

Legal change is the most obvious proximate reason, with the institution of the Family Law Act of 1976 making divorce easy to obtain. However the family models do help explain why pressure built to first legalise then ease, the process of divorce.

Since women specialise in child-care, they are economically vulnerable to divorce (and the death of their partners). All societies have acknowledged this vulnerability and have required long-term contracts, called 'marriage' to be instituted between men and women seeking to have children. However, increases in the skills of women and the income they might command in the market place is expected to be associated with decreases in vulnerability and increases in marriage break-up. The key comparison here is not only the relativity of the wages of husband and wife but also the relativity of the wife's prospective earnings within and without marriage. Furthermore, the decline in fertility is also likely to have had a positive effect on divorce. It implies a reduction in the time when young children are present and when women are most dependent on their spouse. Consequently the level of female vulnerability is lessened and the opportunity costs of divorce are reduced.

3.1.7 Factors affecting fertility

Assuming that having children implies that more time needs to be spent in home production, part of the price of having children is the foregone market-oriented human capital of mothers, and perhaps occasionally of fathers (Mincer and Polachek, 1974). As a result, the price of having children rises with an increase in human capital and an increase in real wages.

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[7] For instance there is the idea that a fundamental urge of any member of a species is to maximize the opportunity for his or her gene pool to be passed to following generations. In human societies this is best achieved through the security of establishing life-long mating patterns.

We would expect to see lower levels of fertility and smaller average family sizes in mothers with greater skills. As standards of living rise over time we would also expect to see reductions in fertility as the opportunity cost of the time spent in child bearing and child raising increases.

If full income is fixed then the number of children will fall as the cost of children rises. Similarly with fixed cost of children the number of children desired by the family will fall if either the cost of other things desired by the family rises or if the number of other things desired rises. Thus family size is influenced by (material) desires that may place greater emphasis on other consumption goods or on leisure time.

It is interesting to postulate the consequences of rising full income. If full income rises because the reward for female labour force participation rises, then there will be scope for increased family size. However, the increase in the opportunity cost of raising children will also increase the net cost of children. If the substitution effect dominates, then increases in full income will be more than offset by increases in the net cost of children and the number of children may need to fall to maintain utility. The evidence of the last thirty years suggests that substitution effects do often dominate and are one of the causes of falling fertility.

Women with children have an incentive to engage in activities that are complementary to childcare, including work in a family business based at home. Similarly, women who are involved in complementary activities face fewer disincentives to have children because children do not make large demands on their time.

The net costs of children will be reduced when opportunities for child labour are readily available, as in traditional agriculture. This implies that children are more valuable in traditional agriculture than in either cities or modern agriculture, and explains why fertility has been higher in areas where traditional agriculture occurs.

There is yet another reason that may have contributed to the decline in fertility that we may explain with an extension of the neo-classical model. This is concerned with the quality of children.

In practice we may measure the quality of children by their education, health and earnings capacity although in theory quality can be any attribute desired by parents in their children. We can use the case of education to illustrate the effect of including quality in the model. The fixed cost of children would be all of the costs incurred by the family in having children but not dependent on the number of children. In most circumstances this would be dominated by

the opportunity costs of the parent who foregoes income to provide childcare. The fixed cost of a unit of quality might be a library of resources (books, computers, software etc) maintained by the family for the education of the children but again not dependent on the number of children. The variable costs of quality are those costs of education that are dependent on the number of children, such as school fees. As the number of children rises less can be spent per child. The interaction between quantity and quality can explain why large declines in fertility are usually associated with large increases in spending on education, health, and other measures of the quality of children.

The neo-classical view on fertility has been extended (Easterlin, 1987) to include taste and supply. Allowing for taste enables explanation of marked differences in fertility between families of different socio-economic status, income, and with divergent views derived from different religious beliefs. The supply explanation seeks to account for observed differences in fertility emanating from poor health conditions, as in some undeveloped countries in times of famine; and in government sanctioned programs to control fertility in other countries.

The above explains the observed patterns in Australia of an increasing female participation rate and decreasing fertility as shown in Section 2. However, it should not be forgotten that the widespread availability of reliable contraception is another important factor, which has allowed families to make these choices.

3.2 The institutional and feminist approaches

The second stream of theory was developed to address some of the shortcomings of the neoclassical approach. It was argued that there were advantages to long-term relationships, when these relationships require investment in family-specific capital. Women often invest more in marriage-specific investments, such as specialization in housekeeping tasks rather than labour market participation, which means they will lose more in a divorce than men. Bargaining power or collective approaches fit nicely in this stream, where the wife's and husband's bargaining power are not equal and are determined not only by each person's economic power but also by social norms and institutions.

The difference between the traditional neoclassical models and the bargaining models is that the utility of each person is written down explicitly and income is divided according to some sharing rule. Utility may depend only on one's own consumption (egoistic preferences), which could be written as $U_m = U(l_m, c_m, c)$, where c represents public household goods and c_m is private consumption (in this case of the husband). In the case where an individual's

utility depends on the consumption of all members (altruistic preferences) the utility can be written as $U_m = U(l_m, l_f, c_m, c_f, c)$. Similar expressions can be written down for the wife's utility. Although the utilities are separate, optimising them still requires a joint decision process within the household. Assuming a cooperative approach, the maximisation problem can be written as (Bourguignon and Chiappori, 1994):

$$\begin{aligned} &\text{maximise } \lambda U_m + (1-\lambda)U_f \\ &\text{subject to } p(c_m + c_f) + Pc + w_m l_m + w_f l_f = y_{full}, \\ &\qquad T = h_m + l_m \text{ and} \\ &\qquad T = h_f + l_f. \end{aligned} \tag{3.3}$$

where,

p is the price of private goods;

P is the price of public goods; and

λ is a function dependent on prices p and P, wages w_m and w_f, and on total income y_{full}, which generates a value between 0 and 1 to weight the utility of each member.

c, c_m, c_f, l_m, l_f are solved as functions of prices p, P, w_m, w_f and total income y_{full} for a given λ. Different values for λ give different Pareto efficient outcomes. However following this approach, the solutions are dependent on the chosen utility function. If a transformation of U is chosen which changes the relative values of utility in the different points for men and women, then different demand functions for c, c_m, c_f, l_m, l_f will result.

In case of egoistic preferences and without any public goods present, the decision process could be separated conditional on the existence of some rule about the sharing of total income. In this case, the demand functions should not be sensitive to a monotone transformation of utility U. For the husband the maximization problem would then look as follows (a similar expression exists for the wife):

$$\begin{aligned} &\text{maximise } U(l_m, c_m) \\ &\text{subject to } c_m + w_m l_m = \theta y_{full}, \\ &\qquad T = h_m + l_m. \end{aligned} \tag{3.4}$$

where θ is a sharing rule which determines which proportion of full income is allocated to the husband.

A popular subclass of cooperative models are Nash bargaining models, where each member in the household has a threat point or reservation utility. These threat points, H_m and H_f for a

husband and wife respectively, represent the minimum level of utility that can be achieved by the husband or wife on their own (perhaps the utility after divorce). In a cooperative model the surplus of cooperation is shared between the members. The maximisation can be written as follows:

$$\begin{aligned} &\text{maximise } (U_m - H_m)(U_f - H_f) \\ &\text{subject to } \mathrm{p}(c_m + c_f) + Pc + w_m l_m + w_f l_f = y_{full}, \\ &\qquad T = h_m + l_m \text{ and} \\ &\qquad T = h_f + l_f. \end{aligned} \tag{3.5}$$

The implication of this model is that each person has to be better off in the household compared to their potential situation outside the household; otherwise the household will break down. It also implies that people with higher utility outside the household have a better bargaining position and can thus secure higher utility levels as a member of the household. However, in this model the individual utilities may still contain the other member's consumption as an argument, so that more power for one of the household members only translates into a (much) worse position for the other members if the more powerful individual has egoistic preferences.

Gustafsson (1993) argues for adaptation of neoclassical models (including bargaining models) to reflect the feminist view. For example, specialisation in housework decreases the threat point (or reservation utility[8]) of an individual in the next period by decreasing their earnings capacity. This means the utility they can achieve on their own after a divorce would be lower. The utility of the person specializing in market work, on the other hand, will suffer much less from a divorce (if we focus on the financial side only). Even if this household starts out on an equal basis, the bargaining power of the person specializing in market work increases over time relative to the person specializing in homemaking, particularly given the fact that in a divorce the children normally go with the homemaker. Economic inefficient outcomes may occur because women, particularly those with higher education levels, who have potentially more to lose, might not have children or fewer children even though the utility of the household would increase from having more children.

Lundberg and Pollak (1993) introduce the 'separate spheres' bargaining model, which differs from divorce threat bargaining models in that the threat point is not divorce but non-

[8] This is the utility that can be obtained by the individual on their own, that is, after a divorce for example (Bourguignon and Chiappori, 1994).

cooperative equilibrium within marriage reflecting traditional gender roles. In empirical work there has been interest in whether social security family transfers made to mothers have different effects from those made to fathers. Neither the neoclassic (Becker) model based on altruism nor the divorce threat bargaining model can explain potential differences in the effects of payments to the mother rather than the father. In the separate spheres model, cash transfer payments can – but need not – imply different equilibrium distributions in existing marriages. In the long run the distributional effects of transfer policies may be substantially altered by changes in the marriage market equilibrium.

3.3 Concerns about the neo-classical approach

Many of the critiques of the neo-classical approach centre on the assumption of a joint utility function and the associated aggregation of individual tastes and preferences. The bargaining models described in section 3.2 are an attempt to develop models that answer these concerns by separately specifying the utility functions of different household members. However a number of commentators have raised broader problems with the Becker approach. Berk (1987, p677) provides a useful summary of this and associated concerns. He notes that the neo-classical approach (or new home economics) has gained a lot of adherents both within the economics discipline and in other social science disciplines, in part because of the lack of persuasive alternatives.

3.3.1 Optimisation and equilibrium

Berk (1987) sees two immediate problems: the assumption of optimisation is not necessarily suitable for a family and second it is not clear whether families are ever in equilibrium.

In the context of the family he opines, utility maximisation is especially problematic. Families are expected to allocate resources optimally. Families are thought to form within a marriage market in which inefficient matches will either not form in the first place, or if they do, will not survive. However to survive, it is not necessary to optimise, only to allocate resources in such a way that a sufficiently high level of utility is obtained. This level of utility may be reasonably close to the maximum, but it depends on the information an individual has on the available choices and the relative benefits each choice brings.

Second, Berk points out that families are subject to constant change and are relatively slow in reacting to changes. In addition, some changes are irreversible, such as for example the number of children, which cannot be reduced in reaction to a sudden increase in the costs of schooling. So often, before some reaction to a situation of disequilibrium can return the

family to equilibrium, further changes will have occurred requiring a new equilibrium. However, the conventional neo-classical utility optimisation models are predicated on the assumption of the existence of equilibrium states.

3.3.2 Modelling home production

Berk raises several other issues to do with the specification of the model. He notes that existing models do not cater well for joint production whereas anecdotal evidence suggests that joint production is widespread (cooking is home production but can also give psychic gratification and be regarded as a leisure activity). The simple model assumes constant returns to scale in the home-production function while common experience often suggests the opposite. For example, cooking for four persons does not take four times as long as cooking for one person.

According to Berk the neo-classical model is an abstraction of the production process, which assumes frictionless interchange between individuals. In practice however there are considerable transaction costs which are not explained. Pollak (1985) has suggested an approach that explicitly deals with transaction costs. This approach focuses on the role of institutions in structuring complex long-term relationships. It generalizes neo-classical theory by recognizing that internal structure and organization matter. It treats the family as a governance structure (rather than a preference ordering augmented by a production technology). The advantages of the family as a governance structure arise from its ability to integrate activities with pre-existing ongoing significant personal relationships. Families also have traditionally provided protection against the economic consequences of uncertain adverse events.

3.3.3 Behavioural underpinnings and generality

Blaug (1992, p209) introduces the concept of *methodological individualism*, in which social phenomena are traced to their foundation in individual behaviour. Individuals act in their own interests. The so-called altruist has family harmony as an important part of his optimisation function. However the justification of altruism explaining what is seemingly selfless behaviour, is nevertheless still founded on individuals making decisions in their own best interest. This approach may be contrasted with that adopted by other social scientists (sociologists, anthropologists and political scientists) who study households as whole units, and aggregations of households (communities) as whole units. Their behaviour is explained not by aggregating up from the individual but by considering the characteristics of the

aggregated unit of observation. While macroeconomic analysis also envisages aggregate entities as economic agents there has been limited development of macroeconomic models of household or community.

On a general level Blaug (p226) notes that the household production model is so formulated as to be compatible with almost any finding. The ability to explain observed phenomena does not derive from the model but from assumptions about elasticities, about the form of functions and so on, which drive the model. For instance in order to combine market goods and services purchased with the own time and skills of household members into a single aggregate of 'full income', it is assumed that the household's technology exhibits constant returns to scale and no joint production. Dropping the assumption of constant returns to scale and allowing for joint production, as well as the multiplicity of traits by which family members differ, allows almost any observed partnering choice to be explained.

Blaug is concerned that the model does not incorporate changes in taste over time or differences between people since such changes and differences can account for almost any behaviour that might be observed. The problem he highlights, is that the model is empty. It can explain behaviour, but so too can a myriad other models. To provide a powerful tool for social sciences the model needs to uniquely explain behaviour. Blaug acknowledges that with further development and enhancement this may be achieved.

Reflection on Blaug's critique leaves one with the impression that rather than consider the neo-classical model as a model to explain family behaviour, it should be regarded as a framework within which models may be constructed to explain behaviour. Indeed Blaug stylises it as a research program with much 'work to be done'.

4. Empirical studies in economics

While the previous section has outlined a theoretical framework for the study of families and phenomena associated with families, very few empirical studies overseas or in Australia have used this framework explicitly. However many of these studies can be viewed as partial models of some aspect of family functioning in which there is an underlying but unstated utility maximisation problem similar to those discussed in the previous section. In discussing the empirical work no attempt is made to relate the partial models to the underlying family objective functions.

The first subsection considers social norms. They are usually not explicitly included in economic models, but play a role through preference parameters. Therefore, preferences may

change through time with changing social norms. Two exactly identical persons, one born in 1910 and the other in 1970 may behave very differently. This can be explained by a shift in preferences induced by a shift in social norms, which is however implicit rather than explicit in the model. The following subsections deal with family issues such as marriage, fertility, home production and intra-family transfers.

4.1 Norms regarding family and work

A body of research concerning social norms has developed from surveys of householder attitudes towards economic and social phenomena. While it is accepted that there is a gap between self-reported data (what people say) and observed behaviour (what people do) nevertheless attitudinal data is a powerful tool for studying social norms and differences in norms between communities and over time. The correlation between attitudes and observed behaviour may be very strong or it may be very weak depending on the nature of the material of interest. It is always incumbent on the researcher to be cautious about inferences from self-reported data particularly where this relationship is known to be fragile. However in the following discussion it is believed that, in the main, the reported attitudes of individuals provide a strong indicator of behaviour.

4.1.1 Fertility

Using the International Social Science Survey of Australia (ISSSA)[9] Vandenheuvel (1991) reports that the majority (85 percent) of respondents still see marriage as the preferred life style. Regarding the number of children, less than 2 percent named no or one child as the ideal number. Interestingly, men saw more positive values in having children than women, perhaps because men generally have to give up less than women to have children. Gustafsson (1993) explains how women may have fewer children than optimal for the household's utility, because of the unequal division of the gain in utility. However Evans and Kelley (1999) found no gender difference in family size ideals. Seven years later, using the 1996/1997 ISSSA, Evans (2001) finds that 7 percent of Australians prefer to be childless. Disaggregating this number by birth cohort, it is found that only 3 percent of those born before 1929 would have preferred to remain childless, whereas this increases to 9 percent for

[9] The nearly-annual series of the ISSSA began life as the National Social Science Survey in 1984; now incorporated as a module in the ISSSA. The ISSSA is a nearly annual survey of respondents from around 2500 households. While most surveys carry questions about family in 1989 in particular, questions were asked on attitudes towards marriage, family, and working mothers. Much of the material here draws on this and other surveys of the IsssA. For more detail on the ISSSA see Kelley and Evans, 1999

those born in the 1960s. Actual numbers of people remaining childless are higher and are projected to be between 27 to 31 percent for those born in the 1960s, up from 13 percent for the cohort born before 1929. This trend is also clear from the time series on fertility presented in Section 2.

4.1.2 Employment of mothers

The ideal of life-long full-time homemaking for women no longer holds sway in the Australian population. Instead most mothers are full-time homemakers when their children are young. As the youngest children go to school, Australian mothers return to paid employment. Inferring from age effects net of many controls, Evans and Mason (1996) argue that liberalisation of gender role attitudes has been occurring across the 20th century, with the greatest change appearing to occur in the early decades of the century. By the middle 1980s, Evans (1988: Chart 1) found in ISSSA that large majorities of women (over 80 percent) would prefer to work full-time as singles and as newly-weds, then (77 percent) to stay home when there are children under school age, then (65 percent) to work part-time while the children are at school. There was more diversity of opinion about the "empty nest" stage, with only a small minority preferring full-time homemaking, and the rest fairly evenly divided between part-time and full-time employment.

From a slightly different angle, generalised approval of married women's employment in a question not mentioning children had risen to a majority, and the claim that "A married woman should not attach too much importance to a career" only elicited agreement from 25 percent of the population (Evans 1989: Chart 1). Using later ISSSA data, Vandenheuvel (1991) reported that that the majority of mothers believes women have the right to be concerned with their own careers, even if there will be some negative effect on children and family. However, the majority believed that new mothers should be homemakers (66 percent of men and 62 percent of women). Fewer than 4 percent thought full-time work was the preferred option. ISSSA data also reveal that the percentage believing that new mothers ought to be homemakers fluctuated between 65 percent and 70 percent during the 1990s in the general population (Evans 1995; 2000: Figure 7) and remained at about 70 percent among mothers in 2001 (Evans and Kelley 2001: Table 1). However, the answers of young women were somewhat different, only 53 percent see full-time homemaking as ideal. Nonetheless, full-time work for mothers of small children is seen as ideal by just 5 percent of women born in the 1960s and by 9 percent of women born in the 1970s

4.2 Marriage and fertility decisions

In labour supply research a considerable amount of attention has been paid to labour supply over the life cycle, in particular for women, where the presence of children and a (working) partner is a major determining factor in the decision to work and how many hours to work. Often this is restricted to including the number of children or marital status as explanatory variables in an equation explaining labour supply. This can lead to interesting studies such as Hamermesh's (2000) analysis of the jointness in spouses' leisure time and the effect the birth of the first or an additional child has on this jointness. He finds that there is jointness, which is reduced by the presence of children. In addition, he identifies who is changing their work schedule most. Not surprisingly, the answer is new mothers. Although he analyses the effect of changes in the number of children from one year to the other, the number of children and the arrival of additional children is taken as given. In the following subsections we focus on studies where marriage and fertility choices are the main issue.

4.2.1 Women on welfare payments

Several studies have examined marriage and fertility choices trying to explain these decisions. For example, marriage and fertility decisions are estimated for women who start out on welfare payments in the U.S. (Grogger and Bronars, 2001). The effect of the generosity of welfare payments on the duration until the first marriage and on the duration until the birth of the next child, is analysed. Welfare payments differ between states, however the model assumes that welfare payments are exogenous and no movement takes place towards states with higher benefit levels. Additionally, no account is taken of the possibility that labour supply may be affected as well. Conditional on this, the authors find that white mothers postpone their first marriage and black mothers hasten their next birth. The effects are very small. No evidence is found of an effect from increased benefits as a result of larger family size after an additional child is born. Fitzgerald (1991) follows up on this result, also found in other research, that white sole mothers are more likely to exit through marriage than black sole mothers (exit through employment is similar for both groups). He analyses the possibility that black mothers' marriage prospects are poorer due to the lack of potential spouses with sufficient income. Neither the ratio of available potential spouses to the number of single women nor the ratio of employed single men to single men are important in the exit rates of black mothers, contradicting the idea that a poor marriage market is the cause for lower exits through marriage of black mothers on welfare.

In the U.S., a large number of papers have been written on marriage and birth rates for sole mothers given the incentives of the welfare system, which is generous to sole mothers compared to the available programs for other groups. Examples are Moffitt (2001), who finds a small effect of welfare benefits on female headship (defined as women who are not married, with children) using time-series data, which is consistent with the wide range of mostly positive effects found using cross-section data.

Lefebvre and Merrigan (1998) find similar results of welfare benefits for Canadian sole parents on marriage rates, and additionally they find that higher welfare benefits available to couples with children increase the probability of marriage. Their study is not restricted to sole parents who are dependent on welfare benefits. A U.S. study based on all young women aged 16 to 24, examines the influence of labour market (for men and women) and marriage market conditions on female marriage decisions over time (Blau, Kahn and Waldfogel, 2000). They find, as one would expect, that better female marriage markets, worse female labour markets and better male labour markets all increase marriage rates for white women (the results for black women are not robust for this age group, but for the 25 to 34 age group somewhat stronger results are obtained). Welfare benefits decrease the marriage rate, however this effect disappears largely in the fixed effect specification.

4.2.2 Employment of mothers

A different line of research focuses on the probability of women working in general rather than concentrating on women in receipt of welfare payments only. Persistence with regard to labour force participation has not changed much over time (that is persistence in being a worker and persistence in being a non-worker), however the number of persistent workers (rather than non-workers) did increase from 1967 to 1987, from about 27 to 51 percent of all married women (Shaw, 1994). This resulted from fewer women dropping out of employment after marriage, even after childbirth (short-term hours reductions make this feasible).

A similar persistence is found in Shapiro and Mott (1994) and Dex et al. (1998). Shapiro and Mott look at the employment behaviour of women around their first childbirth and find it has an effect on subsequent labour force behaviour (even 14 to 19 years after the first birth an effect is still visible, although it is somewhat smaller than at first) and on wage rates. The question is whether the effects of this behaviour of the most strongly attached women can be extrapolated to other women, if they could be induced to remain in the labour force by better maternal leave policies? Similarly, Dex et al. (1998) find a propensity (unexplained) to either

stay in or out of the labour force, even after controlling for a wide range of observable factors in the labour force participation decision. There is however evidence of large differences between highly educated, high-wage women and lowly educated, low-wage women. The former group is more likely to have continuous employment, and delaying childbirth does not seem that important. For low-wage, lowly educated women, a delay in the first childbirth lowers the chances of continuous employment.

The increase in female labour force participation has been highest for women married to high-wage men, whereas the slowdown in earnings was highest for low-wage men (Juhn and Murphy, 1997). This increase in participation can therefore not be explained as a compensation for the lower earnings growth of their husbands.

4.2.3 Occupational choice of women

Although women may stay in employment more often after childbirth now than they did in the past, they may also choose different types of jobs than men to accommodate their family responsibilities. However, an interesting alternative explanation for occupational segregation according to gender is provided by Badgett and Folbre (1999). They argue that it might not just be caused by family responsibilities, which are more easily accommodated in some types of jobs (which are then, as a result, favoured by women). They hypothesize that gender nonconforming occupations reduce the attractiveness of both men and women. As a result choosing gender nonconforming occupations may penalize individuals in the marriage market. This hypothesis is tested with the generation of a large number of personal advertisements by combining eight characteristics in several (random) ways. These personal advertisements were then put before a sample of about 500 students, who were asked to rank the response they thought the advertisement would receive. From a regression of all the different characteristics on the rating it was found that individuals in nonconforming occupations are expected to get fewer responses to their advertisement.

In addition to different types of jobs, mothers may experience lower wage growth than others as a result of the fact that they need to spend more time and effort in unpaid work at home. This is supported by the explanation of Becker (1985) that everyone has a limited amount of energy available. If more energy is spent outside the labour market, less energy is available for labour market activities. Thus as one would expect, Waldfogel (1995) finds that the gap between male and female earnings is much larger for mothers (38 percent) than for non-mothers (16 percent). This is largely due to the effect of family status (both direct and

indirect by women with family responsibilities taking more time out of the labour market). Human capital was important but unobserved heterogeneity not (that is, differences in motivation or other unobserved attributes do not seem to explain much). Nevertheless a large part of the child penalties remains to be explained, perhaps by differences in effort (supporting the theory of Becker (1985) on the allocation of energy), discrimination, or opportunities.

4.2.4 Endogeneity of fertility and marital status

Lately, the importance of treating marital status and number of children as endogenous factors together with the work decision has become more acknowledged. Finding data on labour supply, marriage decisions and fertility decisions and then setting up models taking the endogeneity of several variables into account can be complicated and sometimes impossible. Ideally, such analyses require detailed longitudinal data with information on labour supply, marital status and number of children at different points in a person's life cycle.

In one of the earlier studies on fertility, female labour supply and wages, Moffitt (1984) addresses the jointness of these three variables and their changing patterns over the life cycle. The presence of children often is not a random event but a well-planned decision taken together with the decision on labour supply. Furthermore, women with lower wage levels may be more likely to have children but vice versa, having children (and reducing time in the labour market) may reduce wage growth as well, which means the causal relationship may run both ways. Moffitt looks at the time path of the above three endogenous variables and finds that shifts in the wage path leads to shifts in the fertility profile (slightly lower path for higher wage paths) and shifts in the employment path (higher path for higher wage paths).

Few papers look at all three components. However looking at two components at a time, researchers find that accounting for the endogeneity of additional factors changes estimated results. Thus family formation can be important when looking at economic issues. Van der Klaauw (1996) finds that accounting for the simultaneity of the labour supply decision and the marriage/divorce decision of women leads to higher estimated wage effects on female labour supply. This study has potentially 17 years of data on labour supply and marital status of young women (between 29 and 36 years old in the final year of the data). On average 13 years of data are available for each woman. The model evaluates the utility of marriage and labour supply at several points in time using an estimated earnings function for the woman

and an earnings function for a (potential) husband. Account is also taken of the different arrival rates of marriage opportunities for different women.

The increasing divorce rate has been at least partly attributed to an increase in economic independence of women over the past few decades. However, it could be argued that the causal relation works in both directions: with divorce more prevalent, women might re-enter the labour market or become the primary wage earner instead of the second wage earner. In addition, women might be more cautious about giving up paid employment in favour of full-time homemaking when divorce rates are high. Ressler and Waters (2000) analyse divorce rate and female earnings[10] by (U.S.) state for the years 1960, 1970, 1980 and 1990 in a simultaneous equations model, allowing the causal relation to go in either direction. They find that divorce and female earnings are indeed jointly endogenous, and that there exists a two-way causal relationship. Not accounting for the simultaneity of these two variables could overstate for example the effect of earnings on divorce. They argue that women with higher earnings are typically higher educated and thus more able to end an unsatisfactory marriage. Over time the effect of earnings on divorce has decreased.

4.3 Home production

To assess the welfare of a household correctly, home production should be taken into account. If one of the household members is a full-time homemaker, non-financial advantages are present which may increase the welfare of a household. Services and goods that households without a full-time homemaker need to purchase in the market could be produced at home.

Becker (1965) assumes that households maximize a utility function where the arguments are both market produced and home-produced commodities. Both types of commodity combine household resources of time and money; however the market good usually requires less time and more money, whereas the home-produced good requires less money and more time. The utility function is therefore maximised subject to a time constraint, an income constraint and a technology function, indicating how a good can be produced (see 3.1.1, equation (3.2)). The lack of data on home-produced goods means that the effects on behaviour resulting from preferences and technology cannot be disentangled.

[10] Female earnings are defined as median female income of full-time year-round workers, divided by the U.S. Gross Domestic Product Price deflator.

4.3.1 Time-use studies

To examine home production properly, time-use data are necessary to provide information on the time spent in various activities. For example, Joyce and Stewart (1999) suggest a sequence of time-use surveys may answer whether in times of recession people shift from market goods to home-produced goods.

Bitmann et al. (1998) undertook an analysis with Australian data at two points in time, utilising an expenditure survey and a corresponding time-use survey. They compared expenditure on domestic outsourcing in 1984 and 1994. They expected that an increase in female labour force participation (and the reluctance of men to do more unpaid work at home) would lead to an increase in outsourcing of domestic tasks. They found the largest increases in expenditures on food preparation and childcare. However real expenditure on outsourced cleaning and the amount of time spent cleaning had remained constant.

Examination of time-use surveys for the same years, revealed the increase in spending on childcare did not mean that people were spending less time with their children in 1994 compared to 1984. In fact, time spent with children increased by a small though significant amount. This was possible because time spent in other areas, food preparation, laundry and clothes care, had decreased. No doubt technological changes have helped enable a reduction in time on these activities at home.

Models that analyse the effect of taxation reforms on the income of families without accounting for home production leave out part of the welfare of families generated by home-produced goods. Apps (1994) compares the results from two models of Australian female labour supply and housework: one defining women's time spent in home production as a separate activity and the other including women's home-production time in women's leisure time. She assumes that home-produced and market goods are perfect substitutes and that home-produced goods are valued at the time it takes to produce them multiplied by the woman's net market wage rate. Data on labour supply and data on home production are available from two separate surveys. A housework equation is estimated from the time-use survey. Imputed hours of housework are then generated for each observation in the other survey and used in the demand for leisure and consumption equations. Under these assumptions, she finds the second model (which does not distinguish home production) overstates the distributional merits of policies disadvantaging employed married women. Women in larger families and with younger children spend more time doing housework, and (in the home-production model) generate more welfare for the family.

4.3.2 Multiple utility functions within the family

Pollak (1999) points out that models that rely on household utility instead of individual utilities for two-person households are likely to misinterpret important effects. In the household utility models, expenditure and time-use patterns should not be influenced by which of the household members is in control of the resources. However this is rejected by empirical evidence. Apps and Rees (1996, 1997) address this issue by incorporating home production in a collective labour supply model allowing the individuals in a household to have distinct utility functions. Instead of obtaining a transfer model, where one individual receives large transfers of consumption from the other individual and may seem parasitic, they set up an exchange model, where an interpersonal exchange of production of homemade goods and consumption takes place. This provides a plausible economic explanation of why transfers between individuals take place. First of all, accounting for home-production time reduces the seemingly large consumption of leisure by the person working at home in housework and secondly, valuing the output of home production means it can now be included in the full income[11]. The empirical results from the exchange model present much smaller wage and income elasticities than the model without home production. This means for example that people are less sensitive to lower income tax rates than would appear from a model without home production.

Often (as in the above paragraphs) it is assumed that total consumption is the sum of output of the home-production process and market expenditures, and that home-produced and market goods are perfect substitutes (that is preferences for home-produced or market goods do not play a role). An alternative is to construct a reduced form utility function, which is dependent on goods (consumption) and on time spent on different activities (including home production). The utility function is reduced form because the effect of technology and preferences cannot be separated. Kooreman and Kapteyn (1987) distinguish seven different activities in a study based on a reduced form model. They show that small changes in the aggregate time use may disguise larger movements in the separate components. For example, male leisure is quite unresponsive to female wage rates, but time spent on organized activities, hobbies and sports increases quite substantially, whereas time spent on entertainment, and social activities decreases to some extent.

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[11] Assumptions are needed in the valuation of home production. Here, the price of home-produced goods is assumed to depend on the market wage or reservation wage of the individual producing the good.

4.3.3 Unpaid, on-call and parallel activities

The time spent on eight unpaid activities is examined by Williams (1999). He found that female wage rates are an important factor in determining what sort of unpaid work is done and who does it. Women spend less time in unpaid work if their wage is higher and more time if there are children (particularly pre-school children). Men spend more time on cooking, general housework and home maintenance if the female wage rate is higher and more time on child care if there are pre-school children. Williams and Donath (1994) found a similar result looking at aggregate unpaid work. Their model was limited by the lack of information on the presence of durable goods. Information about durables would allow the effect of contracting out to be distinguished and would explain reductions in time spent on unpaid work due to technological improvements.

Pollak (1999) and Joyce and Stewart (1999) make it clear that including home production is not straightforward. First of all, the commodities produced need to be identified and valued (what wage rate should be chosen for the time used in home production?). Second, in the collection and analysis of time-use data simultaneous activities raise problems. Pollak (1999) suggests a distinction should be made between on-call (caring for a sleeping child while doing other housework) and parallel (driving and listening) activities. The most important combinations can be treated as separate compound activities. The number of categories needs to remain manageable however. Third, a home-production process may generate more than one output, for example if someone enjoys cooking, the output can be a home cooked meal and time spent cooking. In most cases (unless there is no joint production and the household technology exhibits constant returns to scale), commodity shadow prices depend on preferences (likes and dislikes of activities), on prices of market goods, on wage rates, and the parameters of household technology. Williams and Donath (1994) use data on Australian households where simultaneous activities are recorded. They use an approach where one accounts for the less intense input of time when attention is divided between different activities. Although it is known which activity is the primary activity and which the secondary activity, they argue after estimating the weight for each activity, that the empirical results suggest that the input hours on an activity should be divided by the number of activities undertaken at the same time. This gives each activity an equal weight, but the results are quite insensitive to the treatment of secondary time.

Longitudinal data would help identify the relation between time use and the purchase of goods by providing price variations (Kooreman and Kapteyn, 1987). This data should ideally contain information on time use, household production, stock of durables and consumption.

4.4 Intra-family transfers

Two types of intra-family transfers may be distinguished in the literature. The first is between independent households that are however blood related. This type includes transfers from parents to children (for example when helping with the buying of a house) and from children to parents (when for example, parents are living close to their children in a "granny flat"). The second type of transfers relates to the distribution of consumption over the members within a single household. For example is there a difference in how income is spent, depending on who receives it? For both types, transfers can be in time or money. The two types of transfers are discussed in the following two subsections.

4.4.1 Transfers between households

The first type seems less relevant to Australian families then the second one. Most articles on this type of transfer relate to developing countries, where, in the absence of national provisions like old age pensions, older people often need to be supported by their children. King and McDonald (1999) find receipt and provision of transfers in Australia occur only at a rate of 5 to 10 percent (and this includes inheritances). Financial transfers are most likely to happen between the better-off families, while transfers of care occur more frequently among the lower income groups. U.S. research (McGarry and Schoeni 1995b), however, has found that time and financial transfers from children to parents occur quite frequently. These transfers are more likely to occur and involve larger amounts when the parents have lower incomes.

The Australian results are mostly from univariate analysis of the 1992 Family Survey by the ABS. The personal characteristics of both the provider and recipient are only known when the provider and recipient are part of the same household. The lack of detail precludes the use of multivariate analyses of transfers (like those by McGarry and Schoeni) with Australian data. However, deeper analysis of the Australian data would be useful to gain insight in the timing and reasons for transfers.

With the increased prevalence of superannuation and the Australian system of Age Pension payments, Australians should not need children to provide for them in their old age, so one would expect fewer of these transfers to take place. Some support for this is provided by

King and McDonald (1999), who find that Australian individuals between 35 and 74 years old are more likely to be providers than recipients of transfers, indicating that many older people are still helping others rather than being helped. For those over 75 years transfers are most likely to be in the form of personal care and home help. Further support for the idea that social security replaces the old-age provision function of children is found in a macro-economic analysis by Cigno and Rosati (1997). They suggest that the social security system, the capital market and the extended family are all ways to make life-cycle adjustments (that is transfers from prime-aged individuals to old-age parents and children). Evidence from Japan (and from Germany, Italy, the U.K. and the U.S. in earlier articles) support the idea that changes/introduction of a social security system affect the deployment of the other methods of life-cycle adjustment.

In Australia, there is anecdotal evidence of transfers from parents to children when the children start setting up their own households. As far as we know this has not been subject to empirical research in Australia. In the U.S., some supporting evidence is found by McGarry and Schoeni (1995a, 1995b) in a study of older people. Information is available on the occurrence of transfers of more than US$500 to the respondent's children during the past year. They find that more and larger transfers are made to the less-well-off children within the family, to younger children, to children who live nearby and to children who own a home (indicating some transfers may be made to help with the purchase of a home). Interestingly, no evidence is found for a relationship between help provided by the children to the parents and financial transfers from the parents to the children (now or in the past). There is, however, some evidence of a positive (small) correlation between current financial transfers and whether the respondent thinks the child will provide help in the future. Thus it seems that overall the transfers are not driven by self-interest of the parents.

Further U.S. evidence for parent-to-child transfers is found by Rosenzweig and Wolpin (1988). They examine transfers (in the form of financial transfers or shared residence) from parents to young adult sons (18 to 30 years old), many of whom invest in human capital through schooling or in the labour market. These transfers are found to be at least as important as governmental transfers. The transfers are conditional on the sons making human capital investments and are seen to help smooth the young men's consumption over time.

4.4.2 Transfers within a household (intra-household transfers)

Transfers within a family belonging to the same household is particularly relevant in relation to the choice by government to whom family payments should be paid. Foreman and Wilson (1995) examined financial arrangements within families for family allowance or family payments recipients who had a partner on Job Search, Newstart or Sickness allowance in 1992 or 1993 and family payment recipients in 1994. They found that finances are often controlled jointly, and that in particular for low-income households, the wife's role in day-to-day financial management is large. The husband's role is more important in higher income families especially when the wife is not in paid employment. The evidence in this article however cannot be used to identify whether income is spent in different ways depending on who receives and controls the income. Unfortunately, little data is available on the individual's consumption within households and so this is a little-researched topic. The lack of suitable data is noted by the few articles on this topic (Browning et al. 1994, Apps and Rees 1996).

Even if data were available, the estimation of how income is shared in the household is not straightforward. For example, it is necessary to assign consumption to individual household members and allow for substitution effects between consumption and labour supply. Browning et al. (1994) estimate a collective model where the individual rather than the household as a whole acts as the decision-making unit. To illustrate the relevance of using a collective rather than a unitary utility function they look at the expenditure on clothing in a couple without children where both members work full-time (the latter selection means that for this group there is no substitution between consumption and labour supply, furthermore it is assumed that selection into this group is exogenous). Clothing clearly is a private good, which means it can easily be assigned to one of the two persons in the household. Many other consumption goods are more difficult to assign. The results indicate that the relative age of the members is important (older members have a larger expenditure share), as is the relative income (a larger share in the household income earned by the member means a larger share in the expenditure). Finally the wife has a larger share when total household expenditure is higher.

This clearly is an interesting result indicating the importance of the amount of income earned by each member. However, estimating a similar model for the share of expenditure on food and schooling for children in a diverse range of household types (allowing for working and non-working members), which would be relevant for policy making, is much more

complicated. The above example by Browning et al. has been constructed in such a way that the problem is simplified and although it tackles an interesting issue, more work is needed to make it useful from a policy perspective. Apps and Rees (2000) have started this complicated task using Australian data. From their paper, it is clear that several assumptions have to be made to set up a model where all members (including children) are treated as individuals with their own utility function. In their model the cost of a child is defined as the amount of consumption allocated to the child, which is the outcome of the choice of an intra-family distribution of consumption. Consumption incorporates time costs of childcare and domestic work. They find that time transfers to the child are largely those of the female partner and that in non-traditional households (where the female partner works more than 500 hours per annum) there are higher (financial) transfers to the child from the employed mother substituting domestic goods with market goods.

Phipps (1999) reviews the literature to find whether the child's well-being is dependent on which parent is receiving extra cash or whether support is directed towards the child directly (for example through provision of school lunches). Few studies are concerned with the children's consumption, but rather focus on either parents or on the household as a whole. Phipps states that from research in developing countries there is evidence that increases in the mother's income will benefit children more than increases in the father's income.

As a result of the replacement of a tax exemption for children by a family allowance benefit in the late 1970's in the U.K., a natural experiment occurred, which facilitated analysis of this issue. The change meant that income was shifted from fathers to mothers. At the same time a shift from expenditure on men's clothing to expenditure on children's clothing was observed (Lundberg, Pollak and Wales, 1997). Thus it appears that in the U.K., mothers also spend more of their income share on children's consumption than do fathers.

In the U.S., where there are both cash and in-kind transfers to families with children, Currie (1995) concludes that in-kind transfers seem most effective in increasing children's well-being, since cash transfers are likely to be only partly spent on children's consumption. In fact, there is not even a guarantee that it will benefit the children in a family, whereas the provision of a warm lunch at school will, with certainty, improve children's well being. The downside of such a system is the paternalistic nature of such transfers, that is, the consumption of these families is restricted to what other people think is best for them.

From this review of research on intra-family transfers, we conclude that in Australia more research should be done on the ABS 1992 Family Survey and the survey for the Australian Living Standards Study 1991-92 (undertaken by the Australian Institute of Family Studies), the two data sets that contain information on intra family transfers. So far, little multivariate analysis has been done to answer the question why and when transfers occur. The Household, Income and Labour Dynamics in Australia (or HILDA) Survey contains a variable indicating the amount of income received from parents in the last financial year and it has some information on the amount of time spent caring for elderly parents and disabled adult relatives. This would allow researchers to examine more recent developments for particular categories of intra-family transfers.

5. Concluding comments

We undertake two tasks in this final section. We explore what has been learned about theory and applications in economic approaches to the family and we make some suggestions for future research in relation to the family.

5.1 Summary of existing research

Economics typically starts with a theory of the way people behave. While motivated by observation or intuition from application elsewhere, theory is initially abstract, general and much simplified in relation to reality. Thus, we cannot expect it to adequately explain all possible empirical observation. A better approach is to see theory as providing a framework for understanding. From this point of view the Becker models outlined in section three, are consistent with many developments we see in family life. They need to be tested more rigorously and await an appropriate data set. It is also possible and desirable to extend and develop them to portray families and family life more accurately.

The empirical work drawn from the economic literature and described in section four does not draw explicitly on the theory of section three though many of the applications can be seen as reduced forms of equation systems similar to those defined in section three. The economic literature is largely focussed around the labour market with marriage and fertility decisions related to participation of partners. The review identifies models, which include home production and are concerned with decisions about marriage, fertility and workforce participation. This is partly a reflection of the focus of economic models that generally have been concerned with aspects of behaviour that are measurable (in money terms).

Some of the results from the empirical section are listed here. Welfare payments have only a small, if any, effect on the probability of marriage and childbirth of sole mothers in the U.S. and Canada. There is a high correlation between labour market behaviour around childbirth and later labour market behaviour, that is, there is a large persistence in being in the labour market and a persistence in being out of the labour force. Accounting for the simultaneity of decisions in labour supply and marriage/divorce shows that there is a two-way causal relationship. Ignoring this simultaneity would result in biased estimates of effects. Empirical studies that incorporate home production show that this is complicated and needs detailed data, which is often unavailable. As a result strong assumptions need to be made. Models that include home production may however lead to different conclusions than models that do not include home production. An Australian study found that households are less sensitive to the level of tax rates in a model including home production. Finally, looking at intra-family transfers, there is some evidence in Australia, the U.K. and the U.S. that children's consumption benefits more where family income is received by the mother.

5.2 Future work

The studies reviewed show that family formation and family function are relevant to economic research. However, a dominant theme in the discussion of family research has been the paucity of data to support the models outlined in section three. In part this will be alleviated by the availability of longitudinal data on families from two major new surveys recently commissioned by FaCS. The first of these is the Household income and labour dynamics of Australia (HILDA) survey being run by the Melbourne Institute in association with the Institute of Family Studies and The Australia Council for Education Research with the first wave of annual collections of data becoming available in 2002. As its name suggests this survey will obtain detailed data about family income and employment. The second is the Longitudinal Survey of Australian Children. The lead organisation for this survey is the Australian Institute of Family Studies and this survey will provide information with a major focus on understanding early childhood development.[12]

The review has considered the development of economic theories of the family. While many interesting and important issues may be, and have been, explored without formulating an

[12] More information about the HILDA survey is available from the Melbourne Institute website (www.melbourneinstitute.com) while for the childhood survey see the FaCS website (www.facs.gov.au) and follow appropriate links.

explicit theory, the application of theory does help explain and contextualise family formation and function. Much remains to be done. This should include the testing of existing models – how does the basic single family utility function stand up in comparison with bargaining models in which partners maximise individual utility functions; how important is it to include home production in the model – as well as the development of more complicated models. The availability of data such as that emanating from HILDA may provide the opportunity to apply Becker type models in a more rigorous way.

While the development of theory and the issue of adequate data are pervasive concerns for researchers, the review of the empirical literature has raised a number of areas, in which further research would be desirable as well.

There are few existing models that allow for substitution (or complementarity) between home and market production and as discussed in section 4.3, these are subject to strong assumptions. However, home production is a major resource for families and the importance of market or other income would be considerably less, if the value of this production were brought to account. For instance if goods and services produced at home are valued according to the price they would fetch if sold in the market the total value would be of the order of 40 percent of the value of goods and services included in national accounts (Ironmonger 2000).[13] Thus, with shifts in income levels, the degree and nature of home production might be expected to adjust to smooth the total level of family consumption.

Interactions between family structure and labour market behaviour and recognition of the simultaneous nature of decisions on family formation and employment are critical to research in this area.

The survey has yielded little discussion or evidence of sharing within families. Many existing and past studies assume the family acts as a single unit. The development of approaches that recognise husbands and wives (and also children) have different objectives such as the bargaining models of section three are a first step towards an understanding of arrangements within families. However with few exceptions, explicit sharing within families is not recognised in most studies and may be difficult to achieve.

The statistics presented in Section 2 reveal increasing longevity, increased numbers of singles

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[13] The true value is likely to be less than indicated because the market price would adjust with such a large extra volume of production.

and couples without children, falling marriage rates and increased rates of divorce, and falling fertility. In sum they represent dramatic change in the structure of Australian families. The economic theory suggests that these trends can be explained, at least in part, by families maximising utility subject to constraints on expenditure and time. While empirical work in this area has only recently started, the evidence seems to support the theory. However further research is needed to explore these issues with Australian data and to develop and extend the theory to cover more complicated circumstances.

There are a number of areas in which intergenerational aspects are important in family policy. For instance we have mentioned support between households or families including support by children of elderly parents and support by parents of children (provision of monetary support or in-kind support such as childcare). The extent of intergenerational transfers and the implications of reforms to wealth, gift and death duties could be further explored.

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